VAS 2025 PADOVA

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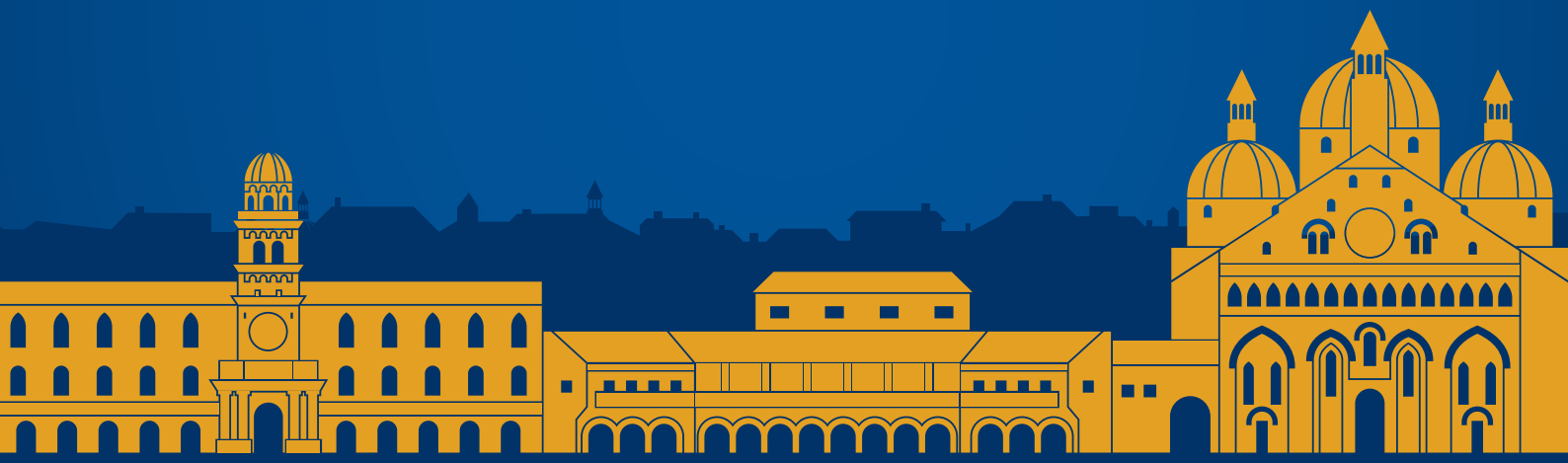

Theme of the VAS 2025 Congress:
Dialysis access, a multidisciplinary perspective

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[1]University Medical Center Ljubljana, Ljubljana, Slovenia; [2]University of Ljubljana, Ljubljana, Slovenia

Best Oral Presentation Award, 2nd prize

The single cell landscape of the human vein after arteriovenous fistula creation and implications for maturation failure (ID 35)

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[1]Maastricht University Medical Center+, Maastricht, Netherlands; [2]Leiden University Medical Center, Leiden, Netherlands; [3]Maastricht University, Maastricht, Netherlands

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Ben Edgar[1,2], Karen Stevenson[2], Emma Aitken[2], Peter Thomson[2], David Kingsmore[1,2]

[1]University of Glasgow, Glasgow, United Kingdom; [2]Queen Elizabeth University Hospital, Glasgow, United Kingdom

BEST POSTER AWARDS

Best Poster Award, 3rd prize

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Amel Mekroud
University of Bejaia, Bejaia, Algeria. University Hospital of Bejaia, Bejaia, Algeria

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[1]Hospital Rede Casa, Rio de Janeiro, Brazil; [2]Hospital Federal Servidores do Estado, Rio de Janeiro, Brazil; [3]Clinique Jouvenet, Paris, France; [4]IDOMED, Rio de Janeiro, Brazil; [5]Universidade Federal da Bahia, Vitoria da Conquista, Brazil; [6]Hospital Universitario Clementino Fraga Filho., Rio de Janeiro, Brazil; [7]Hospital Federal de Bonsucesso, Rio de Janeiro, Brazil

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Jakob Gubenšek
Center for Acute and Complicated Dialysis and Vascular Access, Department of Nephrology, University Medical Center Ljubljana, Ljubljana, Slovenia. Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

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Ben Edgar[1,2], Karen Stevenson[2], Emma Aitken[2], Andrew Jackson[2], Shannon Thomas[3], Snoeijs Maarten[4], Marco Franchin[5], Matteo Tozzi[5], David Kingsmore[1,2]
[1]University of Glasgow, Glasgow, United Kingdom; [2]Queen Elizabeth University Hospital, Glasgow, United Kingdom; [3]Prince of Wales Hospital, Sydney, Australia; [4]Maastricht University Medical Centre, Maastricht, Netherlands. [5]University of Insubria, Varese, Italy

Best Poster Award, presented by a fellow. 1st prize

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[1]Department of Nephrology, Herlev, Denmark;[2]Department of Nephrology, Roskilde, Denmark; [3]Department of Nephrology, Holbaek, Denmark; [4]Department of cardiovascular and renal research, Odense, Denmark; [5]Department of Nephrology, Copenhagen, Denmark; [6]Department of Vascular Surgery, Copenhagen, Denmark; [7]Department of Nephrology, Hilleroed, Denmark

ORAL PRESENTATIONS

Arteriovenous fistula

Innovative and unconventional techniques to accelerate maturation of distal fistulas (ID 161)

Tomasz Gołębiowski
Wroclaw Medical University, Wroclaw, Poland

Abstract

The most common form of vascular access for haemodialysis is a native arteriovenous fistula (AVF), which connects the artery to the end of the vein. The maturity of the fistula is an important step in establishing functional vascular access. It is a complex process that involves changes in both the artery and the vein, characterised by vessels dilatation and an increase in blood flow. Over 80% of patients suffering from end-stage renal disease (ESRD) started hemodialysis (HD) with a catheter because of the lack of an AVF or the inability to cannulate one. A prolonged maturation time is typically associated with conditions that occur prior to AVF formation, such as vein destruction and radial artery (RA) atherosclerosis. Usually, two types of techniques are used for accelerating AVF maturation. Endovascular or open repair may be performed, depending on the underlying cause. During the lecture, I will describe unique strategies to accelerate of AVF maturation that have been published by our team in last two years.

1. Radial artery deviation and reimplantation (RADAR) to accelerate the maturation of radial-cephalic fistulas for hemodialysis in patients with end-stage renal disease. Journal of Clinical Medicine, 2023.
2. The role of a distal forearm perforating vein and deep vein system in supporting patency of a snuffbox fistula - A case report. J Vasc Surg Cases Innov Tech. 2024.
3. The forearm's subcutaneous venous network to accelerate maturation of native arteriovenous fistula - a case report. Case Reports in Nephrology and Dialysis, 2025.

The first manuscript describes the RADAR technique in specific cases of radial artery stenosis, the second discusses the importance of distal perforating vein and deep vein system as an outflow for distal fistula, and the third addresses the possibility of using the vein of the subcutaneous vein system to accelerate snuffbox fistula.

The advantages of side-to-side anastomosis in vascular access surgery **(ID 30)**

Bostjan Leskovar, Tjasa Furlan, Jernej Vrtek, Mojca Bratanic
General hospital Trbovlje, Trbovlje, Slovenia

Abstract

Background. End-to-side (ETS) anastomosis is the classic anastomosis used in vascular access surgery. However, due to early reports of venous hypertension, the side-to-side (STS) anastomosis was not commonly used. We aimed to compare the ETS and STS in distal radiocephalic arteriovenous fistula (AVF).

Material and methods. We retrospectively analysed the patency and complication rate in ETS and STS anastomosis in patients who had a distal radiocephalic AVF constructed at the Vascular Access and Vascular Disease Unit, Trbovlje General Hospital, between April 2018 and June 2024.

Results. We included 273 patients (151 with STS and 122 with ETS anastomosis). We observed no significant demographic differences between the groups. In the STS group, the radial artery was slightly larger (2.6±0.5 vs. 2.4±0.4 mm, p=0.008), and the vein narrower (2.6±0.8 vs. 2.8±0.8 mm, p=0.01). We observed significantly higher AVF flow at discharge and after 6 weeks in the STS group (959±307 vs. 812±321 ml/min, p=0.00; 1037±380 vs. 872±384 ml/min, p=0.00). Cumulative primary patency over the entire observation period (median 28 (IQR=16,50) months) was better in the STS group (56 vs. 43%, p=0.025), as was 12-month primary assisted patency (91 vs. 82%, p=0.03). There was no difference in secondary patency, but the rate of access abandonment was low (97 vs. 93%, p=0.229). We observed less AVF thrombosis in the STS group (3 vs. 10%, p=0.00) and even less concomitant radial artery thrombosis (0.7 vs. 5%, p=0.03). Additional interventions (TEA and PTA with/without stenting) are easier in the STS group through the vein, distal to the anastomosis. We observed no significant venous hypertension in our group of patients.

Conclusion. Our results suggest superiority of STS to ETS anastomosis in patency, easier additional interventions and low rate of complications in the STS group.

Intimal neovascularization is correlated with systemic inflammation and long-team arteriovenous fistula failure: a preliminary report **(ID 40)**

Emil Marian Arbănași[1,2,3,4], Réka Bartus[1,2], Petru Alexandru Ion[3,4], Emőke Horváth[5], Eliza Mihaela Arbănași[3,4], Adrian Vasile Mureșan[1,2], Eliza Russu[1,2]

[1]Department of Vascular Surgery, George Emil Palade University of Medicine, Pharmacy, Science and Tech-nology of Targu Mures, Târgu Mureș, Romania; [2]Clinic of Vascular Surgery, Mures County Emergency Hospital, Târgu Mureș, Romania; [3]Doctoral School of Medicine and Pharmacy, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Târgu Mureș, Romania; [4]Regenerative Medicine Laboratory, Centre for Advanced Medical and Pharmaceutical Research (CCAMF), George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Târgu Mureș, Romania; [5]Department of Pathology, George Emil Palade University of Medicine, Pharmacy, Science and Tech-nology of Targu Mures, Târgu Mureș, Romania

Abstract

Background: The arteriovenous fistula (AVF) is the primary option for hemodialysis vascular access but with poor patency rates over the long term. This study aims to analyze the influence of existing vascular abnormalities within vein specimens on the long-term failure of AVF.

Materials and Methods: This retrospective observational study involves 50 patients admitted to the Vascular Surgery Department for AVF creation between 2020-2022. During the AVF creation, a 10 mm specimen of the vein wall was obtained for histological analysis (staining with H&E, trichrome, and von Kossa) in addition to CD31 immunostaining (neovascularization). Based on AVF failure during the follow-up, the patients were categorized into: *„Functional AVF"* and *„AVF Failure"*. The patient's progress was tracked through medical record review, telephone interviews, or direct patient contact.

Results: During the follow-up period (2.39±1.31years), 14 patients experienced AVF failure. No statistically significant differences were observed in demographics, comorbidities or AVF types between the two groups of patients. However, AVF failure patients present elevated CD31 positive relative surface (p=0.020) and interleukin-6 (IL-6) (p<0.001). The ROC Curve analysis revealed an association between the CD31 positive relative surface (AUC:0.713,p=0.012) and AVF failure. A positive correlation was also noted between intimal neovascularization and IL-6 (r=0.411,p=0.004). Moreover, the Kaplan-Meier survival curve analysis revealed that elevated CD31 positive relative surface values have a higher incidence of AVF failure (p=0.027). Lastly, the Cox regression analysis indicated that elevated CD31 positive relative surface values are associated with long-term AVF failure (HR:1.81,p=0.004).

Conclusion: In this preliminary study, our observations indicate that the intimal CD31 positive relative surface levels are correlated with systemic inflammatory status and are consequently associated with long-term AVF failure.

The single cell landscape of the human vein after arteriovenous fistula creation and implications for maturation failure **(ID 35)**

Laisel Martinez[1], Roberto Vazquez-Padron[1], Filipe Stoyell-Conti[1], Marwan Tabbara[1], Juan Duque[1], Loay Salman[2]
[1]University of Miami, Miami, USA; [2]Albany Medical College, Albany, USA

Abstract

Background:

The biological mechanisms underlying arteriovenous fistula (AVF) maturation in hemodialysis patients remain poorly understood despite decades of research.

Materials and Methods:

To address this gap, we investigated the cellular changes in the venous wall after fistula creation in histological biopsies of longitudinal veins and AVF samples (N=23 patients). Using single-cell RNA sequencing of 70,281 cells from pre-access veins, mature, and failed AVFs (N=20 patients), we created a complementary transcriptomic atlas of the human vein before and after anastomosis.

Results:

Postoperatively, the fistula exhibited increased intimal hyperplasia and cell number but reduced cell density, indicating that extracellular matrix (ECM) deposition was more prominent than cell proliferation. Analysis of 14,475 cells from fistulas obtained within one week of creation revealed that inflammation drives early adaptation across all vascular cell types. This includes the postoperative differentiation of endothelial cells (ECs) and production of a hyaluronic acid-rich neointima by fibroblasts. By 13 ± 6 weeks, transcriptomic profiles continue to reflect active healing of the vasculature by ECM-producing myofibroblasts and fibroblasts that were found localized throughout the vascular wall and in the intima using immunofluorescence and in-situ hybridization. Postoperative ECs maintained significant hemostatic adaptations and upregulation of inflammatory molecules (*ACKR3, ICAM1, IL1R1, COL8A1, SELP*) supporting their role as gatekeepers of immune cell infiltration. Comparative analyses of failed versus mature AVFs revealed persistent inflammatory signaling among macrophages, ECs, myofibroblasts, and fibroblasts with AVF failure.

Conclusion:

These findings uncover previously unrecognized cellular and molecular patterns in human veins following AVF creation, providing novel insights and potential therapeutic targets to improve AVF outcomes.

Mechanisms of arterialization of arteriovenous fistulas for hemodialysis and their correlation with functionality **(ID 83)**

Raffaella Mauro[1], Gianluca Faggioli[2,1], Cristina Rocchi[2], Alessia Pini[2], Silvia Morreale[2], Rodolfo Pini[2], Maurizio Alberto Gallieni[3], Mauro Gargiulo[2,1]

[1]IRCCS Sant'Orsola University Hospital of Bologna, Vascular Surgery Unit, Bologna, Italy; [2]Alma Mater Studiorum - University of Bologna, Vascular Surgery, Department of Medical and Surgical Sciences (DIMEC), Sant'Orsola University Hospital of Bologna, Bologna, Italy; [3]University of Milan, Milan, Italy

Abstract

BACKGROUND

The process of arterialization of arteriovenous fistulas(AVFs) for hemodialysis plays a crucial role in obtaining a functioning vascular access.

MATERIALS AND METHOD

Venous tissue samples were taken during the creation and treatment of complications/revisions of AVFs (January 2018-March 2024). Samples taken during the creation of a primary vascular access were defined as T0 (native vessel), while those taken during a re-intervention were defined as T1 (potentially arterialized vessel). The variables considered were: reason for re-intervention, time elapsed between the first and second intervention (arterialization time), and presence of myointimal hyperplasia in the T1 sample.

RESULTS

Two hundred and sixty-four samples were analyzed. Seven patients presented T0 and T1 samples. The re-interventions were performed for secondary superficialization of the basilic vein(3), failure of AVF development(3), and malfunction(2). The mean arterialization time was9±6months. Six T0 samples showed physiological histological analysis; the remaining sample showed intra-parietal calcification. Histological analysis of the T1 samples revealed:3 samples with unchanged histology and 4 with myointimal hyperplasia (nodular and/or concentric, with focal neoangiogenesis). T1 samples with normal histology were associated with failure of AVF development, thrombosis, and the formation of a post-anastomotic stenosis; T1 samples with intimal hyperplasia were related to 3 cases of basilic vein superficialization (with proper fistula maturation) and one case of AVF failure. The T1 samples with normal histology were taken 1.9 and 28 months after the respective T0; T1 samples with hyperplasia were taken 14.5, 2, and 4 months later.

CONCLUSION

Re-interventions occurring in a well-functioning AVF showed myointimal hyperplasia in all cases, associated with adequate fistula maturation. In cases of re-intervention due to complications, abnormalities in the arterialization process were observed.

Pre-emptive vascular access creation – getting the timing right **(ID 91)**

Ben Edgar[1,2], *Karen Stevenson*[2], *Emma Aitken*[2], *Peter Thomson*[2], *David Kingsmore*[1,2]

[1]University of Glasgow, Glasgow, United Kingdom; [2]Queen Elizabeth University Hospital, Glasgow, United Kingdom

Abstract

Background: Timing vascular access creation necessitates balancing risks of non-maturation at the time of need against potentially unnecessary surgery and resource consumption. Contemporary guidelines recommend vascular access creation approximately 6 months prior to dialysis initiation but this can be difficult to predict due to variable rates of renal function decline, symptomatology and local nephrology practice. There is a lack of clear guidance to indicate the likelihood of initiating dialysis within 6 months.

Materials and Methods: Renal function (eGFR), slope of renal function decline and 2-year Kidney Failure Risk Equation (KFRE) scores were retrospectively analysed for pre-dialysis patients at the time of review in a vascular access planning clinic over a 10-year period. Patients were followed up until dialysis initiation, pre-emptive transplantation, death or end of study. Receiver operator characteristic (ROC) analysis was used to identify thresholds indicative of a greater likelihood of initiating dialysis within 6 months.

Results: 912 patients were followed up for a total of 1173 follow up years (59% Male, 38% Diabetic, median age 62 years). At the time listing for AVF creation, median eGFR was 11.9 ml/min/1.73m^2, slope of decline 6ml/min/year and KFRE 50%.

23% had initiated dialysis at 6 month follow up and optimal predictive thresholds were eGFR ≤ 11 ml/min1.73m^2, decline in function of ≥ 6 ml/min/year, and KFRE ≥ 55%. Combining these thresholds into a predictive score outperformed the use of any one measure in isolation, with an area under the curve of 0.78 for predicting dialysis initiation if any 2 of the 3 thresholds were met.

Conclusions: Multiple factors should be considered when estimating the time to dialysis initiation. Prospective evaluation of these thresholds may facilitate better understanding of the optimal time to create pre-emptive vascular access.

Intraoperative optimization of radiocephalic arteriovenous fistula surgery with contemporary techniques: a retrospective study **(ID 128)**

Nicholas White[1,2], Eduard de Winter[1,3], Ruth Bulder[4,3], Thijs Urling[4], Timothy van Steenhoven[4,3], Daniel Eefting[1,3,4], Willen Jan de Jong[4,3], Janna Specken-Welleweerd[4,3], Laima Siddiqi[4], Joris Rotmans[1], Koen van der Bogt[4,1,3]

[1]Leiden University Medical Center, Leiden, Netherlands; [2]Delft University of Technology, Delft, Netherlands; [3]University Vascular Centre West, Leiden | The Hague | Delft, Netherlands; [4]Haaglanden Medical Center, The Hague, Netherlands

Abstract

Background

Radiocephalic arteriovenous fistulas (RCAVFs) remain the vascular access of choice for patients commencing hemodialysis despite low maturation rates. Several modalities exist that have shown improved maturation rates. This retrospective study evaluates the effect on RCAVF outcomes of a standardized and optimized intraoperative RCAVF procedure combining several modalities: transit time flow measurement, perioperative papaverine administration and an external support device.

Methods

Retrospectively, patients were included that received a primary RCAVF with the optimized procedure in a single center in The Netherlands. Intraoperative flow rates, maturation rates, and (assisted) patency rates at 6 and 12 weeks, and 6 and 12 months are compared to a contemporary control group from the same center.

Results

41 patients (85% male, mean age 59, 27% prevalent hemodialysis) were included in the intervention group, and 59 in the control (66% male, mean age 64, 25% prevalent hemodialysis). Intraoperative flow rates were significantly higher with the optimized RCAVFs (210 ± 89 mL/min vs. 163 ± 85 mL/min, P = 0.008). A significant increase in maturation at both 6 weeks (77% vs. 43%, P = 0.002) and 12 weeks (91% vs. 59%, P = 0.003) was found. 160 mL/min intraoperative flow was the cut-off value of a 74% chance of maturation. Overall, maturation rates in males were higher (66% vs. 38%, p = 0.03). At one year, no significant difference in 12-month primary (Hazard Ratio = 0.77, P = 0.46) or primary assisted patency (Hazard Ratio = 0.27, P = 0.09) was found (n= 22 vs. 43).

Conclusions

Intraoperative optimization of the RCAVF procedure with readily available modalities yields superior intraoperative flow rates and 6- and 12-week maturation rates. Effects of the intraoperative modalities were most apparent in the first post-operative months. The final benefit and cost effectiveness needs to be established in larger, randomized trials.

Pilot study for the identification of native arteriovenous fistula failure markers through patient-specific computational models based on fluid dynamics **(ID 168)**

Lidia Martinez[1,2], Miriam Caravaca[1], Andy Olivares[2], Oscar Camara[2], Joaquim Vallespín[1,3], Jana Merino[1,3], Teresa Gonzalez de la Huebra[1,4], Roberto Correa[1,4], Jose Ibeas[1,5]

[1]Clinical, Interventional and Computational Nephrology group (CICN) – Parc Taulí Hospital Universitari. Institut d'Investigació i Innovació Parc Taulí (I3PT - CERCA), Sabadell, Barcelona, Spain; [2]Physense group; Department of Information and Communication Technologies - Universitat Pompeu Fabra (UPF), Barcelona, Spain; [3]Vascular Surgery Department, Hospital Universitari Parc Taulí. Universitat Autonoma de Barcelona, Sabadell, Barcelona, Spain; [4]Interventional Radiology – UDIAT, Hospital Universitari Parc Taulí. Universitat Autonoma de Barcelona, Sabadell, Barcelona, Spain; [5]Nephrology Department, Hospital Universitari Parc Taulí. Universitat Autonoma de Barcelona, Sabadell, Barcelona, Spain

Abstract

Background:
Although native arteriovenous fistulas (nAVFs) are the preferred vascular access for hemodialysis, they have a high risk of failure due to multifactorial causes. This study aims to identify morphological and hemodynamic markers associated with nAVF failure by constructing a computational fluid dynamics (CFD) model during its maturation process.

Material and Methods:
Three patients were analyzed at 1 week, 1 month, and 6 months post-surgery. The 3D geometry of the nAVF was obtained via magnetic resonance imaging, while flow data from ultrasounds and pressure estimates from the 3-element Windkessel model were integrated using Ansys Fluent. CFD simulations provided key markers such as velocity, pressure, and Wall Shear Stress (WSS) to identify regions prone to complications.

Results:
The temporal follow-up revealed arterialization of the nAVF, reducing pressure and WSS along the vein (e.g., 22.10 Pa at 1 week, 10.68 Pa at 1 month, and 10.36 Pa at 6 months). A perpendicular anastomosis configuration correlated with lower WSS (e.g., 38.89 Pa at 1 week, 26.24 Pa at 1 month, and 27.91 Pa at 6 months) and an increase in blood flow from 1,800 mL/min at 1 week to 2,800 mL/min at 6 months. Velocity declined from 3.68 m/s at 1 week to 1.49 m/s at 1 month, stabilizing at 1.56 m/s at 6 months, reflecting hemodynamic adaptation.

Conclusion:
At 1 week, WSS and velocity were highest, particularly in the juxta-anastomotic section, which showed the greatest hemodynamic impact. A turning point at 1 month was identified, marking stabilization in WSS and flow, aligning with clinical consensus. This study establishes a robust CFD protocol with temporal follow-up, providing novel insights into geometries less prone to nAVF failure.

Vascular access surgery timing: A prospective European cohort study in elderly patients with end-stage kidney disease **(ID 84)**

Boudewijn Heggen[1], Friedo Dekker[2], Joris Rotmans[2], Merel van Diepen[2], Mickaël Hiligsmann[3], Geert Willem Schurink[1], Maarten Snoeijs[1], on behalf of the EQUAL study investigators[2]
[1]Maastricht University Medical Center+, Maastricht, Netherlands; [2]Leiden University Medical Center, Leiden, Netherlands; [3]Maastricht University, Maastricht, Netherlands

Abstract

Introduction

Timing vascular access creation for elderly patients with end-stage renal disease (ESRD) poses a challenge. Autologous arteriovenous fistulas (AVF) are often created either too early, leading to unused fistulas, or too late, necessitating the use of central venous catheters (CVC). This study reports on the timing of vascular access creation in relation to the start of hemodialysis treatment in current European practice.

Methods

This study is a secondary analysis of the EQUAL registry: a prospective observational study that recruited patients aged 65 years and older with stage 4 or 5 chronic kidney disease from six European countries. Patients were included in this study once their eGFR dropped below 15 ml/min/1.73m², if they received a vascular access, and if they had at least six months of follow-up. Vascular access timing was categorized into three groups: early (no dialysis within six months), on time (dialysis initiated with an AVF within six months), and late creation (hemodialysis initiated with a CVC within six months).

Results

A total of 332 patients were included: 221 patients (67%) received an AVF as first vascular access and 111 patients (33%) a CVC. For 53 patients (48%) with an initial CVC, an AVF was later created. At dialysis initiation, 157 patients (53%) used an AVF, while 137 patients (47%) used a CVC. AVF creation was on time in 87 of 274 patients (32%), early in 114 patients (42%), and late in 73 patients (27%). For the remaining 58 patients, a CVC was considered the intended vascular access strategy. Despite the high rate of early AVF creation, the vast majority of fistulas were eventually used as 90% of patients initiated hemodialysis within three years.

Conclusion

Only 32% of elderly ESRD patients started hemodialysis with a functional AVF that was created within the six-month window before dialysis initiation. Clinical prediction tools are needed to improve the timing of vascular access creation in these patients.

Central venous catheters

Multicentre data in crashlanders: should we reduce tunneled CVC insertion? (ID 97)

Elettra Lomeo[1], Roberto Mangiacapra[1], Francesca Maria D'Ascenzo[1], Fabio Aureli[1], Raghvinder Pal Singh Gambhir[2], Mitta Nivedita[2], Domenico Valenti[2], Giuseppe Grandaliano[1], Francesco Pesce[3,1]
[1]Nephrology, Dialysis and Transplantation Unit, Department of Medical and Surgical Sciences, Fondazione Policlinico Universitario A. Gemelli IRCCS, Universita' Cattolica del Sacro Cuore, Rome, Italy; [2]Department of Vascular Surgery, King's College Hospital, London, United Kingdom, London, United Kingdom; [3]Division of Renal Medicine, Ospedale Isola Tiberina-Gemelli Isola, Rome, Italy

Abstract

BACKGROUND: Choosing the dialysis modality for ESRD patients is a complex process that should focus on "the right access, in the right patient, at the right time, for the right reasons". Early referral of patients with a risk-based threshold >40% or eGFR < 15 ml/min/1.73m² is beneficial in terms of vascular access patency, whereas "late referral" has a negative impact, also on the quality of life and survival.

MATERIALS AND METHODS: We carried out a multicentre retrospective observational study on tunnelled CVC insertions and AVF creations performed between January 2020 and May 2024 at King's College Hospital in London (N=249) and at Policlinico A. Gemelli Foundation in Rome (N=214) and analysed related outcomes. We included patients who received a tunneled CVC and referred to a nephrologist up to 90 days before dialysis initiation.

RESULTS: A total of 463 CVCs were placed in crashlander patients (60.4±15.8 years; F=36,7%, M=63,3%). Catheter related bloodstream infection (CRBSI) occurred in 16% of patients and relatively earlier in the UK cohort [123 (IQR 33-222) vs 228 (IQR 51-600) days; p<0.04]. The reinfection rate after CVC removal/replacement and exchange was also higher in the UK cohort (19.4% vs 0%; p<0.01).

AVF was created after CVC placement in 195 patients (42.1%), with a primary patency of 68.7% at 2 months. In the UK, the AVF creation after CVC placement was performed later than in the Italian cohort [(140 (38-251) vs 28 (IQR 1-60) days, p<0.001)]. For 32.3% of these patients an AVF reintervention was necessary.

Overall, the mortality rate was 9.9%, significantly lower in AVF patients (p<0.002), who were also at lower risk of bacteremia (p<0.03), compared to non-AVF.

CONCLUSIONS: Mortality is significantly lower in crashlander patients with AVF, thus reducing the use of CVC, mainly in those eligible for AVF creation, is the most effective approach to improve long-term outcomes. Early patient assessment is crucial to minimize CRBSI risk and mortality.

Vascular access site selection

From vascular mapping to hemodialysis: determinants of arteriovenous vs. catheter access as the first vascular access (ID 182)

Luís Santos, Tiago Pereira, Patrícia Alves, Maria Menezes, Paula Guimarães, Ana Domingos, João Martins, Cristina Jorge
Unidade Local de Saúde de São José, Lisboa, Portugal

Abstract

Background: Arteriovenous (AV) access, whether an arteriovenous fistula (AVF) or graft (AVG), is widely recognized as the optimal vascular access (VA) for hemodialysis due to its superior long-term functionality and lower complication rates compared to central venous catheters (CVCs). Pre-emptive construction of AV access before the initiation of hemodialysis is a critical step in optimizing patient outcomes

Materials and Methods: A retrospective observational study (March 2023 - September 2024) analyzed 304 patients evaluated for vascular mapping for AV access creation. The study focused on pre-dialysis patients, using chi-square tests or student's t-test and Mann-Whitney U tests for categorical or continuous variables, respectively. Multivariate logistic and linear regression was performed to control for other clinical and vascular variables.

Results: Among 203 pre-dialysis patients, 115 underwent AV access construction, with 52 inducing hemodialysis during a 405-day mean follow-up. Data on access type was available for 50 patients: 23 started with a CVC, while 27 initiated via AV access. A longer interval between mapping and access creation significantly increased CVC use at initiation ($p = 0.002$). AV patency at 3 and 6 months was a key determinant, as patients with thrombosed or intervention-requiring AV access were more likely to initiate with a CVC ($p<0.01$). Estimated GFR (EPI) at mapping showed no significant correlation with access type. Subsequent multivariate analysis showed that patients on antiplatelet or anticoagulants were more likely to initiate dialysis with AV access ($p < 0.05$).

Conclusions: Timely AV access construction is crucial for reducing CVC dependence at dialysis initiation. Delays between mapping and creation, along with access patency issues, significantly impact initial access availability. These findings underline the need for AV access surveillance and early planning and intervention to optimize VA and patient's outcomes.

Gender disparity in autologous arteriovenous access for hemodialysis **(ID 188)**

Luís Santos, Tiago Pereira, Patricia Alves, Maria Menezes, Paula Guimarães, Ana Domingos, João Martins, Cristina Jorge
Unidade Local de Saúde de São José, Lisboa, Portugal

Abstract

Background:

Gender-related disparities in vascular access(VA) for hemodialysis are well documented, with women showing lower arteriovenous fistula(AVF) creation rates and poorer maturation outcomes, though the underlying causes are unclear. This study aims to evaluate gender differences in arteriovenous(AV) access creation and identify influencing factors.

Materials and Methods:

A single-center observational study (March2023–September2024) analyzed 304 patients undergoing vascular mapping for AV access. Clinical and ultrasound data were assessed using chi-square tests for categorical variables and t-tests or Mann-Whitney U tests for continuous variables. Multivariate logistic and linear regression analyses controlled for clinical and vascular variables.

Results:

Among 304 patients, 42% were women and 58% were men (median ages of 70 and 73 years, respectively). Women had smaller arterial diameters (brachial: 3.9±0.7mm vs 4.5±0.8mm $p<0.001$; radial: 1.9±0.4mm vs 2.3±0.6mm $p<0.001$; ulnar: 1.5±0.4mm vs 1.7±0.4mm $p<0.001$) and smaller cephalic veins (distal forearm: 1.7±0.9mm vs 2.1±1.5mm $p<0.001$; proximal cephalic: 2.3±1.5mm vs 2.8±2.3mm $p=0.013$) when compared to men.

Women had significantly lower rates of successful radio-cephalic AVF creation ($p=0.003$) and brachial-cephalic AVFs ($p<0.01$) and were more likely to have arteriovenous graft(AVG) access as the only viable option ($p=0.04$). Constructed VA showed fewer RC AVFs in women ($p=0.004$) and higher AVG use ($p=0.012$).

Multivariate analysis confirmed female sex as an independent predictor of smaller vessel diameters ($p<0.001$).

Conclusions:

Women undergoing vascular mapping for AV access creation demonstrated significant clinical differences compared to men, resulting in a lower likelihood of autologous AV construction. These disparities seem to be influenced in particular by smaller vessel diameters. Further research is needed to elucidate the underlying causes and develop strategies to mitigate these gender disparities.

Vascular access surveillance and monitoring

Impact of Ultrasound (US) surveillance on arterovenous fistula (AVF) survival among hemodialysis patients. A retrospective single-centre 2-cohorts study. (ID 15)

Silvia Corti, Danilo Borghini, Ilaria Calcina, Emiliano Casadei, Lorenzo Antonio Dallari, Lucia Principe, Chiara Ralli, Federica Rossi, Sandra Sacchetti, Paolo Conti
Azienda USL Toscana Sudest, U.O. Nefrologia e Emodialisi, Arezzo, Italy

Abstract

Background: the VA has a crucial impact on hemodialisys (HD) quality and on mortality of patients. AVF has been considered the best option for many years, while nowadays the scientific community trend is more focused on a patient centered vision, where the professionals have the role to suggest the best VA according also to patient's assessment. The surveillance of the VA has an important role and is among nurses' and phisicians' main duties.

Materials and methods: we compared two groups of patiens on a retrospective cohort study. The setting is a public Hospital located in Arezzo, Tuscany; 110 patients are currently treated with chronic HD. First group belongs to 2021-2022 period, when surveillance consisted on physical examination only and deeper investigations were considered in case of an evident clinical failure. Second group was observed between 2023-2024, when US was introduced as an additional tool. In both groups we compared the AVF's medium age and number of interventions for failure. The use of US was managed by the vasculas access care team, which includes nurses and physiciants in HD setting; vascular surgeons were involved in case of new findings.

Results: the analysis of our two groups showed that AVF's mean ages differ of 18.67 months (86.42 vs 67.75, p value 0.27), while the number of interventions were much lower in the first group (5 vs 23, ic 95%, p value 0.01).

Conclusions: we believe that the impact of US is the first cultural change in the management of AVF, since it allows earlier detachment of sub-clinical pathological conditions and referral to the vascular surgeon, therefore improving the medium age of VA.

Influencing factors in arteriovenous fistula needling suitability for hemodialysis **(ID 49)**

Rui Pinto[1], João Barros[2], Ricardo Ferreira[1], Alcides Pereira[3], Pedro Santos[4], Andreia Henriques[4], Emanuel Ferreira[4], Fernando Mata[4], Rui Alves[4], Eduardo Santos[5]

[1]Unidade Local Saúde de Coimbra - University Hospital - Nursing Vascular Access Consultation - Nephrology Department, Coimbra, Portugal; [2]Programme in Health Data Science, Faculty of Medicine, University of Porto, Porto, Portugal; [3]Nursing School of Coimbra, Coimbra, Portugal; [4]Unidade Local Saúde de Coimbra - University Hospital - Nephrology Department, Coimbra, Portugal; [5]Associate Professor at the Polytechnic University of Viseu, School of Health, Viseu, Portugal

Abstract

Background: The suitability of arteriovenous fistula (AVF) for needling is critical for the hemodialysis (HD) treatment efficiency. Identifying factors that influence AVF needling suitability is essential to optimize HD clinical outcomes. This study aims to identify clinical patient specific and AVF-related factors in order to provide key indicators for determining AVF needling suitability.

Materials and Methods: This retrospective cross-sectional study analyzed data from 322 patients with AVF, assessed at a dedicated nursing vascular access consultation between January 2022 and December 2024. AVF maturation was evaluated through a comprehensive assessment, that combines structured physical examination with ultrasound criteria. The structured physical examination (PE) was conducted following predetermined parameters for inspection, palpation and auscultation. The ultrasound criteria considered a minimal vein diameter of at least 4 mm, a vein depth no greater than 6 mm, and a blood flow equal to or greater than 500 mL/min. Descriptive statistical analysis was carried out to characterize all the variables and a logistic regression model was used for to identify the predictors of AVF parameters to needling suitability.

Results: The patients had a mean age of 70.25±11.80 years and an average AVF maturity of 11.8 weeks. Of these, 250 (77.6%) achieved needling suitability. Factors negatively associated with needling suitability included greater vein depth (β=–0.17, p=0.02; OR=0.72 [95%CI:0.58–0.88]), older patients (β=–0.02, p=0.02; OR=0.97 [95%CI: 0.96–0.99]), and previous AVFs (β=–0.60, p=0.004; OR=0.54 [95%CI: 0.35–0.82]). Conversely, positive associations were identified with increased blood flow (β =0.01, p<0.001) and higher PE scores (β=0.77, p<0.001).

Conclusion: A combination of patient-specific and AVF-related factors, such as vein depth, blood flow, PE scores and patient age, provide reliable indicators for determining AVF readiness for needling.

Establishment of an ultrasound screening program for arterio-venous fistulas at the time of kidney transplantation **(ID 132)**

Jakob Gubensek[1,2], Barbara Vajdic-Trampuz[1,2], Denis Fornazaric[1,2], Matej Zrimsek[1,2], Jadranka Buturovic-Ponikvar[1,2]
[1]University Medical Center Ljubljana, Ljubljana, Slovenia; [2]University of Ljubljana, Ljubljana, Slovenia

Abstract

Background. Follow-up and management of arterio-venous fistulas (AVF) after successful kidney transplantation is often a neglected issue, although complications related to AVF keep occurring also after transplantation. We report preliminary results of AVF screening at kidney transplantation.

Methods. We established a prospective screening of all functional AVFs at the time of kidney transplantation at our institution. A detailed ultrasound exam of the AVF, including the arterial system, size of anastomosis and the entire fistula vein was performed and brachial artery diameter on the contralateral arm was recorded for reference.

Results. Among patients transplanted between January and December 2024, 26 had a functional AVF and were included in the study. Their mean age was 53±15 years and 18 (69%) were male. There were 15 (58%) forearm and 11 (42%) elbow AVFs. Mean blood flow was 1398±786 (range 480-3000) ml/min and was >2000 ml/min in 8 (31%) and >2500 ml/min in 2 (8%) cases. Mean brachial artery diameter on the side of AVF was 7.4±1.7 (range 4.7-11) mm, on contralateral side 4.8±0.8 (range 3.2-6.6) mm. There were two cases (8%) of brachial artery aneurism found (diameter of 1.5 and 2 cm). For 11/26 (42%) AVFs, an active US follow-up was planned. Two AVFs had a clinical indication for follow-up (mild chronic ischemia and venous congestion/edema), while for others, it was determined by the ultrasound exam: relatively high-flow (>2 l/min, 6/11) or wide/aneurysmatic brachial artery (3/11). For three patients (12%), an elective AVF closure after kidney TX was planned.

Conclusions. A prospective screening of AVFs at kidney transplantation was established at our center. Preliminary results show that comprehensive AVF evaluation at transplantation is worthwhile, as active follow-up was planned in 42% of AVFs because of significant potential for developing complications, in majority based on the findings of the ultrasound exam.

Complications of vascular access

High flow reduction on distal radio-cephalic fistula: description of a novel banding technique. (ID 51)

Arianna Ceravolo[1], Jacopo Scrivano[2], Juan Diego Balseca Maldonado[1], Daniela Coclite[3], Roberto Pirozzi[4], Sandro Mazzaferro[1], Nicola Pirozzi[2]
[1]Department of Traslational and Precision Medicine, Policlinico Umberto I Hospital, Sapienza University of Rome, Rome, Italy; [2]Interventional Nephrology Department, CdC Nuova ITOR, Rome, Italy; [3]Istituto Superiore di Sanità, Centro Eccellenza Clinica, Qualità e sicurezza delle Cure, Rome, Italy; [4]Endovascular Surgery for Hemodialysis Angioaccess, CdC Nuova ITOR, Rome, Italy

Abstract

Background: Distal radio-cephalic arteriovenous fistula (RCAVF) is the gold standard vascular access for haemodialysis (HD). A rare complication of RCAVF is high blood flow (defined as flow (Qa) >1,5 L/min/1.73m^2). In order to reduce high flow in RCAVF, we conceived a novel banding technique, as a variant of the Bourquelot's proximal radial artery ligation (PRAL). We describe our experience started from 2016.

Methods: we retrospectively examinated prospectively collected data from 20 consecutive patients treated from 2016 to 2023 in a single centre.
All patients were referred because of RCAVF high flow and evaluated systematically by preoperative (Qa0), 1, 6 and 12 months postoperatively (Qa1, Qa6 and Qa12) ultrasound examination.
In short, the procedure consisted in the ligation over a 2 mm tutor of the proximal radial artery (banding-PRA). Thus, compared to classic PRAL the banding-PRA conserved the patency of the proximal radial artery, in order to prevent its excessive involution in young patients and over reduction of flow (in case of early appearance of juxta-anastomotic stenosis).
Patient characteristics (means): age 69 years, M 60%, F 40%, Comorbidities (Hypertension 85%, Diabetes 0%, CVD 35%), HD vintage 21 months, AVF vintage 31,5 months, Qa0 2650 ml/min.
Primary and secondary patency following banding-PRA were estimated at 6 and 12 months (P6, P12, S6, S12).

Results: At T1, T6 and T12, AVF mean flow reduction rates were 52,8%, 52,8% and 50,9%, respectively.
Primary and secondary patency rates at 6 and 12 months were 100%, 83.3%, 100% and 100% respectively.
3pts (16.6 %) necessitated of iuxta-anastomotic revision because of low flow within 12 months. 1pt died 5 months postoperatively unrelated to the procedure, 1pt was lost from follow up.
Any thrombosis nor hand ischemia occurred postoperatively.

Conclusions: Bandind-PRA is as safe and effective as PRAL for surgical reduction of high-flow RCAVF with satisfying mid- and long-term patency results.

Cardiovascular effects of hemodialysis access

Effect of arterio-venous fistula on advanced echocardiographic parameters in chronic kidney disease patients with preserved ejection fraction heart failure **(ID 121)**

Denis Fornazarič[1], Marta Cvijič[1], Manja Antonič[2], Jakob Gubenšek[1], Rafael Ponikvar[1], Jernej Pajek[1]
[1]University Clinical Centre Ljubljana, Ljubljana, Slovenia; [2]General Hospital Trbovlje, Trbovlje, Slovenia

Abstract

Background: Arterio-venous fistulas (AVF) might lead to worsening of cardiac function and an increase in cardiovascular mortality in chronic kidney disease patients. We evaluated the effect of AVF construction on cardiac function in patients with heart failure with preserved ejection fraction (HFpEF) using advanced 3D echocardiographic method.

Methods: In this prospective single-center study, chronic kidney disease stage 5 patients scheduled for AVF placement were included. Echocardiography was performed before AVF construction and 6 to 9 months after AVF construction together with ultrasound measurement of AVF flow. 3D echocardiographic measurements of left and right ventricular end diastolic volumes (LVEDV and RVEDV), 3D ejection fraction (EF) and myocardial deformation (left ventricular global longitudinal strain (LVGLS) and right ventricular free wall strain (RVFWS)) were performed. Analysis was performed in patients with HFpEF, characterized by elevated noninvasively measured pulmonary capillary wedge pressure (PCWP).

Results: We evaluated 14 (12 men, 70 ± 13 years) patients with HFpEF (PCWP: 24 ± 8 mmHg). After 8 ± 1 month of AVF construction, the average AVF flow was 1029 ± 359 ml/min. During this period, both ventricles increased significantly (LVEDV: 168 ± 31 ml to 187 ± 43 ml, RVEDV: 155 ± 36 ml to 179 ± 31 ml, $p < 0.05$). There was minimal, nonsignificant change in LVEF (52 ± 6 % to 53 ± 5 %, $p = 0.8$) and RVEF (46 ± 13 % to 51 ± 10 %, $p = 0.3$), while LVGLS (-16,6 ± 2% to -16 ± 1.7 %, $p = 0.43$) and RVFWS (-25.5 ± 5% to -25.4 ± 4 %, $p = 0.92$) were not significantly different.

Conclusion: Patients with HFpEF and normal blood flow through AVF showed both left and right ventricular remodelling with no significant effect on systolic function. As evaluated with advanced echocardiography, an AVF with a normal flow rate is still a relatively safe option for patients with preexisting HFpEF who require vascular access for hemodialysis**.**

Does dialysis access flow affect right ventricular-pulmonary arterial coupling in patients on chronic hemodialysis with pulmonary hypertension? (ID 77)

Kristina Buryskova Salajova[1], Jan Malik[1], Lucie Kaiserova[1], Zuzana Hladinova[2], Zdenka Hruskova[2], Simona Janakova[2], Vladimir Tesar[2], Satu Sinikka Pesickova[2,3], Kristyna Maichalickova[2], Katarina Rocinova[3], Barbora Szonowska[4], Anna Valerianova[1]

[1]Third Department of Internal Medicine, General University Hospital and First Faculty of Medicine, Charles University, Prague, Czech Republic; [2]Department of Nephrology, General University Hospital and First Faculty of Medicine, Charles University, Prague, Czech Republic; [3]B. Braun Avitum, Dialysis Center, Prague, Czech Republic; [4]Dialysis Center Cerny Most, B. Braun Avitum, Prague, Czech Republic

Abstract

Learning objectives:

1. To analyze the relations between dialysis access flow (Qa) and current hydration with pulmonary hypertension (PH) and right ventricular-pulmonary arterial (RV-PA) coupling

2. To analyze structural heart changes associated with RV-PA uncoupling

3. To reveal the prevalence, etiology and severity of PH in the Czech hemodialysis population

Background

PH is a common condition among patients on chronic hemodialysis, however the data of impact of Qa are controversial. The prevalence of RV-PA uncoupling in this population has not been established yet. We performed a cross-sectional analysis of the inclusion visits of patients included in the "CZecking Heart Failure in patients with advanced Chronic Kidney Disease study.

Materials and Methods

We performed expert echocardiography with non-invasive hemodynamic assessment, evaluation of Qa, bio-impedance analysis and basic laboratory tests.

Results: We analyzed data of 336 patients. PH was present in 114 (34 %) patients and RV-PA uncoupling was present in 25 % of patients with PH. We proved a slightly significant contribution of higher Qa to PH using upper and lower quartile (Qa 1400 mL/min v.s. 510 mL/min), OR 1.27, CI 1.10-1.46. Patients with and without PH and RV-PA coupling vs. uncoupling did not differ in Qa. Both PH and RV-PA uncoupling were strongly associated with hydration status and the prevalence of heart failure was higher (for PH 79 % vs. 37.5 %, $p<0.0001$, for RV-PA uncoupling 88 % vs. 52 %, $p=0.0003$).

Conclusions: 1. The relation between Qa and the diagnosis of PH or RV-PA uncoupling was weak. Both PH and RV-PA uncoupling were strongly related to fluid overload; 2. RV-PA uncoupling was associated with more advanced structural heart changes in patients with PH; 3. PH was present in about one-third of Czech hemodialysis population and among them, one quarter of patients suffered from RV-PA uncoupling. Heart failure was the strongest contributor of PH.

Endovascular interventions for vascular access

The role of Vessel Preparation and drug-coated angioplasty in treatment of hemodialysis access (ID 151)

Robert Shahverdyan
Vascular Access Center, Hamburg, Germany

Abstract

Background:

PTA remains the first choice for treatment of dialysis access dysfunction. However, it may rupture the neointimal layer, causing injury with the need for repeated interventions. Vessel preparation (VP) creates controlled longitudinal microincisions in the lesion, reducing barotrauma and improving vessel compliance prior to PTA. Additionally, using drug-coated balloon might increase the drug uptake into the treated lesion.

Materials and Methods:

Retrospective comparison of VP in AV-access with balloon-angioplasty (POBA) and Scoring-Balloon angioplasty (SB) with similar demographics and followed up for up to 12 months of experience with all three groups including drug-coated balloon angioplasty. Significant differences were seen in the number of prior interventions per group, with more interventions (mean 2.32, SD 2.22) in the VP-group as compared to both POBA (mean 1.00, SD 1.25) and SB (mean 1.04, SD 1.44) ($p<0.0001$). In total, 62.9% of patients had 1 or more previous interventions on their VA circuit.

Results:

From 175 patients who underwent interventions, 57 with POBA, 47 with SB and 71 with VP. 71 of 175 patients underwent secondary interventions. Number of reinterventions per-patient-year was 0.695, 0.917 and 0.372 for POBA-, SB- and VP-groups ($p<0.0001$). At 6 and 12 months, access circuit patency (ACPP) was 78.5% and 37.9% for POBA, 65.4% and 35.6% for SB and 84.7% and 57.0% for VP, and target lesion patency (TLPP) was 79.1% and 40.1% for POBA, 67.7% and 41.2% for SB and 86.0% and 73.6% for VP, respectively, both were however statistically not significant.

Conclusion:

Although no significant difference in patency outcomes was seen between POBA, SB and VP, both ACPP and TLPP were higher after VP as compared to POBA and SB-angioplasty at up to 12 months. The number of prior interventions were identified as significant factors affecting patency rates, yet the number of reinterventions after VP was significantly lower as compared to both other groups

Latest clinical results from the Covera Covered Stent In arteriovenous fistulae **(ID 148)**

Robert Shahverdyan
Vascular Access Center, Hamburg, Germany

Abstract

Background: Historically, clinical data for covered stents in vascular access has been reported in arteriovenous grafts (AVG). The AVeNEW clinical trial was the first randomized controlled trial to study covered stents in stenotic lesions of arteriovenous fistulae (AVF). A post approval study (PAS), AVeNEW PAS, was conducted to confirm the results in a real-world patient population.

Materials and Methods: 100 participants were enrolled at 11 US centers in this prospective, non-randomized trial with the Covera Covered Stent. A post-hoc analysis was performed on key subgroups.

Results In the AVeNEW trial, the covered stent demonstrated a 31% improvement over plain balloon angioplasty (PTA) and 78.7% target lesion primary patency (TLPP) at 6 months. The AVeNEW PAS trial confirmed the result with a TLPP of 82.2%. Moreover, access circuit primary patency (ACPP) was 60%. Reflecting a real-world patient population, 75% of lesions were in the cephalic arch, 35% of subjects had additional secondary lesions, and 81% of lesions were recurrent. Subgroups of gender, diabetes, and lesion type will be additionally presented.

Conclusion AVeNEW PAS supports the results from the AVeNEW trial in using Covera Covered Stent in AVF stenosis lesions. Subgroup results suggest limited variance in results when using the device; and additional research is needed.

Efficacy of Ultrasound-Guided Selective cutaneous Nerve Block During PTA for Dysfunctional Forearm Radiocephalic AVFs **(ID 55)**

Taisuke Shimizu, Momoko Sekiguchi, Akihiko Seo, Nozomi Abe, Tomonari Ogawa
Saitama Medical University, Kawagoe, Japan

Abstract

Background and Objective:

Recent advancements in ultrasound anatomy have enabled precise identification of sensory cutaneous nerves without motor components. This study aimed to evaluate the efficacy of Ultrasound-Guided Selective Cutaneous Nerve Block (SCNB) for pain management during Percutaneous Transluminal Angioplasty (PTA) for forearm radiocephalic arteriovenous fistulas (RC-AVFs).

Methods:

A total of 292 patients with RC-AVFs undergoing 444 PTA procedures were retrospectively reviewed. The procedures were categorized into three groups: Infiltration Anesthesia (IA, 76 cases), Ultrasound-Guided Infiltration Anesthesia (USIA, 123 cases), and USIA combined with SCNB (USIA+ SCNB, 245 cases). SCNB targeted the lateral antebrachial cutaneous nerve (LACN) in all cases, with additional superficial radial nerve (SRN) blocks performed in 169 cases at the operator's discretion. Ultrasound imaging (SONIMAGE HS1, KONICA MINOLTA) with an 18 MHz linear probe was used to visualize nerves and veins, and 1% lidocaine was administered using a 25G 25 mm needle (TERUMO needle, TERUMO, JAPAN). Pain during balloon inflation was assessed using the Numerical Rating Scale (NRS).

Results:

The average time required for SCNB, including ultrasound guidance, was 7.4 ± 0.3 minutes. NRS scores were significantly lower in the USIA+ SCNB group (2.0 ± 2.2) compared to the IA group (5.0 ± 2.4, $p<0.01$) and the USIA group (4.0 ± 2.6, $p<0.05$). For isolated peri-anastomotic lesions, adding an SRN block provided superior pain relief compared to LACN block alone (LACN+SRN: 1.9 ± 0.2 vs. LACN: 2.9 ± 0.4, $p<0.01$).

Conclusion:

In radiocephalic AVFs, LACN block is effective for forearm stenosis, while SRN block is beneficial for peri-anastomotic lesions. Selective cutaneous nerve blocks tailored to the lesion site enable effective pain relief. This method is particularly useful in Japan, where forearm AVFs are prevalent.

Six-month reintervention rates following treatment with WRAPSODY vs PTA **(ID 99)**

Leonardo Harduin[1], Mahmood Razavi[2], Saravanan Balamuthusamy[3], Angelo Makris[4], Jeffrey Hoggard[5], Prabir Roy-Chaudhury[6,7], Robert Jones[8]

[1]Liv Care Centro Clínico, Niterói, Brazil; [2]St. Joseph Heart and Vascular Center,, Orange, USA. [3]PPG Health, Fort Worth, USA; [4]Chicago Access Care, Westmont, USA; [5]North Carolina Nephrology, Raleigh, USA; [6]University of North Carolina Kidney Center, Chapel Hill, USA; [7]W.G. (Bill) Hefner Salisbury Department of Veterans Affairs Medical Center, Salisbury, USA; [8]Queen Elizabeth Hospital Birmingham, Birmingham, USA

Abstract

Background: Results from the randomized arm of the WAVE trial have demonstrated there are significant clinical benefits of WRAPSODY vs PTA; however, a comparative analysis of differences in reintervention has yet to be conducted.

Materials and Methods: The WAVE study is a prospective, international trial (NCT04540302). The randomized arm of the study included patients with venous outflow stenosis/occlusion in their AVF who were randomized 1:1 to treatment with WRAPSODY (n=122) or PTA (n=123). Treatment efficacy was based on TLPP, defined as freedom from clinically driven target lesion revascularization or target lesion thrombosis. The safety profile of WRAPSODY was determined based on the proportion of patients without any localized or systemic safety events through 30 days post procedure. Kaplan-Meier analyses were conducted to determine time to event; log-rank tests were used to determine statistical significance (threshold 0.05).

Results: Six-month TLPP was higher for patients treated with WRAPSODY vs PTA (89.8% vs 62.3%; p<0.0001). ACPP was also higher for patients treated with WRAPSODY vs PTA (72.6% vs. 57.9%; p=0.015). A similar proportion of patients were free from safety events (WRAPSODY: 96.6%; PTA: 95.0%; p=0.53). The mean number of interventions to maintain target lesion patency was lower for WRAPSODY vs PTA (0.18 vs 0.47, p<0.0001) and the mean number of interventions to maintain access circuit patency was lower for WRAPSODY vs PTA (0.48 vs 0.78, p=0.018). More patients treated with PTA vs WRAPSODY required target lesion reintervention (38.9% vs 13.7%, p<0.0001) and any reintervention in the access circuit (42.1% vs 28.3%, p=0.021). The mean time to the first target lesion intervention was longer for WRAPSODY vs PTA (103.5±43.3 vs 88.2±55.2 days) and any reintervention within the access circuit (89.3±51.9 vs 79.9±50.2 days).

Conclusions: WRAPSODY is associated with significant clinical benefits through 6 months, including longer time to reintervention.

Percutaneous echo-guided mechanical thrombolysis with Cleaner XT™ in hemodialysis patients with graft thrombosis (ID 102)

Valentina Stucchi, Giuseppe Bacchini, Elena Rocchi, Vincenzo La Milia
Alessandro Manzoni Hospital, Lecco, Italy

Abstract

Background:partial or complete thrombosis of the vascular access is one of the main complications in hemodialysis patients. The aim of this study is to evaluate the feasibility,the efficacy and the safety of performing mechanical thrombolysis with Cleaner XT™ using ultrasound guidance in prosthetic fistula thrombosis.

Materials and methods:the study included 17 thrombolyses performed on 10 patients with graft thrombosis who were treated with echo-guided mechanical thrombolysis using Cleaner XT™, a rotational thrombectomy system. We define technical success as flow restoration at the end of the thrombolysis procedure and clinical success as the performance of at least one complete hemodialysis session. Post-procedural complications were evaluated using the classification of the American Society of Diagnostic and Interventional Nephrology (ASDIN) which categorizes them on a scale from 1 to 4 according to increasing severity.

Results:technical success rate was 94.1%(16/17) and clinical success rate was 94.1%(16/17). The post-procedural complication rate reported in our study is 17.6% and including one hematoma, two episodes of anemia and one case of pain at the procedure site. All complications had a low score on the ASDIN classification and did not require any major intervention. Pulmonary embolism is one of the major risks during the thrombolysis but no patient developed chest pain during and after the procedure. In one patient, we performed effective thrombolysis 23 days after graft thrombosis demonstrating that excellent results can still be achieved even after a delay.

Conclusion: echo-guided mechanical thrombolysis with Cleaner XT™ is an effective, minimally invasive and safe method for treating prosthetic fistula thrombosis.

Safety and performance of a cell-impermeable endoprosthesis for hemodialysis vascular access central venous occlusion: a brazilian multicenter retrospective study **(ID 111)**

Leonardo Cortizo[1], *Leonardo Harduin*[2], *Marcio Filippo*[3], *Thiago Barroso*[4]
[1]Hospital Ana Nery, Salvador, Brazil; [2]Livcare, Niteroi, Brazil; [3]Clinia Vene, Rio de Janeiro, Brazil; [4]Afya, Brasilia, Brazil

Abstract

Background: To retrospectively evaluate the initial results of a new impermeable endoprothesis for the treatment of vascular access central venous occlusion.

Materials and Methods: This retrospective analysis from 4 centers enrolled 44 patients treated with Wrapsody endoprothesis from November 2021 to April 2023. De novo or restenotic lesions located in the subclavian and innominate veins were treated. The primary efficacy outcome measure was target lesion primary patency (TLPP) at 1, 3, 6 and 12 months. Secondary endpoint included access circuit primary patency (ACPP) and secondary patency (SP) at 1, 3, 6 and 12 months. The primary safety endpoint was freedom from localized or systemic serious adverse events through 30 days.

Results: The target lesion primary patency rates at 1, 3, 6 and 12 months were 100%, 98%, 93% and 73% respectively. The ACPP rates were 100% at 1 month, 86% at 3 months, 74% at 6 months and 66% at 12 months. The primary safety endpoint was 100%. The SP rates at 1, 3, 6 and 12 months were 100%, 98%, 95% and 92,8% respectively. Stent crossed the costoclavicular space in 59% of patients. In multivariate Cox regression analysis with adjustment for gender, age, size and diameter of the stent, stent crosses costoclavicular space, thrombosis at initial presentation, recurrent lesions or stenosis sites, only lesion affecting both subclavian and innominate veins ($p = 0,036$), and stent diameter <14 mm were associated with reduced primary patency ($p = 0,042$).

Conclusion: In this retrospective analysis Wrapsody endoprothesis was safe and effective for the treatment central venous occlusions in vascular access in a 12 month follow-up.

Patient education on vascular access care

Mobile health app reduces catheter time for patients with newly created arteriovenous fistulas (ID 100)

Qining Fu, Liuyin Chen
the First Affiliated Hospital of Chongqing Medical University, Chongqing, China

Abstract

Background: To explore the effect of mobile health application in the management of patients with newly created arteriovenous fistulas （AVFs）.

Materials and Methods: A total of 71 maintenance hemodialysis patients who started dialysis with dialysis catheter, received AVF creation in our hospital from January 2023 to June 2024 and follow-up using a mobile health app were reviewed as the study objects. While 66 patients follow-up with traditional phone call from July 2022 to December 2022 were selected as the control group. The time from the creation of AVF to the removal of dialysis catheter (CVC day), the time of first cannulation of AVF, and complications within post operation 6 months were compared between the two groups.

Results: CVC day of dialysis catheter was 61.0 (50.0,67.0) days in mobile health app group and 88.0 (75.0,99.3) days in control group (P< 0.05). The first cannulation time was 57.000(45.0,62.0) in mobile health app group and 80.000(69.0,92.0) in experimental group. There was no significant difference in complications between the two groups within 6 months. And these results were independent of the patients' age, education background, and dialysis hospital level.

Conclusion: Mobile health application can help reduce the length of CVC days and earlier canulation of newly created AVFs without increasing the risk of complications.

Impact of vascular access on patients' quality of life

AVF elective ligation in kidney transplant recipients (KTRs) is not associated with an acceleration of kidney function decline **(ID 79)**

Francesco La Fergola, Cosma Cortese, Alessandra Pesino, Marco Fiorentino, Loreto Gesualdo

Nephrology, Dialysis and Transplantation Unit, Department of Precision and Regenerative Medicine and Ionian Area (DiMePRe-J), University of Bari, Bari, Italy

Abstract

Background: KTRs frequently keep hemodialysis access in case of future allograft failure; however, the persistence of an unused dialysis access may limit vein availability for phlebotomy procedures. A persistent and patent AVF is associated with complications such as aneurysm formation, thrombosis, steal syndrome, arm edema and can contribute to left ventricular hypertrophy. It is still discussed whether AVF ligation after KT is associated with worsening of renal allograft function. This study aims to analyze our single-center experience of the impact of elective AVF ligation on renal function of KTRs

Materials: This retrospective study analyzed 49 patients who underwent elective AVF ligation after KT at the Nephrology Unit of Policlinico-Bari between 2021 and 2023. All patients had stable renal function and no episodes of graft rejection. Key renal function markers (creatinine clearance, sCr, BUN, and 24-hour proteinuria) were assessed at the time of AVF ligation, and at 1, 3, 6, 12, and 24 months post-ligation. Statistical analysis was done using ANOVA with repeated measures

Results: 49 patients were included in this analysis (mean age was 54.5 ± 12.1 years, 67.3% male). Mean sCr was 1.5 ± 0.46 mg/dl, and mean creatinine clearance was 60.4 ± 23.06 ml/min. At the time of AVF ligation, the median 24-hour proteinuria was 292 mg/24h. No significant protein loss was documented in the study population at the time of AVF ligation, with a median 24-h proteinuria 292 mg/24h. No significant differences were reported regarding sCr ($p=0.52$) and creatinine clearance ($p=0.06$), suggesting stable renal function during the follow-up period. No significant increase in proteinuria was documented after AVF ligation ($p=0.239$)

Conclusion: No decline of GFR and 24-hour proteinuria are observed after the closure of a functioning AVF in KTRs. AVF ligation could be safely carried out in KTRs, given the potential complications associated with large AVFs, such as high-output cardiac failure

The Role of ePROM in improving patient-centered care through enhanced vascular access management in Hemodialysis: A case-control study **(ID 118)**

João Pedro Barros[1,2], Rui Pinto[3], Alcides Pereira[2], Beatriz Queirós[2], Jorge Pratas[2], Ricardo Correia[4]
[1]Programme in Health Data Science, Faculty of Medicine, University of Porto, Porto, Portugal; [2]NephroCare Oliveira do Bairro, Fresenius Medical Care,, Oliveira do Bairro, Portugal; [3]Unidade Local Saúde de Coimbra - University Hospital - Nursing Vascular Access Consultation - Nephrology Department, Coimbra, Portugal; [4]Center for Health Technology and Services Research, Faculty of Medicine, University of Porto, Porto, Portugal

Abstract

Background: Hemodialysis (HD) patients experience reduced Quality of Life (QoL) due to vascular access (VA) complications. Electronic Patient-Reported Outcome Measures (ePROMs) enable tailored care capturing patient perspectives.

Materials and Methods: A multicentric case-control study included 183 HD patients, 61 cases using ePROM, with an average age of 69.6 ± 11.0 years and an HD vintage of 38.2 ± 27.6 months. Over six months, the case group completed the Short-Form Vascular Access Questionnaire and SF-36v2 monthly.

Results: No significant differences were noted in VA interventions and hospitalizations between the case and control groups. In univariate analyses, the odds ratios (OR) were 0.95 (95% CI: 0.30–2.98, p = 0.929) for VA interventions and 0.59 (95% CI: 0.22–1.57, p = 0.290) for hospitalizations. Similarly, multivariate analyses showed an OR of 0.87 (95% CI: 0.28–2.68, p = 0.95) for VA interventions and 0.52 (95% CI: 0.20–1.34, p = 0.174) for hospitalizations. In the cases group from T0 to T6, a decrease in VA impact in the Physical, Social, and Dialysis Complications domains ($p < 0.001$) and an increase in Qol domains, including Role Emotional, Physical Function, Social Function, and Mental Health ($p < 0.001$) was observed. A machine learning (ml) model using GP Boost algorithm identify Pain, Difficulty in Care, Sleep, and Bruising events as top factors negatively impacting patient VA satisfaction (β = -0.10, 95% CI: -0.16 to -0.03, p = 0.003; β = -0.12, 95% CI: -0.19 to -0.04, p = 0.002; β = -0.11, 95% CI: -0.21 to -0.01, p = 0.036; β = -0.08, 95% CI: -0.16 to -0.00, p = 0.038) (AIC: 1294; BIC: 1322). A Dynamic Bayesian network was also implemented to assess VA satisfaction (MAE: 0.86).

Conclusion: The use of ePROM improved Qol and reduced VA-related impacts. ML models identified key factors affecting VA satisfaction, providing insights for patient-centred care.

Innovations in vascular access devices and materials

Evaluation of safety and performances of the novel Silkothane® vascular access in a clinically-relevant ovine model (ID 43)

Stefania Adele Riboldi[1], *Matteo Tozzi*[2], *Alice Caldiroli*[1], *Francesco Giovanni Greco*[1], *Fabio Acocella*[3]
[1]Dialybrid S.r.l., Cantù, Italy; [2]University of Insubria, Varese, Italy; [3]Università degli Studi di Milano, Milano, Italy

Abstract

Background: The novel vascular access SAG (Silkothane® Arteriovenous Graft), manufactured for *in situ* engineering using Silkothane®, was previously tested *in vitro* and *in vivo*, demonstrating proper mechanical properties and biocompatibility features. In a proof-of-concept ovine study, SAG showed 89% primary unassisted patency and initial *in situ* remodeling at 90 days. For FDA clearance and CE mark, a GLP ovine study was conducted, evaluating safety and performances of the graft in the longer term, and more faithfully recapitulating clinical features such as subcutaneous tunneling, early cannulation and repeated puncture.

Materials and Methods: 12 SAGs were implanted between common carotid artery and external jugular vein of 12 sheep via subcutaneous tunneling. Animals were cannulated 48 hours after surgery and every 2 weeks thereafter, and scheduled for sacrifice at 4, 26 or 52 weeks (N=4 per group). Graft patency was examined daily by palpation, every 2 weeks by ultrasound, every 3 months via echo-color Doppler; blood analyses were done monthly. At sacrifice, either elective or due to thrombosis of the access, grafts were harvested and submitted for histopathology, SEM analysis and explant biomechanics, while target organs were analyzed to evaluate host response and systemic effects.

Results and Conclusion: SAG demonstrated to be safe and showed positive performances. No deaths, no major complications/clinical signs, nor consistent changes in clinical blood values, occurred in this study. No severe local inflammatory or toxic response was detected, as judged by an expert pathologist. No infections nor grafts' aneurysmal dilation and a low incidence of peri-graft seroma (2/12) were recorded. Despite limited kinking resistance and only occasional endothelialization at the mid-graft level, SAG showed 83% primary unassisted cumulative patency rate at 2 months, 60% at 7 months and 45% at 10 months, and it is now ready to be challenged in a first-in-human clinical study.

Failed thoracic central vein recanalization: salvage utilizing a radio frequency guide wire (ID 119)

John Aruny
Medical University of South Carolina, Charleston & Orangeburg South Carolina, USA

Abstract

Background Central vein occlusion is a known complication of hemodialysis catheters. The incidence appears to increase as catheter contact time increases. Because we are a referral center we see a disproportionate. number of these patients. Many of these patients had been labeled as catheter dependent. Long standing occlusions can be severely dense and fibrotic. We present our experience in treating with these difficult lesion.

Materials and Methods This presentation retrospectively reviewed patients who presented in 1 of 3 groups. Group I had bilateral occlusion of the innominate veins and associated subclavian vein occlusion or significant stenoses and were turned down for peripheral access secondary to their extensive disease. This group presented with a femoral catheters and required a pathway to place a HeRO device. Group II patients underwent recanalization to re-establish blood flow. Group IIA: Short segment occlusion treated in preparation for access creation. Group IIB: Recanalization of venous occlusion to re-establish flow in a functioning dialysis circuit. The usual presentation was arm and/or neck edema. The majority of patients were recanalyzed with non-thermal methods. Hot Wire was used to treat the remainder.

Results 75 patients, of whom 44% were males, ages 36-76 years, underwent central vein intervention.. Of all patients Group I-44% (n=32), Group IIA-22% (n= 16) & Group IIB-37% (n=27). The hot wire was successfully utilized in Group I-12% (n=4), Group IIA-44% (n=7) & Group IIB-44% (n=12) for a total of 23 patients. Folllow-up ranged from 3 months to 3 years. 94% of treated vessels and previously placed stents (Group IIA & Group IIB) were found to be patent at follow-up. There were no complications.

Conclusion The Baylis Hot Wire has become an essential tool in our armamentarium when other techniques have failed. Venous occlusive disease, regardless of severity should not condemn a patient to catheter dependenc

Reduced platelet activation and fibrin adsorption on the surface of urokinase-coated dialysis catheter **(ID 44)**

Kenichi Kokubo[1,2], Yuya Iino[2], Yohei Shigenaga[1], Madoka Iwata[1], Kozue Kobayashi[1,2], Masaru Kubota[1,2]
[1]Kitasato University School of Allied Health Sciences, Sagamihara, Japan; [2]Kitasato University Graduate School of Medical Sciences, Sagamihara, Japan

Abstract

Background: Urokinase-coated catheter was developed with the expectation that the immobilized urokinase would exhibit antithrombotic properties due to its fibrinolytic properties. The objective of the present study was to ascertain whether a urokinase (UK) coating is effective in preventing thrombus formation, platelet activation, or fibrin adsorption on the surface of UK-coated catheter in vitro.

Materials and Methods: Three types of catheters were inserted into the simulated circulatory circuit: a UK catheter with urokinase coating (UK), a catheter with a structure similar to UK but without coating (non-UK), and a catheter with a structure different from UK and without urokinase coating (GamCath). The catheters were subjected to a 24-hour circulation experiment utilizing fresh porcine blood at a flow rate of 1.5 L/min. The surface of the catheters were evaluated via scanning electron microscopy, and the quantity of fibrin and blood cell components that had adsorbed or adhered to the surface of the catheter were determined by western blotting for fibrin and measurement of the hemoglobin (Hb) level and lactate dehydrogenase (LDH) activity of the eluate.

Results: In the UK group, no thrombus formation was observed on the outer surface of the catheter. In contrast, the non-UK and GamCath groups exhibited thrombus formation on the outer surface and partial or extensive fibrin formation and numerous activated platelets on the surface of the catheters. Fibrin adsorption was found to be less pronounced in the UK group, and residual Hb and LDH activity levels in the UK group were significantly lower than those observed in the non-UK and GamCath groups ($p < 0.05$). These findings indicated that urokinase inhibited thrombus formation by reducing platelet activation and fibrin adsorption on the surface.

Conclusion: In vitro experiments demonstrated that urokinase coating is effective in enhancing anti-thrombogenicity on the surface of catheters.

"Haptic simulators, virtual reality, augmented reality, extended reality in pre-operative planning and practical training in vascular access surgery" (ID 45)

Andrea Gattuso, Marco Heidempergher, Maria Antonietta Orani, Tiziano Porretta, Maurizio Gallieni
ASST Fatebenefratelli-Sacco, Milano, Italy

Abstract

A.Gattuso, M. Heidempergher, M.A. Orani, T. Porretta, M. Gallieni, M. Vertemati, T. Santaniello

BACKGROUND. We present our experience in pre-operative planning and practical training in vascular access surgery in collaboration with HUVANT, a medical simulation platform for advanced practical training in healthcare. Haptic simulators, virtual reality, augmented reality, and extended reality are very useful for good pre-operative planning, increasing the patient's anatomical knowledge and reducing operating times. Simulation is also beneficial in practical training for surgeons and students.

MATERIALS AND METHODS. HUVANT produces 3D haptic simulators, 3D physical models capable of reproducing the mechanical, tactile, and functional response of organs and anatomical parts. These models are used for practical training and provide users with a reliable and realistic simulation experience. 3D digital models are integrated and displayed into immersive virtual reality (VR) environments.

RESULTS. Using different VR headsets, users can navigate human anatomy in 3D, focusing on different pathologies, malformations, and healthy cases. 3D digital models can be displayed as holograms using augmented reality environments.

CONCLUSIONS. With this technology, the user can interact with the scene and manipulate the models in real physical space using see-through displays. By merging haptic simulators and augmented reality environments, virtual and physical models are coupled into a single anatomical and functional system, as in the digital twins domain.

Nursing in vascular access

Implementation of the Multiple Single Cannulation Technique (MuST) in Spain: Training and Initial Experience (ID: 155)

Ruben Iglesias Sanjuan[1], Adrian Gomez Campos[1], Maria del Carmen Perez Sanchez[2], Ana Vanesa Fernandez Martinez[3], Mª Jesus Moreno Rubio[4], Alvaro Leon Cabello[4]

[1]Fresenius Medical Care, Madrid, Spain; [2]Fresenius Medical Care, Murcia, Spain; [3]Fresenius Medical Care, Cartagena, Spain; [4]Fresenius Medical Care, Córdoba, Spain

Abstract

Background
The Multiple Single Cannulation Technique (MuST) for arteriovenous fistulas (AVF) has been used in Portugal since 2013, combining the benefits of the rope-ladder and buttonhole methods. It assigns specific cannulation sites for each session of the week, ensuring an equal number of sites for both arterial and venous punctures, ensuring proper rotation and healing. MuST reduces aneurysms and complications, and matches rope-ladder survival rates. It also enhances patient comfort, safety, and AVF management.

Objective
This study describes the implementation process of the MuST technique in Spain following specialized training with experts from Portugal, and the initial experience of its application in four Spanish hemodialysis centers.

Methods

Spanish vascular access nurses and coordinators followed a structured training program, starting with online pre-training, followed by in-person theoretical and practical sessions in Portugal. With on-site support from a Portuguese expert, they introduced MuST in selected Spanish hemodialysis units, ensuring strict protocol adherence. Weekly follow-ups were conducted initially, later transitioning to monthly meetings to address challenges and for ongoing monitoring and improvement. Continuous follow-up and experience-sharing facilitated seamless integration into clinical practice.

Results

MuST was well received by healthcare professionals for its structured approach and standardized methodology. Patients showed high interest due to its perceived benefits, while newly trained staff and rotating personnel found it easier to adopt. The technique also enhanced patient safety, comfort, and reduced anxiety, improving the overall cannulation experience.

Conclusion
The initial implementation of the MuST technique in Spain has been successful, with positive feedback from both nurses and patients. Given its promising benefits, we will continue monitoring its **clinical outcomes** and expand its application.

Global differences in using point-of-care ultrasound for assessment and cannulation in haemodialysis (ID: 11)

Monica Schoch[1], Catherine Fielding[2,3], Rosa Marticorena[4], George Smith[5,6], Peter Sinclair[7], Ruben Iglesias[8], Paul Bennett[9]
[1]Deakin University, Geelong, Australia; [2]Nottingham University Hospitals Trust, Nottingham, United Kingdom; [3]University of Nottingham, Nottingham, United Kingdom; [4]William Osler Health System, Ontario, Canada; [5]Hull University Teaching Hospitals, Hull, United Kingdom; [6]Hull York Medical School, Hull, United Kingdom; [7]University of Technology Sydney, Sydney, Australia; [8]Fresenius Medical Care, Barcelona, Spain; [9]Griffith University, Brisbane, Australia

Abstract

Background

The use of point-of-care ultrasound (POCUS) for assessing and cannulating vascular access in patients undergoing haemodialysis has demonstrated beneficial clinical outcomes. Despite this, global uptake among renal healthcare providers remains inconsistent, and limited research has explored the global variances.

Materials and Methods

The objectives of this study were to explore regional differences in uptake and use of point-of-care ultrasound for assessment and cannulation in haemodialysis. A 21-item exploratory, descriptive cross-sectional survey was conducted online from November 2022 to May 2023. Renal and vascular access organisations in Australia, Europe, Canada, the United States, and South America facilitated survey distribution.

Results

645 healthcare clinicians from 38 countries completed the survey, with 96% from high-income countries (n=619). Most regions with >20 respondents had between 75% and 93% of respondents reporting that POCUS was available in their haemodialysis facility; however, in the United States (US), only 26% reported POCUS availability. Similarly, the number of respondents who had completed POCUS training in the US was very low compared with much higher numbers in Australia/New Zealand (NZ), Canada, Europe, and the United Kingdom (UK)/Ireland. Canada also had 23% reporting that they had learned to use POCUS when they learned to cannulate, as opposed to <6% in other regions. 87% of respondents from Canada reported using POCUS often or all the time, compared to other regions with >20 respondents: Australia/NZ (68%), Europe (38%), UK/Ireland (21%), and US (18%).

Conclusion

This study revealed regional disparities, particularly the lower availability and utilisation of POCUS in US haemodialysis clinics compared to other high-income regions. Understanding these regional differences is crucial for developing effective education and implementation strategies.

POSTER PRESENTATIONS

Arteriovenous fistula

P-001 High-oxalate diet kidney disease induces hypertension and inflammation and drives impaired murine arteriovenous fistula remodeling (ID: 89)

Eduard de Winter, Nicky Kruit, Kayleigh van Dijk, Erna Peters, Novella Nicese, Thijs Sluiter, Emmelotte Snijder, Saskia Gast, Joris Rotmans, Margreet de Vries
Leiden University Medical Centre, Leiden, Netherlands

Abstract

Background.
The patency of arteriovenous fistulas (AVF) is far from optimal and the mechanisms underlying their failure remain poorly understood. Representative animal models that include kidney disease are essential to gain mechanistic insights in order to develop therapeutic interventions. This study assessed the use of high-oxalate diet induced kidney disease in an AVF mouse model and the effect on AVF remodeling.

Methods.
C57BL/6J male and female mice were fed a high-oxalate diet to induce kidney disease or a control diet for 6 weeks. All 65 animals underwent AVF surgery 3 weeks after start of the diet. Glomerular filtration rate (GFR) was assessed by measuring FITC-sinistrin clearance in week 0, 3 and 6. Blood pressure and blood urea was measured biweekly. AVF volume and blood flow were assessed weekly using duplex ultrasonography. AVFs, blood and kidneys were harvested 3 weeks after surgery. Subgroups were analyzed by (immuno)histochemistry to assess morphometry and immune cell infiltration or by flow cytometry to assess immune cell quantity and activation.

Results.
Kidney disease was confirmed by a 50.2% decrease in GFR ($P<0.001$), and a 2.73-fold increase in blood urea ($P<0.001$) in the high-oxalate group compared to control. AVF volume and blood flow did not differ between groups over time, whereas mean arterial pressure was 23.2% higher in the high-oxalate group compared to control ($P=0.024$). Histology of the AVFs showed a 13.0% decrease in outward remodeling compared to control ($P=0.026$), a trend towards immune cell infiltration and significantly increased vascular calcifications (38.5% vs. 0%). Flow cytometry demonstrated a 29.3% reduction in endothelial cells ($P=0.020$) in the AVFs of the high-oxalate group and a 28.0% increase in systemic leukocyte activation ($P=0.029$).

Conclusion.
High-oxalate diet induced kidney disease provides a representative mouse model of impaired AVF remodeling which is driven by hypertension, endothelial damage and inflammation.

P-002 Comparision of three types distal arteriovenous fistulas for hemodialysis - short term results (ID 135)

Tomasz Gołębiowski, Mariia Chumadevska, Julia Grasela, Olga Kwiecień, Anna Kuźniar, Mariusz Kusztal
Wroclaw Medical University, Wroclaw, Poland

Abstract

Background: According to European Society of Vascular Surgery (ESVS) and European Renal Best Practice guideline on vascular access (VA) a distal arteriovenous fistula (dAVF) should be considered as the first choice of VA. A proximal fistula involving the brachial artery is an alternative choice due to the risk of limb ischemia and heart failure.

In practice, three types of distal arteriovenous fistulas (dAVF) are utilized for dialysis: radiocephalic AVF (RCAVF), radiocephalic AVF with venous patch (pRCAVF) and snuffbox AVF (SBAVF).

The aim of this study is to evaluate and compare outcomes of three different dAVF in hemodialysis patients.

Materials and methods: Design and methodology of this study is available at (ClinicalTrials.gov (NCT06550479). Since April 2023 until now 222 patients (pts.) (mean age 62±16y.) were recruited, including 68 already on hemodialysis maintenance.

Results: RCAVF, pRCAVF, SBAVF were created in 89, 61 and 71 pts., respectively. There were no differences in baseline clinical data, including the cause of chronic renal disease, comorbidities, and preoperative vascular parameters. However, the SBAVF group had lower age and less advanced atherosclerosis. Immediate fistula thrombosis occurred in 4 patients in the RCAVF group. Fistula flow rate (FFR) was significantly higher in pRCAVF. FFR for RCAVF, pRCAVF, SBAVF was 458±221, 589±220, 463±196ml/min. ($p<0.01$). All parameters describing the fistula patency were comparable. 6-months primary patency rare were 62%, 52%, 47%, assistance patency were 64%, 52%, 53%, secondary patency were 71%, 55%, 58% and functional patency were 38%, 40%, 39,44 for RCAVF, pRCAVF, SBAVF ($p>0.05$), respectively.

Conclusion: All three dAVF demonstrate similar patency and functionality. SBAVF should be favored because it preserves significant portion of the vein. Probably proper individual patient selection are responsible for similar short term outcomes in all dAVF.

P-003 No-way out - new outflow tract formation with a stent-graft (ID 2)

Taegeun Rim
HANA General Hospital, Cheong-Ju, Republic of Korea

Abstract

A female patient who has a native arteriovenous fistula for hemodialysis on the right wrist. Sudden fistula occlusion due to acute thrombosis leads to a visit to the clinic.

After surgical thrombectomy, a fistulogram was done. It showed no proper outflow tract, no visualized upper arm cephalic vein, and a tortuous configuration of the perforator vein on the antecubital fossa. The patient did not want to get operative management such as graft interposition.
Doppler SONO examination proves the proper vein 4mm in diameter as an outflow tract of this fistula, distal brachial vein.

Inflow occluded with proper-sized balloon inflation and fine needle puncture to selected target vein. Small size balloon was applied to subcutaneous tissue to build a tract for a stent-graft. A 6x40mm stent-graft was placed on the exact position, and repeated angiogram showed stenosis of aneurysm stump. An additional 10x40mm bare metal stent was placed to expand the stenotic portion. It required adjuvant PTA with 8x40mm balloon.

Completion angiogram showed proper fistula flow with a nice outflow tract.
After 10 months after the procedure, this patient enjoys dialysis with this fistula.

P-006 Stable high flow AV fistula reconstruction using external support stenting (ID 7)

Anthos Koureas[1], Andreas Hadjipolycarpou[1], Panagitsa Christoforou[2]
[1]Apollonion Private Hospital, Nicosia, Cyprus; [2]Nicosia General Hospital, Nicosia, Cyprus

Abstract

High-flow AV fistulas suggest a major issue for haemodialysis patients. It can be related to cardiovascular complications, aneurysm formation and ischemic steal syndrome. Standard flow reduction procedures have been associated with moderate efficiency and a high recurrence rate. External stenting, as a banding technique, offers a promising solution with potentially long-term outcomes.

We report a case of a male 64-year-old patient with a radiocephalic cimino fistula of 5213ml/min and coexisting post-anastomotic, 4cm diameter, aneurysmal dilatation of the cephalic vein. Flow reduction with surgical revision was performed using FRAME FRTM (VGS, Tel Aviv, Israel) external support stent and precise intraoperative flow adjustment by securing the device on the vessel wall at both edges with interrupted sutures. Concurrent cephalic vein excessive aneurysmal tissue resection and calibrated vessel reconstruction preceded.

A final flow reduction of 983ml/min was maintained, and the patient continued to use the AV fistula from the next day without the need for haemodialysis catheter placement during the postoperative period.
External stent support of high-flow AV fistula suggests a unique controlled solution for flow reduction. Establishing its use will potentially be related to fewer procedure failures and recurrences, maintaining normal AV fistula flow long-term.

P-007 Are there the same opportunities for hemodialysis vascular access for women and men? (ID 9)

Sonia Mendoza[1], Jose L. Merino[1], Esther García[1], Lola Prieto[2], Patricia Domínguez[1], Blanca Bueno[1], Beatriz Sualdea[1], Beatriz Espejo[1], Maite Lopez[1], Vicente Paraíso[1]
[1]Hospital Univ. del Henares, Coslada, Spain; [2]Universidad Francisco de Vitoria, Madrid, Spain

Abstract

Introduction: Achieving vascular access (VA) suitable for hemodialysis (HD) is one of the most critical aspects. The autologous arteriovenous fistula (AVF) is the VA that offers the best conditions and is recommended by all VA guidelines. However, numerous factors will affect the possibility of obtaining adequate AVF for dialysis. Classically, being a woman has been described as an unfavorable condition for obtaining a proper AVF. We proposed to analyze our HD population at the current time and compare the VA presented by our patients differentiated by their gender.

Material and Methods: At the end of the year, we analyzed all patients included in our HD Unit and compared the type of VA in the female and male populations.

Results: Our dialysis unit attended 64 patients at the time of the study. The distribution by gender (20 women) and etiology of kidney disease (DM women: 14 (70%) vs men: 20 (45%)) was analyzed. Of the 20 women in our HD unit, 20% (4) presented their first and unique VA, the same percentage was observed in men 20% (9). Seventy percent of women (14) presented a tunneled catheter (TC) compared to 48 % (21) of men. (p: 0.11). Of the total number of women, 8 of them (40%) had an AVF (2 in the maturation phase) and of the men, 22 presented an AVF (50%). Only one woman was dialyzed by a graft (5%) versus 5 men (9%). The number of VAs before the current VA was greater in women.

Conclusion: The percentage of TCs in our dialysis unit was high, above the current recommendations of the VA Guidelines. This percentage is even higher in women. Among the various factors to consider, the higher percentage of DM in the female group of our Unit could influence our results. Improving the percentage of grafts could be an option to reduce the number of TCs.

P-008 Effect of far infrared radiation on patency of the arteriovenous fistula in patients on hemodialysis. A randomized, controlled, multicenter trial. (ID 16)

Kristine Lindhard[1], Henrik Post Hansen[1], Kirstine Gliese[2], Emilie Hansen[1], Kristine Hommel[3], Boye Jensen[4], Ylian Liem[5], Brian Lindegaard Pedersen[6], Mahshid Pourarsalan[7], Marianne Rix[5], James Heaf[2], Ditte Hansen[1]
[1]Department of Nephrology, Herlev, Denmark;[2]Department of Nephrology, Roskilde, Denmark; [3]Department of Nephrology, Holbaek, Denmark; [4]Department of cardiovascular and renal research, Odense, Denmark; [5]Department of Nephrology, Copenhagen, Denmark; [6]Department of Vascular Surgery, Copenhagen, Denmark; [7]Department of Nephrology, Hilleroed, Denmark

Abstract

Introduction: In patients on hemodialysis, the risk of arteriovenous fistula (AVF) failure is unacceptably high. Up to 67% of AVFs need an intervention within one year after placement. Currently, there are no effective treatments to improve the longevity of the AVF. Far infrared radiation (FIR) is electromagnetic radiation, that may enhance the survival of the AVF. The present trial investigated the effect of FIR on AVF patency and survival.

Methods: In a multicenter, randomized, controlled trial, patients were allocated to receive FIR treatment or no FIR. Patients eligible were patients on hemodialysis with a well-functioning AVF. The FIR group received FIR above the skin of their AVF for 40 minutes at every HD treatment for one year. The primary outcome was the difference in the number of patients with at least one intervention (thrombectomy or percutaneous transluminal angioplasty) after 12 months between treatment groups. The difference was analyzed by the Chi-square test. Secondary outcomes were differences in the number of thrombosed AVFs, access flow at different time points, and differences in time to first intervention between groups.

Results: In total, 115 patients were randomized to FIR (n=58) and control (n=57). No difference in baseline characteristics was found between groups. There was no difference in the number of patients with interventions in the FIR group compared to the control group (19% vs. 28%, p=0.25) and number of thrombosed AVFs (5% vs. 3%, p=0.26). Time to first intervention was 164 (86;272) days in the FIR group and 127 (44;164) in the control group, p=0.26. No differences were seen in the change of access flow throughout the time between groups (p=0.86)

Conclusion: No difference was found in the number of patients with interventions. No difference was found in any of the secondary outcomes. FIR has no therapeutic effect on the function and patency of the AVF. (Clinicaltrials.gov: NCT04011072)

P-010 Hemodialysis on the catheter at the time of arteriovenous fistula creation is associated with long-term vascular access failure (ID 38)

Emil Marian Arbănași[1,2,3,4], Petru Alexandru Ion[3,4], Réka Bartus[1,2], Eliza Mihaela Arbănași[3,4], Adrian Vasile Mureșan[1,2], Eliza Russu[1,2]

[1]Department of Vascular Surgery, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Târgu Mureș, Romania; [2]Clinic of Vascular Surgery, Mures County Emergency Hospital, Târgu Mureș, Romania; [3]Doctoral School of Medicine and Pharmacy, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Târgu Mureș, Romania; [4]Regenerative Medicine Laboratory, Centre for Advanced Medical and Pharmaceutical Research (CCAMF), George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Târgu Mureș, Romania

Abstract

Background:
The autologous arteriovenous fistula (AVF) is the primary vascular access (VA) choice for hemodialysis, exhibiting superior permeability and a reduced incidence of complications in comparison to arteriovenous graft (AVG) or central venous catheter (CVC). This study aims to analyze the impact of dialysis on the CVC at the time of AVF creation concerning its long-term primary patency.

Materials and Methods:
This retrospective observational study enrolled 153 ESKD patients admitted to the Vascular Surgery Department for AVF creation from January 2020 to December 2023. The patients were categorized into two groups based on the presence of hemodialysis CVC at admission: „CVC absent" and „CVC present". The patient's demographic, clinical, and laboratory data were collected from the hospital's electronic database at admission. The patients' progress was tracked through medical record review, telephone interviews, or direct patient contact. Following surgery, patients were observed for an average of 2.02±1.51 years.

Results:
Patients who had a CVC at the time of admission exhibited a greater incidence of peripheral arterial disease ($p=0.034$), outpatient setting AVF creation ($p=0.044$), and AVF failure ($p<0.001$), along with a lower occurrence of Radio-Cephalic AVF ($p=0.044$). Additionally, regarding the survival Kaplan-Meier curve's analysis, we observed a higher rate of AVF failure among patients with a CVC at the time of AVF creation ($p<0.001$). At cox-regression analysis, CVC presence is associated with long-term AVF failure (HR: 3.87, $p=0.009$). The association is independent of age and sex (HR: 4.69, $p<0.001$), common cardiovascular risk factors (HR: 3.67, $p=0.004$), and pre-operative vascular mapping determinations (HR: 3.87, $p=0.009$).

Conclusion:
A dialysis CVC at the time of AVF creation adversely affects the long-term primary patency of the AVF, independent of demographic data, common cardiovascular risk factors, and pre-operative vascular mapping.

P-011 Introduction of MUST Multiple Site Cannulation Technique on Hemodialysis (HD) patients as a new option. (ID 48)

Silvia Corti
Azienda USL Toscana Sudest, Arezzo, Italy

Abstract

Background:
The Arterovenous Fistula (AVF) cannulation technique has a crucial role in the vascular access patency and survival. MUST cannulation is a relatively new technique which combines the benefits of Button-Hole and Rope-Ladder techniques. The main goal is to achieve ease of execution and to propose an alternative procedure of cannulation for all nurses working in the HD setting, also for the newly-added ones.

Materials and Methods:
The setting is a public Hospital located in Arezzo, Tuscany; 110 patients are currently treated with chronic HD. We chose three patients with well-established AVF, not presenting any difficulty in cannulation and informed about the new technique. We started in November 2024 with the first one, followed by second and third on December 2024. We took pictures of the AVF and Ultrasound monitoring for the cannulation site choice, together with the patient's wills. We are monitoring the evolution of the cannulation sites and the feedbacks from the colleagues about the new technique. The chosen sites were marked with a demographic crayon in order to see the "next two" sites of cannulation (es. Monday we mark the ones for Wednesday and Friday and so on…) and found this quite helpful in order not to confuse the sites and do not have an "area" cannulation.

Results:
Since November 2024 we don't have any difficulty regarding cannulations. We took many pictures and ask colleagues about their impressions on the new technique.

Conclusion:
this project is still ongoing, so we'll have better results by the time of the Congress and we'll show our pictures and share comments/doubts with expert colleagues.
We'll add a short description of the three patients and pictures ...

P-012 Finerenone encapsulated in nanoparticles prevents juxta-anastomotic stenosis in rat arteriovenous fistula models (ID 54)

Xianhui Liang[1], *Yamin Liu*[1], *Kai Wang*[2], *PEI WANG*[1]
[1]The First Affiliated Hospital of Zhengzhou University, Zhengzhou, China; [2]Nankai University, Tianjin, China

Abstract

Background:
Arteriovenous Fistula (AVF) dysfunction presents a significant clinical challenge, severely affecting long-term patency. Mineralocorticoid receptor (MR) antagonists have shown promise in improving vascular remodeling by modulating phenotypic switching of VSMCs. Localized drug therapy offers the advantage of delivering higher drug concentrations directly to the fistula, minimizing the adverse effects typically associated with systemic drug therapy. This study investigates the effects of MR antagonist, finerenone, encapsulated in nanoparticles on AVF stenosis.

Methods:
Finerenone was encapsulated into PLGA nanoparticles (NP) using the interfacial method and further loaded into Pluronic (F127-Fin NP). Different encapsulated drug dosages were evaluated for their effects on VSMC viability and phenotypes. The efficacy of F127-Fin NP on AVF stenosis was assessed on 21 days in rat AVF models.

Results:
The F127-Fin NP were spherical with a particle size of 385.5 ± 19.32 nm and a zeta potential of -21.54 ± 4.98 mV. In vitro and in vivo release experiments demonstrated sustained finerenone release over 21 days. In vitro studies showed that F127-Fin300 NP (300 μg) effectively inhibited VSMC proliferation and migration without significant cytotoxicity. F127-Fin300 NP treatment markedly suppressed the synthetic differentiation of VSMCs, marked by increased expression of the contractile marker calponin and decreased expression of the synthetic marker osteopontin. In rat AVF models, F127-Fin300 NP significantly increased lumen diameter and blood flow. In addition, the venous neointimal hyperplasia was improved, accompanied by increased calponin expression and decreased osteopontin expression, indicating a protective effect of finerenone by local drug therapy on AVF stenosis.

Conclusion:
F127-Fin300 NP effectively inhibits the synthetic differentiation of VSMCs and reduces stenosis in rats AVF, providing valuable evidence for potential clinical applications.

P-014 Association between high-frequency wall vibrations and adverse vascular remodeling in arteriovenous fistulae: a fluid-structure interaction longitudinal study (ID 59)

Luca Soliveri[1], Sofia Poloni[2], Giulia Cabrini[2], Paolo Brambilla[3,4], Simona Zerbi[3], Anna Caroli[1], Andrea Remuzzi[2], Kristian Valen-Sendstad[5], Michela Bozzetto[1]
[1]Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Bergamo, Italy; [2]Università degli Studi di Bergamo, Bergamo, Italy; [3]ASST Papa Giovanni XXIII, Bergamo, Italy; [4]Università degli Studi di Milano Bicocca, Milano, Italy; [5]Simula Research Laboratory, Oslo, Norway

Abstract

Background:
The mechanobiological mechanisms driving vascular remodeling and failure in arteriovenous fistula (AVF) for hemodialysis are not fully understood. This study aims to investigate the relation between flow-induced vascular wall vibrations and adverse remodeling in AVFs.
Materials and Methods: Six patients with native distal radio-cephalic AVF were monitored over a 1-year period using magnetic resonance imaging and Doppler ultrasound. Patients were divided based on AVF outcomes: two maintained AVF patency, while four experienced complications (two venous stenoses and two excessive dilatations). Patient-specific high-fidelity fluid-structure interaction simulations were conducted at different time points to investigate the association between vascular vibrations and AVF outcomes.

Results:
Patients with complications showed distinct frequency components in wall displacement compared to those with maintained patency. Prior to vascular remodeling, stenotic AVFs exhibited two dominant frequency bands between 45 and 100 Hz, whereas excessively dilated AVFs presented a single band at 50 Hz. Before remodeling onset, patients with complications demonstrated significantly higher vibration amplitude (22.5 ± 5.8 μm vs. 6.6 ± 2.0 μm, $p < 0.01$) and high-pass strain ($(1.30 \pm 0.35)\cdot10^{-3}$ vs. $(0.30 \pm 0.10)\cdot10^{-3}$, $p < 0.01$) compared to those with maintained patency. Significant differences in vibration amplitude and strain were also found between patients with preserved patency and those with stenosis ($p < 0.001$ and $p < 0.01$), as well as in strain between those with proper patency and those with excessive dilatation ($p < 0.01$).

Conclusion:
Specific vibration frequencies and amplitudes are associated with distinct AVF outcomes, highlighting the potential of mechanical vibrations as a novel mechanobiological stimulus for vascular remodeling. These findings could provide valuable insights into the complex mechanisms underlying neointima formation and stenosis development in AVFs.

P-015 Salvage vascular access for long-term cytapheresis in a young patient with sickle cell disease (ID 65)

Tiago Pereira, Patricia Alves, Ana Pena
Hospital Curry Cabral, Unidade Local de Saude Lisboa Central, Lisbon, Portugal

Abstract

Introduction:
Sickle-cell disease (SCD) is an inherited and young-onset disease, with potentially devastating phenomena that lead to significant morbimortality. Current management is limited, and cytapheresis, or exchange transfusions, can be employed. However, this treatment option often requires multiple venous peripheral cannulation or central venous catheter (CVC) insertion.

Case report:
A male of African descent presented with SCD at the age of 1 year due to HbSS homozygosity. He experienced multiple hemolytic anemia crises and suffered one ischemic stroke.
Despite medical and transfusional support, the patient still developed secondary complications, including hyperviscosity, necessitating regular cytapheresis treatments at a 6-week interval.
At the age of 22, following numerous peripheral venous cannulations, vascular access became increasingly challenging and multiple (>10) temporary central venous catheters (CVCs) were inserted.
After consultation with Nephrology, the potential benefits of an arteriovenous fistula were discussed to minimize the risk of infections and central vein complications. Vascular mapping revealed only a right basilic vein with borderline characteristics, suitable for a brachiobasilic fistula.
Following surgery, ultrasound evaluation confirmed fistula patency, although the anastomosed vein was ultimately determined to be a brachial vein, which was subsequently transposed.

Discussion:
Vascular exhaustion presents a significant dilemma in young patients necessitating long-term apheresis therapy. In carefully selected cases, primarily in young patients with multiple risk factors for vascular exhaustion, the creation of an arteriovenous fistula should be considered as a proactive strategy instead of a CVC insertion. This approach should be recognized by different specialties facing similar challenges, such as Hematology in severe sickle cell disease, to enhance early and comprehensive discussions with vascular access teams.

P-016 Correlation between clinical features and morphological and histopatological characteristics of arteriovenous fistula in hemodialysis patients (ID 80)

Raffaella Mauro[1], Gianluca Faggioli[2,1], Cristina Rocchi[2], Alessia Pini[2], Chiara Mascoli[1], Rodolfo Pini[2], Maurizio Alberto Gallieni[3], Stefano Ancetti[1], Mauro Gargiulo[2,1]
[1]IRCCS Sant'Orsola University Hospital of Bologna, Vascular Surgery Unit, Bologna, Italy; [2]Alma Mater Studiorum - University of Bologna, Vascular Surgery, Department of Medical and Surgical Sciences (DIMEC), Sant'Orsola University Hospital of Bologna, Bologna, Italy; [3]University of Milan, Milan, Italy

Abstract

BACKGROUND
The rate of "primary failure" of arteriovenous fistulas(AVF) ranges between 20%-30%. In these cases, the process of arterialization fails.

MATERIALS AND METHODS

In this monocentric, observational, prospective study conducted between January 2018 and April 2022, patients with end-stage renal disease(ESRD), candidates for hemodialysis treatment and underwent AVF creation were enrolled. A venous segment was intraoperatively collected and histologically analyzed. Immunohistochemical staining was performed to evaluate the expression of alpha-smooth muscle actin(α-SMA), desmin, and Ki67. The primary endpoint was to evaluate the primary patency rate defined as the ability to cannulate the AVF with a blood flow≥300 ml/min. The secondary endpoints included evaluating clinical, biochemical, and histological factors associated with primary patency.

RESULTS

Sixty-nine(8.2%) of a total of 843 patients were enrolled in this study(mean age:63.7years; 61.2%male). The primary patency rate at 3 months was 82.1±6.3%. Histological and immunohistochemical characteristics associated with a higher primary patency rate included a higher expression rate of Ki67 at the periendothelial level, a lower percentage or absence of calcifications, and reduced positivity in the immunohistochemical examination for desmin. The biochemical variables correlating with the primary endpoint included parathyroid hormone, phosphorus, white blood cells, C-reactive protein, fibrinogen, and uric acid.

CONCLUSION

This study confirm prevous literature data showing high expression of Ki67 at the myointimal level is associated with hyperplasia and a higher failure rate of AVFs. However, this study found that the proliferative activity of periendothelial cells, along with increased expression of desmin (indicative of smooth muscle component expression) seems to favour AVF patency. The proliferative response of different vascular components (i.e. periendothelium vs myointima) may be relevant in AVF patency.

P-017 Thermography and vascular access for hemodialysis: its potential use in the diagnosis of arteriovenous fistulas. (ID 82)

Giuseppe Gatta[1], Antonio Scarlatella[1], Arcangelo Merla[2], Michele Tritto[3], Filippo Aucella[1]
[1]IRCCS "Casa Sollievo della Sofferenza", San Giovanni Rotondo, Italy; [2]Università di Chieti-Pescara, Chieti, Italy; [3]Next2u Solution, Pescara, Italy

Abstract

The arteriovenous fistula (AVF) represents the favorite vascular access in individuals with chronic kidney disease (CKD).

It is now well established that the advent of instrumental diagnostics has contributed significantly to improving primary and secondary patency of FAV and early diagnosis of vascular access complications.
In this area, clinical thermography, a noninvasive and nondestructive diagnostic technique for assessing minute surface temperature differences, has shown good potential for the assessment of AVF.
The presence of AVF results in a change in the hemodynamics of the upper limb; arterial and venous flows increase and result in changes in skin temperature that can be highlighted with a thermal imaging camera.
Over a period of about 2 years, we analyzed with a thermal imaging camera (FLIR 500A) the upper limbs of about 300 AVF patients and evaluated the images both in real time and post-processing. In particular, we noticed an increase in temperature in the area overlying the anastomosis and along the course of the arterialized vein (figure 1). In the latter case, it was possible to easily highlight the course of the vessel and the presence of any significant stenosis and accessory venous vessels. Thermographic analysis also made it possible to study hand perfusion and thus diagnose steal-syndrome (Figure 2).

Preoperatively, thermography was used to assess the function of the arterial circulation by the postacclusive reactive hyperemia test (PORH) (figure 3) and to check the patency of the vein candidate for anastomosis by administering a cold saline solution (figure 4).

Thermography is an easy, fast and harmless way to assess arm perfusion before AVF intervention and in post operative evaluation.

Further studies could validate the use of clinical thermography as a diagnostic technique to be used in the field of hemodialysis vascular accesses.

P-018 Preoperative Duplex Ultrasound Parameters for AVF Maturation: A Focus on Radial and Brachial Arteries (ID 104)

Suehyun Park, Deokbi Hwang, Seung Huh, Hyung-Kee Kim
Kyungpook National University Hospital, Daegu, Republic of Korea

Abstract

Background:

The achievement of early maturation of arteriovenous fistulas (AVFs) is crucial for ensuring effective and sustainable hemodialysis. Identification of preoperative predictors for AVF maturation may help reduce the rates of maturation failure.

Objectives:

This study aimed to evaluate preoperative Duplex ultrasound parameters as predictors of radiocephalic-AVF (RC-AVF) maturation.
Materials and Methods: This retrospective study included 49 patients who underwent RC-AVF creation in 2018 without prior ipsilateral AVF creation were included. All patients underwent preoperative evaluation with Duplex ultrasound, during which peak systolic velocity (PSV), blood flow rate (BFR), and the diameters of the radial and brachial arteries were measured. Six weeks after AVF creation, AVF maturation was assessed using physical examination or Duplex ultrasound.

Results:

Among the 49 patients, 29 (59.2%) were male. The mean age of patients was 60.4±13.3 years. AVF maturation was achieved in 40 (81.6%) patients. Between maturation group (MG) and non-maturation group (non-MG), there was no significant difference in PSV (MG: 55.39±16.96 vs. non-MG: 49.36±14.06, P=0.33) and BFR (MG 19.15[9.73-33.38] vs. non-MG 15.7[8.85-23.75], P=0.31) of the radial artery. Similarly, no significant difference was observed in PSV (MG 66.6±18.52 vs. non-MG 60.82±21.12, P=0.41) and in BFR (MG 78.7[46.2-126.3] vs. non-MG 45.8[39.2-103.5], p=0.15) of the brachial artery. However, unlike the brachial artery, the radial artery diameter showed a significant difference between the two groups. (MG 2.45[2.2-2.8] vs. non-MG 2.2[2.0-2.25], P=0.02).

Conclusion:

The radial artery diameter prior to AVF creation may serve as a significant predictor of RC-AVF maturation.

P-019 New electrospinning impermeable covered stent for the treatment of vascular access outflow stenosis - 12 months results (ID 107)

Leonardo Cortizo[1], Leonardo Harduin[2], Marcio Filippo[3], Thiago Barroso[4]

[1]Hospital Ana Nery, Salvador, Brazil; [2]Livcare, Niteroi, Brazil; [3]Clinica Vene, Rio de Janeiro, Brazil; [4]Clinica Afya, Brasilia, Brazil

Abstract

Background:

To retrospectively evaluate the safety and initial results of a new electrospinning impermeable covered stent for the treatment of vascular access outflow stenosis.

Materials and Methods:

This retrospective analysis from two centers enrolled 114 patients treated with Solaris covered stents from September 2018 to June 2023. Lesions treated were de novo and restenotic located in the venous graft anastomosis, outflow segments, cephalic arch and basilic swing point. Patients were followed by in person physical examination at 3, 6 and 12 months and additional Duplex ultrasound was performed in all the patients to evaluate the vascular access circuit and in-stent restenosis. The primary efficacy end point was target lesion primary patency (TLPP) at 3, 6 and 12 months. Secondary endpoint included access circuit primary patency (ACPP) and secondary patency (SP) at 3, 6 and 12 months. The primary safety endpoint was freedom from localized or systemic serious adverse events through 30 days.

Results:

The target lesion primary patency rates at 3, 6 and 12 months were 88,5%, 73,7% and 56,4% respectively. ACPP rates were 82,7% at 3 months, 61,9% at 6 months and 37,7% at 12 months. The primary safety endpoint was 100%. The SP rates at 3, 6 and 12 months 96,1%, 94,2% and 87,9% respectively. In multivariate Cox regression analysis with adjustment for gender, age, diabetes status, size and diameter of the stent, AVF site, thrombosis at initial presentation, recurrent lesions or stenosis sites, only thrombosis with a hazard ratio of 1.86 (95% CI, 1.02 - 3.39; p = 0.044) was associated with reduced primary patency. De novo lesions with a hazard ratio of 0.34 (95% CI, 0.18 - 0.62; p <0.001) and stent diameter >7 mm with a hazard ratio of 0.53 (95% CI, 0.29 - 0.96; p = 0.036) were associated with better primary patency.

Conclusion:

In this retrospective analysis Solaris covered Stent was safe and effective for the treatment of peripheral outflow stenosis in vascular access.

P-020 Surgical management of a venous aneurysm in a pediatric patient with arteriovenous fistula: a case report. (ID 108)

Jose Maria Igeno San Miguel[1], *Mirko Menegolo*[2], *Germana Longo*[1], *Giovanni Ceschia*[1], *Mattia Parolin*[1], *Enrico Vidal*[1]
[1]Pediatric Nephrology, Dialysis, and Transplantation Unit, University Hospital of Padua, Padua, Italy;
[2]Vascular Surgery Unit, University Hospital of Padua, Padua, Italy

Abstract

Background

Arteriovenous fistula (AVF) is the preferred vascular access also for pediatric patients on hemodialysis, excluding small children with small size vessels, due to fewer complications than other access types. One complication of AVF is the formation of a venous aneurysm (VA). Expansion of VA reduces the available sites for cannulation and lead to vessel thrombosis or rupture with massive hemorrhage. The presence of a massive VA therefore requires surgical treatment which generally involves ligation or resection with AVF sacrifice.

Case presentation

We present the case of a 16-year-old boy with severe IgA nephropathy, characterized by the development of end stage kidney disease one year after onset, followed by need to start hemodialysis via AVF (anastomosis between the humeral artery and the left cephalic vein) after 6 months. About a month after the creation of AVF, a progressively enlarging VA appeared. Further investigation with an angio-CT scan revealed the presence of kinking in the cephalic vein at the proximal third of the left arm. To complete the evaluation, genetic tests were performed, excluding mutations in known genes associated with collagenopathies. Given the enlargement of the VA, 8 months after the creation of AVF, surgical intervention was performed to remove the proximal aneurysmal dilation and reduce the distal aneurysmal portion, restoring venous flow through an end-to-end anastomosis of the cephalic vein. Hemodialysis via AVF was then regularly continued for a further 10 months, until the patient underwent a kidney transplant.

Conclusion

With our procedure the VA was remodeled to an appropriate size to preserve and utilize the already thickened vein wall, avoiding the need for temporary catheter placement. In conclusion, surgical remodeling of an AVF venous aneurysm is a safe and effective procedure, particularly beneficial for young patients in whom the preservation of a functioning native AVF offers significant advantages.

P- 021 Role of USG doppler in predicting suboptimal vein maturation of AV fistula creation - A nephrologist perspective from India (ID 113)

Vinant Bhargava, Rajdeb Saha, Anil K Bhalla, Ashwani Gupta, Manish Malik, Anurag Gupta, Vaibhav Tiwari, D S Rana
Sir Gangaram Hospital, New Delhi, India

Abstract

Background:
* With the increasing global burden of chronic kidney disease, it is inevitable for all nephrologists to be well versed with using ultrasound doppler and creation of AV Fistulas.
* In our centre we studied the role of duplex sonography in predicting the outcomes of AV Fistula maturation in Indian population.
Materials and Methods
* Study type: prospective observational single centre study
* Population selected: patients with eGFR< 30 mL/min/1.73 m2 BSA, with age more than 18, referred for an AV fistula creation, which was created by two competent intervention nephrologists.
* Type of access: Radio-cephalic AVF
* Follow up period: after 6 weeks .
* Primary end points: Time to first canulation of the AV fistula
* Secondary end points: Time taken to AVF maturation as per KDOQI guidelines
* Stastistical analysis: Wilcoxon signed ranks test

Results:
Study population: 112 patients
Mean Age 53.4 ± 11.5 years,
Gender: 66 males and 46 females.
Mean duration of CKD was 3.1 ± 1.1 years.
Most commonly associated conditions included Diabetes and Hypertension in 81 and 67 patients respectively.
Mean eGFR was 7.1 ± 1.1 ml/min/1.73m2. Out of 112 patients, 82 (73.7%) patients were successfully cannulated after 8 weeks.
Post op scanning was done for only 55 patients while12 (10.2%) patients had maturation failure and 10 (9.6%) are awaiting cannulation.82 patients met the primary endpoint and 18 patients met the secondary endpoint.

Conclusion:
In our study, Cephalic Vein maturation post AVF creation was favourable even upto 1.6mm. Hence we propose that Indian sub population have better AVF outcomes even with suboptimal vein diameter upto 1.6mm as compared to western population.

P-022 Proximal Ulnar Artery Fistula Enabled by a Nitinol Extravascular Support Produce Significantly Higher Unassisted Maturation Rates than Brachial-Based Fistulas (ID 116)

George Blessios
Kaleida Health, Buffalo, USA. Blessios Medical, Williamsville, USA

Abstract

Proximal ulnar artery fistulas (proxUAF) are rarely used alternatives to brachial artery fistulas (BAFs) as the surrounding muscular tissue risk external compression of the anastomosis. Here, a nitinol extravascular support is evaluated to prevent compression and facilitate the maturation of proxUAF.

ProxUAF were created in consecutive patients with a suitable medial cephalic vein diameter (≥2.5 mm) and proximal ulnar artery volume flow (20 ml/min). All procedures were performed by a single surgeon, under local anesthesia with sedation. After mobilizing the proximal forearm vasculature, the medial cephalic vein was threaded thru the nitinol extravascular support (VasQ, Laminate Medical) before anastomosis creation. The device was positioned over the anastomosis and secured with prolene around the artery. Patients were evaluated at 2 and 4 weeks for maturation via 600 ml/min arterial flow and 6 mm vein diameter and compared to a historical controls of 142 BAFs in a logistic regression analysis including sex, age >70yrs, race, diabetes, BMI >30, ESKD and vessel diameter.

ProxUAF were created for 95% (41/43) of upper arm fistulas from March to October 2024. ProxUAF patients were 45% female, 43% ESKD, and 57% diabetic with a median age of 72 years, BMI of 26.4, vein of 3.5 mm and artery of 4.0 mm. Three patients died and were excluded from the analysis. No evidence of steal was observed. The 2-week follow-up reported 71% (27/38) of patients had mature fistulas ready for cannulation, which increased to 84% (32/38) by 4-weeks without intervention. Total maturation was 92% (35/38) and 8% (3/38) were abandoned. In a logistic regression analysis, proxUAFs were statistically more likely to mature without intervention vs BAFs (OR: 3.8, 95%-CI: 1.5-9.8, p=.006).

The study suggests that extravascular support enables the regular creation of a proxUCF with higher unassisted maturation rates than unsupported BAVFs and may serve as a better anastomotic option for upper arm fistulas.

P-023 Distal forearm perforating vein for native arteriovenous fistula – a case series (ID 137)

Tomasz Gołębiowski, Mariusz Kusztal
Wroclaw Medical University, Wroclaw, Poland

Abstract

Background:

Two major groups of perforators connecting, through the deep fascia, the superficial veins (under the superficial fascia) to the radial and ulnar venae comitantes (under the deep fascia). The well-known proximal perforating vein is in the antecubital fossa. In the distal part of the forearm numerous perforators were found, concentrated on the radial side.

The purpose of this study is to describe utilization of distal perforating vein (DPV) as an outflow for native arteriovenous fistula in distal part of the forearm.

Materials and methods:

Five patients with chronic kidney disease in stages G4 and G5, aged 64±17, who underwent AVF utilizing DPV, were qualify for the study. In all patients vascular mapping using Ultrasound were performed. The DPV was identified as a vessel running transverse or oblique to the long axis of the forearm and connecting the cephalic vein with the deep venous system. Following that, an AVF had been created in the distal part of the forearm.

Results:

All AVFs were patent after discharging. No short time complications were observed. The mean diameter increase of the radial artery, brachial artery, and vein in the antecubital fossa 24 hours after surgery was 0.45, 0.5, and 4.6mm, respectively. The mean fistula flow rate was 610±126ml/min. The first cannulation were performed uneventful in 45 (IQR 20-100) day post-surgery.

Conclusion:

All five fistulas demonstrate adequate functionality. Due to the proximity of the radial artery and the DPV, the wound was much smaller than in a wrist radiocephalic fistula. DPV should be considered as an outflow vein in cases when distal cephalic vein were not available.

P-024 Pattern of patients referred for permanent vascular access formation for chronic haemodialysis. A single surgeon experience. (ID 139)

Jarek Kowalczyk
Arwyp Hospital, Johannesburg, South Africa

Abstract

Introduction:

The global population is ageing with life expectancy of around 80 years in Europe, USA and 92 years in Japan. There is also a significant increase in cardiovascular disease in haemodialysis (HD) patients from 22% to 34 % as well as diabetes mellitus (DM) from 18% to 33 % over the last 15 years. HIV/AIDS contributes towards renal failure in affected patients. Therefore, an annual increase of patients requiring chronic renal replacement therapy is around 5-7 % worldwide. According to the DOQI guidelines primary arterio-venous fistula (AVF) should be utilized for HD in about 65 % of all new patients.

Methods:

This is a retrospective analysis of data of a single surgeon practice based at Arwyp Hospital, Johannesburg. The referring Renal Unit is overseen by 4 nephrologists and dialyse 272 chronic renal patients utilizing 71 dialysers. Between 2005-2009 (period A) and 2015-2019 (period B) we created 301 AVF and 378 AVG for chronic HD.

Results:

The average age of the patients submitted to vascular access formation was similar over the years: A-50.7y and B-50.9 y. We treated more male patients compared to females A-192/109, B-242/136 but with the identical ratio: 1.8:1. The majority of patients had arterial hypertension; 95.2 % and 97.1 %. DM prevalence was A-25.4 % and B-32.5 %. HIV (+) was present in 8.4 % in A period with an increase to 20.9% in B period. Morbid obesity of patients was similar in both periods studied: 9.3 % and 8.6 %. In terms of AVF vs AVG creation there was no significant change A-70.4 % to 29.6 %; B- 75.1% to 24.9 %.

Conclusions:

-there is no significant difference in age, male to female ratio or hypertension in our patients over the 10 years period (2005-2009 vs 2015-2019)
-we noted a significant increase in the number of patients suffering from DM and HIV
-primary AVF was constructed in the majority of patients requiring chronic HD

P-025 Brain morphological changes, cognitive impairment and cerebral oxygenation in hemodialysis patients. (ID 143)

Martin Michna[1,2], Romana Burgetova[1], Jan Malik[2], Hana Malikova[1]
[1]Department of Radiology and Nuclear Medicine, Third Faculty of Medicine, Charles University, University Hospital Kralovske Vinohrady, Prague, Czech Republic, Prague, Czech Republic; [2]Third Department of Internal Medicine, General University Hospital in Prague, First Faculty of Medicine, Charles University, Prague, Czech Republic, Prague, Czech Republic

Abstract

Background:

End-stage kidney disease (ESKD) patients often experience cognitive decline and they have prevalent brain morphological changes. Recent studies have shown reduced cerebral oxygenation in this population. The etiopathogenesis of cognitive decline is not fully understood. We hypothesize that brain hypoxia drives brain morphological changes and cognitive decline in ESKD patients and that arteriovenous fistula (AVF) contributes to reduced cerebral oxygenation.

Materials and Methods:

We conducted a prospective study involving 44 hemodialysis (HD) patients and 24 age- and gender-matched healthy controls. Cognition was assessed using the Montreal Cognitive Assessment (MoCA). Brain morphology was evaluated via magnetic resonance imaging (MRI), including total brain, cortical grey matter, white matter, thalamic, hippocampal, and amygdala volumes, as well as T2 white matter lesions, microbleeds, and lacunar infarcts. Regional cerebral oxygen saturation (rSO_2) was measured using the INVOS 5100C Oximetry system. Statistical analyses included Mann-Whitney U, Chi-square, Spearman rank correlation, and Wilcoxon signed-rank tests ($p<0.05$).

Results:

HD patients had significantly lower rSO_2 ($p<0.001$) and MoCA scores ($p<0.001$) compared to healthy controls. MRI showed reduced brain volumes ($p<0.05$) except for the hippocampus and amygdala, and increased microbleeds ($p=0.001$), lacunar infarcts ($p=0.003$), and T2 white matter lesions ($p=0.04$). MoCA scores correlated with brain volumetry ($p<0.05$), but rSO_2 did not correlate with cognitive decline or brain morphological parameters in HD patients. Patients with AVF had lower rSO_2 ($p=0.02$) than those with a central venous catheter.

Conclusions:

HD patients had worse cognitive functions, prevalent brain morphological abnormalities, and reduced cerebral oxygenation. However, brain oxygenation did not correlate with cognitive decline or brain morphological changes. Lower rSO_2 in AVF patients suggests a potential "steal effect."

P-026 Multidisciplinary team effort can drastically and effectively reduce catheter rates. (ID 152)

Theodoros Akrivos[1], Ioannis Boletis[1,2], Georgios Chatzantonis[3], Georgios Tsaples[3], Alexandros Mallios[3,4], Georgios Triantafyllis[5], Fotini Alevizaki[6], Panagiota Tsatsani[7], Anastasios Drakopoulos[8], Alexandra Patrinou[9], Georgios Skoutelis[10], Vasiliki Zoi[1], Carlos Lucas[11], Fernando Macario[11]

[1]Diaverum Hellas, Athens, Greece; [2]Medical School - University of Athens, Athens, Greece; [3]Department of Vascular Surgery and Access – Henry Dunant, Athens, Greece; [4]Vascular Surgery Department, Groupe Hospitalier Paris Saint Joseph, Paris, France; [5]Peristeri HD clinic - Diaverum, Athens, Greece; [6]Ilion HD clinic - Diaverum, Athens, Greece; [7]Chalkida HD clinic - Diaverum, Chalkida, Greece; [8]Livadeia HD clinic - Diaverum, Livadeia, Greece; [9]Koropi HD clinic - Diaverum, Koropi, Greece; [10]Attiko HD clinic - Diaverum, Athens, Greece; [11]Diaverum AB, Malmo, Sweden

Abstract

Background:

Central venous catheter (CVC) rates remain unacceptably high, often >50% even in countries where the health system allows for early detection of chronic kidney disease (CKD). We evaluated the effectiveness of a multidisciplinary approach for drastic catheter reduction in a specific cohort of patients.
Materials and Methods: Interventional cohort study included 67 patients from 6 Greek dialysis units from an international renal care provider. Our objective is to describe the clinical outcomes including, maturation, patency rates at four, eight and twelve weeks, along with complications.

Results:

Between July 2024 and November 2024, a new vascular access was created in 67 patients. In 79%, a forearm AVF was created. Four-week patency for the entire group was 91%. Venous congestion and edema were the most frequent complications and occurred at 16% of patients followed by minor infections at 4%. No patient required urgent reintervention. Eight-week maturation was 62% and thrombosis rate was 13%. Interestingly, in the "VA exhausted" group (20 patients), a fistula creation was possible with an eight-week maturation rate of 60% and a thrombosis rate of 25%. In 70% of them a forearm fistula was created. In the subgroup of elderly patients (> 75 years old) - (25 patients), the eight-week maturation rate was 52% while the thrombosis rate was 16%. In these 67 operations, there was no need for use of AVG, stent or stent graft.

Conclusion:

A multidisciplinary team including surgeons, nephrologists and dialysis nurses can drastically improve quality of vascular access in a short period of time without the need for expensive resources. The systematic evaluation of patients previously characterized as "VA exhausted" by experienced vascular access surgeons supported by Doppler Ultrasound can lead to a successful AVF creation. Older patients should not be excluded from AVF creation programs.

P-027 Innovative and unconventional techniques to accelerate maturation of distal fistulas (ID 161)

Tomasz Gołębiowski
Wroclaw Medical University, Wroclaw, Poland

Abstract

The most common form of vascular access for haemodialysis is a native arteriovenous fistula (AVF), which connects the artery to the end of the vein. The maturity of the fistula is an important step in establishing functional vascular access. It is a complex process that involves changes in both the artery and the vein, characterised by vessels dilatation and an increase in blood flow. Over 80% of patients suffering from end-stage renal disease (ESRD) started hemodialysis (HD) with a catheter because of the lack of an AVF or the inability to cannulate one. A prolonged maturation time is typically associated with conditions that occur prior to AVF formation, such as vein destruction and radial artery (RA) atherosclerosis. Usually, two types of techniques are used for accelerating AVF maturation. Endovascular or open repair may be performed, depending on the underlying cause. During the lecture, I will describe unique strategies to accelerate of AVF maturation that have been published by our team in last two years.

1. Radial artery deviation and reimplantation (RADAR) to accelerate the maturation of radial-cephalic fistulas for hemodialysis in patients with end-stage renal disease. Journal of Clinical Medicine, 2023.

2. The role of a distal forearm perforating vein and deep vein system in supporting patency of a snuffbox fistula - A case report. J Vasc Surg Cases Innov Tech. 2024.

3. The forearm's subcutaneous venous network to accelerate maturation of native arteriovenous fistula - a case report. Case Reports in Nephrology and Dialysis, 2025.

The first manuscript describes the RADAR technique in specific cases of radial artery stenosis, the second discusses the importance of distal perforating vein and deep vein system as an outflow for distal fistula, and the third addresses the possibility of using the vein of the subcutaneous vein system to accelerate snuffbox fistula.

P-028 Changes in brachial artery blood flow and diameter after AV fistula creation (ID 166)

Rafael Ponikvar[1], Bojan Medved[1], Jakob Gubenšek[1], Matej Zrimšek[2], Denis Fornazarič[1], Jadranka Buturović[1]
[1]Ljubljana, Ljubljana, Slovenia; [2]Ljubljana, Ljubljana, Somalia

Abstract

Changes in brachial artery blood flow and diameter after AV fistula creation
Rafael Ponikvar, Bojan Medved, Jakob Gubenšek, Matej Zrimšek, Denis Fornazarič, Jadranka Buturović Ponikvar
Department of Nephrology, University Medical Centre Ljubljana, School of Medicine, University of Ljubljana, Slovenia

Background:

To elucidate dynamics of increase of blood flow and diameter we conducted retrospective analysis of blood flow through brachial artery and diameter after creation of AV fistulas.
Materials and Methods: In 96 chronic hemodialysis patients, 32 women, mean age 68.7±13.3 years, radiocephalic (RC) or brachiocefalic/basilic (B-C/B) AVF was created by nephrologist with surgical skills. Blood flow through brachial artery and diameter were measured by US/Doppler, before, after, 2 hours, 1 week, 2 weeks and 4 weeks after surgery.

Results:

Blood flow through brachial artery (ml/min.) in RC AVF before, after, 2 hours, 1, 2, and 4 weeks after surgery was 99.0±46.2, 405.0±206.6, 542.1±217.0, 794.6±153.8, 857.1±429.9, 976.2±439.1, respectively and in B-C/B AVF 76.9±38.6, 694.0±343.0, 855.4±349.5, 1294.8±709.1, 1149.2±563.8, 1000.8±497.7 respectively. Diameter of brachial artery (mm) was 4.7±0.7, 4.8±0.8, 5.0±0.8, 5.3±0.9, 5.1±1.3, 5.7±0.9, before, after, 2 hours, 1, 2, 4 weeks after RC AVF surgery, respectively and 4.7±0.9, 4.8±0.9, 5.0±0.9, 5.4±1.1, 5.2±1.1, 5,2±0.9, before, after, 2 hours, 1, 2 and 4 weeks after B-C/B AVF surgery, respectively. Blood flow was increasing after surgery of RC AVF, by 4.1, 5.5, 8.0, 8.6 and 9.8 times, after, 2 hours, 1, 2, and 4 weeks after surgery, respectively. Blood flow after B-C/B AVF creation increased by 9.0, 11.1, 16.8, 15.0 and 13.0 times, after, 2 hours, 1, 2 and 4 weeks after surgery, respectively.

Conclusions:

The most important hemodynamic changes occured already 2 hours after surgery and may be early predictors of future AVF patency, maturation and clinical usability

P-029 Preliminary Findings from a Cohort Study Comparing Arteriovenous and Venovenous Anastomosis in Two-Stage Basilic Vein Transposition (ID 179)

Daniel Mendes, Paulo Almeida, Andreia Pinelo, Clemente Sousa, Luis Loureiro, Sérgio Teixeira, Duarte Rego, Gabriela Teixeira, Carlos Veiga, Carlos Veterano, António Norton de Matos
GEV-Grupo de Estudos Vasculares, Porto, Portugal

Abstract

Background:

The traditional basilic vein transposition (BVT) technique involves juxta-anastomotic ligation of the fistula and the creation of a new side-to-end proximal arteriovenous anastomosis (AVA). A quicker approach preserves a short segment of the juxta-anastomotic vein, constructing an end-to-end venovenous anastomosis (VVA). There are no relevant studies comparing these two techniques. We hypothesized that the increased turbulence in the juxta-anastomotic vein associated with VVA might contribute to greater intimal hyperplasia and inflow stenosis. This study aimed to compare these two techniques.

Methods:

A retrospective cohort study was conducted at the GEV – Vascular Access Center, from January 2017 to December 2022. Patients undergoing two-stage BVT were categorized into two groups based on the anastomosis type: AVA or VVA. Data were extracted from institutional databases, capturing demographics, comorbidities, surgical technique, and follow-up. Primary outcomes were primary and secondary patency rates at 24 months. Secondary outcomes included inflow interventions within 24 months, defined as surgical or endovascular procedures targeting the anastomosis or juxta-anastomotic segment.

Results:

Of 151 patients identified, 33 were excluded due to deviations from the standard technique or single-stage transposition, leaving 118 patients (mean age 69 ± 17 years, 70% male) for analysis. Diabetic nephropathy was the predominant cause of renal disease. Seventy-eight patients underwent AVA anastomosis, and 40 underwent VVA anastomosis. No significant differences were observed in primary or assisted primary patency rates at 24 months. However, inflow interventions were significantly more frequent in the VVA group (18%) compared to the AVA group (10%; $p < 0.05$).

Conclusions:

This study demonstrates that VVA, while not associated with differences in patency rates, appears to exhibit a higher frequency of inflow interventions compared to AVA.

P-030 Introduction of the endovascular arteriovenous fistula (endoAVF) program: A Croatian Center's Experience (ID 183)

Lovro Tkalčić[1,2], Stela Živčić-Ćosić[1,3], Boris Bezak[1], Slavica Kovačić[1,3], Dean Markić[1,3], Sanja Pečanić[1,3], Edita Vojnović[1], Dimitrij Kuhelj[4,5]

[1]Clinical Hospital Center Rijeka, Rijeka, Croatia; [2]Faculty of Health Studies, University of Rijeka, Rijeka, Croatia; [3]Faculty of Medicine, University of Rijeka, Rijeka, Croatia; [4]University Medical Centre Ljubljana, Ljubljana, Slovenia; [5]Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

Abstract

Background

Endovascular arteriovenous fistula (endoAVF) formation was introduced in Croatia in September 2022, simultaneously in three clinical hospital centers (CHC). Our aim was to analyze the leading factors for the success of the endoAVF program at the CHC Rijeka, where the most experience with endoAVF usage was gained.

Materials and Methods

A multidisciplinary team has been established for vascular access planning and selection of candidates for endoAVF creation. In all cases the 4F Wavelinq system was used. Routine data on all patients, complications and outcomes were collected and analyzed statistically.

Results

Between September 2022 and August 2024, 17 patients were selected for endoAVF creation. Most patients (n=13; 76.5%) were male. The median age of the patients was 63 years (range: 35-79 years). EndoAVF creation was successful in 16 patients, without major periprocedural complications, besides one puncture site hematoma. The median time period from endoAVF creation to usage for hemodialysis was 7.9 weeks (range: 6.0-39.0 weeks). Primary functional patency at 6 months was 88%. Four patients required an intervention to maintain patency due to deep vein thrombosis and two endoAVF did not maturate.
The success of the endoAVF program was mainly based on collaboration of the vascular access team, dedicated to improve treatment outcomes in dialysis patients. In the beginning, the lack of expertise, financial and organizational constraints, as well as patient vascular comorbidity and complications, hampered the acceptance of the endoAVF program.

Conclusion

The implementation of the endoAVF program emphasized the importance of a structured educational program for medical personnel and patients. Despite initial challenges, the endoAVF program resulted in usage of additional options for dialysis access, increased the number of patients having a fistula for dialysis, advanced expertise and interdisciplinary collaboration, and improved patient outcomes.

Arteriovenous prosthetic grafts

P-033 Correcting deeply positioned prosthetic grafts in adipose tissue: an AVF-inspired breakthrough technique (ID 64)

Alessandra Pesino, Cosma Cortese, Francesco La Fergola, Nicola Grandolfo, Loreto Gesualdo
Policlinico di Bari, Bari, Italy

Abstract

Introduction:

Arteriovenous grafts (AVGs) are key for patients lacking veins for arteriovenous fistulas (AVFs), the preferred option due to better patency and fewer complications. Meticulous technique is crucial to avoid issues like deep implantation, which hampers patency and cannulation.

Case Presentation:

We present the case of a 58-year-old woman with ESKD secondary to ADPKD, on hemodialysis for 7 years, with a history of sleeve gastrectomy and a current BMI of 27. Previously managed with an AVF, she transitioned to a left jugular central venous catheter in January 2024 due to inadequate superficial venous access. The patient presented to our center in June 2024. Following a Doppler ultrasound of the upper limbs, she underwent implantation of the innovative aXess® conduit (Xeltis BV, The Netherlands) at our facility. An upper arm straight brachio-cephalic configuration was performed under local anesthesia, achieving a 2000 ml/min flow and venipuncture within a month. One week later, poor conduit palpability caused cannulation issues, requiring ultrasound-guided puncture. This prompted us to consider lipectomy, a minimally invasive procedure often used in obese patients with native AVFs, where the arterialized vein is located deeper than 6 mm from the skin. Lipectomy removes excess adipose tissue above the vein, thus facilitating easier cannulation. Unlike vein transposition, it limits the dissection to the anterior surface of the vein and reduces the risk of vein kinking or twisting. The transverse incisions used in lipectomy also result in superior aesthetic outcomes compared to the longitudinal scars from forearm transposition.

Conclusion:

The integrity of this novel conduit was not affected by the lipectomy procedure, despite traditionally it's a procedure performed on AVFs. This procedure offers a viable solution to improve venipuncture accessibility and reduce complications in AVG patients, expanding the indications for lipectomy beyond native fistulas.

P-034 PulssibleTM mechanically reinforced biotubes for dialysis access: 18 months results from a first-in-man structured registry study (ID 101)

Qining Fu[1], Deling Kong[2], Kai Wang[2], Xianhui Liang[3], Pei Wang[3], Yu Zhao[1]
[1]The First Affiliated Hospital of Chongqing Medical University, Chongqing, China; [2]NankaiUniversity, Tianjin, China; [3]The First Affiliated Hospital of Zhengzhou University, Zhengzhou, China

Abstract

Background:

Arteriovenous graft (AVG) is an important substitution for hemodialysis patients who cannot have arteriovenous fistula. However, AVGs using expanded Polytetrafluoroethylene are associated with high risk of infection, low patency rates, and lack of tissue regenerative properties which limit their service life. PulssibleTM biotube is a mechanically reinforced tube, using poly ε-caprolactone (PCL) fiber skeletons subcutaneously embedded in sheep, then decellularized and implanted into the patient. This first-in-man study assesses the safety and medium-term patency performance of this new graft.

Materials and Methods:

A total of 20 patients who required an upper limb AVG were recruited/registered from two hospitals in China. AVGs were created using PulssibleTM biotube as per usual protocol. Kaplan-Meier analyses were used to calculate primary and secondary patency rates.

Results:

The AVGs received their first cannulation on average 19.3 days after operation. There were 15 episodes of thrombosis and 18 episodes of stenosis, and all were successfully treated with endovascular interventions. The 6-, 12-, and 18-month primary patency rates were 75%, 50%, and 20%, primary assisted patency rates were 95%, 80%, 55%, and secondary patency rates were 100%, 100%, 100% respectively.

Conclusion:

This first-in-man series demonstrated the appropriate mechanics of PulssibleTM biotubes, their cannulation resistance, and their acceptable long-term patency, without incidence of luminal expansion. These optimized PulssibleTM biotube properties show promise as an alternative vascular grafts for clinical applications.

P-035 Outcome of aXess® hemodialysis conduit in a case of a septic patient (ID 114)

Cosma Cortese, Francesco La Fergola, Alessandra Pesino, Nicola Grandolfo, Loreto Gesualdo
Policlinico di Bari, Bari, Italy

Abstract

AVFs are considered the most effective vascular access for hemodialysis (HD). For patients unsuitable for AVFs, arteriovenous grafts (AVGs) are considered the optimal access option for chronic HD patients. The high infection risk associated with AVGs has limited their use. A new, innovative conduit, Xeltis aXess Hemodialysis Conduit, was implanted at our center for a pre-market pivotal study. This case highlights the promising characteristics of the conduit in a patient with ADPKD who developed septic status one month after implantation

A 55-year-old woman with ESKD due to ADPKD underwent a successful brachio-comitans aXess conduit implantation after unsuitable superficial veins were identified. Post-surgery Doppler US showed good AVG performance. 34 days later, the patient presented with systemic infection symptoms, macrohematuria, and a retroperitoneal hematoma from a ruptured renal cyst. She required hospitalization, antibiotics, and blood transfusions. Due to worsening renal function, she started HD via the conduit during the hospitalization without complications. A Doppler US 24 hours after the first cannulation showed excellent AVG performance with a blood flow volume of 1501 mL/min in the brachial artery and 1140 mL/min in the conduit's arterial side. The patient stabilized over the next 3 days with normalization of inflammatory markers and negative blood cultures. She received 10 HD sessions during her 3 week hospital stay, was discharged in stable condition, and continued dialysis without issues for the next 11 months

While AVGs are typically second-line options due to infection risks, the case highlights the promising features of the aXess conduit, an innovative biomaterial designed for tissue restoration and reduced bacterial adhesion. Early antibiotic intervention, combined with the unique properties of the conduit, likely prevented bacterial colonization and the need for graft removal, allowing the patient to continue dialysis successfully for 11 months

P-036 The aXess Pivotal EU trial: first insights from a multicentric study (ID 172)

Mauro Gargiulo, Silvia Morreale
Vascular Surgery University of Bologna, Bologna, Italy. IRCCS University Hospital Policlinico S. Orsola, Bologna, Italy

Abstract

Background:

Xeltis' aXess hemodialysis conduit is a novel arteriovenous graft consisting of a bioabsorbable polymer that, after implant, transforms into a human vessel (including endothelium) through a process called endogenous tissue restoration. In this paper we report the perioperative results of this conduit as arteriovenous graft for hemodialysis in the first multicenter study (aXess Pivotal EU trial - NCT05473299).

Materials and Methods:

The aXess Pivotal EU trial is a multicenter, single-arm study that obtained Ethical and Regulatory approvals in 9 EU countries, at 23 trial sites. Study enrollment was between November 2022 and December 2024. The trial primary endpoints are primary patency and freedom from device related serious adverse events at 1 and 6 months and up to 5 years.

Results:

The aXess Pivotal EU trial enrolled 120 subjects (male 63, female 57, mean age 64 years). Patient baseline characteristics included arterial hypertension (70%), diabetes (26%) and at least one failed AV fistula (28%). Procedural success, defined as a successful and patent conduit at hospital discharge, was 95%. In 25% of the cases, a loop configuration was used (of those, 60% in the lower arm, 27% in the upper arm and 13% crossing the elbow) and in 75% of the cases a straight implant was performed (96% in the upper arm, 4% in the lower arm). There were no surgical revisions or acute reinterventions needed, with the exception of one case of acute steal syndrome that mandated conduit explant at the day of the implant.

Conclusions:

The perioperative results of the aXess Pivotal EU trial indicate a high rate of procedural success with minimal adverse events. The successful enrollment and implantation of this graft across multiple European sites will demonstrate the feasibility and potential clinical benefit of the aXess hemodialysis conduit. Monitoring and early to long-term data will be essential to confirm these findings and support market approval in Europe.

P-037 Are the arteriouvenous grafts always the last choice? - evaluating vascular access options in older patient (ID 178)

Andreia Henriques, João Venda, Emanuel Ferreira, Nuno Oliveira
SANFIL Vascular Access Centre, Coimbra, Portugal

Abstract

Introduction:

In patients unable to construct a hemodialysis vascular access (VA) through the cephalic vein, options include brachiobasilic fistula (BBAVF) or arteriovenous graph (AVG). The preference of BBAVF over AVG remains debatable, especially in older patients.

Methods:

Retrospective evaluation of BBAVF and AVG constructed at a Vascular Access Centre between 2018 and 2022. Primary outcomes: primary patency (PP), and secondary patency (PS). Secondary outcomes: primary failure (PF), time to first puncture and central venous catheter (CVC) removal, complications, and survival.

Results:

Included 133 patients, mean age 72.3±11.0 years, 60.9% male, with 71 BBAVF and 62 AVG. Mean follow-up of 23.20±15.6 months. Between AVG and BBAVF, PP and SP did not significantly differ. BBAVF had higher probability of PF, yet lower likelihood of intervention and thrombosis ($p<0.05$). There was no statistical difference in the total number of complications or endovascular interventions between the 2 groups. Time to first puncture and CVC removal was longer for BBAVF than AVG, 5.3±3.0 versus 1.2±0.5 and 6.4±3.1 versus 2.1±1.1 months, respectively ($p<0.05$). VA type did not impact mortality. AVG revealed higher SP in patients aged 70-79 years (43.1±3.9 versus 22.5±4.7 months, $p<0.05$).

Discussion:

AVG is associated with a higher risk of thrombosis and endovascular intervention, but this does not result in greater long-term VA abandonment. Notably, in patients aged 70-79 years, AVG demonstrated higher SP. Additionally, AVG showed lower PF and a shorter time to first puncture and CVC removal. Therefore, AVG may be an attractive alternative for patients over 70 years.

Central venous catheters

P-038 Placement of the Central Venous Catheter for Hemodialysis using wireless endocavitary ECG: is it possible the correct TIP location? (ID 14)

Valli Cristina
ASST dei Sette Laghi, Varese, Italy

Abstract

Aim:

The objective of this study is to assess the practicality and feasibility of employing intracavitary electrocardiography (ECG-IG) to confirm the proper positioning of the tip of a Central Venous Catheter (CVC) required for hemodialysis.

Background:

Central venous catheters are typically placed using an echo-guided puncture technique based on anatomical landmarks, followed by radiological confirmation of the correct position. According to the most recent anesthesiology guidelines, evaluating the intracavitary electrocardiogram during the procedure is the best approach to verify the correct placement of the CVC.

Matherial and Methods:

The study involved 12 patients without rhythm disturbances, in whom a central venous catheter for hemodialysis was placed in the right internal jugular vein between March and September 2024. During the procedure, the patients' electrocardiogram was analyzed using the MAGELLANO® device to identify modifications in the P wave or QRS complex, which were used to confirm the correct placement of the CVC at the right cavoatrial junction. Thoracic ultrasound was employed to exclude any iatrogenic pneumothorax. Additionally, a subsequent plain chest X-ray was performed after the procedure to further confirm the correct placement.

Conclusion:

Chest X-Ray consistently verified the correct placements identified by ECG-IC across all patients, with no post-procedure complications observed. ECG-IC is a straightforward and viable technique, demonstrating high sensitivity, and is a cost-effective approach without risks when administered by properly trained and skilled professionals.

P-039 Rational clinical use of 12.0 Fr. or 12.5 Fr. dialysis catheters at blood flow rate 400 ml/min are possible. (ID 29)

Junichi Iida[1], *Toko Endo*[2]
[1]Tomakomai Nissho Hospital, Tomakomai, Japan; [2]H.N.Medic, Sapporo, Japan

Abstract

(Background)

Various coaxial dialysis catheters with inner diameters ranging from 12.0Fr to 15.5Fr have been commercialized. Small size-diameter catheters are safer to plant. However, if the catheter tips are located in the superior vena cava, catheters larger than 14.5Fr may be necessary to achieve a constant blood flow of 400 ml/min. In cases, rhabdomyolysis or requiring emergency hemodialysis, 400 ml/min blood flows are required. Until now, 330 ml/min of blood flow has been said to be the limit for small diameter dialysis catheters, but we have felt a gap between vitro experiments and in actual clinical practice.

(Materials and Methods)

12.0 Fr. or 12.5 Fr. dialysis catheters with an effective intravascular length of 16-25 cm had a slit shape added to improve hemodilution performance. In 21 cases of HD patients and 3 cases of on-line HDF patients, we estimated blood flow rate at 250 to 400 ml/min with sufficient consideration for patient safety. We measured venous pressure, estimated blood flow, fluid pressure, and recirculation rate multiple times at blood flow rates from 250 to 400 ml/min. and investigated whether the catheters were suitable for actual clinical use at a blood flow rate of 400 ml/min. In addition, 5 cases were treated with normal dialysis at 400 ml/min for 3 hours.

(Results)

The highest venous pressure at 400 ml/min was 230 mmHg. But in most cases, less than 200 mmHg in most cases. The difference between the set flow and the actual flow was about 10 ml/min. At 400 ml/min, recirculation rate were low, ranging from 0% to 6%. No problems occurred in actual clinical use, including the dialysis membrane (filter), even at 400 ml/min.

(Discussion)

The maximum working pressure for most dialysis membranes are 500 mmHg. In Japan, there are many cases of internal shunts, so the maximum flow rate of dialysis machines is set at 350 ml/min or less. We reconfirmed that a dialysis catheter of 12.0-12.5Fr can be used safely at a blood flow rate of 400ml/min.

P-040 Catheter-related sepsis in tunneled central venous catheters (ID 32)

Tjasa Furlan, Karmen Terbovc, Simona Poznic, Bostjan Leskovar
General hospital Trbovlje, Trbovlje, Slovenia

Abstract

Background.

A tunneled central venous catheter (CVC) is the recommended permanent hemodialysis access in patients where arteriovenous fistula (AVF) or graft (AVG) construction is impossible/contraindicated. Catheter sepsis is a significant complication of CVC, which significantly increases patients' morbidity and mortality. Our study aimed to assess the incidence of catheter-related infections in tunneled CVCs at our dialysis center.

Material and methods.

We retrospectively analysed the incidence of catheter sepsis and tunnel infections in patients with a tunneled CVC inserted at our Vascular access unit, between January 2015 and August 2024. Indications for insertion of a tunneled CVC were a reduced left ventricular ejection fraction (<30%), short life expectancy (<1 year), or impossible AVF/AVG construction. CVCs were inserted under ultrasound and diascopy guidance. We advised our protocol of regular intermittent use of bactericidal and thrombolytic filling solutions, antibacterial caps, covering the exit site with air-permeable dressings or not covering the CVC at all, and strict aseptic care when handling with the CVC.

Results.

We included 344 patients (average age 73±13 years, 49% men). We inserted all tunneled CVCs retrogradely (64% via the right jugular vein, alii with symmetrical tip (Arrow®)). During the observed period, we found 16 catheter sepsis (after 10 (1–66) months) and four catheter tunnel infections (after 9 (1–23) months). The most common infectious agent was methicillin-susceptible Staphylococcus aureus. In all described cases of catheter sepsis, the catheter was replaced. In the case of tunnel infections, the tunnel incision of the exit site was performed, and the tunnel infection was treated locally. The incidence of catheter sepsis was 0.092/1000 catheter days.

Conclusion.

The incidence of catheter-related sepsis in our sample was low, most likely due to the use of the preventive protocol for insertion and care of the tunneled CVC.

P-041 Substitution of stuck cuffed central venous catheter (ID 62)

Costanza Margheritini[1], *Massimiliano Millarelli*[2], *Chiara Pranteda*[3], *Rosario Micali*[4], *Roberto Chiappa*[2]
[1]Vascular Surgery Unit – La Sapienza University, Rome, Italy; [2]Vascular Surgery Unit - Sandro Pertini Hospital, Rome, Italy; [3]Vascular Surgery Unit - Sant'Andrea Hospital, Rome, Italy; [4]Vascular Surgery Unit – Tor Vergata University, Rome, Italy

Abstract

* Understand challenges and risks associated with long-term use of CVCs

* Describe the endovascular technique used for the successful removal
* Recognize the importance of follow-up after removal and replacement of tunneled dialysis catheters

The long-term application of tunneled central venous catheters (CVCs) can result in the formation of adhesions between the vein wall and the catheter. These adhesions may lead to catheter entrapment or incarceration, making removal difficult or sometimes unfeasible. The treatment options available include: complete removal of the catheter and adoption of an open surgical approach through sternotomy.

We present a case of a haemodialysis catheter that became lodged in a 72-year-old female patient. The patient was referred to our clinic following an unsuccessful removal attempt, which resulted in catheter ligation and subsequent embedding. Under local anaesthesia, a 5 Fr sheath was inserted into one lumen through the resected end of the double lumen catheter. Under fluoroscopic guidance, a 0.035 guidewire was inserted into the right atrium via the sheath. A 4x80mm angioplasty balloon was inserted and inflated in the entire intravascular tract of the catheter, resulting in the breakdown of adhesions, allowing the catheter to be extracted without resistance. The insertion of a 11 Fr sheath was undertaken to achieve haemostasis and facilitate an angiogram to assess the patency of the superior vena cava and atrium. Consequently, a new tunneled dialysis catheter was inserted into the same access site. There were no intra-operative complications, and the patient experienced no immediate post-procedural infections or hemorrhage. Follow-up at six months confirmed proper catheter function and resolution of the insertion site without complications.

The understanding of this fundamental endovascular technique facilitates a minimally invasive, safe and effective approach for the removal and replacement of stuck tunneled dialysis catheters.

P-042 Right internal jugular vein recanalization with balloon assisted puncture for tunneled hemodialysis catheter placement: Case series. (ID 81)

Bartosz Baścik[1], Rafał Bromirski[2], Tomasz Liberek[3], Piotr Skonieczny[3], Fabian Kosko[3], Alicja Dębska-Ślizień[3]
[1]Interventional Radiology Unit, Copernicus PL, Gdańsk, Poland; [2]Interventional Radiology Unit, University Clinical Centrę, Gdańsk, Poland; [3]Department of Nephrology, Transplantology ans Internal Medicine, Medical University of Gdańsk, Gdańsk, Poland

Abstract

Background.

Increasing number of patients use tunneled hemodialysis catheters (TDC) as vascular access. Previous catheter placement may cause central vein occlusion, resulting in difficulty in new catheter insertion.

Objectives.

To test the feasibility of right internal jugular vein (RIJV) recanalization with balloon-assisted puncture for TDC placement.

Materials and methods:

The procedure was performed in 6 patients with chronic occlusion of RIJV requiring TDC placement. In all patients TDC insertion through left IJV was impossible due to thrombosis or occlusion. Patent upper (defined as suprahyoid) portion of the RIJV, superior vena cava (SVC) and cavoatrial junction were required. Upper portion of RIJV was punctured directly with ultrasound guidance. The 5F vascular sheath was advanced over the wire into upper portion of the RIJV. Hydrophilic guidewire and angioplasty balloon catheters were used to recanalize and dilate occluded lower portion RIJV and innominate vein (if needed). For balloon-assisted puncture, a catheter with balloon extending from the lower portion of the RIJV to the SVC was inflated to low pressure (<1 atm). Inflated balloon was punctured through the skin under ultrasound guidance at the lower portion of the neck required for the placement of TDC. Immediately after a successful puncture, a guidewire was inserted through the needle into the lumen of the balloon. Deflated balloon was pushed down into the inferior VC, thus releasing from its lumen guidewire inserted by puncture of balloon at the lower portion of the RIJV. Balloon catheter was then withdrawn. The TDC was inserted with standard technique using guidewire inserted with balloon puncture at the lower portion of RIJV.
Results. The described technique was successful in 5 patients and failed in 1 case due to inability to recanalize RIJV. No major adverse events were observed.

Conclusions:

Presented technique enabled placement of TDC through the typical entry site into the occluded RIJV.

P-043 Impact of vascular access typology on mortality in unplanned haemodialysis initiation due to cardiorenal syndrome (ID 85)

Rafael Figueiredo[1,2], *Catarina Oliveira*[1], *Hugo Diniz*[1], *Luís Coentrão*[1,2]
[1]Hospital de São João, Unidade Local de Saúde São, Porto, Portugal; [2]Faculdade de Medicina da Universidade do Porto, Porto, Portugal

Abstract

Background:

Initiating haemodialysis (HD) with a central venous catheter (CVC) in patients with cardiovascular disease, particularly those with cardiorenal syndrome (CRS), is associated with worse 1-year patient-related outcomes. This study investigates the association between vascular access (VA) typology and mortality in this population.

Methods:

A retrospective analysis of the patients who initiated unplanned HD (uHD) due to CRS in our center in 2022 and 2023 was performed. Demographic data, VA-related data, and 1-year outcomes were collected from patient´s electronic-health records. Two independent authors classified CRS cases. The primary outcome was to identify clinical predictors of 1-year mortality. Statistical analysis was conducted with SPSS v28.0.1.

Results:

Among 184 patients who initiated uHD at our center 57 (31,0%) were due to CRS. Most were male (n=39; 68,4%), with a mean age of 74,8 (±9,7) years and a mean Charlson Comorbidity Index of 7 (IQR 6-8).
Twenty patients (35,1%) had undergone VA mapping at least 4 months before HD initiation. One-third of the patients started HD with an autologous arteriovenous fistula (AVF), two (1,1%) in less than a month after VA construction. Thirty-seven patients (64,9%) had a matured AVF within the first year.
Mortality was significantly higher in CRS patients (28.1% vs 15.0%, p=0.036). Median survival was 179 days with most occurring due to MACE (n=8). Nine of the deceased had a matured AVF and none occurred within the first 5 months after VA construction. No access-related variables, comorbidities or echocardiographic features per si predicted 1-year mortality in this population in our crude variable analysis.

Conclusion:

Patients initiating uHD due to CRS are highly comorbid, have high CVC dependency, and exhibit higher mortality when compared to their non-CRS counterparts. VA type during HD initiation does not influence per si 1-year mortality in this population.

P-044 Tunneled hemodialysis catheter placement without fluoroscopy: tip position and safety outcomes (ID 106)

Joana Andrade Lopes[1], *Philipp Gauckler*[2], *Hugo Diniz*[1], *Miguel Relvas*[1], *Luís Coentrão*[1,3]
[1]Nephrology Department, ULS São João, Porto, Portugal; [2]Department of Internal Medicine IV (Nephrology and Hypertension), Medical University Innsbruck, Innsbruck, Austria; [3]Departamento de Medicina, Faculdade de Medicina da Universidade do Porto, Porto, Portugal

Abstract

Background:

Fluoroscopy is recommended for tunneled central venous catheter (TCVC) placement, but studies show conflicting results comparing fluoroscopy-guided and non-fluoroscopy methods. At our center, TCVCs are routinely placed by nephrologists without fluoroscopy, except in select cases. This study evaluates the accuracy of tip positioning and the safety of this approach.

Materials and Methods:

Retrospective study (January 2023-July 2024) including patients with TCVC placement in the internal jugular vein. Data was collected from electronic health records, and post-procedure chest X-rays were reviewed to classify catheter tip position (P) using predefined landmarks: 0 (not assessable), 1 (superior vena cava), 2 (pericavoatrial junction), 3 (mid-to-deep right atrium), and 4 (inferior vena cava). Anatomical tips (AT) located in P1 or P4 were considered inadequately placed. Statistical analysis was performed using SPSS software.

Results:

Of 144 TCVCs, the median patient age was 70 years (57-80), 60.4% were male and mean height was 164.70±8.01cm. Prior CVC and venous thrombosis were noted in 13.9% and 2.1%, respectively. Median catheter use duration was 168 days (69-249). First-attempt success was 96.5%, with fluoroscopy required in only 0.7% (1 case). AT positions: 0% in P0, 11.11% in P1, 31.25% in P2, 53.47% in P3 and 4.17% in P4. AT was correctly placed in 84.72% of cases. Immediate complications (2.8%) included kinking (2), pseudoaneurysm (1), and superior vena cava syndrome (1). Medium-term complications (10.4%) included 11 infections and 4 mechanical issues (2 thromboses, 1 exteriorization, 1 malfunction).

Conclusion:

TCVC placement without fluoroscopy, performed by trained nephrologists, is a safe and effective procedure with high success rates, satisfactory tip positioning and great long-term patency. This approach reduces radiation exposure and hospital stays, especially when ultrasound is readily available.

P-045 Elective Procedure for Removal of Tunnelled Central Venous Catheter for Hemodialysis: How to Prevent Complications? (ID 117)

Silvia Bellardinelli, Elettra Lomeo, Fabio Aureli, Francesca Maria D'ascenzo, Giuseppe Grandaliano
Policlinico Universitario A.Gemelli, Rome, Italy

Abstract

Background

When a patient has a functioning arteriovenous access (puncturable and with adequate dialysis flow for at least three consecutive dialysis sessions), has successfully started peritoneal dialysis, no longer requires dialysis, or in the case of severe sepsis due to CVC, the tunnelled CVC should be removed.
Tunnelled CVCs are increasingly used in patients with end-stage renal disease (ESRD) to preserve central venous access and reduce the risks of temporary catheters. The CVC removal is typically required when the patient has a functioning arteriovenous (AV) access, has transitioned to peritoneal dialysis, no longer needs dialysis, or in cases of severe sepsis caused by the CVC.

Materials and methods

This study, conducted over five years, involved 62 patients who underwent CVC removal at a single center. with the majority having the catheter placed in the right jugular vein (51 patients), followed by the left jugular vein (6), right femoral vein (3), and left femoral vein. The patients had various clinical conditions: 39 were on hemodialysis with functioning AV access, 10 were undergoing peritoneal dialysis, 9 had kidney transplants with stable renal function, and 4 were receiving treatment for sepsis or infection. The procedure was performed in an outpatient setting with local anesthesia, following a standardized protocol. The CVC was isolated, and its fibrous sheath removed. The catheter was sectioned at the cuff's distal base, and a nylon suture was placed near the entry site to prevent bleeding. The wound was sutured, and a compressive dressing was applied. Patients were observed for 60 minutes post-procedure.

Results

Dates showed no complications, with no infections, bleeding, or wound dehiscence. The surgical wounds healed well.

Conclusions

The study concluded that a standardized procedure with a well-defined protocol minimizes risks and complications, ensuring a safe and successful recovery for patients undergoing CVC removal.

P-046 In vitro safety of power injection of contrast media through central venous hemodialysis catheters (ID 131)

Nicholas White[1,2], Aart van der Molen[1], Ronald Limpens[1], Jacinta Maas[1], Koen van der Bogt[1,3], Tim Horeman[2], Joris Rotmans[1]
[1]Leiden University Medical Center, Leiden, Netherlands; [2]Delft University of Technology, Delft, Netherlands; [3]University Vascular Centre, Leiden, The Hague, Delft, Netherlands

Abstract

OBJECTIVE

Central venous catheters (cvcs) provide direct access to the central circulatory system, commonly used in hemodialysis and intensive care units for drug administration. Although uncertified for the procedure, cvcs are sometimes used for power injection of contrast medium (cm) during ct scans to avoid peripheral intravenous catheter placement. Previous studies suggest this practice is safe, but incidents are reported. This study aims to measure intraluminal pressure during cm injection through cvcs and assess its impact on the luminal surface to guide responsible clinical use.

MATERIALS AND METHODS

An experimental in vitro test setup was developed. Strain gauges were applied to the exterior walls of four samples from three different types of unused cvcs. These gauges measured material deformation due to intraluminal pressure during cm injections at rates of 4.5 ml/s and 8 ml/s, each performed five times. Strain data were calibrated against known pressures in a static system. Three cvcs of each type were then pressurized until bursting, and one was subjected to microscopic analysis of the luminal surfaces.

RESULTS

Intraluminal pressures measured (97-545 kPa or 14-79 PSI) were below the burst pressure (779-1248 kPa or 113-181 PSI) in all instances. Strain regression analysis shows a statistically significant ($p < 0.01$) trend over 10 injections in all CVCs tested except one, indicating material fatigue. Surface microscopy revealed surface micro-cracks from repeated injections, suggesting material damage.

CONCLUSIONS

The intraluminal pressures from power injections of CM are sufficiently low to prevent CVC bursting. While incidental use for CM injection appears safe, repeated use may cause material damage.

P-047 A Safe Guidewire Exchange Technique for the Management of CRBSIs in Hemodialysis Patients: A Single-Center Study (ID 157)

Elettra Lomeo[1], Francesca Maria D'Ascenzo[1], Antonio Sturniolo[1], Roberto Mangiacapra[1], Fabio Aureli[1], Francesco Pesce[1,2], Giuseppe Grandaliano[1]
[1]Nephrology, Dialysis and Transplantation Unit, Department of Medical and Surgical Sciences, Policlinico A. Gemelli Foundation IRCCS, Universita' Cattolica del Sacro Cuore, Rome, Italy; [2]Division of Renal Medicine, Ospedale Isola Tiberina-Gemelli Isola, Rome, Italy

Abstract

Background:

The prolonged use of central venous catheters (CVCs) as permanent hemodialysis (HD) access has been associated with a higher incidence of CVC-related complications, primarily catheter-related bloodstream infections (CRBSIs). Despite their clinical significance, management of infected tunneled CVCs remains inconsistent, leading to practice variability. The key to this technique is utilizing the inner stylet of the new CVC to prevent direct contact between the old and new catheter, minimizing contamination and preserving the vascular access site.

Methods:

We conducted a retrospective single-center observational cohort study on infected tunneled CVC replacement procedures performed at the Nephrology Unit of Policlinico A. Gemelli Foundation in Rome between January 2019 and June 2024. Microbiological cultures were obtained from most guidewires used during the procedures.

Results:

During the study period, 99 CVC exchanges were performed (M 48.4%; median age: 72 years, IQR 62–78.5). The median dialysis duration was 36 months (IQR 5–30), and the median catheter dwell time was 30 months (IQR 25–34). Among Gram-positive bacteria, the most frequently isolated pathogens were Staphylococcus aureus (73.2%) and coagulase-negative staphylococci (CNST) (19.6%). Despite guidewire cultures identifying the initial CRBSI pathogen, relapse occurred in only 2% of cases: one Pseudomonas aeruginosa (after 3 months) and one Staphylococcus aureus complex (after 8 months). The reinfection rate with different pathogens was 11.1%, occurring after a median of 283 days (IQR 121–642).All CVCs maintained an extracorporeal blood flow ≥ 250 mL/min, ensuring optimal dialysis performance.

Conclusions:

Our technique demonstrated excellent infection-free survival, even in cases involving high-risk pathogens such as Staphylococcus aureus. These findings suggest that this method is a safe, effective and reproducible technique for infected tunneled CVC replacement in HD patients.

P-048 Impact of interprofessional collaboration of advanced practice providers - led team and nephrologists in placing non-tunneled dialysis access among cancer patients (ID 23)

Joanne Dalusung, Sreedhar Mandayam, Aelyn Abardo
UT MD Anderson Cancer Center, Houston, USA

Abstract

Background:

Advanced practice providers' (APPs) scope of practice and role continue to evolve in healthcare. The presentation aims to share the interprofessional collaboration between a group of APPs and nephrologists in a large cancer facility. Non-tunneled dialysis catheters for temporary hemodialysis are placed in the inpatient or ambulatory settings by APPs versus the conventional interventional radiology or operating room, which requires scheduling. The workflow design contributes to minimizing delays in care, decreasing patient financial costs, and improving patient experience. The collaborative relationship between the APPs and nephrologists has led to quality improvement projects to improve the clinical processes and promote positive outcomes.

Methods:

retrospective

Results:

Decrease in catheter-related bloodstream infection, low complication rates

Conclusion:

Interprofessional collaboration between APPs and nephrologists promotes positive patient outcomes. An APP-led procedure team is an alternative to interventional radiology in placing temporary non-tunneled dialysis catheters for urgent hemodialysis for cancer patients.

Vascular access site selection

P-049 Vascular Access in the elderly population in a Hemodialysis Unit. Are the results due to unfavorable conditions or insufficient assessment? (ID 10)

Esther García[1], Jose L. Merino[1,2], Sonia Mendoza[1], Lola Prieto[2], Patricia Dominguez[1], Blanca Bueno[1], Beatriz Sualdea[1], Beatriz Espejo[1], Raquel Moya[1], Vicente Paraíso[1,2]
[1]Hospital Univ del Henares, Coslada, Spain; [2]Universidad Francisco de Vitoria, Madrid, Spain

Abstract

Introduction:

The current aging of the population causes new situations without sufficient accepted evidence. The ideal vascular access (VA) for dialysis is the autologous arteriovenous fistula (AVF), but adequate vascular capital is required to achieve it. The hemodialysis (HD) in elderly than 80 years population has been increasing progressively and although various studies and some guidelines recommend AVF as the first VA, there are heterogeneous results and no clear evidence. We evaluated our HD patients and their VA comparing the elderly 80-year-old population with younger HD patients.

Material and Methods:

We analyzed all prevalent patients in our HD Unit at the end of the year. We compared the type of VA in the elderly 80-year-old population vs. the younger patients.

Results:

Our HD unit attended 64 patients at the time of the study, 54 were younger than 80-years-old and the rest were elderly. The distribution by gender, etiology, and Diabetes was analyzed. Half of the patients over 80-years-old presented their first VA for HD, of which 60% (6) were using tunneled catheters (TC). Fifteen percent (15%) of under 80-years-old patients had their first AV and the rest of the patients (85%) presented more than one VA (of all of them 54% (29) were dialyzed using a TC for HD). Four of the patients over 80-year-old had functioning autologous AVF (40%, 3 radio-cephalic (RC) and 1 humero-cephalic (HC)) and there were no grafts. Of those under 80- years-old, 26 had AVF (48%, 11 RC, 19 HC and 2 humero-basilic) and five presented a graft (9%).

Conclusions:

The percentage of patients with TCs in our unit is higher than recommended by current guidelines. The percentage of TC is similar in both populations, although the younger population has presented more previous VAs. The percentage of VA through RC AVF is higher in the population over 80-years-old in our unit. An autologous VA can be available regardless of age.

P-050 Concordance of different ultrasound methods in assessment of calcified arteries and outcomes of arterio-venous fistulas (ID 19)

Jakob Gubenšek
Center for Acute and Complicated Dialysis and Vascular Access, Department of Nephrology, University Medical Center Ljubljana, Ljubljana, Slovenia. Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

Abstract

Background.

Arterial calcifications are common in elderly and diabetics with advanced kidney disease. We aimed to assess appropriateness of calcified arteries for arterio-venous fistula (AVF).

Methods.

In prospective observational study in patents, referred for vascular mapping in years 2022-2024 with arterial calcifications present, a detailed ultrasound (US) assessment of brachial artery (BA), proximal, mid and distal radial artery (RA) was performed. We assessed degree of calcifications (none, spotty=mild, linear=moderate, linear with complete distal shadowing=severe), homogeneity of color Doppler (CD) signal and compressibility with US probe. We planned the site of AVF construction based on arterial and venous exam or decided for a catheter. Outcome of created AVFs was followed.

Results.

We included 26 patients (mean age 70±12 y, 96% diabetics) and assessed arteries at 185 sites. Peripheral distribution of severe calcifications was observed: 65% on distal, 54% on mid, 18% on proximal RA and in 9% on BA. Analysis of concordance of US parameters showed that arteries with mild or moderate calcifications almost always had homogenous CD and were compressible. Arteries with severe calcifications (N=68) still had homogenous CD in 69% and were compressible in 41%. Six patients were put on catheter, in 3 an AVF is planned and in 17 an AVF was constructed: 13 distal, 2 proximal radio-cephalic, 1 brachio-cephalic and 1 graft. 13/17 (76%) constructed AVFs matured, 3 did not and 1 patient died prior to assessment. There was no case of clinically significant distal ischemia.

Conclusions.

If compressibility of the artery at site of anastomosis is considered as minimal criterium for AVF construction, even among arteries with severe calcifications approx. 40% are compressible and therefore potentially appropriate. Homogeneity of CD and compressibility with US probe can be useful additional criteria for arterial assessment, resulting in high likelihood of maturation.

P-051 Femoral long-term catheters for dialysis: a choice or last option? (ID 120)

Francesca Maria D'Ascenzo, Fabio Aureli, Elettra Lomeo, Roberto Mangiacapra, Giuseppe Grandaliano
Policlinico A.Gemelli, Rome, Italy

Abstract

BACKGROUND:

Long-term femoral-inserted central catheters are considered the last option in dialysis catheterism reserving their indication for two specific conditions: loss of any access in cervicothoracic area or preserving thoracic central veins for AFV creation in the upper arm. In the last period, we assisted in the increased use of femoral long-term catheters in dialysis patients. However, it is known that the risk of mechanical complications and lumen occlusion is higher in femoral CVC compared to CVC placed in upper body extremity.

MATERIALS AND METHODS:

We report preliminary data about patients who came to our attention in emergency due to malfunction of the femoral tunneled CVC and inability to perform dialysis at Policlinico A. Gemelli Foundation in Rome. We analyzed the clinical patients' characteristics, the type of catheter, indications of CVC, causes of malfunction, and possible solutions.

RESULTS:

We observed 20 patients, median age 62.3, sex 60% female. Malfunction diagnosis: iliofemoral -cava thrombosis, fibrin sheath tip occlusion, rupture of CVC hub, dislocations with cuff extrusion. Tip position: 30% in the upper third of the IVC, 20% in the right atrium, and 50% in IVC below renal veins. Treatment: 6 patients converted with tunneled CVC via supraclavicular brachiocephalic vein, 4 patients converted with tunneled CVC via left internal jugular vein, 10 patients treated with guidewire replacement femoral CVC.

CONCLUSIONS:

These preliminary data suggest that there is no homogeneity in the indications to femoral tunneled CVC and there is no homogeneity in the position of the tip. Let's pay attention to the fact that 50% of femoral tunneled CVC were converted to other catheters.

P-052 Feasibility and appropriateness of PICCs among cancer patients with chronic kidney disease observed over a two-year period (ID 133)

Joanne Dalusung, Sreedhar Mandayam
UT MD Anderson Cancer Center, Houston, USA

Abstract

INTRODUCTION:

Considerations for insertion among patients with an eGFR lower than 45 mL/min diagnosed with chronic kidney disease (CKD) stage 3b or higher is recommended for vessel preservation in the event of an AV Fistula need. The study is a follow-up on a related project that attempts to explore the competing risk of death or progression to kidney failure among patients with cancer, which should be considered in evaluating the appropriateness of PICC placement.

METHODS:

Retrospective Study. Using an institutional electronic health record (EHR) and a cohort that included patients with eGFR <60 ml/min 90 to 180 days before and after a PICC placement from 2018 to June 2021 were selected using CPT codes. Patients who survived the initial data extraction were reviewed and followed up from June 2021 to November 30, 2023.

OUTCOME:

Proportion of patients who died of cancer versus those who progressed to renal failure requiring dialysis

RESULTS:

Of the 26 patients who survived from the original cohort, 61% (16) are living, 35% (9) died, and one was lost to follow-up. One patient needed dialysis for acute renal failure and died.
Patients with CKD stage 4 lived for 44 months on average after the PICC line, and those with stage 3b were alive for 32.5 months. Only one patient went on dialysis in the entire cohort. No patient progressed to ESRD. Cancer diagnoses of patients with CKD who died and did not progress to ESRD are diverse.

CONCLUSION:

PICC lines are feasible for patients with cancer and CKD stage 3 or higher. The risk of ESRD is significantly less than the risk of progression of cancer or death when followed over two years after PICC placement.
Types of cancer and advanced age likely contributed to the death of cancer patients with CKD who did not progress to ESRD.

The results support a relatively low proportion of cancer patients with CKD that progressed to end-stage renal disease when followed over two years.

P-053 Vascular access creation following kidney transplantation - what to expect? (ID 136)

Tiago Pereira, Patricia Alves, Ana Domingos, Joao Martins, Luis Santos, Paula Guimarães
Hospital Curry Cabral, Unidade Local de Saude Lisboa Central, Lisbon, Portugal

Abstract

Background:

Kidney transplant patients (KTP) are a high-risk subset of chronic kidney disease (CKD) patients, often younger but with prior dialysis and vascular access (VA) use. Following kidney transplantation (KT), no specific VA maintenance is recommended and VA loss can occur. This study aims to compare vascular data between KTPs and non-KT CKD patients.

Materials and Methods:

We conducted an observational cohort study of patients undergoing ultrasound mapping for VA creation. We collected sociodemographic, comorbidity, and vascular data and compared KTPs to a control group.

Results:

A total of 303 patients were evaluated, with a mean age of 67 years. 57% were male, 77% were white, 67% pre-dialysis, and 5.6% following KT (n=17). Compared to other patients, KTPs were younger (age 56.8, p=0.002), had higher eGFR (eGFR 23.1 vs 14.7 mL/min/m², p=0.000), and in 29% (vs 91%) it was the first VA constructed. No other differences were reported.
Univariate analysis revealed larger left arm arterial and venous diameters in KTP, but lower peak systolic velocities (PSVs) in the left brachial and radial arteries. KT status independently predicted larger diameter but lower PSV in the left brachial artery and a higher risk of compromised flow in the left radial artery, even after adjusting for sociodemographic and clinical factors (p=0.017, p=0.003, and p=0.003, respectively). eGFR, obesity, and diabetes were also independent predictors of these parameters.
Regarding VA feasibility, there was a trend towards fewer possible left radiocephalic and brachiocephalic fistulas in KTP (p=0.063 and 0.053, respectively).

Conclusion:

KTP differed from controls by younger age, higher eGFR, prior VA history, and earlier referral. Changes were prominent in the non-dominant arm used for prior VA, affecting both arterial and venous structures. VA feasibility was similar. However, larger studies, including more KTP, are needed to confirm these findings.

P-054 Preoperative volume status in vascular access creation, a despised influence? (ID 141)

Maria Guedes Marques[1], *Pedro Maia*[1], *Ana Martins*[1], *Pedro Ponce*[2]
[1]NephroCare Coimbra, Coimbra, Portugal; [2]NephroCare Portugal, Lisboa, Portugal

Abstract

Background

The most common causes of early primary failures of VA is related to small caliber vessels. Weight gain between dialyses expands both extracellular and blood volume, which may lead to rises in intravascular filling and vessels caliber. If patients presented after weekend, their weight and volemia would be higher.
We hypothesized that preoperative volume status may influence vessels diameter with a significant impact on VA outcomes

Methods and patients

Clinical, prospective, randomized, open-label, single-center crossover trial.
Inclusion criteria: age 18-80ys, under regular HD, no heart failure (CHF) and no acute pulmonar edema (APE) on the previous year.
Exclusion criteria: >3 sessions/week, CHF or APE.
Before the last-week session, patient's clinical parameters were recorded. BIA and ultrasound vascular mapping were performed.
Then, dry weight was increased 0,5 Kg, and after weekend, the same protocol was conducted.
Primary end point was to compare vein diameters

Results

126 vessels were evaluated (84 veins; 42 arteries) from 21 patients. Mean age was 69±10y and 52% female.
Other than humeral arterial blood flow, every parameters evaluated through ultrasound mapping significantly increased ($p<0,05$) after dry weight adjustment (>0,5 Kg) plus weekend weight gain.
After cross over, weight, overhydration (OH), extracellular water (ECW) and OH/ECW significantly increased ($p<0,05$), however, most patients had a mild-moderate OH (86-90%). Blood pressure and total body water haven't changed significantly.
No complications were reported.

Conclusions

Some additional degree of OH may be effective and safe in improving vascular conditions predictors of VA success.
The currently lack of evidence of vascular mapping may be due to the lack of evaluation of cofactors such as volemia. Therefore, BIA and lung ultrasound may be combined to vascular ultrasound for a safe and effective way to optimize and evaluate preoperative conditions to improve VA outcomes.

P-055 Gender Differences In the Vascular Access Data In the Swedish Renal Registry (ID 163)

Gunilla Welander[1], *Birgitta Sigvant*[2]
[1]Department of Medical Sciences Uppsala University, Uppsala, Sweden; [2]Department of Surgical Sciences Uppsala University, Uppsala, Sweden

Abstract

Background:

The Swedish Renal Registry (SRR) covers data on the entire patient trajectory, from renal biopsy to chronic kidney disease (CKD) and renal replacement therapy (RRT), including the dialysis access, a key factor in dialysis care quality.

Method:

Since 2014 nurses at all dialysis units and outpatient clinics has routinely recorded data on vascular access in SRR. Comprehensive data as demographics, access type, creation details, and function are captured. As are complications that can be counted by the number of days of access use. Reinterventions are further registered and reason for end of use.

Results:

Between the years 2014 to 2023 n=7996 arteriovenous fistula (AVF) and arteriovenous grafts (AVG) were placed in men and women (n=5202 and n=2794). The distribution of fistula location differed between men and women, forearm 60% vs 46%, upper arm 25% vs 31% and AVG 14% vs 21%. Endovascular fistulas only placed in men n=12. Placement preemptively men vs women (43% vs 44%) or after hemodialysis initiation (55% vs 57%) was similar. Within 30 days, first events occurred in 6% of men and 10% of women, mainly occlusion, non-function, or ligation. After a year, 39% of men's and 46% of women's fistulas had an event. Reintervention rates were similar. Abandonment was more frequent in women (26%)vs men (18%).

Ten- year follow-up showed abandonment divided by type, forearm men;19% vs women;38%, AVG 46% vs 51%, while the opposite was reported in upper arm fistulas 33% vs 38%. Central venous catheter (CVC) use increased, particularly among women, in incident patients 2023 80% vs men 74%, as were CVC use in prevalent patients men 38% vs women 49%.

Conclusion:

There is an increase of CVC use in Sweden, with detriment for women. Although the proportion of preemptive placements of fistulas are not inferior, nor after hemodialysis initiation, a higher risk of complications and abandonment may be an explanation. This must be considered when planning a vascular access in women.

P-056 Diabetes: is it really important for vascular access? (ID 167)

João Figueiredo Martins, Tiago Assis Pereira, Patrícia Alves, Ana Sofia Domingos, Luís Gaião Santos, Paula Guimarães, Cristina Jorge
ULS São José, Lisboa, Portugal

Abstract

Background

Vascular access (VA) construction is crucial in chronic kidney disease (CKD) patients who choose hemodialysis. Diabetic patients (DP) may have unfavourable vascular characteristics, which could lead to fewer site options and worse VA outcomes. Our aim was to compare vascular mapping (VM) and VA patency in DP and non-DP.

Methods

Observational study including all CKD patients who underwent ultrasound VM in a tertiary care hospital from March 2023 to September 2024. Clinical data, VM measurements and VA details were collected. Analysis included descriptive statistics, Mann-Whitney U-test, Chi-square test, and multivariate logistic regression to control for clinical and demographic factors.

Results

A total of 304 patients were included (median age 72 years), 45,1% of which were DP. Median follow-up was 419 days. DP were older (74 vs. 68 years, p=0,013) and had higher frequency of heart failure (46,0 vs. 33,8%, p=0,030) and obesity (44,5 vs. 28,9%, p=0,005).
DP were more likely to have moderate/severe calcification in right radial (44,8 vs. 17,1%, p<0,001), right ulnar (51,2 vs. 26,2%, p<0,001), left radial (38,6 vs. 16,1%, p<0,001) and left ulnar (46,6 vs. 20,7%, p<0,001) arteries, as well as right forearm cephalic (p=0,018) and left median cephalic (p=0,015) vein diameter under 2cm.

Regarding VA feasibility, VM in DP was less likely to be compatible with radiocephalic fistula (RCF) construction compared to non-diabetic patients (34,3 vs. 54,8%, p<0,001).
Multivariate analysis showed that diabetes remained an independent factor for distal artery calcification (p<0,001), insufficient right forearm cephalic (p=0,018) and left median cephalic (p=0,024) vein diameter and RCF infeasibility (p=0,002).

No differences were observed in immediate (p=0,626), 3-months (p=0,787) and 6-months (p=0,112) VA patency between groups.

Conclusion

Although DP have poorer vascular characteristics for VA, VM guides optimal site selection and allows comparable short-term patency.

P-057 Influence of height and weight on vascular parameters in ultrasound mapping (ID 186)

Tiago Pereira, Ines Rodrigues, Patricia Alves, Ana Domingos, Joao Martins, Luis Santos, Paula Guimarães, Cristina Jorge
Hospital Curry Cabral, Unidade Local de Saude Lisboa Central, Lisbon, Portugal

Abstract

Influence of height and weight on vascular parameters in ultrasound mapping

Background:

Few sociodemographic and clinical factors have been identified as determinants of venous and arterial size, which are essential for successful vascular access(VA) creation. This study investigates whether anthropometric measurements influence the standard parameters evaluated for VA creation.

Materials and Methods:

This was a subanalysis of a prospective study whose primary aim is to investigate arm muscular and sensory functions before and after VA creation. Informed consent was obtained from all participants. Sociodemographic, clinical, anthropometric, and ultrasound(US) vascular data were collected. Anthropometric measurements included weight, height, and calculated body mass index(BMI) and body surface area(BSA).

Results:

Twenty-nine patients consented to study participation. The cohort was 69% male, 86% white and 59% diabetics. The median/mean height, weight, BMI, and BSA were 1.63m, 66kg, 25.8 kg/m², and 1.78m², respectively.

Height was positively associated with left arterial diameters; BMI positively associated with the right median cephalic vein diameter; BSA positively associated with left arterial diameters and the median cephalic vein diameter.

Multivariate models adjusting for gender, age, and comorbidities showed that weight and BSA were independent predictors of right arm basilic vein diameter($p < 0.029$). Additionally, there was a trend for weight and BSA to be modify ulnar diameter($p = 0.065$ and $p = 0.063$, respectively).

Conclusion:

This study provides insufficient evidence to support the routine implementation of anthropometrics at this time. However, the observed differences, along with the positive findings in the multivariate analysis within this small sample, warrant further investigation. Continued patient enrollment will increase the sample size and potentially provide stronger evidence of the influence of anthropometric measurements on vascular parameters.

P-058 Should we choose the non-dominant arm for vascular access creation by default? (ID 189)

Paula Milhazes Guimaraes, Tiago Assis Pereira, Luís Santos, João Figueiredo Martins, Ana Sofia Domingos, Patrícia Alves, Cristina Jorge
Nephrology Department, São José Local Health Unit, Lisbon, Portugal

Abstract

Background:

The choice of the arm for vascular access (VA) construction is a routine yet crucial decision in clinical practice. The non-dominant arm is often selected by convention for patient comfort, but supporting evidence is limited. This study aims to evaluate whether there are any differences in vascular parameters between dominant and non-dominant arm and its influence on the VA patency and complications.

Methods:

This was an observational, single-center study that included patients referred for vascular mapping. For primary analysis of non-dominant arm influence on VA, patients were classified based on which arm the VA was created (non-dominant vs dominant).

Results:

Out of 304 vascular mappings performed from march 2023 to september 2024, 184 patients proceeded to VA construction: 103 patients in the non-dominant arm and 81 patients in the dominant arm. The mean age was 66.3 ± 16 years, with 54.8% male and 75.5% caucasian. Comorbidities included hypertension (88%), diabetes (46%). Patency rates declined over time: 98,3% had immediate patency, 83,6% at 3-months and 97,1% at 6-months. VA interventions were common (25.3% at 3-months, 22.4% at 6-months). VA failure occurred in 13,8% and a mean time to failure: 55 ± 91 days.

There were no significant differences between groups in age, time to VA loss, sex, race, or comorbidities. Groups differed in left cephalic and right umeral vein diameters($p<0.01$); arterial diameters showed no differences. Kaplan-Meier analysis showed a significant difference in immediate patency ($X^2 = 7.906$, $p= 0.005$) and 3-month patency ($X^2 = 7.892$, $p = 0.005$). Cox regression confirmed VA laterality as an independent predictor of VA thrombosis/loss (HR 0.189, $p= 0.006$), adjusted for age, sex, diabetes, hypertension.

Conclusion:

These findings suggest that VA laterality influences short-term outcomes and is an independent predictor of access survival. Further studies are needed to refine VA selection strategies and improve patient outcomes.

Vascular access surveillance and monitoring

P-059 Arteriovenous vascular access status in patients with advanced CKD after kidney transplantation: a national cohort study (ID 28)

Bojan Medved[1,2], *Jakob Gubenšek*[1,2], *Miha Arnol*[1,2], *Jadranka Buturović Ponikvar*[1,2]
[1]Department of Nephrology, University Medical Center Ljubljana, Ljubljana, Slovenia; [2]Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

Abstract

Background.

The aim of longitudinal cohort study was to investigate status of arteriovenous (AV) vascular access in adult Slovenian patients with advanced CKD after kidney transplantation. We further focused on the status of AV access in patients from this group who initiated dialysis due kidney graft failure after 3-year follow-up.

Methods.

Data from adult patients with a functioning kidney graft at the end of 2021 were obtained from Slovenian Renal Replacement Therapy Registry. In the group of patients with advanced CKD, data on the presence and type of arteriovenous (AV) fistulas were collected. This group was followed for 3 years. For those who experienced graft failure and were treated by dialysis at the end of 2024, status of vascular access was evaluated.

The results.

At the end of 2021 there were a total of 743 adult patients with a functioning transplanted kidney in Slovenia. 65 (8.8%) of them had advanced CKD (stage 4-5), with 33/65 (51%) having functioning AV fistula. After 3 years 49/65 (75%) of the patients with advanced CKD were alive, 18 of them were dialysis-dependent (15 males, mean age 60, mean 15 years after kidney transplantation). 16/18 (89%) of dialysis-dependent patients had a functioning AV fistula or graft (8 of them newly created, including 2 grafts). 2 patients were dialyzed through hemodialysis catheters, due to inadequate vascular conditions for AV fistula creation. Previous AV fistula were radiocephalic in all 8 patients. Newly created AV fistulas were brachiocephalic AV fistulas in 6/8 (75%) patients, either because of inadequate forearm vessels or previous non-functional AV fistulas in the forearm.

Conclusion.

Approximately half of patients with advanced CKD after kidney transplantation had functioning AV fistula. After 3-year follow up, the vast majority of patients who were dialysis dependent after graft failure had AV fistula as vascular access.

P-060 Vascular access creation for hemodialysis – 10 years data (2014 – 2023) from a large vascular access center in Germany (ID 74)

Jingting Zhao-Kaiser[1], Kijanosh Lehmann[1], Gabriele Eden[1], Ruth Paarmann[2], Yvonne Cain[1], Jan T Kielstein[1], Torsten M Meyer[1]

[1]Medical Clinic V (Nephrology, Rheumatology, Blood Purification), Academic Teaching Hospital Braunschweig, Braunschweig, Germany; [2]Clinic for Cardiothoracic and Vascular Surgery, Academic Teaching Hospital Braunschweig, Braunschweig, Germany

Abstract

Background:

More than 10,000 patients per year initiate chronic renal replacement therapy in Germany, almost 90% hemodialysis. Creation of functional vascular access represents a major hurdle. Due to minor long term complications guidelines recommend native forearm av-fistulas (AVF) as preferred vascular access for the majority of HD-patients followed by upper arm AVF, grafts (AVG) and tunneled central venous catheter (tCVC). The further distal AVF is created the higher the probability for nonmaturation. To achieve short term usability prevalence of upper arm AVF and AVG is still high. This supposed advantage leads to a rise of long term complications. The optimal choice of vascular access remains controversial and is one of the most challenging aspects in predialysis period.

Methods:

We performed a prospective and monocentric cohort study over a period of 10 years and investigated all patients who underwent placement of a new vascular access for hemodialysis. For all patients basic demographics and comorbidities were assessed. Type, location and success of vascular access creation were compared.

Results:

In the period of 10 years we performed a total of 1,588 new created vascular access for HD: 936 AVF, 37 AVG and 615 tCVC. The mean age of AVF/AVG patients was 70 years with male dominance of 66 %. Patients with placement of tCVC were older (74 years) with a lower male dominance of 59 %. All AVF and AVG placements were created on upper arms with preference of forearm as distal as possible, in detail: 832 forearm AVF (85 %), 104 upper arm AVF (11 %), 26 forearm AVG (3 %), 11 upper arm AVG (1 %). There was no significant change in overall rates of AVG, but the number of forearm AVF increased over the observed period from 83 to 93 %.

Conclusion:

With careful preoperative planning combined with innovative anesthesia procedures successful creation of vascular access for HD can achieved with low complication rates, in particular with high proportion of native forearm AVF.

P-061 The role of ultrasound in creating and maintaining the functionality of vascular access (ID 90)

Doru Mihai Velicu
LMH Medlife, Bucharest, Romania

Abstract

Patients with end stage renal disease require renal replacement therapy. A vascular access is essential for patients on hemodialysis.

Duplex ultrasound as a non-invasive tool is the first line imaging method and has multiple roles: pre-operative ultrasound vascular mapping, assessment of maturation failure/ vascular access dysfunction, ultrasound assisted cannulation by direct visualization during cannulation or by marking on the skin the suited areas, in more difficult cases, ultrasound guidance in surgical or percutaneous interventions.

These uses of ultrasound are illustrated with ultrasound images of some clinical cases from single surgeon experience. This presentation addresses a broad issue, posing as an opportunity for a wider dialogue.

P-062 Sound characteristics and blood flow monitoring in arteriovenous fistulas: insights from the VASOUND study (ID 92)

Sofia Poloni[1], Simona Zerbi[2], Chiara Ghilardini[2], Luca Soliveri[3], Carmela Giuseppina Condemi[2], Anna Caroli[3], Andrea Remuzzi[4], Michela Bozzetto[3]
[1]Department of Engineering and Applied Sciences, University of Bergamo, Dalmine, Italy; [2]Unit of Nephrology and Dialysis, ASST Papa Giovanni XXIII, Bergamo, Italy; [3]Department of Biomedical Engineering, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Bergamo, Italy; [4]Department of Management, Information and Production Engineering, University of Bergamo, Dalmine, Italy

Abstract

Background

Monitoring arteriovenous fistula (AVF) function with ultrasounds is challenging in clinical settings, but sounds from unsteady blood flow may provide a non-invasive alternative. This study aimed to detect changes in sound frequency associated with changes in blood flow volume (BFV) resulting from anomalous vascular remodeling.

Materials and methods

The VASOUND study (NCT05612022) is an ongoing single-center, prospective clinical study. After surgical creation, AVFs are monitored for 2 years: weekly during maturation and then every 3 months. During each session, brachial BFV is measured by Doppler ultrasound and AVF sounds are recorded at the anastomosis using an electronic stethoscope. For each recorded sound, peak amplitudes in low (100–250Hz) and high (500–750Hz) frequency ranges is computed, along with the ratio between these peaks (HLPR). This ad-interim analysis includes data from each patient over the available follow-up period.

Results

A total of 14 native radio-cephalic AVFs were monitored in 14 patients (7F/7M; mean age 64.64 years, range 47-82). Among these, 10 were wrist AVFs (4 end-to-side vein-to-artery, 6 side-to-side with subsequent legation of distal vein - SLOT) and 4 were mid-arm AVFs (SLOT).
Already before reaching functional maturation, brachial BFV was directly proportional to the peak amplitudes of low-frequency sound components, and this relationship became more evident post-maturation. In addition, after functional maturation, HLPR was inversely proportional to brachial BFV. In three cases of AVF stenosis development (distal; 2 end-to-side, 1 SLOT), characterized by weakened thrills at the anastomosis, flow reductions between consecutive follow-ups corresponded to increased HLPR due to enhanced high-frequency contributions, predicting AVF failure.

Conclusion

Acoustic analysis of AVFs showed potential for non-invasive monitoring of BFV by wearable devices, enabling early detection of stenosis and improving clinical AVF management.

P-063 Monitoring and instrumental surveillance with color-doppler-ultrasound of haemodialysis angioacess: early complication diagnosis in preventing vascular inaccessibility associated with thrombosis. (ID 130)

Jacopo Scrivano[1], Juan Diego Balseca[2], Loredana Fazzari[3], Lucia Pantano[3], Valentina Sinibaldi[3], Chiara Gonzi[3], Arianna Ceravolo[2], Roberto Pirozzi[4], Coclite Daniela[5], Nicola Pirozzi[1]

[1]Interventional Nephrology Department, CdC Nuova ITOR, Rome, Italy; [2]Department of Translational and Precision Medicine, Policlinico Umberto I Hospital, Sapienza Università di Roma, Rome, Italy; [3]Dialisis Unit CdC Nuova Itor, Rome, Italy; [4]Endovascular Surgery for Hemodialysis Angioaccess, CdC Nuova ITOR, Rome, Italy. [5]CNEC, Istituto Superiore di Sanità, Rome, Italy

Abstract

Introduction

We evaluated the impact of clinical monitoring and instrumental surveillance on functional patency of arteriovenous fistula (AVF) or graft (AVG) for haemodialysis (HD).

Patients and Methods

The study was conducted over 24-month (Jan23 to Dec24) in a single centre cohort of 221 consecutive HD patients (pts). 29 pts were excluded because of central venous catheter (CVC), 12 pts because of denied consent. A total of 171 pts [96% distal, 3% proximal AVF, 0.5% AVG] were observed: 119/52 M/F; mean age 68.7y; hypertension 86%; diabetes 25 %; both 18%.
Clinical monitoring was performed at each HD; in case of abnormal results a eco-color doppler (CDU) was scheduled in the following week. The surveillance was based on CDU yearly examination. In case of abnormalities a shorter follow-up interval was assigned, or treatment was planned in case of significant stenosis (followed by 1 month post operative CDU).

CDU was performed by the same operator and complications managed by the same interventional nephrology team.

Results

Patient FU period was 19 months (3-24 months), with an average of 5 examinations per pt (1-16); 859 CDU examinations were performed in total.
132 hemodynamically significant stenoses were identified in 67 pts (58 inflow; 74 outflow). Of these, 118 were treated by angioplasty, and 14 surgically (10 anastomosis proximalizations; 4 vein transpositions to restore outflow). Immediate functional patency and no need for CVC placement, except in 1 pt, was observed in all.
2 cases of thrombosis were observed. For both, surgical thrombectomy was performed with immediate restore of functional patency. Total AVF/AVG thrombosis rate was 0.72 /100 pts/y and urgent CVC need 0.36 /100 pts/y.

Conclusions

We observed low rate of thrombosis and need for CVC in this 24month study on 171 pts. Based on this results we conclude that early diagnosis and prompt treatment of significant stenosis effectively preserve the functional patency of vascular access for HD.

P-064 The Role of DIAX in the Follow-Up of Hemodialysis Patients Undergoing Endovascular Treatment with Drug-Coated Balloons (DCBs) (ID 149)

Maria Cristina Carvarolo[1], Marco Franchin[1], Francesca Mauri[1], Laura Ros[2], Sara Monteleone[2], Matteo Tozzi[2]
[1]ASST-Settelaghi, Varese, Italy; [2]University of Insubria, Varese, Italy

Abstract

Background

Vascular access (VA) maintenance and follow-up are critical to ensuring long-term patency and dialysis adequacy in haemodialysis patients. The lack of structured follow-up data and standardized maintenance protocols can lead to suboptimal clinical outcomes, increased reinterventions, and a higher burden on healthcare systems.
All patients undergoing VA creation and maintenance in our centre are systematically included in a dedicated follow-up program. Drawing from previous experience in heart failure management, where structured clinical pathways significantly improved patient outcomes, we have implemented DIAX, a digital software solution to enhance the patient follow-up. This study aims to evaluate the clinical impact of DIAX in optimizing follow-up, procedural success, and patient outcomes.

Materials and Methods

The DIAX platform, One Hospital Clinical Service (OHCS) provides a structured framework to collect and manage pseudonymized patient data.
Patients undergoing endovascular VA maintenance with DCBs were prospectively followed using DIAX. The software allowed clinicians to track procedural outcomes, assess restenosis rates, schedule timely interventions and optimize clinical decision-making by integrating real-time data into clinical practice.

Results

Over the past five years our centre has performed 450 PTA-DCBs.
The integration of DIAX allowed for:
* Standardization of follow-up protocols, reducing variability in VA monitoring.
* Optimization of clinical workflows, reducing patient loss during follow-up.
* Improved tracking of long-term outcomes, supporting evidence-based therapeutic adjustments.

Conclusion

The implementation of DIAX in the follow-up of haemodialysis patients has significantly improved our clinical outcomes. By providing a real-time, structured, and patient-specific follow-up approach, DIAX has facilitated better surveillance, reduced complications and enhanced the overall management of vascular access dysfunction.

P-065 Ultrasound arteriovenous morphological and functional changes following stenosis angioplasty: observational study (ID 170)

João Martins, Ana Sofia Domingos, Patrícia Alves, Tiago Assis Pereira
ULS São José, Lisboa, Portugal

Abstract

Introduction

Arteriovenous access (AVA) ultrasound (US) can characterize stenosis by measuring diameter, blood flow (Qa) and resistive index (RI), thus identifying patients at risk for dysfunction or thrombosis. Angioplasty is an approach to relevant stenosis. Our aim was to evaluate US changes following AVA angioplasty.

Methods

Observational study including all patients submitted to successful AVA angioplasty due to US changes (failed maturation, decreasing Qa or critical stenosis diameter <2mm) during 2023. Clinical characteristics, US measurements and angioplasty details were collected. Analysis included descriptive statistics, Student t-test, Wilcoxon signed ranks test and Spearman's correlation.

Results

Twenty-four patients were included (median age 76,5 years). Comorbidities included hypertension (92%), diabetes (67%), tobacco use (50%), obesity (38%), heart failure (38%), cerebrovascular disease (21%) and peripheral artery disease (13%).
AVA were radiocephalic (RC) fistulas (25%), brachiocephalic (BC) fistulas (67%) or grafts (8%). Locations submitted to angioplasty were post-anastomotic (50%), cephalic vein (21%), cephalic arch (21%) and post-graft-vein anastomosis (8%). Mean time between angioplasty and follow-up was 44±22 days.
Mean Qa was 679,8 and 998,3mL/min before and after angioplasty, respectively. Qa significantly increased by 318,5, 95% CI [166,4; 471,7]. RC fistula Qa increased by 226,7 [-39,1; 492,5], BC fistula by 366,6 [146,8; 586,3] and graft by 210,0 [-298,2; 718,2]. RI change was not significant.
Stenosis diameter increased by 1,3mm ($p<0,001$); median relative increase was 65,5%. Qa change showed a positive correlation with stenosis diameter change (Spearman's rho 0,409, $p=0,024$).

Conclusion

AVA angioplasty is associated with improved Qa and stenosis diameter. Interestingly, only a median 1,3mm diameter increase was sufficient for Qa increase.
US is crucial for stenosis diagnosis, decision of intervention, and post-intervention monitoring.

P-066 Vascular access difficulties in patients of African descent - causes and consequences (ID 171)

Ana Sofia Domingos, Tiago Assis Pereira, Patrícia Alves, João Figueiredo Martins, Luís Santos, Paula Guimarães, Cristina Jorge
Hospital Curry Cabral, Lisbon, Portugal

Abstract

Background:

In Portugal, many patients with end-stage renal disease (ESRD) are from Portuguese-speaking African countries and experience worse vascular access (VA) outcomes for hemodialysis (HD), potentially due to socioeconomic disparities and vascular characteristics. This study investigates differences between patients of African descent (AD) and non-AD, aiming to identify factors contributing to VA disparities.

Materials and Methods:

This single-center observational study analyzed vascular ultrasound mapping and clinical data from 304 ESRD patients (63 of AD, 241 of non-AD). Arterial and venous diameters and peak systolic velocities (PSV) were categorized as adequate or inadequate for VA creation. Continuous variables were compared using parametric or non-parametric tests. Categorical variables were analyzed using the Chi-square test. Multivariate logistic regression adjusted for age, sex, and comorbidities.

Results:

AD patients were younger (54 vs 75 years, $p<0.001$), had lower tobacco use (14.3% vs 40.7%, $p<0.001$), and lower rates of peripheral arterial disease (3.2% vs 11.2%, $p=0.011$). 22% were on HD, 58.4% on pre-dialysis care, and 19.9% started HD during follow-up. Univariate analysis revealed significant differences in PSV and diameters of ulnar arteries, cephalic/basilic veins. Multivariate analysis confirmed AD as a strong predictor of worse vascular characteristics, particularly in ulnar artery diameter ($p=0.001$), PSV ($p<0.001$), and cephalic/basilic veins ($p=0.0016$). AD patients were more likely to require a prosthetic arteriovenous graft (AVG) (17.5% vs 7.1%, $p=0.009$) and to initiate HD via central venous catheter (CVC) (58.7% vs 32.8%, $p=0.040$).

Conclusion:

AD patients have worse vascular characteristics for dialysis access, leading to higher dependence on AVG and CVC for HD initiation. These findings highlight the need for targeted vascular care to ensure equitable access to optimal treatment and further investigation into biological mechanisms.

P-067 Peripheral and renal biopsy vascular comparison in diabetic patients (ID 174)

Ana Sofia Domingos, Tiago Assis Pereira, Patrícia Alves, João Figueiredo Martins, Luís Santos, Paula Guimarães, Helena Viana, Mário Góis, Cristina Jorge
Hospital Curry Cabral, Lisbon, Portugal

Abstract

Background:

Diabetes (DM) is a leading cause of end-stage kidney disease, both associated with vascular changes. With the rising incidence of DM, many diabetic patients (DP) with kidney dysfunction present conditions other than diabetic kidney disease (DKD). Peripheral vascular findings might indicate a higher probability of DKD. This study evaluated the correlation between renal biopsy (RB) findings and upper limb vascular characteristics.

Materials and Methods:

This single-center observational study analyzed vascular ultrasound mapping and clinical data from 15 DP who underwent RB. Patients were categorized as DKD (n=6, 40%) or non-DKD (n=9, 60%). Arterial and venous diameters and peak systolic velocities were assessed. Continuous variables were compared using parametric or non-parametric tests. Categorical variables were analyzed using the Chi-square test. Multivariate logistic regression adjusted for age, sex, and comorbidities.

Results:

Demographic and clinical characteristics were similar. Histologically, global glomerulosclerosis was observed in 23.3% of DKD patients vs 38.3% in others (p=0.327). Ischemic glomeruli were found in one DKD patient (p=0.205). Fibrosis and inflammation scores were similar. DKD patients had more arteriolar hyalinosis and intimal thickening (p=0.025). No significant differences were found in upper limb vascular characteristics, including arterial (brachial artery: 4.3mm in DKD vs 5.1mm, p=0.479) and venous parameters (cephalic vein forearm diameter: p=0.767). Arterial flow patterns, vascular calcifications, and venous sclerosis were comparable. No differences were observed in vascular access type at hemodialysis (HD) initiation (p=0.206) or post-mapping cardiovascular events (p=0.411).

Conclusion:

In this small cohort, DKD was associated with renal microvascular changes but not with differences in upper limb vascular characteristics relevant for HD access. Larger studies are needed to access potential systemic vascular correlations.

Complications of vascular access

P-068 Central access related superior vena cava obstruction: a possible overlooked risk factor in kidney transplant outcomes (ID 144)

Gozde Gultekin[1], David Randall[2], Ismail Mohamed[3], Christopher Seet[3], Muhammad Khurram[3]
[1]Barts and the London Medical School, Queen Mary University of London, London, United Kingdom; [2]Renal Department, Renal London Hospital, Barts NHS Health Trust, London, United Kingdom; [3]Renal Transplant and Vascular Access Department, Royal London Hospital, Barts NHS Health Trust, London, United Kingdom

Abstract

* Transplant kidney outflow obstruction can have detrimental effects ranging from prolonged acute kidney injury due to venous congestion to reverse diastolic flow leading to thrombosis. This, however, is usually seen in iliac or IVC stenosis/obstruction. Superior vena cava stenosis (SVCO) is a known complication of hemodialysis, particularly with long-term tunneled dialysis catheter use. While it does not directly restrict transplant outflow, upper body circulation diverts to the IVC, potentially raising venous pressure in the graft. We assessed transplant outcomes in this cohort.

* We reviewed kidney transplant patients (2018-2024) who underwent pre-transplant contrast chest CT/MRI or central venograms to identify SVCO (n=130). 14 patients were identified, excluding those with subclavian/brachiocephalic stenosis but patent SVC. Data on recipient/donor characteristics, operative notes, histology, graft survival/function were collected.

* Among 14 SVCO patients, 10 (71.4%) developed delayed graft function (DGF), vs. a 14% national DGF rate. One had displayed primary non-function. Compared to the non-DGF group (n=4, 3DBD, 1DCD), the DGF group (n=10, 1LD, 6DBD, 3DCD) had a higher mean donor age (51.5 vs. 39.8 years), implantation Remuzzi score (1.8 vs. 1.5), and longer cold (814.6 vs. 678.3 minutes) and warm (48.5 vs. 35 minutes) ischemic times. Serum creatinine concentration was higher than national averages and the non-DGF group (215.4 vs. 230 vs. 125.0µmol/L at 3 months; 264.7 vs. 112 vs. 96.7µmol/L at 12 months). 9/14 grafts remain functional.

* Despite the small cohort with multiple potential explanations for poor transplant outcomes, SVCO in transplant patients may not be as benign as once thought. Special attention should be given to reducing ischemic times and accepting more robust organs in such patients, factors known to affect transplant outcomes. Venous pressure monitoring during the transplant may shed light on the mechanisms underlying graft dysfunction.

P-070 Thrombosis of radio-cephalic arterio-venous fistula is often associated with asymptomatic thrombosis of the feeding radial artery (ID 20)

Jakob Gubenšek[1,2], Denis Fornazarič[1,3], Matej Zrimšek[1,2], Bojan Medved[1,2], Jernej Pajek[1,2], Rafael Ponikvar[1,2]
[1]Center for Acute and Complicated Dialysis and Vascular Access, Department of Nephrology, University Medical Center Ljubljana, Ljubljana, Slovenia; [2]Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia; [3]Ljubljana, Ljubljana, Slovenia

Abstract

Background.

Thrombosis of forearm arterio-venous fistula (AVF) can under certain conditions spread to the feeding radial artery (RA), which usually remains asymptomatic. Thrombosed AVFs are not routinely examined with ultrasound (US) if salvage is not planned (e.g. in patients with poorly developed AVF or after kidney transplantation). Therefore, the incidence of concomitant thrombosis of the feeding artery is not known. We performed a retrospective study to establish the frequency of RA thrombosis accompanying radio-cephalic (RC) AVF thrombosis.

Methods.

Patients, who had an US exam of thrombosed RCAVF performed with focus on the patency of the feeding RA between 2020 and 2024 were included. US was performed either due to recent RCAVF thrombosis or patients came for other reasons (kidney graft US or vascular mapping), but they had an old thrombosed RCAVF, which was examined.

Results.

We included 57 cases of thrombosed RCAVF. Mean age of patients was 62±16 years and 28% were female. 45 had recent thrombosis of RCAVF and 12 had US performed for other reasons. In 15/57 (26%) patients we found a concomitant thrombosis of the perianastomotic segment (in rare cases also of the entire) of the feeding RA. The frequency of thrombosis of RA was similar in the subgroup of patients with recent (11/45, 24%) or old thrombosis (4/12, 33%, p = 0.53). Thrombosis of RA was asymptomatic in all cases. Majority of patients were treated with anticoagulant therapy.

Conclusions.

RA thrombosis accompanying RCAVF thrombosis is relatively common and usually asymptomatic. It can be presumed that feeding artery thrombosis would be less common, if short-term anticoagulant treatment is prescribed in cases of AVF thrombosis, when salvage is not performed. Nevertheless, this strategy remains questionable as patients usually remain asymptomatic. Furthermore, it is unclear if RA thrombosis increases the risk of distal ischemia, should later a brachial artery based AVF be constructed.

P-072 Study on Superficialized Arterial Aneurysm Formation (ID 24)

Sumihiko Sato
Credo Sato Clinic, Chiba, Japan

Abstract

Objective:
The aging population and the growing number of dialysis patients with cardiac dysfunction have led to an increase in cases of superficialized arteries (SA). One significant complication is the formation of aneurysms, often resulting from repeated punctures in localized areas. This study aims to identify factors contributing to SA aneurysm formation.

Methods:
In April 2024, we analyzed 42 of 220 dialysis patients at our hospital with at least one year of SA usage. The minimum and maximum diameters of the brachial artery were measured, with SA aneurysms defined as cases where the maximum diameter exceeded twice the minimum diameter of the brachial artery. Factors evaluated include age, gender, dialysis history, diameter and length of SA, history of SA, presence or absence of diabetes, taking of antiplatelet agents, taking of antihypertensive agents, history of arteriovenous fistula, hemostatic belt (tourniquet), meander of SA, and thrombus.

Results:
Aneurysm formation was significantly more common in male patients and those with thrombus in the SA. The group with aneurysm also had significantly longer SA length (8.0 cm in the group with aneurysm/6.5 cm in the group without aneurysm) and a history of SA use (5.0 years in the group with aneurysm/2.4 years in the group without aneurysm), no other parameters showed significant differences.

Consideration:
A long history of SA use and the presence of thrombus were strongly associated with aneurysm formation, underscoring the importance of avoiding repeated puncture at the same site. The increased prevalence of aneurysms in patients with longer SA lesions warrants further investigation to clarify underlying cases.

Summary:
Male gender, thrombus presence, prolonged SA usage (over 4.2 years), and SA lengths exceeding 7 cm are significant risk factors for SA aneurysm formation. To mitigate these risks, careful puncture techniques, including the use of ultrasonography guidance, are essential.

P-073 Indirect hand perfusion in steal syndrome (ID 33)

Bostjan Leskovar, Jernej Vrtek, Mojca Bratanic, Tjasa Furlan
General hospital Trbovlje, Trbovlje, Slovenia

Abstract

Introduction.
An AVF may cause hand ischemia in patients with diabetes and atherosclerosis. The standard interventions are distal radial artery ligation (DRAL), distal revascularisation and interval ligation (DRIL), proximalisation of the arterial inflow (PAI), and bandaging. In some cases, we can also reduce the ischemia by reducing the flow through the AVF with revision using distal inflow (RUDI) and lengthening the feeding inflow segment of the AVF.

Case report.
In a patient with type 2 diabetes and peripheral arterial disease, a radiocephalic AVF with a side-to-side anastomosis was constructed on the left forearm. After one year, hand ischemia was resolved with DRAL (clipping the distal artery). After a transient improvement, ischemia progressed. We closed the proximal venous outflow of the AVF, removed the clip and diverted the blood supply via a PTFE graft (PAI). Despite the reconstruction, the condition did not improve; angiography showed a functioning AVF, occlusion of all three forearm arteries distally and good filling of the venous arch on the hand via the preserved distal venous outflow of the primarily constructed anastomosis. Based on this, we ligated the veins that represented the main proximal drainages of the venous arch.

Results.
Control angiography showed a well-functioning AVF after PAI reconstruction, complete occlusion of the arterial flow on the forearm, with rapid blood outflow from the distal outlet of the AVF via the prominent draining veins. After the last procedure, we ensured indirect blood supply to the hand through the veins. We achieved healing of all wounds, cessation of ischemic pain, and a gradual improvement in the hand's functionality with a functioning AVF.

Conclusions.
The guideline-recommended rescue procedures for arm ischemia are the basis for treating arterial flow disturbances. A rarely described solution is indirect blood supply to the hand. An individual multimodal approach in a specialised center is required.

P-074 What can be detected by echocardiography after the dialysis catheter removal (ID 34)

Eugene Zeltyn-Abramov[1,2], Natalya Belavina[1], Iulia Barkova[1], Nataliya Klochkova[1,2], Svetlana Kondrashkina[1], Vladimir Vtorenko[1]
[1]Moscow City Clinical Hospital 52, Moscow, Russian Federation; [2]Pirogov Russian National Research Medical University, Moscow, Russian Federation

Abstract

Tunneled central venous catheter (tCVC) is one of the most common vascular access for hemodialysis. tCVC can contribute to the development of some life-threatening complications. The main indications for tCVC removal are catheter dysfunction, thrombosis and catheter-associated bloodstream infection (CABSI). We present 4 clinical cases demonstrating the diagnostic value of Echocardiography (Echo) (Transthoracic (TTE) and transesophageal (TEE)) after tCVC removal.

Case 1. A 68-year-old male was admitted with CABSI. A fragment of fibrin sheath (FS) was detected on the tip of removed tCVC. TEE demonstrated the tubular structure into superior vena cava (SVC) with mobile masses on its distal segment. The diagnosis of right-sided nonvascular infectious endocarditis (IE) with the nidus on the FS was confirmed.

Case 2. A 24-year-old male was admitted with non-functioning tCVC and intermittent fever. The removed tCVC was visually clean. TTE was unremarkable. TEE demonstrated large masses into SVC penetrating the right atrium. The blood culture was positive for Staph. aureus. The case was regarded as right-sided nonvalvular IE.

Case 3. A 64-year-old female was admitted for replacement of dysfunctional tCVC. The patient was asymptomatic. Blood culture was negative. TTE after tCVC removal demonstrated the ribbon-like floating clot penetrating into right ventricle.

Case 4. A 89-year-old female was admitted in critical condition due to sepsis. Her medical history was remarkable for multiple attempts to create vascular access. At admission the femoral tCVC was dysfunctional. The blood culture was positive for Staph. aureus. TTE after tCVC removal demonstrated the FS into IVC. FS was recognized as a nidus of CABSI and tCVC-related sepsis.

Conclusions

Echo can provide crucial diagnostic information, especially in febrile patients with dysfunctional tCVC. In cases of persistent diagnostic uncertainty TEE should be widely recommended as a safe and minimally invasive valuable method.

P-075 Role of echocardiography in the diagnosis of catheter-associated cardiovascular complications in patients with tunneled central venous catheter for hemodialysis (ID 36)

Eugene Zeltyn-Abramov[1,2], Iulia Barkova[1], Natalya Belavina[1], Nataliya Klochkova[1,2], Svetlana Kondrashkina[1], Vladimir Vtorenko[1]
[1]Moscow City Clinical Hospital 52, Moscow, Russian Federation; [2]Pirogov Russian National Research Medical University, Moscow, Russian Federation

Abstract

Background

Despite the advantages of arteriovenous fistula, tunneled central venous catheters (tCVC) are applied as a vascular access for maintenance hemodialysis. tCVC may contribute to thrombotic and infectious complications. The aim of the study was to investigate the incidence of catheter-associated cardiovascular events (CVE) by echocardiography (Echo).

Method

138 patients were included in retrospective study from 11.01.2023 to 11.01.2024. Echo was performed initially and after tCVC removal. All patients were divided into gr: 1 – with tCVC dysfunction (34 pts), 2 – without (104 pts). Statistical analysis was done with STATISTICA 13 (M-W U test, Chi-Square, Yates corrected).

Results

Mediana age was 55 y [38;68], females 54%. The groups didn't differ in age (56 y [37;70] vs 55 [39;67], M-W U test p=0.849), gender (female 17 (50%) vs 57 (55%), χ^2 p=0.625), duration of tCVC function (86 days [38;190] vs 83 [17;175], M-W U test p=0.619). The total number of CVE was 52. CVE were detected (1gr vs 2 gr): infective endocarditis (IE) of the tricuspid valve – 2 (5.9%) vs 0 (0%) χ^2 p=0.013, right-sided nonvalvular IE – 1 (2.9%) vs 0 (0%) χ^2 p=0.079, tCVC thrombosis – 12 (35.3%) vs 13 (12.5%) χ^2 p=0.003, right atrial wall thrombosis – 6 (17.6%) vs 10 (9.6%) χ^2 p=0.204, pulmonary embolism – 4 (11.8%) vs 4 (3.8%) χ^2 p=0.086. 34 tCVC were removed (1gr – 20, 2 gr – 14). CVE were detected (1gr vs 2 gr): residual thrombosis – 10 (50%) vs 8 (57%) χ^2 p=0.951, fibrin sheath (FS) – 4 (20%) vs 0 (0%) χ^2 p=0.079, right-sided nonvalvular IE on FS – 1 (5%) vs 0 (0%) χ^2 p=0.855, right-sided nonvalvular IE on superior vena cava (SVC) – 1 (5%) vs 0 (0%) χ^2 p=0.855. Right-sided nonvalvular IE on FS and on SVC were confirmed by transesophageal Echo (TEE).

Conclusions

The incidence of CVE is higher in patients with tCVC dysfunction. Echo is a primary method for diagnostic of catheter-associated cardiovascular complications. TEE should be performed in doubtful cases after tCVC removal.

P-076 Techniques on overcoming the stenosis of AVF (ID 42)

Mihai Cucu, Victor Costache
Sanador, Bucharest, Romania

Abstract

Background

AVF is the first line vascular access for patients with CKD in predialysis. Due to hemodynamic changes in the vascular wall - mostly the venous segment, this leads to stenosis in different parts of this segment, the major cause of AVF thrombosis.

Materials and methods

This is a retrospective, multicentric five-year study, single surgeon experience on correcting the stenosis of AVF on different levels of the venous and arterial segments, either by balloon angioplasty or by surgical means. The goal was to achieve optimal dialysis flow, either pre or post AVF thrombosis, by stenosis correction with minimal local and systemic complications, with catheter insertion avoidance by all means. The surgical techniques used in the study were: patch angioplasty (ePTFE, venous, bovine pericardium), graft interposition either with or without thrombectomy, re-routing to collateral or profound venous system, techniques used according to ESVS guidelines.

Results and conclusions

The techniques used had an over 90% success rate, with a high primary patency at one year, without restenosis in the surgical correction group.

P-077 Endovascular management of central vein stenosis/occlusion in haemodialysis patients: clinical success needs additional procedures to improve the patency (ID 53)

Raffaella Mauro[1], Gianluca Faggioli[1,2], Cristina Rocchi[3], Alessia Pini[1,3], Chiara Mascoli[1], Rodolfo Pini[3], Mohammad Abualhin[3], Maurizio Alberto Gallieni[4], Mauro Gargiulo[3,1]
[1]IRCCS Sant'Orsola University Hospital of Bologna, Vascular Surgery Unit, Bologna, Italy; [2]Alma Mater Studiorum - University of Bologna, Vascular Surgery, Department of Medical and Surgical Sciences (DIMEC), Sant'Orsola University Hospital of Bologna, Bologna, Italy; [3]Alma Mater Studiorum - University of Bologna, Vascular Surgery, Department of Medical and Surgical Sciences (DIMEC), Bologna, Italy. [4]University of Milan, Milano, Italy

Abstract

Background:

The aim of this study is to evaluate efficacy and safety of the endovascular treatment of central venous stenosis/occlusion in patients with central venous stenosis/occlusion.

Materials and Methods:

This is a monocentric observational study. All haemodialysis patients by artero-venous fistula (AVF) and undergoing percutaneous transluminal angioplasty (PTA) or PTA/stenting of cephalic arch, axillar, subclavian, brachiocephalic trunk and/or superior cava vein for venous hypertension syndrome from January 2019 to December 2023. From October 2022, intraoperative intravascular ultrasound (IVUS) technique was also introduced to evaluate the need of additional surgical proceedings. The data were prospectively collected and retrospectively analysed to determine technical success, patency, and clinical result.

Results:

Forty-two patients (17 males) were recruited. In 7 (17%) cases a plain PTA was performed, while in 35 (83%) cases PTA/stenting was carried out. Sinus Venous (Optimed, Ettlingen, Germany) used in 27 (64%) cases, Covera (Bard, Tempe, AZ) in 5 (25%) cases and Venovo Venous stent (Bard, Tempe, AZ) in 3 (15%) cases were the most used stents. Technical success was obtained in 39 (93%) cases. Immediate decrease of deep vein pressure (mean DVP:190±7mmHg vs 123±13mmHg), increase of dialytic flow (mean DF:281±15mL/min vs 361±9mL/min) and a reduction of recirculation value (mean RR:11±0.9%) were observed. 30-day primary patency was 100%. At a mean follow-up (26±19months), the primary patency was 85%; 6 (15%) restenosis occurred, with an assisted patency of 92%. Intraoperative IVUS was performed in 8 cases, with evidence of residual intrastent stenosis in 3 cases, which were corrected intraoperatively.

Conclusion:

Endovascular treatment of central venous stenosis is effective and safe. A close follow-up is needed in order to accomplish timely adjunctive procedures to maintain patency. Intraoperative IVUS is a valuable operative tool to optimize the results.

P-078 The end of intravenous heparin for treatment of dialysis access thrombosis and as bridging before vascular access intervention: an audit (ID 61)

James Larkworthy, Sarah Lawman
University Hospitals Sussex NHS Trust, Brighton, United Kingdom

Abstract

Introduction

Intravenous heparin is currently recommended for treating acute thrombosis in patients with creatinine clearance < 15ml/min when treatment dose low molecular weight heparin would otherwise be used, and as anticoagulation bridging before vascular access procedures. There are many complications associated with its use, particularly bleeding. The alternative options are to use subcutaneous low molecular weight heparin, and to use apixaban instead of warfarin, as it does not require bridging.

Aim/Objectives

Review the indications and complication rate of using intravenous heparin

Methods

Patients were included if they had been prescribed intravenous heparin sodium between October 2022-2023. Data was recorded for the indication and duration of treatment, the time within required APTT ratio, and the number of blood tests required to get the patient into range.

Results

51 patients were prescribed intravenous heparin, of which almost 25% were for loading warfarin, 25% were for acute thrombosis and 25% were for bridging peri-procedure. Patients on intravenous heparin required 2-3 blood tests to achieve the necessary APTTr range, but were only within range for 50% of the time. Complications included an additional 77 days of inpatient admission; and 13 patients had bleeding, of which three were serious bleeds.

Conclusions

Intravenous heparin is useful for close monitoring of anticoagulation and rapid reversal, but is difficult to manage, associated with additional length of stay in hospital and a high rate of complications. In our unit, we have opted to use low molecular weight heparin off-licence with patient consent as an alternative to IV heparin, and apixaban off-licence with patient consent instead of warfarin where safe to do so. We have created a guide for healthcare professionals and patients to treat them and bridge safely.

P-079 Management of large venous aneurysm (ID 63)

Massimiliano Millarelli[1], *Rosario Micali*[2], *Costanza Margheritini*[3], *Roberto Chiappa*[1]
[1]Vascular Surgery Unit – Sandro Pertini Hospital, Rome, Italy; [2]Vascular Surgery Unit – Tor Vergata University, Rome, Italy; [3]Vascular Surgery Unit – La Sapienza University, Rome, Italy

Abstract

* Understand vascular access complications and their impact on long-term function and durability
* Describe the surgical techniques used to manage complications
* Recognize the importance of timely diagnostic assessment and appropriate therapeutic interventions

Arteriovenous fistulas (AVFs) are the gold standard for hemodialysis access in patients with chronic kidney disease, offering superior longevity and reliability compared to other access modalities. However, over time, AVFs can develop complications such as aneurysms and stenoses, which can significantly impair their function and jeopardize the long-term durability of the access. Timely diagnostic assessment and appropriate therapeutic strategies are crucial for maintaining the functionality of the vascular access. Several surgical techniques are available to manage these complications.

We present the case of a 66-year-old female patient with a bulky venous aneurysm associated with stenosis, leading to AVF dysfunction. Under local anesthesia, a longitudinal skin incision was made laterally to the aneurysm and extending to the stenotic area. The stenosed segment and aneurysm were resected, and the posterior wall of the vein was tubularized via direct suturing. Vascular reconstruction was completed with an end-to-end anastomosis, followed by removal of excess skin. Palpable thrill and adequate blood flow, confirmed by ultrasound, were observed post-procedure. A temporary central venous catheter (CVC) was placed into the right jugular vein to ensure dialysis sessions. After approximately one month, the CVC was removed once the surgical wound had healed.

Managing aneurysms and stenosis in AVFs typically requires surgical interventions to restore adequate flow. The choice of surgical approach depends on the severity and location of the lesions, with the goal of maintaining fistula patency, minimizing complications, and improving patient outcomes while prolonging the functionality of the vascular access.

P-080 Endovascular repair of a brachial artery pseudoaneurysm (ID 75)

Massimiliano Millarelli[1], *Rosario Micali*[2], *Alessandro Carra*[1], *Costanza Margheritini*[3], *Roberto Chiappa*[1]
[1]Vascular Surgery Unit – Sandro Pertini Hospital, Rome, Italy; [2]Vascular Surgery Unit – University Tor Vergata, Rome, Italy; [3]Vascular Surgery Unit – University La Sapienza, Rome, Italy

Abstract

* Understand etiology and clinical presentation of artery pseudoaneurysms
* Use of Ultrasound-Guided and Endovascular Techniques in their management
* Evaluate benefits of minimally invasive techniques in vascular access complications
Penetrating or blunt trauma, percutaneous coronary artery intervention, drug abuse and arterial gas sampling can lead to artery pseudoaneurysms. Clinical findings include a pulsatile mass, bruit, and adjacent nerve injury. Treatment options include ultrasound-guided compression, percutaneous intervention, and open surgery. We present a case of a 64-year-old female patient presenting with an iatrogenic brachial artery pseudoaneurysm in the left upper arm.

The patient had a functioning left distal arteriovenous fistula (AVF) and presented with a subfascial hematoma caused by an accidental puncture of the brachial artery, which had occurred 20 days earlier. Despite palpable peripheral pulses, she exhibited clinical signs of nerve compression for the past 7 days.
Through ultrasound-guided puncture of the right common femoral artery and selective left brachial artery catheterisation an angiography was performed revealing the presence of a pseudoaneurysm of the distal brachial artery and extrinsic compression by the hematoma. After the negotiation of the stenosis and predilation with a 6 mm balloon, a 7x75 mm Viabahn endoprosthesis was released and subsequently dilated to 6 mm. Final angiogram showed exclusion of the bleeding site and direct downstream flow. Hemostasis was achieved using a mechanical system, and the patient's neurological symptoms resolved completely within 20 days.

Advances in endovascular techniques and devices have revolutionized the treatment of replenished hematomas, offering minimally invasive options, reducing the risk of complications associated with extensive surgical dissection. This is particularly relevant in high sensorimotor innervation regions and in patients with omolateral vascular access for haemodialysis.

P-081 Thermographic monitoring during corrective surgery of steal syndrome (ID 86)

Giuseppe Gatta[1], Antonio Scarlatella[1], Arcangelo Merla[2], Michele Tritto[3], Filippo Aucella[1]
[1]IRCCS "Casa Sollievo della Sofferenza", San Giovanni Rotondo, Italy; [2]Università di Chieti-Pescara, Chieti, Italy. [3]Next2u Solution, Pescara, Italy

Abstract

Thermography is a noninvasive diagnostic technique for assessing minute differences in surface temperature. Several studies have shown its usefulness in diagnosing skin perfusion defects. In these cases, the less perfused skin surface appears cooler in comparison with surrounding areas. Its use in the diagnosis of Hemodialysis access-induced distal ischemia (HAIDI) has already been reported in the literature.
Hand ischemia in subjects with a distal radio-cephalic arteriovenous fistula is a rare but possible event. It is due to retrograde blood overflow through the radial artery distal to the anastomosis, which reduces arterial perfusion of the fingers.

Treatment of this condition involves reducing fistula flow by banding the arterialized vein, ligation of the radial artery, or fistula suppression.

We report the clinical case of an 80-year-old subject with a distal radiocephalic fistula who manifested a steal syndrome due to radial artery overflow.

He underwent iuxta-anastomotic cephalic vein banding surgery. The efficacy of the procedure was verified in real time by intraoperative thermographic monitoring of hand perfusion, which improved markedly after flow reduction.

P-082 Distal hypoperfusion ischemic syndrom in a patient with type 1 diabetes mellitus (ID 87)

Eva Chytilova[1], *Jan Malik*[1], *Marcela Slavikova*[2], *Adriana Mackova*[2]
[1]3rd Departement of Internal Medicine, General University Hospital, Prague, Czech Republic; [2]2nd Surgical Clinic - Cardiovascular Surgery, General University Hospital, Prague, Czech Republic

Abstract

Distal hypoperfusion ischemic syndrome is a rare but significant complication in patients with end-stage renal disease (ESRD) with vascular access. The case report presents a 40 years old female with type 1 diabetes mellitus (T1DM), and complex medical history including coronary artery disease (CAD) and peripheral artery disease after bellow-knee amputation.

The patient developed distal hypoperfusion syndrome after recanalisation of thrombosed polytetrafluoroethylene (PTFE) graft on right arm. The emboli in distal parts of forearm stenotic arteries triggered symptoms.

The patient reported coolness, paresthesias, pain and after three weeks ulcetarion on 2nd, 3th finger and necrosis on 4th proximal interphalangeal joint. Treatment, including fingertip amputation, took 7 months and involved repeated percutaneous angioplasty, antimicrobial therapy, anticoagulation. The aim was alleviate ischemia, while preserving vascular access. The patient has no chance to place another graft on her extremities, and is also contraindicated for renal tranplantation due to CAD.

This case demonstrates the need for for a multidisciplinary approach involving nephrologists, vascular surgeons, and interventional radiologist to optimize patient outcomes and prevent severe complications ealy on.

P-083 Vascular access exhaustion in hemodialysis patients awaiting urgent kidney transplantation (ID 98)

Roberto Mangiacapra, Elettra Lomeo, Francesca Maria D'ascenzo, Giuseppe Grandaliano
Fondazione Policlinico Universitario Agostino Gemelli IRCCS - Università Cattolica del Sacro Cuore, Roma, Italy

Abstract

ESRD patients often experience recurrent dialysis catheter removals due to comorbidities. Repeated replacements increase the risk of vessel damage, venous thrombosis and chronic vascular occlusion.
Identifying patients with limited vascular access options is essential to avoid delays in life-saving interventions, including timely referral for kidney transplantation.
We present two cases of vascular access exhaustion that came to our attention over the past year.

CASE REPORT

Case 1: A 37-year-old male with congenital urinary malformation, childhood ischemic injury, psychomotor delay and obesity.
Case 2: A 42-year-old female with a history of staghorn kidney stones, McKusick-Kaufman syndrome and psychomotor delay.

Both patients had multiple failed vascular accesses and chronic thrombosis of the superior and inferior vena cava, with extensive collateral circulation. They presented with malfunctioning femoral CVCs, preventing effective hemodialysis.

In the male patient, we placed a femoral double-lumen CVC with its tip in the right iliac vein and a Tesio catheter in the right subclavian vein. In the female patient, we placed a femoral double-lumen CVC with its tip in the left iliac vein and a Tesio catheter in the right internal jugular vein. The positioning of the catheter tips was constrained by chronic occlusion of the central venous vessels.
Both patients were promptly listed for urgent kidney transplantation. The male received a successful transplant two days later and remains in stable condition. The female underwent transplantation six days later but unfortunately died weeks later from sepsis.

CONCLUSION

These cases highlight the critical need to monitor the vascular history of ESRD patients to detect early signs of access exhaustion.

Timely detection, multidisciplinary collaboration, and proactive vascular access management are crucial to reducing the risk of life-threatening complications and ensuring continuity of care for dialysis-dependent patients.

P-084 Advances in right cardiac thrombus aspiration: navigating complex cases with innovative techniques (ID 109)

Ludovico Ambrosi[1], Riccardo Corti[2], Mauro Antonio D'Agostino[2], Nicola Cionfoli[2], Paola Falvo[1], Carlotta Cremaschi[1], Pietro Quaretti[1]
[1]Diagnostic Imaging and Radiotherapy Unit, Department of Clinical, Surgical, Diagnostic, and Pediatric Sciences, University of Pavia, Pavia, Italy; [2]Interventional Radiology Unit, IRCCS Policlinico San Matteo of Pavia, Pavia 27100, Italy, Pavia, Italy

Abstract

Right heart thrombosis (RHT) poses a significant mortality risk if not promptly recognized and managed. The European Working Group on Echocardiography classifies right atrial thrombi (RAT) into three types—A (in transit), B (in situ), and C (mobile in situ)—each differing in mobility, attachment, and propensity for embolization. Although interventions such as anticoagulation, surgical thrombectomy, or thrombolysis can reduce mortality by several fold, no definitive management algorithm exists.

We present three consecutive cases of RHT in which advanced thrombectomy devices and multimodal imaging significantly influenced outcomes. In the first case, a patient with chronic renal failure had an infection-related thrombus (24mm) adherent to a dialysis catheter (RAT B). Under fluoroscopic guidance—without computer-assisted aspiration or ultrasound—the FlowTriever and Triever24 systems successfully removed the clot, although about 400mL of blood was aspirated.

Subsequent cases used a computer-assisted Lightning Flash aspiration system, reducing blood loss. The second patient, with infective endocarditis and a non-occlusive thrombus (14mm) extending into the superior vena cava (RAT B), benefited from IVUS plus fluoroscopic imaging for targeting thromboaspiration; Cone Beam CT confirmed complete recanalization.

In the third case, a patient with endometrial and ovarian adenocarcinoma presented with a thrombus (15 mm) at the tricuspid valve plane (RAT C). Cine-recorded, real-time transesophageal echocardiography guided Lightning Flash extraction, ensuring thorough thrombus removal while preserving the valve apparatus.

Collectively, these cases underscore the importance of individualized treatment strategies for complex right atrial and central venous thromboses. They highlight how emerging thrombectomy devices and advanced imaging—from IVUS to echocardiography—can facilitate exact diagnosis, guide targeted interventions, and ultimately improve patient outcomes.

P-086 The Swedish Renal Registry Comprise Long- time Follow-up of National Data on Vascular and Peritoneal dialysis access (ID 146)

Gunilla Welander[1,2], Birgitta Sigvant[3]
[1]Nephrology Unit, Karlstad, Sweden; [2]Department of Medical Sciences Uppsala University, Uppsala, Sweden.
[3]Department of Surgical Sciences Uppsala University, Uppsala, Sweden

Abstract

Background:
The Swedish Renal Registry (SRR) covers data on the entire patient trajectory, from renal biopsy to chronic kidney disease (CKD) and renal replacement therapy (RRT), including the dialysis access, a key factor in dialysis care quality

Material and methods:
Nurses at all outpatient clinics and dialysis units has routinely recorded data on vascular accesses since 2014 and peritoneal accesses since 2017. Data as demographics, access type, creation details, and function are captured. As are complications that can be counted by the number of days of access use. Reinterventions are further registered and reason for end of use.

Results:
The registry encompasses data on n=23020 central venous catheters (CVC), n=15266 arteriovenous fistula (AVF) and arteriovenous grafts (AVG). A decrease of access creation was found between 2014 to 2023 (n=886 to n=579), were forearm remained the most common type. During this time, fewer incident patients had a functional fistula from 29% to 24%, and in prevalent patients the number of AVF/AVG decreased from 70% to 58%, with a variation between units 32-87%. The number of CVC days increased by 20%. In total are 23 764 reinterventions registered (endovascular n=19654, and open n=4110). Endovascular interventions decreased from 1.3 to 0.8/1000 AVF/AVG days. Thrombectomy was the most common open reintervention (29%) and decreased annually from 0.15 to 0.06/1000 days.
Data on peritoneal dialysis (PD) catheters (n=5643) shows an increasing use of laparoscopic technique from 2019 to 2023 (24% to 41%). The use of tungsten catheters increased from 38 to 50%, but the migration complication was unchanged. In 2023 the infection rate was 40 months in 11 693 patient months and peritonitis/patient year 0.3. Infection (28%) was the most common reason for change of modality to hemodialysis.

Conclusion:
SRR access module provides an opportunity for national audits, research, and international collaboration to improve patient outcomes.

P-087 Restoring arteriovenous fistula functionality: The role of surgical patch angioplasty in salvaging complex stenosis cases (ID 150)

Blaž Slonjšak, Jernej Pajek
UMC Ljubljana, Ljubljana, Slovenia

Abstract

Background:

Arteriovenous fistulas (AVFs) are the preferred vascular access for hemodialysis due to their durability and low infection risk. However, long-term functionality is often compromised by stenosis, requiring intervention. Standard treatments, such as balloon angioplasty or creating a new anastomosis, may be ineffective in complex cases. Surgical patch angioplasty offers a novel approach to salvaging AVFs and restoring functionality.

Case Series:

We report three cases of AVF dysfunction: two caused by stenosis and subsequent thrombosis, and one by insufficient blood flow. The first case involved a 51-year-old male with a distal radiocephalic AVF created 24 months prior. The second case featured a 42-year-old female whose lower-arm AVF failed after 48 months. The third case involved a 58-year-old male with dysfunction 11 months post-creation. The median time from AVF creation to dysfunction was 24 months. Juxta-anastomotic stenosis was found in two cases and downstream stenosis in one. Balloon angioplasty or a new anastomosis was not viable due to stenosis location and reduced available needling segments. Surgical patch angioplasty was performed in each case.
A vein segment from the ipsilateral arm was harvested, and the stenotic AVF segment was incised longitudinally. A vein patch was sutured using 7-0 Prolene to expand the lumen and restore blood flow. Postoperative Doppler ultrasound confirmed improved flow rates in all cases. Follow-up assessments at 12 weeks to six months showed sustained AVF patency without restenosis or dysfunction.

Conclusion:

Surgical patch angioplasty successfully restored AVF function in patients with stenosis at various sites, proving a reliable salvage option when endovascular interventions or new anastomosis creation are ineffective. Larger cohort studies are needed to validate these results and develop refined clinical guidelines.

P-088 Incidence and related factors of superior vena cava syndrome: two-year experience (ID 153)

Mercedes Baltasar[1], Carlos-Jesús Cabezas[1], Nicolás Morell[1], María-Ángeles Fernández[1], Irene Cifuentes[2], Borja Alonso[3], Desirée Bustos[1], Iván Carmena[1], Elena Pascual[1], Francisco-Javier Ahijado[1]
[1]Nephrology, Hospital Universitario de Toledo, Toledo, Spain; [2]Radiology, Hospital Universitario de Toledo, Toledo, Spain; [3]Avericum Hemodialysis Center, Toledo, Spain

Abstract

Background:

Superior vena cava syndrome (SVCS) is an entity characterized by obstruction of venous flow in SVC. The use of central venous catheters (CVC) in hemodialysis (HD) patients is a potential risk factor. We propose a study to estimate incidence of SVCS in our HD unit and explore associated risk factors.

Materials & Methods:

This retrospective observational study included prevalent HD patients using CVC>3 months during 2023-24 period who developed SVCS (>50% SVC diameter obstruction on CT). Treatment was always percutaneous transluminal angioplasty (PTA). Two comparative groups were established: patients who underwent 1PTA and those requiring>1 PTA. We analyzed SVCS incidence adjusted to 1000 CVC-days and assessed association of PTA number with age, sex, surface area (Dubois), diabetes (DM), HD duration, adequacy (Kt), number CVC, duration CVC use, infectious complications, cardiac devices, hypercoagulability, anticoagulation and CVC patency at the end of the study period. Statistical analysis was performed using univariate: Mann-Whitney U and Fisher's exact test.

Results:

N=23 episodes on 15 patients. Incidence SVCS was 0.12 episodes/1000 CVC-days. Age 63.7±11.78y; 73.3%male; 40% DM; surface area 1.84±0.18m²; HD duration 49.53±24.45months; Kt 42.3±6.35L; Duration of CVC use 706.27±582.49days; CVC-related exit-site infections 6.7% of patients; 6,7% had cardiac devices; 33,3% had a positive hypercoagulability test; anticoagulation was always with warfarin, 20% on prior anticoagulation for other reasons and 26.7% initiated post-SVCS diagnosis. 10 patients underwent 1 PTA, 5 required > 1 PTA. A higher prevalence of DM (p=0.044) and a lower number of prior CVC (p=0.001) were observed in 1 PTA group.

Conclusion:

The incidence of SVCS was 0.12 episodes/1000 CVC-days during the 2-year period. DM and a lower number of prior CVC were associated with fewer PTA procedures. It is likely that DM alone doesn´t fully explain vasculopathy component in pathogenesis of SVCS.

P-089 Tunneled hemodialysis catheter allocated in azygos vein as a consequence of superior vena cava syndrome: case report. (ID 154)

Nicolás Morell, Carlos-Jesús Cabezas, Mercedes Baltasar, María-Antonia García, María-Ángeles Fernández, Iván Carmena, David Carro, Laura Cueto, Maite Padrón, Francisco-Javier Ahijado
Nephrology, Hospital Universitario de Toledo, Toledo, Spain

Abstract

We present a 53-year-old male with hypertension and dyslipidemia and a multifactorial chronic kidney disease treated with hemodialysis since July 2020 through a right tunneled jugular catheter (TJC). Other relevant medical history includes monoclonal gammopathy of uncertain significance and antiplatelet therapy with acetylsalicylic acid due hyperhomocysteinemia and a positive Russell test in hypercoagulability study.
Regarding vascular access history, the first was a right TJC (24 cm), placed at the cavo-atrial junction in July 2020, which had to be replaced after one week due to dysfunction. It was replaced with a longer one (28 cm) through the same tunnel. In February 2022, due to clinical findings compatible with superior vena cava syndrome (SVCS), an upper limbs venography and a cava scan were performed, revealing no pathological findings. Following this, there was a gradual improvement, and symptoms resolved.

In March 2023, with reappearance of symptoms and vascular access dysfunction, a new cava scan was performed, showing partial stenosis of SVC with significant collateral circulation through azygos system. Angioplasty of the stenosis and catheter replacement were decided. In April 2023, he was evaluated by Vascular Surgery for arteriovenous fistula creatin, but the patient ultimately refused.

Due to new episode of dysfunction, in November 2023, a new cava scan was performed, showing complete occlusion of the superior vena cava. After several attempts, no angioplasty was possible. A new catheter was placed, with the tip located in azygos vein. Since then, it has functioned normally (mean flow rate 350ml/min and mean Kt 50L).

Currently, patient is on high-flow dialysis with azygos catheter functioning excellently. As a conclusion, azygos vein should be a explored as a potential permanent vascular access when other alternatives are impossible or extremely difficult to resolve.

P-091 A case of surgical removal of an adherent jugular hemodialysis catheter (ID 164)

Joana Andrade Lopes[1], *Hugo Diniz*[1], *Miguel Relvas*[1], *Hugo Ferreira*[2], *Luís Coentrão*[1,3]
[1]Nephrology Department, ULS São João, Porto, Portugal; [2]Cardiothoracic Surgery Department, ULS São João, Porto, Portugal; [3]Departamento de Medicina, Faculdade Medicina da Universidade de Porto, Porto, Portugal

Abstract

Introduction:

Vascular access is essential for hemodialysis (HD) in end-stage kidney disease. Central venous catheters (CVC) serve as a lifeline for patients without autologous options, but dysfunction often mandates replacement. In rare cases, severe adhesions prevent catheter removal, posing risks such as cardiac tamponade, hemothorax, and hemorrhagic shock. We present a case of a tunneled CVC that demanded surgical removal due to firm adherence.

Case Report:

A 57-year-old woman on chronic HD since 2021 with a history of two failed arteriovenous fistulas, relied on a CVC in the right internal jugular vein. In February 2023, suboptimal dialysis efficacy was temporarily improved with fibrinolytic therapy. By October 2024, persistent CVC dysfunction despite multiple fibrinolytic interventions led to an attempted catheter replacement under local anesthesia but was unsuccessful due to firm adherence within the vein and surrounding tissues. A multidisciplinary team, including interventional nephrologists and cardiothoracic surgeons, performed surgical removal under general anesthesia. Transthoracic echocardiography (TTE) confirmed the catheter tip was not attached to the tricuspid valve so a supraclavicular surgical incision with meticulous tissue debridement was conducted. After debridement, a double polypropylene purse-string suture was made for safety in case of uncontrolled bleeding. The adherent catheter was successfully removed, and a new tunneled CVC was placed via wire exchange. Tip position was confirmed with TTE. At three months postoperatively, the new catheter remains patent, ensuring effective HD.

Conclusion:

This case highlights the challenges of managing CVC dysfunction in long-term HD patients and the potential dangers of forced traction in cases of rigid adhesions. Multidisciplinary planning is crucial to prevent life-threatening complications. Sharing such cases is essential to improve understanding and guide the management of complex CVC issues.

P-092 Vascular access closure: Are we closing them for right indications ? – snapshot review of practice at a tertiary vascular access centre. (ID 165)

Harry Beresford, Venugopal Shankar
Leeds Vascular Institute, Leeds, United Kingdom

Abstract

Background:
Indications for ligation or closure of vascular access (av fistula/ graft) include Ischaemic Monomelic Neuropathy (IMN) and severe cases of vascular access induced limb ischaemia (VAI). In post renal transplant (RTx), closure is carried out with pre-existing HF, refractory CHF after transplantation, high flow VAs, other VA complications like bleeding, increasing aneurysmal change, functional impairment of the limb and for cosmetic reasons.

Materials and Methods:
We analysed data of patients who underwent closure of vascular access at Leeds Vascular Institute from February 2019 to January 2025. Analysis done using standard statistical methods including Chi-square test looking in to ligations carried out overall, in those on haemodialysis (on HD) and in those who have received renal transplants (RTX / eGFR 52+/- 20.6).

Results:
Total ligations 72 patients (20, 85); 56+/-14.4 yrs; Men 45 patients 56+/-14.8 ;Women: 27 (56+/-14.7); Time to ligation of access :1 day to 20 years : 6 years +/- 4.97months(Mean) . Ligated fistula configurations: Brachio-cephalic 43;Radio cephalic 22;brachio-basilic 6; AV graft (brachio-axillary)1. Indications for ligation: Overall: IMN (2,on HD +0 Post RTx); Severe VAI (5/7); Aneurysmal(8/1/7); Functional impairment of limb 26(6/20); Non specific complications10(9/1): Cosmetic(0/10) and Others 4(1/3). Amongst 48 Transplant patients closure only 15 had ECHO in the prior 2 yrs and only 1 patient had evidence of HF.

Conclusion:
This study is reassuring that closure of vascular access is being done for appropriate indications. There is currently no clinical evidence favouring routine closure of a functioning fistula following successful transplant. However, we found, in transplant patients closure is being carried out significantly more for functional impairment and more exclusively for cosmetic reasons. A larger randomised control study of access closure in transplant patients is needed for effective change in current practice.

P-093 Bottonhole cannulation in hemodialysis – an option not to be overlooked (ID 177)

Andreia Henriques[1], Ricardo Duarte[1], João Venda[1], Emanuel Ferreira[1], Ana Belmira[1], Jesus Garrido[2]
[1]Pombaldial - Dialysis Clinic, Leiria, Portugal; [2]Diaverum, Portugal, Portugal

Abstract

Introduction:
The primary goal of hemodialysis (HD) vascular access (VA) cannulation is to maximize fistula lifespan while minimizing complications such as infection, stenosis, and aneurysm. While rope ladder cannulation is preferred, buttonhole (BH) cannulation may offer advantages for selected patients, despite remaing concerns about potential risks.

Methods:
A retrospective analysis was conducted on patients undergoing BH cannulation at a dialysis clinic in 2024. Following comprehensive assessments, patients were proposed for BH cannulation, and a rigorous protocol was led by a specialized nursing team. This study aimed to assess the clinical benefits and complications of BH cannulation.

Results:
Of 112 HD patients, 11 were cannulated using BH (mean age of 68.7 ± 14.8 years, 81.8% female). The median HD duration was 47 [16–120] months, with BH cannulation maintained for 24 [10-95] months. 63.6% had diabetes. Fistula types included radiocephalic (27.3%), brachiocephalic (18.2%), and brachiobasilic (54.5%). Indications for BH included short cannulation tract (36.4%), tortuous vein (37.3%), deep vein (27.3%), and self-image preservation (9.1%). The median last measured Qa was 670 [580 – 1050] mL/min. No aneurysms developed. While on the BH cannulation, 5 patients (45.5%) required endovascular intervention due to stenosis, only 1 due to puncture site stenosis. There were no cases of thrombosis, and only 1 VA (9.1%) had an uncomplicated infection. Notably, 3 patients used BH cannulation for over 7 years with minimal complications.

Conclusion:
BH cannulation demonstrated several benefits, including minimal aneurysm formation, low thrombosis and infection rates, and a rare need for endovascular interventions. These findings suggest that while BH may not be suitable for widespred adoption, it offers significant benefits when applied to appropriately selected patients under a strict protocol that ensures high standards of care.

P-095 Not always a happy ending: complications following HD catheter placement after fistula thrombosis (ID 185)

David Conejo Gómez, Raquel Barba Teba, Elena Herrera Martín, Ana Lengua Rueda, Esther Rodríguez Suarez, Patricia De Sequera Ortiz
Hospital Universitario Infanta Leonor, Madrid, Spain

Abstract

We present the case of a 75-year-old man in chronic hemodialysis, with a clinical history of hypertension, diabetes and a coronary bypass in 2020, with a humero-basilic fistula that got thrombosed. After surgical evaluation, the fistula was not salvable and had to undergo right femoral catheter insertion, developing in a short time a deep vein thrombosis secondary to its placement, following enoxaparin treatment ever since. Claudication was never assessed due to bed-ridden situation onwards.

He arrived at his dialysis session a month later with acute discomfort in the right leg for a couple of days, not reaching maximum blood flux, as well as not achieving correct clearance parameters. An ultrasound of the leg was performed on the spot, showing a pseudoaneurysm on the superficial femoral artery, with possible involvement of the popliteal artery of the same side, and then he was sent to the referring hospital for surgical evaluation.

On his arrival, the patient's right popliteal pulse was non-palpable, neither were distal pulses. An angiogram was then done and revealed complete occlusion of the right superficial femoral artery with no evidence of distal repermeabilization, as well as a large hematoma with active venous bleeding in the medial compartment of the right thigh.

Hematoma drainage was done and femoral artery performed, but this didn't provide a significant solution. The patient reported an increasingly intense pain. With no other options, it was decided to proceed with the amputation of the right leg.

After recovering from the surgery, he returned to our unit and expressed feeling devastated. With the support of the team, we managed to help him gradually accept his situation and feel supported. At present, he continues his dialysis sessions using a permanent catheter in the jugular vein. We hope that this case highlights the importance of complications that can arise in vascular access, such as fistula thrombosis, and that not all cases have a happy ending.

Cardiovascular effects of hemodialysis access

P-096 Vascular access and life outcome in patients with low cardiac function (ID 115)

Sadanori Shintaku, Hideki Kawanishi, Masataka Banshodani, Shinichiro Tsuchiya
Tsuchiya General Hospital, Hiroshima, Japan

Abstract

Background:
During the induction phase of hemodialysis, the choice of vascular access in patients with low cardiac function is an important issue. Arteriovenous anastomosis increases cardiac preload and may worsen life expectancy in patients with low cardiac function. In this study, we examined life expectancy and vascular access selection in patients with low cardiac function during the induction phase of hemodialysis.

Materials and Methods:
A retrospective observational study was conducted on patients who underwent echocardiography during the induction phase of hemodialysis. Patients with a left ventricular ejection fraction (EF) of 40% or less during the induction period were defined as low cardiac function cases, and these were further classified into two groups: a moderate cardiac hypofunction group with an EF of 30% or more (group 1) and a severe cardiac hypofunction group with an EF of <30% (group 2). The Kaplan-Meier method was used for the survival curves, and the log rank test was performed, with $P < 0.05$ being considered significant.

Results:
The number of patients with low cardiac function was 72, with a mean age of 73 years, 64% male, and 65% with diabetes mellitus. The 3-year survival rates were 67% for group 1 and 40% for group 2, with no significant difference in survival between the two groups (P=0.20). In the 60 patients with low cardiac function who chose arteriovenous fistula (AVF) for vascular access, there was no significant difference in survival between the two groups (P=0.78).

Conclusion:
There was no significant difference in prognosis between patients with moderate cardiac hypofunction and those with severe cardiac hypofunction, and the same was true in the analysis of AVF patients only. The results suggest that AVF may be an acceptable option in patients with low cardiac function from a prognostic point of view.

P-097 Severe left ventricular dysfunction after flow reduction therapy for high-flow fistula in a hemodialysis patient and recovery trajectory of 4years (ID 27)

Narae Joo, Hyundong Lee
Hanmaeum Hospital, Jeju, Republic of Korea

Abstract

A 65-year-old male hemodialysis (HD) patient visited a vascular access center due to a high-flow fistula. The flow volume (FV) of arteriovenous fistula (AVF) was 4,450 ml/min, and it was reduced to 1,114 ml/min via flow reduction surgery. After 12 hours of the operation, new onset dyspnea of the New York Heart Association class IV occurred. The ejection fraction (EF) was 24% in transthoracic echocardiography (TTE), which was markedly decreased compared to EF (≥ 50%) of the TTE examined before the surgical revision. The symptoms and radiologic findings were improved by increasing ultrafiltration during HD and reducing afterload with angiotensin receptor antagonist.

The EF gradually restored to 32% in followed TTE at 2months and more improved by 44% at 1year. As a result of follow-up observation of cardiac function with TTE performed annually for the next 4 years, EF was measured at 42% at 2 years, 45% at 3 years, and 45% at 4 years, respectively. EF did not change significantly after 1year, otherwise factors such as LV mass index and Factional shortening showed improvement until 2 years(LV mass index and Fractional shortening were 240.2g/m2, 9.6% at 1week, 250.5g.m2, 14.2% at 2months, 165.1g.m2, 19.8% at 1year, 137.5g/m2, 28% at 2years, 141.89g/m2, 25.75% at 3years and 143.32g/m2, 25.6% at 4years respectively).

These observations suggest that myocardial remodeling due to changes in AVF blood flow could be continued up to 2 years after the correction. At present, the patient is maintaining HD via the AVF of reduced FV without any signs or symptoms. Flow reduction therapy is known to improve cardiac mortality. However, there has been a concern that transient heart failure may occur immediately after the flow reduction therapy especially in a case with a large amount of flow reduction volume. It presumed to stems from abrupt decrease in the LV preload and increment in the afterload, which can promptly lead to LV systolic dysfunction with significant EF reduction.

P-098 Blood pressure measurement in kidney transplant recipients after arteriovenous fistula ligation or thrombosis (ID 52)

Yara Fares[1,2], Tristan De Nattes[1], Margaux Van Wynsberghe[1], Steven Grange[1], Dominique Bertrand[1], Dominique Guerrot[1]
[1]Rouen University Hospital, Rouen, France. [2]Clinique Saint Hilaire, Rouen, France

Abstract

Objective:
Blood pressure (BP) measurement is a major issue in kidney transplant recipients (KTr). After transplantation, ligation or thrombosis of an arteriovenous fistula (AVF) is frequent, but its long-term impact on local hemodynamics remains unclear. In the absence of guidelines, BP is generally measured in the non-AVF forearm. This study aimed to evaluate the reliability of BP measurement and its relationship with local hemodynamic changes in this population.

Methods:
We prospectively included 52 KTr with a history of unilateral AVF, at least one year after ligation (n=41) or thrombosis (n=11). Standardized BP measurements were performed twice simultaneously in both arms using StrideBP-validated devices. Peak systolic velocity (PSV) and humeral artery anatomy were assessed using ultrasound in both arms in a subset of 37 KTr. Statistical comparisons were conducted using paired t-tests.

Results:
Overall, no significant differences were observed between the AVF and contralateral arms in systolic BP (136.7±17.9 vs. 136.8±18.5 mmHg), diastolic BP (81.3±13.0 vs. 83.4±13.4 mmHg), or PSV (71.0±25.3 vs. 77.0±17.3 cm/s). Rare cases of BP discrepancies were associated with arterial stenosis or anatomical variations.

Conclusions:
Blood pressure can be reliably measured in either arm after AVF ligation or thrombosis in kidney transplant recipients. Incorporating this practice into routine care may simplify BP monitoring, with ultrasound evaluation reserved for cases with significant inter-arm discrepancies.

P-099 The impact of dialysis arteriovenous fistula blood flow reduction on the heart in one-year follow-up (ID 94)

Anna Valerianova, Kristina Buryskova Salajova, Eva Chytilova, Jan Malik
General University Hospital in Prague, Prague, Czech Republic

Abstract

Background:
Part of chronic haemodialysis patients develop a high-flow arteriovenous fistula (AVF). The volume overload caused by the high-flow AVF negatively impacts the heart and leads to dilation of all heart chambers, increase of pulmonary artery pressure or even development of high-output heart failure. Our first data showed a positive effect of AVF flow-reducing surgery in 6 weeks follow-up. The purpose of this study was to analyse the effect of procedure after one year.

Material and methods:
We included patients with high-flow AVFs (defined as blood flow over 1500 mL/min) indicated for blood flow reduction surgery for heart failure symptoms or pre-defined echocardiographic changes (left ventricle dilation or hypertrophy, pulmonary hypertension, right ventricle dysfunction or dilation, severe secondary valvular regurgitation). Echocardiography and ultrasound Qa measurement were performed one day before the surgery, 6 weeks, 6 months and 12 months after the procedure.

Results:
27 patients were included, aged 57 ± 13 years. The AVF blood flow after 12 months remained lower than in baseline, however, we observed failure of procedure after 1 year in 8 (=30%) patients defined by increase of blood flow back to pre-surgery values. Estimated pulmonary artery pressure and left atrial volume remained significantly lower after 1 year. Although the left and right ventricular dimensions and left ventricular stayed lower than in baseline, the result did not reach statistical significance. Effective cardiac output as a surrogate of organ perfusion (calculated as cardiac output – AVF blood flow) rose immediately after the surgery and remained increased during the follow-up period.

Conclusions:
We observed a long-time positive effect of AVF blood flow reduction surgery on decreasing pulmonary artery pressures and left atrial volume. The effective cardiac output remains increased despite the gradual increase of Qa, possibly by adaptation of systemic vasculature.

Surgical techniques for vascular access creation

P-100 Usefulness of brachial artery superficialization in vascular access (ID 17)

Norio Mori
Sanyo Hospital, Fukuyama, Japan

Abstract

Background
Vascular access includes AVF, AVG, and TCC, but in Japan, there is another procedure called brachial artery superficialization. This procedure is mainly used for patients with low cardiac function.
Our hospital focuses on brachial artery superficialization (hereinafter referred to as superficialization), and we investigated its usefulness.
Materials and Methods
We investigated patients with superficialization who visited our hospital as of April 2023. We examined the indications for superficialization, the period during which therapeutic intervention could be avoided, and complications.

Results
The subjects were 53 patients, age 77.6 years, EF: 53.8%.
Indications were low cardiac function: 11/53 cases, reconstruction from AVF: 23/53 cases, and attending physician's judgment: 11/53 cases.
The period during which therapeutic intervention could be avoided was 59.8 months from the creation of the superficialization to December 2024.
Complications were aneurysm: 5/53 cases, occlusion: 1/53 cases, and difficulty in returning blood: 2/53 cases.

Discussion
Although superficialization is generally indicated for low cardiac function, many cases of reconstruction from AVF were included. There are two advantages to changing from AVF to superficialization. The original AVF makes it easier to secure a return vein, and the brachial artery is dilated. The fact that superficialization avoids treatment intervention for about 5 years is considered favorable compared to AVG.
This is thought to be due to the fact that we accurately puncture the superficialized artery using ultrasound at our hospital.

However, once problems such as aneurysm, occlusion, or difficulty in returning blood occur, it becomes difficult to continue using it.

Conclusion
As a vascular access, the brachial artery superficialization at our hospital maintains patency that is comparable to other options, and it is thought to be a useful option depending on the case.

P-101 Four cases of graft bypass surgery performed on stent grafts placed for venous outflow stenosis of arteriovenous grafts. (ID 58)

Shina Sueki[1], Kazuhiro Sato[1], Hiroshi Nihei[2], Konosuke Hirano[1], Masahito Miyamoto[1], Naru Sasagawa[1]
[1]Yokohama Daiichi Hospital, Yokohama, Japan; [2]Saiseikai Kanagawaken Hospital, Yokohama, Japan

Abstract

Background:

In Japan, stent grafts(SGs) were launched in 2020 as a treatment for arteriovenous graft (AVG) outflow vein stenosis. Since the introduction of SGs, AVGs have been able to be maintained for longer, but problems due to graft deterioration have become more apparent than before. Therefore, we report cases in which we performed vascular access reconstruction using a SG as the outflow.

Case 1; Female in her 60s. She has been on dialysis for 10 years and has used an AVG for 4 years. It has been 3 years since the SG was placed. She has a history of taking oral steroids for rheumatoid arthritis. She had multiple graft pseudoaneurysms, which made it impossible to puncture. A bypass was performed from the proximal radial artery to the SG.

Case 2; Male in his 70s. He had been on dialysis for 12 years and had been using AVG for 1 year. He had a SG placed 1 year ago. He had frequent graft occlusions after AVG placement at another hospital. We determined that the graft material was the cause and performed bypass surgery from the brachial artery to a SG.

Case 3; Male in his 70s. He had been on dialysis for 4 years, had been using AVG for 2 years and 4 months, and had had a SG placed for 1 year and 2 months. The puncture site on the blood return side became locally infected. We determined that the infection had not reached the puncture site on the blood removal side, so we performed partial removal of the infected graft and then bypass surgery to the SG.

Case 4; Female in her 70s. She had been undergoing dialysis for 9 years and had been using AVG for 7 years. She had frequent graft occlusions about 2 years and 7 months after SG insertion. We diagnosed the obstruction as being due to graft deterioration and reconstructed the AVG by anastomosing the graft to a SG.

Conclusions:

The anastomosis between the graft and the SG is relatively easy, and no problems have occurred to date. This method allows the vascular access to be preserved.

P-102 Femoral Vein Transposition Arteriovenous Fistulas Ensure Effective Hemodialysis Access in Patients with Exhausted Upper Extremity Options (ID 60)

Márcio Filippo
UFRJ, Rio de Janeiro, Brazil

Abstract

Backgroud:
Vascular access is a critical component of hemodialysis, and creating reliable arteriovenous fistulas (AVFs) remains a priority for patients with end-stage renal disease. When an upper limb AVF is no longer feasible, the dialysis team may consider femoral vein (FV) transposition arteriovenous fistulas (FV tAVFs). The objective of this study is evaluate the safety, efficacy, and long-term outcomes of FV tAVFs.

Materials and Methods:
This retrospective study included 32 adult patients undergoing FV tAVF creation between 2013 and 2023 at three centers in Brazil. Patients included in the study had exhaustion or unavailability of upper arm veins or bilateral upper central venous occlusion and adequate lower extremity circulation. Primary and secondary patency rates were evaluated at 6, 12, 24, and 60 months. Complications, including wound issues, thrombosis, and steal syndrome, were also analyzed. Exploratory analyses included the impact of demographic and clinical variables on primary and secondary patency rates.

Results:
Technical success was achieved in 90.62% of cases. Primary patency rates were 90.63% at 6 months, 84.38% at 12 months, 60% at 24 months, and 18.18% at 60 months. Secondary patency rates were 90.63% at 6 and 12 months, 79.31% at 24 months, and 36.84% at 60 months. Wound complications occurred in 46.88% of patients, with most managed conservatively. Steal syndrome and venous thrombosis were observed in 18.15% and 12.5% of patients, respectively. Female sex and wound complications impacted secondary patency, while a shorter duration of hemodialysis (<27 months) correlated with higher primary and secondary patency loss. Age, previous femoral catheter on the same side of FV tAVF, and average time to first cannulation did not influence primary or secondary patency rates.

Conclusions:
FV tAVF is a feasible and durable vascular access option for complex hemodialysis cases, providing robust patency rates and manageable complication profiles.

P-103 Optimizing femoral vein transposition for lower limb hemodialysis access: what we learned over 24 years. (ID 67)

Marcelo Paiva[1,2], Pierre Bourquelot[3], Júlia Ramos[4], Lucas Ferreira[5], Luiza Maximo[6], Hermógenes Petean (in memoriam)[7]
[1]Hospital Rede Casa, Rio de Janeiro, Brazil; [2]Hospital Federal Servidores do Estado, Rio de Janeiro, Brazil; [3]Clinique Jouvenet, Paris, France; [4]IDOMED, Rio de Janeiro, Brazil; [5]Universidade Federal da Bahia, Vitoria da Conquista, Brazil; [6]Hospital Universitario Clementino Fraga Filho., Rio de Janeiro, Brazil; [7]Hospital Federal de Bonsucesso, Rio de Janeiro, Brazil

Abstract

Background:

Compared to thigh PTFE, the femoral vein tunnel-superficialization offers superior patency rates and reduced infection risk, but previous studies have documented a significant incidence of complications.

Methods and Results:

From January 2001 to December 2024, 137 femoral vein superficializations were created. The analysis includes
1) Indications: upper extremity veins thrombosis,
2) Exclusion criteria: peripheral artery occlusive disease, diabetes, heart disease,
3) Surgical technique: careful dissection, gentle manipulation of the skin, tension-free anastomosis,
4) Patency: a total of 128 patients reached the end of the first year with a functioning fistula, while 46 patients maintained function at the end of nine years; secondary patency rates were not included due to the loss of follow-up for some patients and the unavailability of endovascular techniques to treat stenoses for financial reasons in most cases,
5) Complications: a) skin incision self-limitating necrosis was observed in 28 patients,
b) postoperative infection progressed in two pts, one to septicemia and death, the other to access deactivation,
c) infection was observed at eight puncture-site aneurysms,
d) distal ischemia was historically a major concern, but improved patient selection and refinements in intraoperative techniques have reduced their incidence. Nevertheless, it was observed in five patients and two of them required major amputation after 8 months and two years respectively,
e) lower limb edema occurred in 42, associated to iliac vein stenosis/occlusion in 21.

Conclusion:

Femoral vein transposition is an efficient lower limb hemodialysis access. Optimizing outcomes requires a comprehensive approach that includes well-defined indications, strict exclusion criteria, meticulous surgical technique, and proactive management of complications.

P-104 Creation of arteriovenous fistula with PTFE graft after femoral vein superficialization thrombosis . (ID 68)

Marcelo Paiva[1,2], *Júlia Ramos*[3], *Lucas Ferreira*[4], *Luciano Martins Duarte*[5]
[1]Hospital Rede Casa, Rio de Janeiro, Brazil; [2]Hospital Federal Servidores do Estado, Rio de Janeiro, Brazil;
[3]IDOMED, Rio de Janeiro, Brazil; [4]Universidade Federal da Bahia, Vitoria da Conquista, Brazil;
[5]CDR7Fresenius-Nova Iguaçu, Nova Iguaçu, Brazil

Abstract

Introduction

After thrombosis of an arteriovenous fistula (AVF) with the superficial femoral vein, a new access can be created with a PTFE graft in a thigh loop configuration. This report presents three cases and their outcomes.

Case I
A 49-year-old woman, on hemodialysis (HD) since 2008, switched to peritoneal dialysis in 2010, returning to HD in 2014 due to refractory peritonitis. After multiple upper limb accesses and central vein thrombosis, she had femoral vein loop creation in 2019, functioning until December 2023. After thrombosis, she was on HD for 4 months with a permcath until receiving a PTFE graft AVF in a thigh loop. The access worked for 4 months, but at month 5, edema developed, and phlebography revealed inferior vena cava thrombosis. She remains on HD with anticoagulation.

Case II
A 50-year-old man with chronic hypotension and colostomy had multiple failed upper limb accesses, leading to central venous thrombosis. In 2012, an AVF was created by superficialization of the femoral vein in his left lower limb. After thrombosis, a PTFE graft AVF in a thigh loop was created. In 2024, thrombosis occurred and was treated with balloon angioplasty. The access is functioning well.

Case III
A 46-year-old woman with multiple upper limb AVF thromboses required prolonged catheter use. She had a PTFE graft AVF in a thigh loop after a femoral vein superficialization. Thrombosis occurred after 2 years, treated with thrombectomy. The access lasted another 2 years before thrombosis recurred, and she was transferred to peritoneal dialysis.

Conclusion

The PTFE graft in a thigh loop configuration after thrombosis of a superficialized femoral vein loop shows viability, low infection rates, and superior patency compared to primary PTFE fistulas. Further studies are needed to confirm these results.

P-105 'HeRO Graft, innovative device for vascular access in haemodialysis patients: analysis of 52 implants in a specialised centre' (ID 72)

Fabrizio LoIacono[1], Guido Saracino[1], Francesca Perinelli[2]
[1]Clinica Malzoni, Avellino, Italy; [2]Altro, Roma, Italy

Abstract

In the management of fully implantable arterio-venous (AV) accesses for hemodialysis patients, the HeRO Graft has established itself as a reliable and well-proven solution. Used for several years and now included in the American guidelines, this device represents a significant advancement in the management of complex vascular accesses. It consists of a prosthetic component made of ePTFE and a flow component (HEROVOC) made of silicone reinforced with Nitinol. The configuration enables direct connection to the central venous system via the right atrium, bypassing central venous stenoses that are not amenable to angioplasty, thereby creating a prosthetic vascular access in cases otherwise destined for a tunneled CVC.
The main indications include unpassable central stenoses/thromboses, salvage of complex proximal accesses, such as brachiocephalic AV fistulas with anatomical complications, and the management of patients with severe obesity or significant peripheral venous hypoplasia.

This study examines 52 HeRO System implants performed from 2016 to the present, with 6 devices remaining in use for over 4 years. Among these, one case involved the implantation of a Super HeRO using a standard prosthesis. Primary and secondary patency, survival, and clinical efficacy of the system were analyzed using statistical methods, including Kaplan–Meier plots to evaluate mortality in treated patients.

Finally, the possibility of replacing the HeRO Graft with a permanent tunneled CVC in case of failure is described, ensuring a stable reconversion of the vascular access.

P-106 Have we defined the gold standard in surgical AVF creation? (ID 93)

Ben Edgar[1,2], Karen Stevenson[2], Emma Aitken[2], Andrew Jackson[2], Shannon Thomas[3], Snoeijs Maarten[4], Marco Franchin[5], Matteo Tozzi[5], David Kingsmore[1,2]
[1]University of Glasgow, Glasgow, United Kingdom; [2]Queen Elizabeth University Hospital, Glasgow, United Kingdom; [3]Prince of Wales Hospital, Sydney, Australia; [4]Maastricht University Medical Centre, Maastricht, Netherlands. [5]University of Insubria, Varese, Italy

Abstract

Background:
Although it is accepted that a functional arteriovenous fistula (AVF) is the optimal vascular access for dialysis, the outcomes of AVF creation are sub-optimal. Innovation focuses on novel approaches to optimise outcomes and alternatives such as percutaneous AVF creation. However, to accurately compare the outcomes of novel techniques we must define the gold standard of surgical AVF creation.
Many technical steps have been advocated to improve outcomes, but the evidence to support these is unclear. Thus, a systematic review of all randomised controlled trials (RCT) of surgical modifications to optimise AVF outcomes was performed.

Materials and Methods:
MEDLINE, Embase and Cochrane databases were systematically searched to identify RCTs of a surgical intervention or modification in AVF creation. Relevant outcomes were any description of fistula patency or maturation at any time point. Quality assurance was assessed in the description of selection criteria, procedural details and adjuvant therapies.

Results:
Of 4945 records meeting the search criteria, 21 RCT were included. Interventions related to anastomotic techniques (suturing method, orientation, angle), arteriotomy techniques, mechanical vessel dilatation and management of venous branches.
All studies involving a surgical intervention in RCF reported a significant benefit. 80% of studies in BCF or larger vessels reported no benefit. Most RCT omitted critical aspects of technical description, with a mean of 4 key details not reported.

Conclusion:
There is evidence that several technical steps may be important in improving AVF outcomes in smaller vessels; namely vessel dilatation, excision arteriotomy and interrupted sutures. However, the adequacy of reporting technical details was poor and gaps in the literature remain. It would be important for future studies of novel techniques to incorporate a standardised operating procedure of optimal current practice as a meaningful comparator.

P-107 Interposition ePTFE grafts in treating aneurysmal arteriovenous fistulae-a failed experiment? (ID 181)

Nivedita Mitta, Raghvinder Pal Singh Gambhir, Fatima De Figueredo, Domenico Valenti
Kings College Hospital NHS Trust, London, London, United Kingdom

Abstract

Background

Aneurysmal dilation is one of the chronic complications of Arteriovenous fistula (AVF) which apart from being uncomfortable and unsightly, could also lead to access abandonment. Aneurysmorrhaphy is the standard treatment, but interposition ePTFE grafts also have been used for their management.(1)

Materials and Methods

An observational study was conducted on aneurysmal AVFs repaired using an interposition ePTFE graft between January 2017 and December 2023 at our centre. Primary success rate was defined as a functional AV access at discharge. Secondary outcomes assessed were new complications, need for salvage procedures and abandonment of access.

Results

We studied 28 patients who underwent aneurysmal AVF repair with an interposed ePTFE graft. The median age was 62 years (IQR 51-73) and the male to female ratio was 1:1. 42% were of Africo-Caribbean ethnicity. The median duration of aneurysmal change prior to intervention was 12 months (IQR 9.5-48). The initial technical success was 100%.
12 (43%) accesses thrombosed at a median of 14 months (IQR 3 - 24.5). There were 3 (11%) graft infections needing explantation and 2 infections were managed with long term antibiotics. 7 accesses needed salvage interventions – 5 angioplasties and 2 haematoma evacuations. At a median follow up of 31 months (IQR 24 – 53), 11 (39%) of the grafts remained patent and in use. Our primary patency, primary assisted patency and secondary patency at 1 year were 40%, 27% and 54% respectively.

Conclusion

Though aneurysmorrhaphy remains the standard of care, interposition grafts also have a place in the management inspite of increased need for secondary interventions and the risk of graft infection.

Reference

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Endovascular interventions for vascular access

P-108 Transjugular EKOS followed by CATD vacuum-assisted thromboaspiration: a new therapeutic perspective for treatment of acute thrombotic superior vena cava syndrome. (ID 162)

Manuel Di Napoli, Carlotta Cremaschi, Riccardo Corti, Antonio Mauro D'Agostino, Nicola Cionfoli, Paola Falvo, Ludovico Ambrosi, Pietro Quaretti
IRCCS Policlinico "San Matteo", Pavia, Italy

Abstract

Background:

Intravascular devices, regardless of size, can cause stenosis and thrombosis in central veins, with contributing factors including diameter, length, rigidity and indwelling duration. This case describes acute thrombotic superior vena cava syndrome caused by a ventriculo-atrial shunt inserted decades before.

Case Presentation:

A 67-year-old woman, who recently had had ventriculo-atrial shunt replacement with a ventriculo-peritoneal shunt, presented in emergency room with superior vena cava syndrome. CT angiography revealed massive thrombosis in the brachiocephalic veins, azygos vein and superior vena cava, with critical stenosis at the cavo-atrial junction, where a fragment of the old shunt catheter was found. The patient underwent endovascular intervention following a permissive bubble-enhanced echocardiogram that ruled out a patent foramen ovale. Left jugular access was achieved under ultrasound guidance. Fibrinolysis started using the EKOS system with a low-dose infusion of rTPA (1.2 mg/h). After 24 hours, angiographic control showed complete recanalization of the brachiocephalic veins and superior vena cava, with a residual floating thrombus at the site of stenosis. Before stenting, to mitigate the risk of pulmonary embolism, preemptive thromboaspiration was performed using the Indigo CATD catheter. The procedure was concluded with the deployment of a PTFE stent-graft (GORE EXCLUDER) and its post-dilatation to 12 mm. Final angiographic control showed restored brisk venous return to the right atrium. The patient was discharged on aspirin without complications. A follow-up contrast enhanced CT at 1-year confirmed the patency of the subclavian-brachiocephalic axes and the caval stent.

Conclusions:

Long-term presence of even small-caliber intravascular devices can lead to thrombosis and acute complications. New pharmacological and mechanical thrombectomy techniques offer tailored solutions for treating extensive thrombosis in symptomatic patients.

P-109 Retrieval of a migrated stent graft from the central vein (ID 22)

Kazuyoshi Kataoka[1,2], *Takuro Yano*[2], *Tomonaga Noguchi*[2]
[1]Okurayama Jin Clinic, Yokohama, Japan; [2]Kichijoji Asahi Hospital, Musashino City Tokyo, Japan

Abstract

Introduction

We performed VIABAHN® insertion in 86 cases from July 1, 2020 to May 31, 2024. Among these, we experienced one case of stent graft migration(M-SG). We were able to retrieve the SG without serious complications.

Clinical Course

A 73 year old women with chronic kidney disease stage 5（CKD5）due to IgA nephropathy had undergone AVG transplantation at another hospital and then underwent repeated percutaneous transluminal angioplasties (PTAs). In May 2024, she first visited our hospital due to occlusion. We performed thrombectomy and PTA and achieved successful recanalization. Two months later, restenosis was identified, so we performed PTA and VIABAHN insertion under ultrasound guidance at the stenotic lesion. Postoperatively, M-SG was confirmed by X-ray. The SG had migrated and stopped at the right brachiocephalic vein (BCV) to the superior vena cava (SVC).

Retrieval Procedure

First, we inserted a 6Fr sheath into the AVG and passed the guide wire through the SG and advanced the tip to the right femoral vein. Next, we led the 8mm 4cm ballon catheter and positioned its center at the distal end of the SG. The ballon was then inflated properly and the SG was drawn into the axillary vein. Under local anesthesia, the vein was incised at the proximal end of the SG and the M-SG was secured and retrieved.

Observations

In this case, vessel rupture occurred, so the ultrasonographic field of view was poor, but we did not use X ray equipment at the same time. As a result, we speculate that the SG had not overlapped with the site of venous anastomosis of the AVG and migrated to an inappropriate site. We subsequently changed the treatment plan to use both ultrasonography apparatus and X-ray imaging in real time to deal with this kind of situation. Our search of the medical literatures for S-MG, two cases of percutaneous retrieval of S-MG were reported . Since few cases have been reported, the appropriate retrieval procedures need to be considered for each case.

P-110 Management of early restenosis in native AVF using interwoven nitinol stent: a case report (ID 26)

Uberto Percudani[1,2], Stella Bedogni[1,2], Laura Pavone[1], Andrea Andreone[3], Antonio De Cinque[3], Enrico Fiaccadori[1,2], Vincenzo Oliva[1]
[1]UOC Nefrologia, Azienda Ospedaliera-Universitaria Parma, Parma, Italy; [2]Dipartimento di Medicina e Chirurgia, Università Degli Studi di Parma, Parma, Italy; [3]UOC di Radiologia Diagnostica e Interventistica, Azienda Ospedaliero-Universitaria di Parma, Parma, Italy

Abstract

Early restenosis in native arteriovenous fistula (nAVF) represents a significant risk to vascular access survival. Interwoven nitinol stents have emerged as an innovative approach with promising outcomes in terms of long-term patency and reduced re-intervention rates, also due to the possibility of cannulation.
We report the case of a 48-year-old man who started urgent hemodialysis (HD) via a right internal jugular vein catheter. A right distal radiocephalic nAVF was subsequently created, complicated by acute thrombosis within a few hours of surgical procedure. This required surgical revision of the anastomotic site and Fogarty thrombectomy. At 3 weeks post-nAVF creation, Doppler Ultrasound (DUS) revealed a hemodynamically significant post-anastomotic stenosis with reduced brachial artery flow. Angiography confirmed moderate-to-severe efferent venous stenosis, successfully treated by three sequential angioplasties (semi-compliant, non-compliant, and drug-coated balloon), allowing HD catheter removal.

Three weeks later, a DUS evaluation, required by difficulties in nAVF cannulation, revealed early restenosis, confirmed by angiography (Figure 1). After multidisciplinary discussion, angioplasty (PTA) was performed with a non-compliant balloon (Figure 2), followed by the placement of an interwoven nitinol stent (Supera™) across the stenotic site, achieving excellent angiographic results (Figure 3). Prophylactic anticoagulation with low molecular weight heparin was administered for one month, followed by lifelong antiplatelet therapy with aspirin.

At the 40-day follow-up, the patient was undergoing regular thrice-weekly HD sessions with two-needle cannulation, using the stented segment of the AVF as one of the access sites, without complications.
This case highlights the effectiveness of interwoven nitinol stents as an optimal strategy for managing early restenosis when PTA fails and the placement of covered stent would prevent AVF use, because of impaired cannulation.

P-111 Outcomes of stent graft use in AVFs: Two case reports of anastomotic site placement and institutional experience (ID 41)

Takuro Yano, Tomonaga Noguchi
Kichijoji Asahi Hospital, Musashino, Japan

Abstract

Background

Maintaining vascular access is critical for dialysis therapy. While percutaneous transluminal angioplasty (PTA) is widely used, complications such as vessel rupture and pseudoaneurysm can be challenging to manage, especially in autogenous arteriovenous fistulas (AVFs). Surgical interventions for these complications are invasive, significantly impacting patients' quality of life. Stent graft placement offers a minimally invasive alternative but is rarely applied to AVFs in Japan, with limited outcome data. This study reports two cases of stent graft placement for vessel rupture near the anastomotic site and evaluates institutional outcomes.

Case Reports

Two cases involved radiocephalic AVFs: a male in his 70s (Case 1) and a female in her 60s (Case 2). Both experienced vessel rupture near the anastomotic site during PTA for stenosis, resulting in uncontrolled hemorrhage. Stent graft placement using VIABAHN successfully achieved hemostasis without immediate complications. Case 1 maintained uninterrupted access for six months due to favorable anatomy. Case 2 experienced occlusion two weeks post-procedure, requiring a cuffed catheter for dialysis.

Results

Between July 2020 and October 2024, 98 stent graft procedures were performed at our institution, including 18 for AVFs. The mean patient age was 71.7 ± 10.7 years, with 12 males (66.6%). Indications included vessel rupture (7 cases), occlusion (6 cases), and frequent stenosis (5 cases). Primary patency rates were 83.3% at 1 month, 48.2% at 3 months, and 7.0% at 6 months, with a median patency of 88 days.

Conclusion

Stent graft placement offers a minimally invasive solution for PTA-associated complications in AVFs. While effective in one case, early occlusion occurred in another. Patient-specific anatomical considerations and careful evaluation of indications are critical. Institutional outcomes highlight the need for refined selection criteria and long-term evaluation to optimize stent graft use in AVFs.

P-113 4 cases of VAIVT to the brachial deep veins for maintenance of vascular access. (ID 56)

Maki Okamoto, Taisuke Shimizu, Takayuki Hamada, Kouki Ogawa, Akihiko Seo, Nozomi Abe, Tomonari Ogawa
Saitama Medical University, Kawagoe, Japan

Abstract
Upper arm veins are crucial for maintaining a functional arteriovenous (AV) fistula. The cephalic and basilic veins in the upper arm (elbow region) are important for cannulation sites, and the deep communicating branches and brachial veins play a significant role as outflow routes for the AV fistula.

When the anastomosis is located at the elbow or mid-forearm, it is necessary to ensure both the superficial vein cannulation site and the outflow route. To achieve this, we perform EVT, and if this does not resolve the issue, we may proceed to surgical treatments such as artificial graft insertion or autologous vein transposition.In cases of Cephalic Arch Stenosis (CAS) or stenosis of the upper arm cephalic vein, collateral circulation often develops. We have encountered cases where the brachial deep veins develop and function as an outflow vein.

We place significant importance on preserving the patient's own veins whenever possible. Therefore, to delay surgical intervention, we attempt vein dilation of the brachial deep veins in applicable cases. We report four cases in which we performed EVT on the brachial deep veins, along with a brief literature review.

P-114 "Comparison of balloon-expandable and self-expandable stentgrafts in vascular access stenosis management" (ID 70)

Andrea Gattuso[1], Marco Franchin[2], Maria Cristina Cervarolo[2], Tiziano Porretta[1], Maurizio Gallieni[1], Matteo Tozzi[2]
[1]ASST Fatebenefratelli-Sacco, Milano, Italy; [2]Vascular Surgery Unit, Asst-Settelaghi Universitary Teaching Hospital, Varese, Italy

Abstract

Background:
This study represents the first comparative analysis of balloon-expandable and selfexpandable stent grafts in treating severe outflow vein stenosis.

Materials and Methods:
This double-center, non-randomized, observational, retrospective cohort study analyzed consecutive patients undergoing treatment for severe outflow vein stenosis in hemodialysis vascular access using either the WRAPSODY™ Endovascular Stent Graft System or the Viabahn Balloon-Expandable VBX. Patients treated between July 2018 and December 2020 received balloon-expandable stent grafts, while those treated between January 2021 and December 2023 received self-expandable stent grafts. Follow-up included clinical examinations and Doppler ultrasounds at regular intervals post-procedure.

Results:
56 patients were included in the analysis, with 30 receiving balloon-expandable stent grafts and 26 receiving self-expandable stent grafts. Immediate technical success was 96.4%, with no intra-procedural complications. Long-term primary patency rates significantly favored self-expandable stent grafts (100% at 6 months vs. 53.3% for balloon-expandable, $p = 0.036$). Functional patency rates also showed superiority for self-expandable stents at 24 months (75% vs. 26% for balloon-expandable, $p = 0.013$). While both types demonstrated safety and efficacy, self-expandable stent grafts showed superior long-term patency outcomes. Balloon-expandable stent grafts exhibited issues with neointimal hyperplasia and deformation, highlighting challenges associated with this technology in venous applications.

Conclusion:
Our findings suggest that self-expandable stent grafts offer superior durability in managing severe outflow vein stenosis compared to balloon-expandable alternatives. Despite limitations including retrospective design and small sample size, this study contributes valuable insights into optimizing treatment strategies for hemodialysis vascular access.

P-115 Factors determining the outcome of arteriovenous fistula endovascular treatment (ID 71)

Deimantas Kybartas[1], Sondra Kybartienė-Mačiulaitė[2], Rytis Stasys Kaupas[3], Edita Žiginskienė[2]
[1]Lithuanian University of Health Sciences, Kaunas, Lithuania; [2]Lithuanian University of Health Sciences Nephrology department, Kaunas, Lithuania; [3]Lithuanian University of Health Sciences Radiology department, Kaunas, Lithuania

Abstract

Background

Arteriovenous fistulas (AVF) are the gold standard for vascular access in chronic hemodialysis. Their complications like stenosis and thrombosis require interventions. This study aimed to identify factors influencing the success of endovascular treatment.

Materials and Methods

We analyzed data from 103 patients at the Lithuanian University of Health Sciences Hospital who underwent endovascular treatment for AVF dysfunction over three years (2021-2023). Factors examined included age, gender, comorbidities, AVF characteristics, laboratory results. Statistical analysis was performed using SPSS v22.0.

Results

Demographic factors and laboratory results did not significantly influence treatment outcomes. 25.7% of patients with AVF thrombosis at the anastomosis site had procedure failure, versus (vs) 10.3% without (P=0.041). 28.1% of patients with prominent collateral veins experienced procedure failure, compared to 9.9% of patients without them (P=0.018). A low residual stenosis level indicates of 98.6% procedural success, while a high residual stenosis level shows 12.5% success (P=0.001). If both stenting and dilatation were done, 78.6% needed another intervention, vs 37.2% with dilatation alone (P=0.004). 61% of patients with prominent collateral veins needed another procedure, vs 38.5% without (P=0.028). For stenosis in the anastomotic region of above 80%, meant that 50.7% of patients required another intervention in the future(P=0.001). If it was the first intervention, 30.9% required further procedures, vs 69.1% after repeated interventions (P=0.013).

Conclusions

Thrombosis in the anastomotic region of AVF, prominent collateral veins and residual stenosis were associated with unsuccessful endovascular treatment. The need for additional procedures was related to the presence of prominent collateral veins, a history of previous endovascular treatments, high degree of stenosis in the anastomotic region and the type of endovascular procedure conducted.

P-116 Treatment of in-stent central venous stenosis due to innominate artery compression in arteriovenous fistula for hemodialysis. (ID 76)

Apollonia Verrengia, Pietro Dioni, Andrea Melloni, Luca Bertoglio, Stefano Bonardelli
Spedali Civili Brescia, Brescia, Italy

Abstract

In July 2020, a 62 years old man affected by terminl chronic renal disease, following ECD mapping, underwent the creation of a prosthetic left brachio-axillary vascular access with a ePTFE prosthesis 4-7 mm. Due to post-operative appearance of arm edema and thrombosis of the fistula, a CT study was performed with findings of a stenosis of the left brachiocephalic venous trunk.

We proceed with surgical revision for fistula rivascularization and angiography for recanalization and stenting of the venous stenosis (VBX Gore 22x39 mm). The fistula appears to be functioning correctly for the next 4 years. In June 2024 the patient return to our attention due to a recurrence of arm edema and malfunction of the access. A new CT was performed and demonstrated an intra-stent re-stenosis. A new venography was performed during which IVUS confirmed the stenosis of the previous stent. We proceed with a new stenting (Venovo stent 14x10). The angiographic result seems satisfactory with an apparent good re-expansion of the stent and correct central venous perfusion. We decide to carry out a further IVUS check that showed a residue of intra-stent stenosis due to dynamic extrinsic compression from the innominate artery. Trying to overcome the extrinsic force we released a balloon expandable stent (Bentley Plus 10x37 mm).

So IVUS evaluation confirms the correct re-expansion of the stent demonstrating that this procedure allowed the intra-stent lumen to be re-expanded from an area of 68.8 mm2 to 126.9 mm2. Gradually there was a reduction of arm edema; fistula is still regularly patent and functioning today.

Our clinical case aims to underline how the union of different methodologies can be useful in order to better investigate the etiology of a malfunction of the access for hemodialysis. Proceeding with endovascular interventions on the central venous vessels nowadays allows us to optimize the possibilities of safeguarding a fistula and prolonging its use.

P-117 Transformation of a WavelinQ – Endo aVF to a radiocephalic aVF using the "endobypass technique (ID 96)

Georgios Chatzantonis, Theodoros Mansolas, Natasha Hasemaki, Antonia Skotsimara, Athanasios Katsargyris, Chris Klonaris
2nd Vascular Surgery Department, NKUA, Laikon Hospital, Athens, Greece

Abstract

We want to present a case of a 50 years old female patient with Stage 4 End Stage Kidney Disease, who was referred to our Department for vascular access creation. After the vein and arterial mapping with ultrasound, due to lack of appropriate for a distal AVF vessels, we decided to proceed to a radial site Endo- AVF (WavelinQ – BD System) using CO2 Angiography (Angiodroid).

The flow after one month was 324 ml/min, so in order to improve the AVF maturation, we proceeded to selective ligation of the dominant brachial vein. The flow was increased to 600 ml/min.
At 4 months follow-up the flow was decreased to 400 ml/min and a juxtaanastomotic vein stenosis was recognized. Therefore a balloon angioplasty was performed under ultrasonic guidance. The follow up duplex ultrasound before the 1st canulation of the AVF showed a volume flow 750ml/min and a mature cephalic with a diameter of 5 mm.

2 months later, despite the expected maturation result of the duplex ultrasound, the canulation at hemodialysis session was unsuccessful with recurrent drop of the arterial pressure.
We decided to proceed to ultrasound guided placement of a Viabahn Endoprothesis 5 mm x 2,5 cm (GORE) through a retrograde cephalic vein access. The Endoprothesis was placed from the proximal cephalic vein through the deep perforator vein close to the endo anastomosis, transforming our primary endoAVF to a radiocephalic AVF.

With follow-up at 4 and 9 months after the latest intervention, the canulation of the AVF is adequate and hemodialysis is performed without complications

P-118 Early blood redistribution during endovascular arterio-venous fistula (endoAVF) creation using WavelinQ 4F affects postoperative venous embolization rates (ID 103)

Vadym Matsibora[1], Tadeusz Grochowiecki[2], Michal Macech[2], Daniel Jarosz[2], Pawel Zebrowski[3], Magdalena Januszewicz[1], Jolanta Malyszko[3], Zbigniew Galazka[2]
[1]Second Department of Radiology, Medical University of Warsaw, Warsaw, Poland; [2]Department of General, Vascular, Endocrine and Transplant Surgery, Medical University of Warsaw, Warsaw, Poland; [3]Department of Nephrology, Dialysis and Internal Diseases, Medical University of Warsaw, Warsaw, Poland

Abstract

Background.

EndoAVF creation is minimal-invasive procedure which allows to utilize proximal forearm vasculature, preserving proximal vessels for future AVF. In contrary to surgical performed AVF, endoAVF arterializes both deep and superficial vein system. We evaluated impact of the simultaneously venous embolization during endoAVF creation on postoperative necessity of postoperative embolization.

Material and Methods.

16 endoAVF were performed (14 radio-radial / 2 ulnar-ulnar). Succes rate was 93.75%. During operation, additional endovascular procedure was done based on Duplex scan evaluation. Intraoperative and postoperative venous embolization rate was assessed. We compared primary access patency for patient who had no embolization simultaneously with endoAVF, but required embolization postoperatively with those who had embolization simultaneously with endoAVF and did not require further embolization. Life-table analysis was performed.

Results.

The postoperative venous embolization rate was significantly dependent on performing or not performing embolization during endoAVF creation resulted in of 28.6% (2/7) and 75 % (9/12), respectively ($p<0.04$). Primary endoAVF patency for patients (n=5) who had no embolization simultaneously with endoAVF creation, but required embolization postoperatively compared with patients (n=5) who had embolization and not required embolization was significantly lower ($p<0,05$; log-rank test). All postoperative embolizations were performed within 65 days after endoAVF creation in group patient without embolization during endoAVF creation.

Conclusions:

The findings indicate that simultaneous venous embolization during EndoAVF creation facilitates early venous blood redistribution, thereby reducing the necessity for postoperative embolization. This approach may enhance the maturation and allow for appropriate timing of fistula maturation.

P-119 Drug-Eluting Stents vs. Stent-Grafts for Hemodialysis Access Outflow Stenosis 2.0: Expanded Real-Life Results (ID 105)

Andreia Pinelo[1,2], Luís Loureiro[1,2], Duarte Rego[1,2], Sérgio Teixeira[1,2], Daniel Mendes[1,2], Rui Machado[2], António Norton de Matos[1], Paulo Almeida[1,2]
[1]Grupo de Estudos Vasculares - GEV, Porto, Portugal; [2]Unidade Local de Saúde de Santo António, Porto, Portugal

Abstract

Introduction:

Hemodialysis vascular accesses are susceptible to restenosis, requiring frequent interventions to maintain patency. While plain balloon angioplasty (PBA) is the first-line treatment, it has high reintervention rates. Stent-grafts (SGs) have been shown to improve patency and are already approved for use in this setting. This study aims to compare the off-label use of drug-eluting stents (DESs) versus SGs in managing hemodialysis vascular access outflow stenosis.

Materials and Methods:

This single-center retrospective study reviewed patients treated with DES or SG for vascular access outflow stenosis between January 2017 and June 2024. The primary outcome was the comparison of patency rates between DES and SG groups.

Results:

A total of 156 patients were treated with either DES (n=60 DES) or SG (n=106 SG). DES deployment significantly reduced the mean number of target lesion interventions (TLI) from 2.4±0.3 to 0.7±0.1 per year ($p<0.001$) and extended median TLI-free time from 4 to 10 months ($p<0.001$). Similarly, SG reduced mean TLI from 1.3±0.1 to 0.7±0.12 per year ($p<0.001$), increasing TLI-free time from 4 to 13 months ($p<0.001$). At 12 months, DES primary, assisted primary, and secondary patency rates were 49.9%, 78.2%, and 96.7%, respectively, compared to 58.8% ($p=0.198$), 72.3% ($p=0.264$), and 96.9% ($p=0.877$) for SGs.

Conclusion:

Both DES and SG significantly reduced TLI rates and prolonged TLI-free intervals compared to PBA. No significant differences in overall patency were observed between the devices. The slightly improved assisted patency with DES may suggest benefits in preserving collateral vessels. These findings support DES as a potential alternative for managing outflow stenosis, particularly in venous confluent sites, such as the cephalic arch, where the risk of outflow jailing of SGs may compromise future vascular access.

P-120 Efficacy of balloon expadable covered stents in the treatment of brachiocephalic vein stenosis in hemodialysis patients (ID 110)

Carlo Maturi
Vascular Surgery Unit, Padova, Italy

Abstract

BACKGROUND

Central venous stenosis (CVS) is severe complication in hemodialysis patients, often caused to repeatedl venous catheterizations. This condition results in intradialytic hypertension, edema, difficulty achieving hemostasis, and the development of collateral venous circuits. This study evaluates the safety and efficacy of treating CVS in the brachiocephalic veins with covered stents on patients with arteriovenous access and symptoms of central venous overload.

MATHERIAL AND METHODS

This single center retrospective study evaluated the safety and efficacy of Covered balloon-expandable stents (VBX, Gore) in patients with CVS treated between 2021 and 2024. Data collection included baseline patient characteristics, procedural details and follow-up results. The primary endpoints were safety, freedom from reinterventions and symptoms resolution.

RESULTS

We collected 10 cases,70% were male (mean age 65.25±7.6 years). All patients underwent an angioCT scan. The most common location of stenosis was the left brachiocephalic vein 8 patients (80%); in 1 case the lesion was in the right brachiocephalic vein (10%) and bilateral stenosis was present in 2 patients (20%). A combination an anterograde and retrograde vein access was used.
Mean follow-up was 18 months (SD: 10 months), all patients achieved the primary endpoints, demonstrating 100% technical success, 100% freedom from reintervention, and 100% resolution of symptoms. No major complications were observed during the follow-

CONCLUSIONS

This study highlights the challenges of treating CVS and the advantages of covered stents technology. Precise deployment, protecrion from rupture, selective flaring, flexibility, and minimized migration risks, make them well-suited for the complex anatomy of the brachiocephalic junction. Our findings suggest that tailored interventions and the use of covered stentsis safe and may ensure long-term functionality of dialysis access.

P-121 Personal adaptation of the endovascular technique for stuck CVC removal: advantages of a standardized technique in single operator large series (ID 122)

Guido Saracino[1,2,3], *Fabrizio Lo Iacono*[1,4,2]
[1]Casa Di Cura Maria Rosaria di Pompei - Department of Vascular access surgery in hemodialysis, Pompei, Italy; [2]Clinica Mediterranea Department of Vascular access surgery in hemodialysis, Napoli, Italy; [3]Nefrocenter Research - Department of Vascular access surgery in hemodialysis - Consorzio Servizi Sanitari, Napoli, Italy; [4]Nefrocenter Research - Department of Vascular access surgery in hemodialysis - Consorzio Servizi Sanitari, NAPLES, Italy

Abstract

Background:

Both stuck tunneled central venous catheter (tCVC) and removal procedures are associated with a high risk of complications, even life-threatening. The endovascular technique (Hong technique) has been shown to be effective. The aim of this review was to evaluate the results and benefits in this large personal series using a technique standardized by the author.

Materials and methods:

From January 1, 2014 to December 31 2024 7683 tunneled CVC implantations and 1969 tunneled CVC removals have been performed. In 26 cases the CVC was incarcerated (age 47-94); in 23 cases the tCVC was jugular (88%) in the other 3 it was femoral (12%). The first Author procedure combines use of a stiff wire and a sheath inside the tCVC with high pressure balloon to break the very tenacious adhesions to vessel wall and reduce air embolism and fragmentation/migration of the tCVC.

Results:

Removal was possible in all but 1 case (96%). No CVC ruptures or fragmentations, vascular lesions or embolisms occurred (0%). Only 1 case (4%) had a major complication (severe perioperative bradyarrhythmia) treated with pacemaker implantation without sequelae. In most of cases, CVC could be repositioned in the vein. In all infected cases it was possible to eliminate the infection. In all cases, CVCs were found to be functional for at least 9 months. In one case (very rare in Literature), a patient underwent a second Hong procedure.

Conclusion:

This technique has proven to be effective in all cases of jugular CVC except for one femoral one and safe with respect to complications related to CVC manipulation (fragmentation, embolization, etc.) or vascular lesions. In addition, it has proven to be a winning therapeutic option to increase the possibility of implantation with good CVC performance and without abandoning the previous implant site in cases without signs of infection. In infected cases it has always been successful to eliminate the infection, a potentially life-threatening complication.

P-123 Procedural Safety and Long-Term Clinical Efficacy in the Management of Vascular Access Malfunction (ID 145)

Marco Franchin[1], Maria Cristina Cervarolo[1], Alessandra Bandiera[2], Sophie Salvadore[2], Federico Fontana[2], Filippo Piacentino[1], Andrea Coppola[1], Edoardo Macchi[1], Matteo Tozzi[2]
[1]ASST-Settelaghi, Varese, Italy; [2]University of Insubria, Varese, Italy

Abstract

Background

Stenosis is the leading cause of vascular access (VA) dysfunction, resulting in inadequate dialysis, increased morbidity, and frequent reinterventions. Drug-coated balloons (DCBs) have emerged as a promising solution. This study aims to evaluate the efficacy and safety of DCB treatment. Additionally, we assess the feasibility of performing these procedures using Automated Carbon Dioxide Angiography (ACDA) in patients with residual renal function (RRF).

Materials and Methods

This single-center, retrospective observational cohort study was conducted at university hospital.Patients with RRF underwent ACDA to avoid nephrotoxic contrast exposure.
A total of 234 patients with stenotic or thrombotic lesions in AVFs, AVGs, or CVSs (17.5% of cases) were treated between January 2014 and June 2024. Inclusion criteria comprised symptomatic or asymptomatic stenoses >50% detected via Doppler ultrasound. All treated lesions underwent vessel preparation followed by DCB angioplasty (Aperto OTW, Cardionovum, Germany).
Among them, 45 patients (19.2%) with RRF underwent contrast-free endovascular procedures using ACDA.

Results

Technical success was achieved in 85% of cases, with functional patency rates of 80%, 63%, and 47% at 12, 24, and 36 months, respectively. The annual reintervention rate was 1.3 (IQR: 0.9–3.1). The mean follow-up period was 2,275 ± 578 days (range: 184–3,770 days).
Among the 45 patients treated with ACDA (19.2%), no significant deterioration in renal function was observed at 30 days post-procedure or during follow-up, even in cases requiring repeated interventions.

Conclusion

The use of DCBs reduces restenosis rates and the need for frequent reinterventions. Additionally, ACDA enables contrast-free endovascular procedures, preserving renal function in patients with RRF. These strategies represent a significant advancement in safety and efficacy for high-risk dialysis-dependent patients undergoing multiple endovascular treatments.

P-124 Experience of a single center in endovascular interventions on AVFs (ID 169)

Karmela Altabas[1], Luka Novosel[2], Tomislav Krpan[3], Marija Vučić[4], Nikola Šerman[4], Mia Čolić[5], Goran Radulović[4]

[1]Sestre Milosrdnice UHC ,School of Dental Medicine, University of Zagreb, Zagreb, Croatia; [2]Sestre Milosrdnice UHC School of Medicine University of Zagreb, Zagreb, Croatia; [3]Sestre Milosrdnice UHCCroatian Catholic University in Zagreb, Zagreb, Croatia; [4]Sestre Milosrdnice UHC, Zagreb, Croatia; [5]General Hospital Ivo Pedišić Sisak, Sisak, Croatia

Abstract

Background:

Arteriovenous fistulas (AVF) are essential for dialysis patients. Endovascular interventions have become a viable treatment option. This report presents the experience of a single center in performing endovascular interventions over two years.

Materials and Methods:

From January 2023 to December 2024, the interventional radiology department at Sestre Milosrdnice UHC performed 79 endovascular interventions to treat AVF complications. The cohort included 34 men and 10 women, aged 34 to 89 years, with a median age of 70. Forty percent had diabetes, and 50% had hypertension.

Results:

A total of 44 patients underwent endovascular interventions. Five had intervention on endovascular created fistulas, and 39 had surgically created AVFs.

* 16 interventions (20%) were performed for venous thrombosis, including one on an endovascular fistula.
* 56 interventions (70%) were carried out for venous stenosis, with one on an endovascular fistula.
* 4 interventions (5%) were performed for blood flow rerouting via coiling, all on previously created endovascular fistulas.
* 4 procedures (5%) were technically unsuccessful and abandoned.

The time between AVF creation and the first intervention ranged from 6 days to 4 years, with a median of 11.21 months. Half of the patients required multiple interventions, and 18% had three or more. One patient had seven interventions, six of which were in 2023 or 2024. The time between two consecutive interventions ranged from 2 days to 20 months, with a median of 5.2 months.

* 64 interventions (81%) were on forearm fistulas, and 15 (19%) on upper arm fistulas.
* Only one major complication (1.2%) occurred: a pseudoaneurysm requiring surgical treatment.
* 35 interventions were performed in a day hospital setting, while the rest required hospitalization.

Conclusion:

Endovascular interventions are an effective, repeatable method for extending the lifespan of AVFs and can be safely performed in a day hospital setting.

P-125 Paclitaxel-coated balloon angioplasty in central venous stenosis in hemodialysis patients (ID 173)

Cemal Kocaaslan, Betül Nur Keser, Mervan Aydın, Zaur Guseinov, Sebil Merve Şen Topçu, Fatih Avni Bayraktar, Mehmet Şenel Bademci, Ebuzer Aydın
Department of Cardiovascular Surgery, Istanbul Medeniyet University Göztepe Prof. Dr. Süleyman Yalçın City Hospital, Istanbul, Turkey

Abstract

Background

Although central venous stenosis in hemodialysis patients is traditionally treated with plain balloon angioplasty, the patency rates are not as desired. The studies address paclitaxel-coated balloon angioplasty as promising for central venous stenosis in these patients. This study aims to assess the results of the usage of paclitaxel-coated balloons for central venous stenosis in hemodialysis patients.

Materials and methods

28 hemodialysis patients (14 women; mean age 60.9±14.5), who underwent paclitaxel-coated balloon angioplasty for central venous stenosis between January 2020 and April 2023, are included in this retrograde one-center study. The patients were followed up for a minimum of one year, with the median follow-up duration of 27.5 months (12-49). The primary outcomes of the study are primary patency rates at 6 and 12 months. Secondary outcomes include primary technical success (<30% residual stenosis), intervention-free period and clinical features affecting patency.

Results

The primary technical success rate was 96.4%. The primary patency rates at 6 and 12 months were 100% and 85.7%, respectively. 64.3% of the patients had total central venous occlusion. 16 (57.1%) patients had AVF failure in the follow-up duration, and 14 (87.5%) of these patients underwent reinterventions for central venous stenosis. The median intervention-free period was 22.5 months. The 12-month patency rate was found to be lower in patients with diabetes (p=0.044). The history of an ipsilateral central venous catheter was not found to be associated with patency rates.

Conclusion

In this study, paclitaxel-coated balloon angioplasty seems to have acceptable outcomes in dialysis patients with central venous stenosis. Nevertheless, further studies comparing plain balloon angioplasty and paclitaxel-coated balloon angioplasty are needed.

P-126 Stent grafts in hemodialysis vascular access (ID 180)

Luca Boi, Francesca Nistri, Fabrizio Farneti, Alessandro Beleù, Giancarlo Cicognini, Davide Barbisan, Giovanni Morana, Maurizio Nordio
Ca Fondello Hospital, Treviso, Italy

Abstract

Background
Vascular access dysfunction is the Achilles heel of dialysis therapy with a high morbidity rate, an increased susceptibility to major adverse cardiovascular events, recurrent hospitalization, and a poor quality of life.
Aim of this work is to report our experience in the stent graft implantation to maintain vascular access patency in different anatomical locations and in different clinical scenarios.

Materials and Methods
From April 2024 to December 2024 we performed 9 stent graft deployment in 9 end stage kidney disease (ESKD) Patients (mean age 74y) with native arteriovenous fistula dysfunction.
We treated 3 early recoil lesion of cephalic arch, 2 central vein obstruction, 2 vein rupture irresponsive to prolonged balloon tamponade and 2 recurrent stenosis.
Stent grafts was Wrapsody Merit® (1), VBX Gore® (1), Viabahn Gore® (2), Covera BD® (5),
The diameter measures ranged from 6 to 14mm and length from 40 to 120mm.
Post-dilation for remodeling was done in all cases except in vein rupture.

Results
Technical success was 100% without complications.
At the mean follow-up of 5 months all stents were patent and vascular access are functioning properly.

Conclusion
Stent graft have emerged as a viable therapeutic option for dialysis vascular access dysfunction.
The KDOQI 2019 Vascular Access Guidelines recommend stent graft placement in dialysis vascular access for venous rupture and recurrent, elastic lesions (defined as recurrent narrowing > 30% after full effacement with angioplasty).
Recent clinical trials are bringing evidence that covered stents offer options to prolong the vascular access patency.

P-127 Efficacy of Paclitaxel-Coated Balloon Angioplasty for Dysfunctional Arteriovenous Fistulas (ID 190)

Luca Boi[1], Francesca Nistri[1], Giancarlo Cicognini[1], Alessandro Beleù[1], Davide Barbisan[1], Fabrizio Farneti[1], Giovanni Morana[1], Nicola Marchionna[2]
[1]Ca Foncello Hospital, Treviso, Italy; [2]San Bortolo Hospital, Vicenza, Italy

Abstract

Background

Endovascular treatments, including standard PTA, drug-eluting-ballon (DEB) PTA, thrombo-aspirations and stenting, are recognized tools to treat steno-obstruction of disfunctional native arteriovenous fistula (AVF). The aim of this study is to retrospectively study the outcomes of this procedures with particular focusing in the efficacy of angioplasty with Paclitaxel DEB.

Materials and methods

From January 2019 to December 2022 were performed 62 endovascular treatments in 45 Patients. Analysis to assess primary and secondary patency was made in 34 Patients affected by peripheral steno obstruction. 11 Pazienti with central lesion was excluded.

Results

Of 34 Patients 17 underwent standard PTA and 17 DEB PTA. 14 patients underwent reintervention, 7 with standard PTA and 7 with DEB, for a total of 48 procedures analyzed. Primary and secondary patency were assessed at 30, 90, 180, 360 days and beyond 360 days.
At 180 days total primary patency was 90% without significant differences on DEB e standard PTA soubgroups. Significant difference of primary patency was registered after 360 days with 41% in DEB group versus 13% in standard PTA group.
The secondary patency in the two subgroups was found to be superimposable at long-term.

Conclusions

Our data suggest that PTA with paclitaxel DEB reduce the risk of re-stenosis and is superior to PTA standard in maintaining primary patency a long-term, in secondary patency does not determine significant differences.

Infection prevention in vascular access

P-128 Is pre-cannulation disinfection with Chlorhexidine more effective than ethanol? (ID 13)

Karin Staaf[1], Vendela Scheer[2], Lena Serrander[2], Anders Fernström[3], Fredrik Uhlin[1,4]
[1]Department of Nephrology and department of health, medicine and caring sciences, Linköping University, Linköping, Sweden; [2]Department of Clinical Microbiology and Department for Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden; [3]Department of Nephrology, Linköping University hospital, Linköping, Sweden; [4]Department of Health Technologies, Tallinn University of Technology, Tallinn, Estonia

Abstract

Background:
Buttonhole cannulation technique is known to have an increased risk of AV-fistula related infections. Earlier studies indicate that the type of disinfectant used may influence this risk. In Swedish dialysis units, Chlorhexidine is most commonly used. Only during contraindications or shortage, ethanol is the substitute. The aim of this study was to compare the outcome of bacteria growth after disinfection using chlorhexidine or ethanol in patients treated with haemodialysis.

Materials and methods:
The study was a randomized cross-over, single-blinded, clinical trial. Twenty patients, treated with haemodialysis via AV-fistula chose to participate. Their non AV-fistula arm was sampled for normal skin flora before, directly after, two hours after and four hours after disinfection with ethanol 70% or with Chlorhexidine 5 mg/ml in 70% ethanol during two dialysis treatments each. During two of the occasions, disinfection was combined with arm wash using soap and water. Colony forming units (CFU) were counted. Samples taken directly after disinfection, containing > 5 CFU were considered as positive. Chi-square was used to compare the number of positive and negative samples directly after disinfection. Wilcoxon Signed Rank Test was used to compare the amount of CFU/mL after the different disinfection regimes.

Results:
Seven out of 65 samples (10.8%) were positive when ethanol was used during disinfection compared to one out of 69 samples (1.4%) when chlorhexidine was used ($p = 0.032$). When ethanol was used, in combination with arm wash, the amount of CFU/ml was significantly increased after two ($p = 0.046$) and four hours ($p = 0.022$) compared to disinfection using chlorhexidine without arm wash.

Conclusions:
Pre-cannulation disinfection using chlorhexidine is more effective than ethanol. Arm wash in combination with ethanol reduces the prolonged effect after disinfection. This should especially be considered when the cannulation technique buttonhole is used.

P-129 Addressing infection in TIVAPs: An ex vivo study on bacterial transfer and the Forsvall port needle design (ID 37)

Håkan Pärsson[1,2], Magnus Wagenius[3,4], Maria Utter[3,4], Jonas Tverring[3,5], José Cardoso[3,6], Andreas Forsvall[3,4]
[1]Linköping University, Department of Health Medicine and Caring Sciences, Linköping, Sweden; [2]Department of Surgery, Kalmar Hospital, Kalmar, Sweden; [3]Faculty of Medicine, Department of Clinical Sciences, Infection Medicine, Lund University, Lund, Sweden; [4]Department of Urology, Helsingborg Hospital, Helsingborg, Sweden; [5]Department of Infectious Diseases, Helsingborg Hospital, Helsingborg, Helsingborg, Sweden; [6]Faculty of Medicine, Department of Dermatology and Venereology, Lund, Sweden

Abstract

Background:

Total Implantable Vascular Access Ports (TIVAPs) carry a risk of infection due to bacterial introduction. A Huber needle is used for access. We hypothesized that the Huber needle design facilitates bacterial transfer from the skin into TIVAPs during puncture, leading to infections, and that redesigning the needle could reduce that risk.

Methods:

A novel needle prototype, the Forsvall Port needle, was developed with a closed tip to reduce bacterial transmission inside the needle during tissue and port penetration. In a randomized ex-vivo setting human skin samples and port membranes were punctured repeatedly by the standard Huber needle and the Forsvall Port needle. Physiological levels of Staphylococcus Aureus were placed on the skin before puncture. Cultures from the needle tips were taken after puncture, blinded, and used to compare bacterial transfer into TIVAPS. Punctures in a separate human skin examined the mechanism of bacterial transfer. Bacterial transfer was compared using generalized linear mixed-effects models.

Results:

The Forsvall Port needle prototype reduced average bacterial transfer by 87.0% (95% CI: 77.8% to 92.4%, $p<0.0001$) compared to the Huber needle, based on 10 punctures per needle across 4 skin samples. Additional testing showed that a half-open, defectively fitted Forsvall Port needle prototype did not reduce bacterial transfer relative to the Huber needle (95% CI: 58.3% decrease to 30.0% increase, $p=0.289$). However, a steel rod simulating a perfectly closed Forsvall Port needle achieved a 99.9% (95% CI: 99.5% to 100%, $p<0.0001$) reduction in bacterial transfer into TIVAPs.

Conclusion:

The Forsvall Port needles closed design significantly reduced bacterial transfer into TIVAPs, potentially lowering the risk of infection. Optimizing production of the prototypes used may even further reduce bacterial transfer. Clinical studies are needed to evaluate the effect of needle design on TIVAP-related infection rates.

P-130 Epidemiology of Vascular Access Infections in Dialysis – A Multicenter Retrospective Analysis (ID 158)

Gemene Emanuela Marta, Grecu Ioan Razvan, Tacu Catalin Mihai, Havasi Nicoleta, Ene Ileana
Diaverum Romania, Bucharest, Romania

Abstract

Introduction

Vascular access (VA) infections are a major cause of morbidity and mortality in patients undergoing hemodialysis treatment.

Objectives

Distribution of infectious episodes between the different types of VA, Impact of VA related infections with hospitalizations and death and Identification of risk factors associated with vascular access infections.
Material and Method Multicenter retrospective study conducted over a two-year period in 26 dialysis centers from one country of a large dialysis provider : 4000 patients were included :75% had a AVF and 25% a CVC
Data collected: Type of vascular access.,Number of infection episodes; number of vascular access related infections episodes and Microbial species isolated and antimicrobial resistance profile.
Analysis methods:The last demographic data available before the event were collected and the groups compared using ANOVA and Kruskal-Wallis test for continuous variables and Chi-square (X^2) test for categorical variables.

Results

• Global rate of vascular access related infectious episodes was 0.4 patients/year and occurred more significantly in patients with diabetes
•Infections episodes were more significantly frequent in patients with CVC, when compared with patients with (36% vs. 14%,).
• The pathogens isolated : Staphylococcus aureus (including MRSA strains) – 80%, Pseudomonas aeruginosa (10%) and Klebsiella spp (5%).
• Vascular access infections were associated with hospitalizations: 7% of all hospitalizations were caused by VA related infections

Conclusions

Even that the vascular access (VA) related infections represent a significant proportion of total infectious episodes, especially among patients with central venous catheters (CVC), the global rate of VA episode patient/year its low. This emphasizes importantance of our uniform strategies for the prevention of vascular access infections in dialysis and a judicious use of antibiotic treatments..

Impact of vascular access on patients' quality of life

P-131 Patient perspective on pain during cannulation in AV-fistula (ID 12)

Karin Staaf[1], *Anders Fernström*[2], *Fredrik Uhlin*[1,3]
[1]Department of Nephrology and department of health, medicine and caring sciences, Linköping University, Linköping, Sweden; [2]Department of Nephrology , Linköping University hospital, Linköping, Sweden; [3]Department of Health Technologies, Tallinn University of Technology, Tallinn, Estonia

Abstract

Background

Cannulation related pain is a frequent and disturbing side effect for patients on haemodialysis.
Studies have compared the level of pain experienced by patients when different types of analgesic or cannulation techniques are used. However, studies are scarce on evaluation of cannulation related pain over time. There is also a lack of studies were patients perspective of needle related pain is described

Materials and methods

During their first year of cannulation, ten patients using the cannulation technique buttonhole, choose to participate in a prospective observational study. During in total five treatments, distributed first, second, third, sixth and twelfth month, they were asked to describe their pain and anxiety during cannulation. Numeric rating scale (NRS) and SF-McGill's questionnaire were used. Patients also spontaneously answered by their own words. These thoughts were written down as field notes. Qualitative content analysis was used to analyse the field notes. Quantitative variables were compared using descriptive statistics

Results

NRS diverse from 0 to 7 (mean 3.5 ±2.7) during 1st month and from 0 to 10 (mean 3.1 ±3.0) during 12th month. Patients mainly described pain as stabbing and tender when SF-McGill's was used. The qualitative analysis showed four different categories: When, How, Manage pain and Anxiety. Needle related pain was most common while the cannula passed from the skin into the vessel. Both pain and anxiety were described as something patients got used to. Pain also tended to decrease over time. Patients handled pain in different ways, for example analgesic or distraction. Needle related anxiety was due to pain but also cannulation difficulty

Conclusions

Pain during cannulation is common and needs more attention. When pain is evaluated and compared, it is important to consider the time frame of measurement to reduce the influence of needle related anxiety and cannulation difficulties, which frequently occur in new AV-fistulas

P-132 Personalized vascular access, for the daily comfort of the hemodialysis patient (ID 126)

Amel Mekroud
University of Bejaia, Bejaia, Algeria. University Hospital of Bejaia, Bejaia, Algeria

Abstract

The implementation of vascular access to patients who have been on hemodialysis for years is sometimes conditioned by the demands of patients who have had enough of seeing their quality of daily life affected. We report the case of a patient who required us to remove the tunneled lines at the point that suited his comfort.

Patient S.Y., aged 51, anuric hemodialysis patient with a colostomy due to Crohn's disease, was referred to us by his treating nephrologist for placement of a tunneled, cuffed, central venous catheter.
After a Doppler of thoracic inlet veins, the right subclavian vein was choosed. Our patient demanded that the tunnelisation exit at the level of the arm. A 40 cm doubled catheter was used under ultrasound guidance, tip of the catheters at the level of the innominate vein, and tunneling going from the puncture point to the middle third of the arm.

The implementation of sustainable solutions for hemodialysis patients becomes a challenge in certain clinical situations. The question of the appropriate positioning of the exit site of the vascular access routes to ensure the comfort and dignity of the patient is taken into account (1)
Innovations in care processes are important in order to generate patient-centered solutions. (2)
The guideline proposed in 2020 by the KDOQI has well defined the clinical situations and the principles of decision-making for the personalized access route according to clinical data and history (1)
In our case, the patient, still active, offered the department a painting on canvas.

Exploration and final choice of the central vein, the route to access it and the location of the tip and exit-site of the catheter can be changed according to many factors, the opinion of the patient himself is an important element to take into consideration since it determines the postoperative acceptance of the device and therefore the patient quality of life.

P-133 Correlations between vascular access type and antibiotic use in long-term dialysed patients (ID 142)

Nicoleta Havasi[1], Baliban Simona[1], Blaga Anca[1], Baidog Adriana[1], Ratiu Ioana[1], Bako Gabriel[1], Marta Gemene[2], Ileana Ene[3]
[1]Diaverum Romania, Oradea, Romania; [2]Diaverum Romania, Bucharest, Romania; [3]Diaverum Romania, Petrosani, Romania

Abstract

Background:
Long-term survival in patients with chronic kidney disease undergoing hemodialysis remains a significant challenge for patients, families, and healthcare providers. While the one-year survival rate is approximately 75%, it declines to 50% at five and falls below 20% after ten years. The type of vascular access used plays a crucial role in infection risk and overall prognosis and quality of life.

Materials and methods
Study population: 200 patients undergoing hemodialysis treatment, divided according to the type of vascular access (CVC, AVF, AVG) in one dialysis clinic
Survival rate at 10-year survival rate (12.27%) and the 15-year (6%)
A majority of long-term survivors had an arteriovenous fistula (AVF), with 84% in the 10-year cohort and 92% in the 15-year cohort.

We assessed antibiotic use over one year, comparing AVFs and central venous catheters (CVCs) concerning infection treatment and prevention
Results:
* Antibiotic use for vascular access infections was significantly lower among AVF patients, with only 6% in the 10-year group and 4% in the 15-year group requiring treatment
* In contrast, a single young patient reliant on long-term CVC use due to limited vascular access required prolonged antibiotic therapy for catheter-related and concurrent infections
* For all other cases, antibiotic were prescribed with optimal dose and period to reduce the risk of antibiotic resistance
* Vascular access infections were less associated with hospitalizations, treated in the clinic

Conclusions:
A well-maintained AVF is associated with better long-term survival, reduced infection rates, and improved quality of life in. Achieving this requires a multidisciplinary approach, including patient education on AVF care, well-trained dialysis staff, strict hygiene protocols, and access to experienced vascular surgeons. These measures improve vascular access longevity and minimize antibiotic use, reduce the antibiotic resistance and enhance long-term dialysis outcomes.

P-134 High-performance/cost-controlled private vascular access center concept in Portuguese reality. (ID 176)

Marta Mikolajczak, Clemente Sousa, Luis Loureiro, Paulo Almeida, Antonio Norton de Matos
GEV - Grupo Estudos Vasculares, Porto, Portugal

Abstract

Background:

Since 2011, Portuguese Healthcare System legally enforces cooperation between private haemodialysis (HD) clinics (95% of all units in Portugal) and private Vascular Access Center (VAC), releasing this way the vascular access (VA) complications from public hospital's deficient care. Weekly state payments to HD clinics support this partnership (intentionally, 3% of HD budget), fostering economically sustainable VA maintenance programs. This work describes implemented VAC model and its outcomes within Portugal's financial constraints.

Materials and Methods:

Efficient and cost-effective VAC strategies were identified by analysing a private VAC assisting 30% of Portuguese HD clinics (~3000 patients), performing 1150 interventions annually: surgical, endovascular, and hybrid.

Results:

Legally enforced connection between HD clinics and VACs assured a consistent patient flow due to recurring VA dysfunctions. This allowed an internal study culture that led to the development of new interventional protocols. New, rare or long-forgotten interventional techniques were developed, permitting a low catheter or prosthetic use. A handbook and hands-on courses introduced ultrasound to HD room for assisted puncture and regular surveillance, increasing timely referrals to the VAC and minimizing VA losses. Interdisciplinary online consultations and in-person evaluations provided optimal guidance on VA use and interventions. Consolidation of ultrasound, surgery and endovascular capacities in the single hand of specialist in vascular surgery reduced VA maintenance act to one interventional moment. All this prevented logistic and financial exhaustion of clinics and VAC and nourished the individualization of patient's assessment.

Conclusions:

The most meaningful influence of VAC was the transformation of the approach based on the isolated act of VA creation into the process of vascular patrimony management executed by all stakeholders, staying below the narrow budget.

Innovations in vascular access devices and materials

P-135 Using resorbable extracellular bio-matrix for construction and reconstruction of hemodialysis vascular access (ID 31)

Bostjan Leskovar[1], Tjasa Furlan[1], Jernej Vrtek[1], Zvezdana Dolenc Strazar[2]
[1]General hospital Trbovlje, Trbovlje, Slovenia; [2]Medical faculty Ljubljana, Ljubljana, Slovenia

Abstract

Background.

Bioresorbable extracellular matrix (ECM) is a biomaterial obtained from the submucosa of a pig's small intestine. The properties of the ECM enable the gradual transformation of the embedded biomaterial into mature tissue. In our centre, we use resorbable ECM in vascular access surgery.

Material and methods.

We retrospectively analysed all procedures at our Vascular access unit, where a resorbable ECM (CorMatrix®, Aziyo®) was used for the (re)construction of an arteriovenous fistula (AVF) between May 2016 and May 2024. After preparing the arterial and venous anastomosis, we sutured a tubular graft of the appropriate length from sheets of resorbable ECM. At first, we made 6 mm tubular grafts, but due to the marked hyperplasia on the endothelium side, typical for this biomaterial, we later switched to 8 mm diameter grafts.

Results.

Since 2016, we have used resorbable ECM in 22 patients. We used it as an arterial circuit to the fistula vein (PAVA, RUDI), a reduction segment in high-flow AVF, a connecting segment after partial removal of an AVF, for extending the puncture area, and for construction of an entire AVF. We observed no significant peri- or postoperative complications. There was no considerable swelling of the hand, infection or rupture of the bio-graft. We could safely puncture the material 8-10 weeks after the operation, and hemostasis after needle removal was good. Puncturing was similar to puncturing a native vein. We successfully performed all additional procedures to ensure patency (TEA, PTA with/without stenting, surgical re-anastomosis). After partially removing the graft, we sent the material for histopathological examination. They described native connective tissue, individual smooth muscles, and endothelisation of the inner striatum.

Conclusion.

Using a resorbable ECM in vascular access surgery is safe and feasible. Limitations include unavailability of tubular grafts and marked bilateral hyperplasia of the new vascular wall.

P-136 Intravascular lithotripsy (IVSW): expanding the options for the treatment of hemodialysis access associated steal syndrome (ID 95)

John Aruny
Medical University of South Carolina-The Dialysis Access Institute, Orangeburg & Charleston, USA

Abstract

Background
AV fistulas are common hemodialysis access. Calcified arterial stenoses both proximal and distal to the fistula anastomosis can result in inadequate blood flow to the hand resulting in steal syndrome (DASS). Clinically, hand pain and numbness are related to ischemia. Several surgical procedures have been described for the treatment of DASS. IVSW is a recent technology developed to overcome the challenge of calcified peripheral and coronary arteries. Calcified, stenotic forearm arteries may respond in a similar fashion.

Materials and Methods
This presentation is the initial experience treating forearm arteries of 5 patients with DASS. Four radial arteries and two ulnar arteries had their entire length treated with a 2.5 mm diameter X 8 cm long IVSW catheter. The balloon was first inflated to 2 ATM and then 4 ATM during treatment. 10 rounds of 40 pulses per round for a total of 400 pulses were delivered. Final sub-selective angiograms of the treated vessels were performed. Follow-up at two weeks included repeating the ultrasound steal study.

Results
Ultrasound was performed with the access patent and then manually occluded. Increase in arterial blood flow after the access was occluded was considered positive. All arteriograms demonstrated severe forearm disease. Following treatment, there was resolution of intimal irregularities and stenoses. Two-week follow-up ultrasound showed reversal of the previously seen flow increase with access compression in all subjects. 2 subjects had complete symptomatic relief and 2 subjects had partial relief of symptoms. One subject with severe disease in the hand had little or no relief of symptoms. There were no dissections, distal embolization, extravasation or pseudoaneurysms.

Conclusion
IVSW has been successfully in the coronary and peripheral arteries. Treating forearm arteries appears to be safe and effective with the potential of relieving the symptoms of DASS.

P-138 Soft thermal sensors for the continuous assessment of flow in vascular access (ID 134)

Andrea Carlini
University of California Santa Barbara, Santa Barbara, USA

Abstract

Background:

Hemodialysis for chronic kidney disease (CKD) depends on vascular access (VA) devices, such as arteriovenous fistulas (AVFs), grafts (AVGs), or catheters, to ensure adequate blood flow. However, progressive vascular stenosis caused by neointimal hyperplasia and acute thrombosis-induced occlusion are the leading causes of VA failure. These complications often occur unpredictably, and the absence of reliable early detection tools hampers timely surgical intervention, negatively impacting patient outcomes and survival rates.

Materials and Methods:

In this talk, I will present a soft, wearable device designed for continuous blood flow monitoring to enable early detection of VA failure. The device employs thermal anemometry, utilizing integrated negative temperature coefficient resistors to noninvasively detect flow changes in large vessels.

Results:

Validation through bench testing with AVF and AVG models has shown strong agreement with finite element analysis (FEA) simulations. The device demonstrates a monotonic response to flow changes, with increasing sensitivity as a function of vascular stenosis. Preliminary evaluations calibrate the effects of vessel material and geometry on device sensitivity. Human and preclinical swine trials confirm the device's ability to detect flow alterations. Specifically, the device was challenged with cyclical vascular compressions, temperature-deviated saline injections, balloon catheter occlusions, and real-time thrombosis events.

Conclusions:

A wireless adaptation of this device holds the potential for at-home monitoring, offering a transformative approach to identifying VA-related complications early and improving survival outcomes for CKD patients. My research group invites collaborations to evaluate both biomaterials and devices designed in our lab, which provide chemical and electrical responses to biological signals unique to tissue disease.

P-139 AIDA: A Novel Implantable Device for Vascular Access in Dialysis – Design, Bench Testing, and Future Perspectives (ID 147)

Matteo Tozzi[1], *Marco Franchin*[2], *Gianni Pecorari*[3], *Federico Pecorari*[3], *Marisa Bergamini*[3], *Patrizia Cozzolino*[3], *Pasquina Ciociola*[3], *Elisa Viviani*[3], *Paola Papaleo*[3]
[1]University of Varese, Varese, Italy; [2]Asst-settelaghi, Varese, Italy; [3]Emodial, Ferrara, Italy

Abstract

Background:
Achieving safe and efficient vascular access remains a cornerstone of dialysis treatment. However, repeated cannulation of arteriovenous fistulas (AVFs) can lead to complications such as bleeding, tissue damage, and patient discomfort. To address these challenges, we developed AIDA (Advanced Implantable Device for Access), an implantable vascular access device designed to simplify cannulation, improve durability, and reduce complications in both native and endovascular AVFs, especially in challenging anatomies.

Materials and Methods:
AIDA is composed of four key components—body, valve, diaphragm, and cannula guide—assembled using medical grade silicone. The device implanted creating a stable entry point for dialysis cannulas. The cannula guide ensures axial alignment, while the elastic diaphragm and normally closed valve maintain hydraulic integrity by preventing blood leakage during cannula insertion, use, and withdrawal.
Bench testing was conducted on a custom hydraulic circuit simulating dialysis conditions. Key parameters included:
* Cannulation pressure: 0.2–0.25 bar (±0.05 bar
* Durability testing: 21 cannulations over 56 days, simulating 120.75 cumulative hours of use
* Extended durability: Sessions lasting 14–18 hours to evaluate long-term resistance.
The test setup included two hydraulic circuits, simulating the dialysis monitor, complete with pumps, sensors, temperature control, and manual/automatic valves.

Results:
AIDA demonstrated excellent performance under simulated clinical conditions. The device withstood repeated cannulation without signs of leakage or structural failure. Hydraulic integrity was maintained throughout both short-term and extended-use scenarios, supporting its suitability for clinical applications.

Conclusions:
Preliminary bench tests indicate that AIDA is a promising innovation for vascular access in dialysis. These findings provide a solid foundation for advancing to animal testing and subsequent clinical trials.

P-140 Structural and Biomechanical Optimization of Bovine Pericardium Using UVA/Riboflavin Cross-Linking: A Promising Scaffold for Vascular Access Surgery (ID 175)

Emil-Marian Arbănași[1,2,3,4], Traian V. Chirilă[5,6,7], Eliza Russu[1,2], Petru Alexandru Ion[4,3], Réka Bartus[1,2], Eliza-Mihaela Arbănași[3,4], Adrian Vasile Mureșan[1,2]

[1]Department of Vascular Surgery, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Targu Mures, Romania; [2]Clinic of Vascular Surgery, Mures County Emergency Hospital, Targu Mures, Romania; [3]Doctoral School of Medicine and Pharmacy, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Targu Mures, Romania; [4]Regenerative Medicine Laboratory, Centre for Advanced Medical and Pharmaceutical Research (CCAMF), George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Targu Mures, Romania; [5]George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Targu Mures, Romania; [6]Queensland Eye Institute, South Brisbane, Australia; [7]Australian Institute of Bioengineering and Nanotechnology (AIBN), University of Queensland, Queensland, Australia

Abstract

Background:
The advancement of biologically derived scaffolds in vascular access surgery is intensely studied. Xenograft decellularization yields a biocompatible scaffold characterized by minimal immunogenicity. However, it exhibits inadequate preservation of mechanical properties. The aim of this study is to present ultraviolet-A (UVA) photocrosslinking as an innovative approach to optimizing the biomechanical profile and microstructure of bovine pericardium.

Materials and Methods:
This experimental study involves an analysis of the biomechanical characteristics and microstructure of 20 specimens of bovine pericardium, each measuring 10x10 mm, prior to and subsequent to UVA/R. The specimens underwent exposure to a UVA intensity of 50 mW/cm² for a duration of 180 seconds using the OmniCure-1500 UV Curing System. Additionally, these specimens were subjected to 10 cycles of uniaxial stretching, reaching 25% of their initial area at a tensile rate of 1% per second, utilizing the CellScale-5000 Biotester. Regarding the microstructural analysis, the specimens underwent histological examination employing Hematoxylin and Eosin staining, Elastica Van Gieson staining, and Masson's trichrome staining.
Results: In relation to the uniaxial biomechanical analysis, we computed Cauchy stress and Young's modulus based on the final analysis cycle. Subsequent to the UVA/R treatment, we observed a statistically significant enhancement in resistance, indicated by Cauchy stress ($p<0.05$), alongside a corresponding stiffening of the bovine pericardium specimens, evidenced by Young's modulus ($p<0.05$). Furthermore, a thorough examination of the microstructure of the specimens revealed a notable increase in collagen fiber density.

Conclusion:
The UVA/R crosslinking optimizes bovine pericardium's biomechanical properties and microstructural architecture, rendering it suitable for application as a novel scaffold in vascular access revision surgery.

Nursing in vascular access

P-142 The effect of multiple same-day cannulations when creating buttonhole tracks in an AV fistula. A randomized controlled trial (ID 88)

Mette Axelsen[1], Nanna Lagoni[2], Bibi Gram[3,4]
[1]Esbjerg and Grindsted Hospital, Esbjerg, Denmark; [2]Lillebælt Hospital, Kolding, Denmark; [3]Research Unit of Endocrinology: Bariatrics and Diabetes, University of Southern Denmark, Esbjerg, Denmark. [4]Department of Regional Health Research, University of Southern Denmark, Odense, Denmark

Abstract

Background:

Creating buttonhole (BH) tracks in the arteriovenous (AV) fistulas of chronic hemodialysis patients can be challenging due to the planning and logistics in everyday clinical practice. Ideally, one or two individuals should consistently perform the cannulation. This study evaluates a new method to reduce the number of dialysis sessions required to establish buttonhole tracks. The primary objective is to investigate whether this method for establishing buttonholes leads to a higher rate of successful buttonholes when compared to the standard method.

Materials and Methods:

Patients were randomized into two groups: the intervention group (I) and the control group (C). The C-group underwent cannulation with sharp needles once before each dialysis session, while the I-group was cannulated 4 to 6 times to establish a track. Once the track was formed, blunt needles were used for all subsequent cannulations. Patients were followed for one year during the maintenance phase, with the primary endpoint being the survival of the buttonhole track.

Results:

Present data includes results from analysis of the primary endpoint. A total of 43 patients (mean age 64 yr) with arteriovenous (AV) fistulas (mean age 2.8 yr) were included. Forty-one patients had a BH track successfully established, resulting in 75 tracks: 34 in the I- group and 41 in the C-group. The average time to create a BH track was 4.6 (SD2.8) days in the intervention group and 9.2 (SD4.2) days in the C-group, $p<0.001$. Over one year, there were 19 failures: 9 in the I-group vs. 10 in the C-group. Cox regression analysis showed no significant difference in BH track survival between the groups, with a hazard ratio of 0.75 (95% CI: 0.30 – 1.84, p=0.52).

Conclusion:

The new method was not superior to the standard method in terms of BH survival. However, this method reduces the number of dialysis sessions needed for track formation, simplifying planning and ensuring the continuity of the cannulator.

Peritoneal dialysis catheters

P-143 Analysis of the results of the implantation of peritoneal catheters in two different periods in one center. (ID 69)

Jose Luis Merino[1,2], Sonia Mendoza[1], Esther García[1], Lola Prieto[2], Javier Pardo[1], Miguel Ángel García-Ureña[1,2], Vicente Paraíso[1,2]
[1]Hospital del Henares, Coslada, Spain; [2]Francisco de Vitoria University, Madrid, Spain

Abstract
In our center, the General Surgery Department performs the implantation of the peritoneal catheter (PC). PC implantation is the initial step to begin renal replacement therapy (RRT) through peritoneal dialysis (PD). Minimizing complications is key to starting on time and for optimal adaptation of home treatment. We analyzed the results during two different periods: from 2017 to 2019 and from 2020 to 2022.

Material and Methods: A retrospective and descriptive study of the follow-up of all PC implants performed in two different periods. We evaluated the characteristics of the patients, their complications in both periods and their initial development.

Results:
In the first period, 28 PCs were implanted in 27 patients, the average age of whom was 58 (10 females and 17 males). Fifteen presented diabetes, and only one was anticoagulated. There were 6 reinterventions, 2 for PC removal and 4 for PC replacement. The total number of interventions was 37, with 25 functional PCs to initiate RRT through PD.
In the second period, 28 PCs were implanted in 25 patients, the average age was 64 years (7 female and 18 male). Seventeen presented diabetes, only one was anticoagulated. There were 11 reinterventions, 3 for PC removal and 8 for PC repositioning. The total number of interventions was 42, with 23 functional PCs to initiate RRT with PD.

In the second period analyzed, the number of reinterventions increased, and the number of functioning PCs able to address PD decreased. The number of relocations doubled. The reasons may be diverse: a different percentage of DM and males, changes in the COVID era, and other extrinsic reasons due to possible changes in surgical teams.

Conclusions:

Although there is no clear contraindication to starting RRT through PD, the higher risk profile must be considered to predict complications. Analyzing the results to raise and assess potentially modifiable aspects is essential. Collaborating with a stable surgical team could improve results.

P-144 Revitalizing peritoneal dialysis in Albania: Prioritizing home-based therapies (ID 123)

Erjola Likaj, Merita Rroji, Saimir Seferi
UHC Mother Theresa, Tirana, Albania

Abstract

Introduction:

Since 2006, in Albania, peritoneal dialysis (PD) has continued to sustain the lives of patients with end-stage renal disease (ESRD). PD offers a convenient and comfortable home-based treatment option. Over the past two decades, a total of 203 patients have undergone PD. The mean duration on treatment and procedure survival rates were 33,26 months, and the mean age was 62,3 years.

Results:

Transition to hemodialysis after procedure failure has been encountered in 46 patients whereas 25 patients were switched from hemodialysis to peritoneal dialysis mainly due to vascular access failure.
Complications related to vascular access for hemodialysis have become increasingly life-threatening due to a rise in diabetic patients, older incident patients, and the urgent, unplanned initiation of hemodialysis using temporary central venous catheters. These challenges have necessitated the promotion and revitalization of PD, along with the education of patients and healthcare staff in home-based therapies such as peritoneal dialysis.

In last months of 2024, nine new patients initiated PD. Of these, eight patients were new to kidney replacement therapy (KRT), and only one transitioned from hemodialysis due to vascular access failure. Initial data is promising: only two patients required urgent peritoneal catheter insertion and began therapy 2-3 days post-insertion. We encountered just one case of leakage and one case of peritonitis.

Conclusion:

Revitalizing PD in Albania is essential to provide a viable home-based therapy option, for younger and older to geriatric patients, those expecting for a kidney transplant, long distanced from hemodialysis centers, congestive heart failure and especially for patients facing complications with vascular access in hemodialysis. Continued efforts in patient and staff education, alongside monitoring and managing complications, are critical to the success and sustainability of peritoneal dialysis in the country.

P-145 Incremental peritoneal dialysis in heart failure patients. A new option for both nephrologist and cardiologist (ID 125)

Erjola Likaj, Ermal Likaj, Alma Llukaci
UHC Mother Theresa, Tirana, Albania

Abstract

INTRODUCTION:
The increasing age, comorbidities, particularly diabetes, in the end-stage renal disease population pose significant challenges in their treatment. Cardiac heart failure , commonly observed in these patients, often limits their options for kidney replacement therapy, especially hemodialysis, due to hemodynamic instability. Offering peritoneal dialysis to these patients, represents a novel approach.

CASE PRESENTATION:
We present a case of incremental PD in a patient with heart failure. A 62-year-old male, with diabetes from 11 years, recently underwent coronary artery bypass grafting surgery. He developed acute kidney injury due to prolonged antibiotic use for mediastinitis and underwent several sessions of Hemodialysis. After a three-month hospitalization, he was discharged in stable condition without hemodialysis dependence.
Three weeks later, the patient presented to the Nephrology department in severe condition with oliguria, elevated creatinine, and BUN, along with pneumonia. He resumed hemodialysis for several sessions until his renal function slightly improved, attributed to cardiorenal syndrome. Over the following three months, he was hospitalized twice for volume overload. Severe atherosclerosis made impossible the creation of a permanent vascular access, so peritoneal dialysis was indicated for ongoing kidney failure and a PD catheter was inserted. To preserve residual kidney function, an incremental dosing strategy was employed, with two exchanges per day. We initiated Entresto for CHF, erythropoietin for anemia, diuretics, and antiplatelet therapy.

The patient is currently doing well, with a diuresis of 2 liters per day, ultrafiltration of nearly 500 ml/day from PD, and is normotensive and euvolemic. A cardiac evaluation via echocardiogram showed improved ejection fraction and reduced pulmonary hypertension.

CONCLUSION:
This case illustrates the potential benefits of incremental PD in managing CHF patients with compromised renal function.

P-147 Result of laparoscopic peritoneal dialysis catheter placement and replacement (ID 159)

Munkhjavkhlan Dorjsuren
Mungunguur hospital, Ulaanbaatar, Mongolia

Abstract

Background:

The high risk of catheter related complication and recurrence associated to the surgical technique and individual features and chronic diseases of patient became reason to conduct this study.

Methods:

Study has conducted in a descriptive method by collecting data from health record of 107 patients who had had peritoneal dialysis catheter placed and performed surgery because of complications at the Surgical department of MungunGuur hospital from 1st May of 2018 to 30st July of 2023.

Results:

40(46,9%) of them had performed surgery and initially placed peritoneal dialysis catheter and 67(65.3%) of them had surgery to address complications. Among types of complications, 7(17.5%) were malfunction of catheter, 3(6%) were hernia, 1(2%) was bleeding, 1(2%) was a wound leakage, 15(37.5%) was a peritonitis and exit site infection, respectively.

There were 67 surgeries to treat complications, of which 60(85%) were open and 7(17%) were laparoscopic surgeries. Migration and obstruction complications are more common after open surgery. There were 24(34%) early, 46(66%) late postoperative complications.

Discussion and Conclusion:

There is increased risk of catheter dislocation after open abdominal dialysis catheter placement surgery. Laparoscopic surgery is effective to address complications. Attaching is a method of preventing the catheter dislocation and should be secured with non-melting wire. The cooperation of omentum incision and variable catheter attaching can reduce the risk of recurrence and prevent complications.