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2023 VENOUS SYMPOSIUM EUROPE

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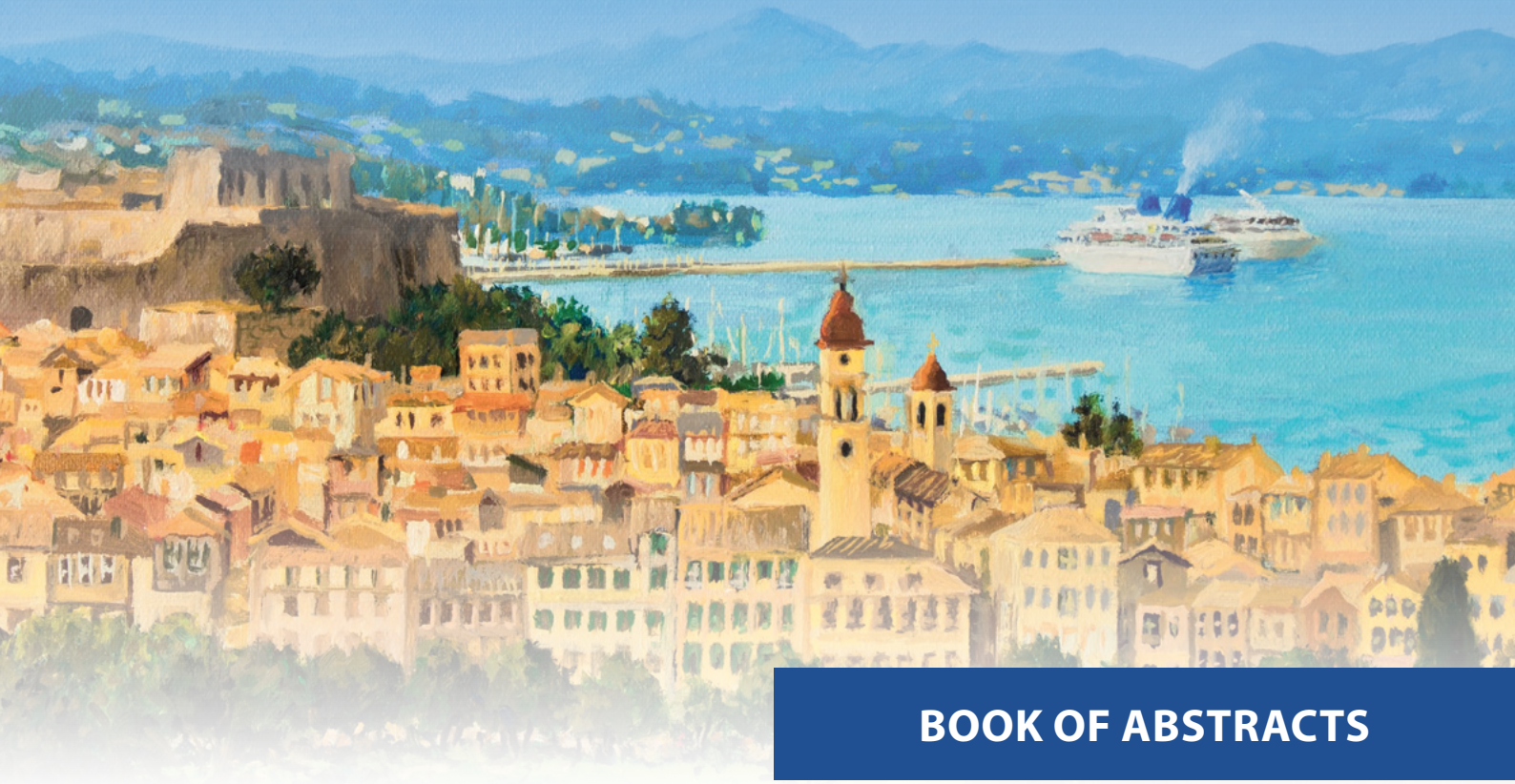

BOOK OF ABSTRACTS

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Institute of Vascular Diseases, (I.V.D.), Greece

Abstract Book

May 18-20, 2023 LIVE 2023 VS VENOUS SYMPOSIUM EUROPE - Leading Innovative Vascular Education vs Venous Symposium Europe

Organization

Organized by

Institute of Vascular Diseases, (I.V.D.), Greece

In collaboration with:

Hellenic Society of Vascular and Endovascular Surgery

Joint Sessions:

The European Society of CardioVascular Surgery

Interventional Master Aortic Course

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Oral Presentations

OP01

INTERVENTION FOR NEAR TOTAL OCCLUSION OF THE INTERNAL CAROTID ARTERY. A SINGLE CENTER EXPERIENCE

Ath. Chaidoulis[1], K. Spanos[1], G. Kouvelos[1], K. Tzimkas-Dakis[1], A. Barbatis[1], G. Volakakis[1], K. Batzalexis[1], M. Matsagkas[1], A. Giannoukas[1]

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Introduction: Recent guidelines recommend best medical treatment for the treatment of carotid near total occlusion (CNO), while the role of intervention with carotid endarterectomy (CEA) or stenting (CAS) remains controversial. The present study investigates our 16-year experience in the treatment of CNO with carotid intervention.

Methods: Single center retrospective study including patients treated with carotid intervention (patch or eversion CEA and CAS) from 2006-2023. Demographics, treatment details, and outcomes such as mortality, myocardial infarction (MI), stroke, intra-cerebral hemorrhage (ICH) were analyzed for the early period (30-day post-operation), while stroke, restenosis and death were also analyzed.

Results: From a total of 760 patients treated with carotid interventions, 29 were treated for CNO (CEA: 20 patch, 6 eversion and 3 with CAS). The mean patients' age was 68.2±9 (89% males). Almost half of the patients were symptomatic (45%; 13/29). The intra-operative stroke rate was 0% for asymptomatic patients and 7.5% (1/13) in symptomatic ones. The mean total hospital stay was 3.9±2. During 30-day period, intracerebral hemorrhage occurred in 6% in asymptomatic and in 7.5% in symptomatic patients and all within the first 7 days associated with development of hypertension. No MI or death occurred during early period. During mean follow up of 32±30 months, the survival rate was 95%, 87% and 58% at 12, 24, and 72 months, respectively. No patient experienced late stroke or significant (>50%) restenosis.

Conclusion: Perioperative risk of stroke and death in patients with CNO remains within the range of other symptomatic and asymptomatic patients with high grade stenosis. However, early postoperative intracerebral hemorrhage associated with hypertension remains high and therefore in such patients intense blood pressure control is of paramount importance.

OP02

DIRECT ISCHEMIC POSTCONDITIONING IN THE PREVENTION OF REPERFUSION INJURY AFTER EVERSION CAROTID ENDARTERECTOMY - OBSERVATIONAL CASE - CONTROL STUDY

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Introduction: Ischemic reperfusion (IR) injury has significant role in adverse neurological events following carotid endarterectomy (CEA). Herein, we are describing a novel surgical technique - ischemic postconditioning (IPCT), designed to attenuate the effects of IR.

Aim: The primary objective of our study was to evaluate the effects of the IPCT on neurological outcome in patients with high risk of IR injury after CEA.

Methods: The study represents an observational case-control study, of the Institution's carotid database. From December 2015 to December 2022, a total of 414 "high-risk reperfusion" patients were included in our study. The criteria for high risk of IR after CEA were: severe internal carotid artery (ICA) stenosis (>90%), severe bilateral ICA stenosis (>80%), severe ICA stenosis (>80%) with contralateral ICA occlusion and severe ICA stenosis with recent transient ischemic attack (TIA) or stroke. Carotid stenosis prior to CEA was evaluated by duplex ultrasound, confirmed by multidetector CT angiography. IPCT group included 207 patients in whom IPCT was performed after CEA and non-IPCT group 207 patients with CEA but without IPCT. IPCT procedure was performed by applying 6 cycles of 30 sec reperfusion (declamping of ICA) followed by 30 sec of ischemia (clamping of ICA) after finishing the initial CEA. The two groups of patients were compared in terms of intrahospital and early postoperative TIA, stroke, and neurological and overall mortality.

Results: Cumulative incidence of intrahospital postoperative TIA/stroke was significantly higher in the non-IPCT group when compared to IPCT group 5.8%% vs. 0.5% (OR 0.079; CI 95% 0.010 - 0.616; p = 0.002). During the 6 months follow-up, there were no TIAs, strokes or neurological mortality in both groups of patients.

Conclusion: In our study IPCT significantly reduced the incidence of postoperative cerebral ischemic events after CEA in patients with high-risk of IR after CEA.

OP03

DO VASCULAR PHYSICIANS HAVE THE RIGHT TO REFUSE INTERVENTIONAL TREATMENT IN PATIENTS WITH PERIPHERAL ARTERY DISEASE (PAD) THAT ARE CURRENT SMOKERS?

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Background: There is controversy whether we should treat patients with peripheral arterial disease (PAD) or not even when they do not attempt to stop it. We conducted a survey in order to investigate whether the physician may have the right to refuse an invasive treatment to PAD patients while they are still smokers.

Methods: A survey Monkey was conducted from May to August of 2022, including 11 main questions on the management of patients with PAD and history of smoking. The questionnaire was sent to vascular specialists in Europe, using Vascular Surgery Department of University of Thessaly mailing list.

Results: The response rate was 17,92% (100/558) and most of the physicians were males (85%), while 48% of them were practicing in a Tertiary hospital service. Most of the responders were experienced vascular specialists (>11 years of experience; 58%). Almost half of the physicians (44%) have never smoked. However, 73% of the physicians would treat a patient who is currently smoking. Almost half of them (46%) believed that it is not justifiable not to treat a current smoker patient with PAD. Almost all of the physicians (92%) have already treated a current smoker patient; 48% in order to improve quality of life, 23% after the patient reassurance that he will stop smoking; 12% due to compassion. After second subanalysis between two groups (refuse treatment vs do not refuse treatment), only age was identified as a factor; physicians <44 years old were more aggressive to refuse treatment in current smoking patients.

Conclusions: Almost all the physicians have already being treated current smoking patients in their experience. Smoking would not hinder most of the physicians to treat a patient with PAD. Younger physicians seem to refuse more often treatment in patients that are current smokers.

OP04

HEMODYNAMIC COMPARISON OF DIFFERENT TREATMENT MODALITIES DURING RECONSTRUCTION OF AORTO-ILIAC OCCLUSIVE DISEASE

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Background-Aim: Several surgical and endovascular techniques are used during treatment of aorto-iliac occlusive disease. Aorto-bifemoral bypass (AoBFB) is the standard of care, but other options such as axillo-bifemoral (AxBFB) bypass and aorto-iliac kissing stents (KS) are also available. We aim to perform a computational comparison of these 3 modalities.

Methods: Three patient-specific anatomies were analyzed. These were treated with an 18/9mm AoBFB, an 8mm AxBFB and 8mm balloon expandable KS for various indications. The CT angiographies were segmented from renal (or axillary) to common femoral arteries and the 3D-geometries were exported. A commercial finite volume solver was implemented for numerical simulations. Outcomes that were assessed were pressure drop (ΔP) between the inlet and the outlet for every configuration and hemodynamic indices of Time Average Wall Shear Stress (TAWSS), Oscillatory Shear Index (OSI) and Relative Residence Time (RRT) as markers of a thrombogenic environment to explain differences in patency rates.

Results: Our results indicate that maximum ΔP was observed at peak systole for all models, with a value around 20mmHg, 45mmHg and 70mmHg for the AoBFB, KS and AxBFB, respectively. Mean ΔP was 70% and 330% higher in the AxBFB and KS configurations compared to AoBFB.

TAWSS, OSI and RRT varied among different configurations, but mostly presented values well above thrombogenic thresholds. Taking into account RRT the percentage of total surface area presenting such values is 1%, 1% and 4.4% for the AoBFB, KS and AxBFB configurations.

Conclusion: Computational modelling indicates a favorable hemodynamic performance of AoBFB compared to KS and AxBFB. This leads to a smaller pressure drop and subsequently a higher pressure in the outlet of the conduit which can be considered as the perfusion pressure of the limb. At the same time, lower patency rates of the latter modalities cannot be definitively explained based on hemodynamic indices alone.

OP05

EFFECT OF FRESH FROZEN PLASMA TRANSUSION ON FIBRINOGEN LEVELS AND OUTCOME IN PATIENTS UNDERGOING ELECTIVE ENDOVASCULAR REPAIR OF ABDOMINAL AORTIC ANEURYSM

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Background-Aim: The aim of the present study is to investigate wheather the transfusion of 2 units of fresh frozen plasma (FFP) can affect the perioperative fibrinogen serum levels and the outcome in patients undergoing elective endovascular repair (EVAR) of infrarenal abdominal aortic aneurysm.

Methods: The study recruited patients after EVAR with the bifurcated stent-graft Endurant-II (Medronic) from 2 vascular units. The patients from the first unit received immediately post aneurysm occlusion 2 units of FFP and formed the FFP group, the patients from the second unit formed the control group as they did not receive any FFP. Serum fibrinogen levels were measured on admission and 24 hours postoperatively. The two groups were compared with regards to perioperative fibrinogen levels and outcome (endoleaks, re-interventions, major adverse cardiovascular events, death) during follow up.

Results: Seventy patients were examined (41 in the FFP group, 29 in control group). The majority were men (68), the mean age was 70+/-7 years and the maximum aneurysm diameter was 63.3 +/-13.8 mm. Six endoleaks were recorded (2 type Ia, 3 type Ib, 1 type II) during follow up (34 +/-19 months). Mean levels of serum fibrinogen was 391.1 +/- 92.8 mg/dl preoperatively, 367.7 +/- 97.8mg/dl 24 hours post-procedure and the mean change in fibrinogen (Δfib, 24hours postoperative minus preoperative level) was -23.5 +/- 51.02 mg/dl. The FFP group had significantly higher 24 postoperative fibrinogen levels and lower Δfib levels compared to control group. No signicant differences were observed between the two groups regarding outcome measures.

Conclusions: FFP Transfusion immediately after exclusion of aneurysm sack during EVAR prevents a significant drop in plasma fibrionogen but the impact on clinical outcome remains unknown.

OP06

ENDOVASCULAR TREATMENT OF RUPTURED AORTIC ANEURYSMS USING THE ENDURANT STENT-GRAFT

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Aim: Endovascular abdominal aortic aneurysm repair (EVAR) represents the main approach for ruptured abdominal aortic aneurysm (rAAA) treatment. The aim of this analysis is to present a single tertiary center experience of rAAA endovascular repair using the Endurant stent-graft.

Methods: A retrospective analysis of prospectively collected data from a single tertiary center, including all patients with ruptured infrarenal and juxta- para- supra-renal abdominal aortic aneurysm treated endovascularly using the Endurant stent-graft from 2008 to 2023 was conducted. Patients managed with the Endurant platform and chimney technique were also included. The primary outcomes were mortality at 30 days, technical success, and reintervention.

Results: One hundred and four patients were treated with EVAR due to rAAA; 96 (92.3%) of them underwent endovascular repair with the Endurant device. The mean age was 73.5±9,3 years and 91,6% were males. The mean AAA diameter was 80.43±18.8mm. Nine patients (9.37%) were managed using the chimney technique (chEVAR; six double chimney and three triple chimney); 59 (61%) with bifurcated endograft, 24 (27.6%) with the aorto-uni-iliac device and femoro-femoral bypass, 11 (12.64%) using iliac limbs, and 2 (2.3%) using an aortic cuff. Technical success was 98.9%. Early re-intervention was required in 5 (5.2%) patients. The median intensive care unit stay was 3.37 days (range 0-46 days). Infrarenal rEVAR 30-day mortality rate was 37.5% (36 deaths), and 22.2% (2 deathts) in chEVAR.

Conclusion: EVAR for rAAA using the Endurant device provided high technical success and low reintervention rate, while the early mortality rates were also acceptable.

OP07

ENDOVASCULAR TREATMENT OF A FORTY-YEAR-OLD POST-TRAUMATIC KNEE ARTERIOVENOUS FISTULA

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Background-Aim: Arteriovenous fistulas (AVFs) of the lower extremity are uncommon. The main causes are traumatic or iatrogenic, with 15% of traumatic AVFs occurring in the popliteal vessels.There have been a few reported cases of AVFs resulting from aneurysmal dilation caused by Marfan disease, human immunodeficiency virus arteritis, and undefined factors. It is highlighted that without repair, complications may include symptomatic venous congestion with subsequent venous ulceration, venous thromboembolism, arterial steal, and high-output cardiac failure.

Methods: A 60-year-old female with a history of a car accident forty years ago, that caused bone fractures in her right leg, presented with right leg venous claudication and symptoms of congestive heart disease. Duplex ultrasound of the lower limb vessels revealed an AVF in the distal part of popliteal artery and CTA confirmed the popliteal AVF. The patient was successfully managed with an endovascular approach and patency of the leg was restored. Initially, a self-expandable stent-graft was deployed (Viabahn 5*10mm, W. L. Gore & Associates). Due to retrograde endoleak of the distal part of the stent-graft we decided to proceed with an extra kissing stent of the posterior and peroneal artery using two 5mm BE Papyrus Stent-Grafts (BIOTRONIK). Also, a microcatheter remained in the space behind the stent grafts and coil embolization of the remaining space of the AVF followed, using 5mm Rubi Coils (Penumbra, Inc.). Final angiography revealed the absence of the previous AVF, no venous plexus depiction and patency of the distal arteries.

Results: At one month follow-up, an impressive regression of 3 cm of the lower extremity edema was observed. Also, upon DUS examination, remission of the AVF was noted and patency of all the distal arteries was achieved.

Conclusions: Primary recognition and management of lower extremity AVFs are of high importance to avoid further complications. An endovascular approach can offer excellent results.

OP08

IMPACT OF THE INCREASE USE OF PERCOUTANEOUS EVAR THROUGH YEARS IN A TERTIARY CENTRE

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Aim: Recently, percutaneous endovascular abdominal aortic aneurysm repair (pEVAR) has gained its role in abdominal aortic aneurysm (AAA) treatment. The aim of the study is to report the increase of pEVAR in a tertiary center through years and its impact on clinical outcome.

Methods: A single-center, observational, retrospective study of prospectively collected data was conducted. All patients who underwent elective pEVAR (using the Proglide device from Abbott) and EVAR with femoral cutdown access between 2017 and 2023 were included [2017-2019 early pEVAR experience (253 patients); 2020-2023 late experience (317 patients)]. Baseline characteristics, intra- and perioperative data were collected. The main outcomes measured were the rate of pEVAR application, the need for blood transfusion and hospital stay.

Results: A total of 570 patients were treated by endovascular means (17% EVAR vs 83% EVAR). Mean age was similar between groups (pEVAR 72±7.5 vs EVAR 72.3±7; p=0.68). The mean number of Proglide closure devices that was used for right and left access was 123 and 126 respectively. There was no difference in terms of type of anaesthesia [pEVAR: local 6% and 94% general anaesthesia (GA) vs EVAR: local 9% and 91% GA, p=0.38].The mean operation time was lower for pEVAR (111±40) vs EVAR 129±45 (p=0.000), while the need for transfusion was similar between groups [pEVAR: 18/99 (18.2%) vs EVAR: 70/434 (16%) p=0.65]. The average hospital stay was significantly lower for patients who underwent pEVAR (1.4±0.8) vs EVAR 3.23±2 (p=0.000). Only 1 death occurred in EVAR group. In the initial period pEVAR was used only in 10% of cases, while it was increased significantly in the later experience to 23%.

Conclusions: pEVAR is a growing trend in the treatment of AAA, and compared with femoral cutdown access, it can be considered safe and effective, reducing the operation time and hospital stay.

OP09

OVERCOMING DIFFICULTIES IN THE ILIAC BIFURCATION. THE OFF THE SHELF COVERED ENDOVASCULAR RECONSTRUCTION OF ILIAC BIFURCATION (CERIB) TECHNIQUE

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Background/Aim: Distal landing zone in iliac arteries represents a common problem during endovascular repair of abdominal aortic aneurysms (EVAR), especially in cases of common iliac artery (CIA) aneurysm or short CIA. The aim of this study is to present a novel technique for landing in the external iliac artery (EIA) during EVAR, with blood flow reservation of the internal iliac artery (IIA), using balloon expandable covered stents (BXCS).

Methods: This is a single-center, retrospective, observational study including patients that underwent EVAR with distal landing zone extending to the EIA, due to CIA aneurysm, type Ib endoleak (ETIb) or a short CIA. The technique is aiming to endovascularly reconstruct the iliac bifurcation, and we name it Covered Endovascular Reconstruction of Iliac Bifurcation (CERIB). For EIA and IIA coverage BXCS were used in parallel configuration, landing inside the ipsilateral iliac limb of the abdominal stent-graft. The distal diameter of the limb was chosen according to the diameters of BXCS to achieve an oversizing of about 10-20%.

Results: Nine patients with 11 CERIB procedures were included (mean age: 72.5± years, 100% males). Indications included 2 patients with ETIb, 5 patients with aorto-iliac aneurysms, and 2 patients undergoing EVAR having a short CIA. In total, six Cook Zenith, two Medtronic Endurant and one Gore Excluder aortic endografts were deployed. Percutaneous femoral access was used in 5 patients. In all patient Gore VBX long BXCS were used. Technical success was 100%. First month CTA (7 available; 8 iliacs) showed full patency of all iliac bifurcations, with only 1 small gutter endoleak which is under surveillance. No death or other complication was observed.

Conclusion: Endovascular Reconstruction of Iliac Bifurcation (CERIB) using BXCS seems a feasible and efficient off-the-shelf technique for endovascular distal iliac zone sealing, while further postoperative surveillance is necessary for robust long-term outcomes.

OP10

CHANGES IN THE MORTALITY AFTER RUPTURED ABDOMINAL AORTIC ANEURYSM REPAIR IN A 16-YEAR TRANSITION PERIOD FROM OPEN SURGERY TO EVAR

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Introduction: Recent guidelines recommend endovascular aneurysm repair (EVAR) as the first option the treatment of ruptured abdominal aortic aneurysms (rAAAs). This study demonstrates the changes in 30-day mortality after the implementation of a structured transition program from open surgical repair (OSR) to EVAR in a reference tertiary center.

Methods: Retrospective analysis of prospectively collected clinical data including all patients with rAAAs treated with OSR or EVAR from 2006 to 2023. Three periods were identified: first (2006-2011), second (2012-2017) and third (2018-2023). The primary outcome was the 30-day mortality in relation to the changing pattern of treatment (OSR and EVAR).

Results: Two hundred patients were treated, 108 with endovascular repair (54%) [EVAR (98), Ch-EVAR (9), BEVAR (1)] and 92 (46%) with OSR. In the first period 61 patients were treated (21% EVAR, 79% OSR), in second 68 (47% EVAR, 53% OSR) and in third 71 (83% EVAR, 17% OSR). Aorto-uni-iliac device was used in first period in 38% of EVAR cases, in second 47%, and in third 8%. rAAAs with a previous EVAR were treated in the second (9%) and third period (17%). Only in the third period juxta-renal rAAAs were treated with EVAR (14%). The total 30-day mortality rate was: OSR 68% (63/92) and EVAR 31% (34/108). In the first period was 46% (31% EVAR, 50% OSR), in the second 64% (46% EVAR, 80% OSR) and in the third 35% (25% EVAR, 83% OSR). After multivariate analysis age > 80 years (OR 0.39, P = .005), initial period (OR, 2.05, P = .012), and OSR (OR 5.3, P = .005), were associated with higher 30-day mortality.

Conclusion: The implementation of a structured transition programme from OSR to EVAR in the treatment of rAAAs resulted in a considerable improvement of the 30-day mortality.

OP11

RUPTURE AFTER EVAR: DATA DERIVED FROM META-ANALYSIS OF PUBLISHED STUDIES

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Background-Aim: A systematic review was undertaken to summarize published data on the late rupture of abdominal aortic aneurysm (AAA) after previous endovascular repair (EVAR).

Methods: We performed a systematic review in conformity with the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines and the review protocol was registered in PROSPERO (CRD42022366951). Search methodology and inclusion strategy were predefined in a research protocol. We included studies reporting on either EVAR or open surgical repair (OSR) of rupture after previous EVAR. The primary endpoint was perioperative mortality. A meta-regression was subsequently undertaken to determine the impact of different risk factors on perioperative mortality.

Results: Twenty-one studies (reporting on 710 patients) were included. Mean time to rupture after the primary EVAR procedure was 40 (range 16-72) months and the cumulative incidence for late rupture was 1.6% (range 0.2-3.2%). The pooled perioperative mortality was 29.1% (95% CI:22.3-37.0). Moreover, the pooled risk ratio (RR) for perioperative mortality with OSR versus EVAR was 1.81 (95% CI:1.31-2.51) in favor of EVAR. Of the variables tested, only study publication year, mid-time study point and complete endograft explantation were significantly associated with perioperative mortality.

Conclusions: The risk for late rupture after EVAR represents the Achilles' heel of the procedure. Data derived from this meta-analysis justify an EVAR-when feasible approach to manage this complication.

OP12

ENDOVASCULAR REPAIR OF NELLIX® ENDOGRAFT'S PROXIMAL SEALING ZONE FAILURE USING THE ALTURA™ STENT-GRAFT DEVICE: A CASE REPORT AND REVIEW OF LITERATURE

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We report a case of endovascular repair of Nellix® endograft's proximal sealing zone failure using the Altura™ stent-graft device and we review the literature.

OP13

THIRTY-DAY OUTCOMES OF JUXTA-, PARA- AND SUPRARENAL AORTIC ANEURYSM REPAIR USING THE CHIMNEY TECHNIQUE

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Aim: To report the 30-day outcomes of para-, juxta- and suprarenal abdominal aortic aneurysm repair using the chimney technique (ChEVAR).

Methods: A single center observational retrospective study of prospectively collected data was undertaken. All patients who underwent ChEVAR for para-, juxta- and suprarenal aortic aneurysms, from May 2016 to December 2022 were included. Baseline characteristics, intraoperative details and perioperative data were collected. Main outcomes included technical success and 30-day mortality. Endoleaks, target vessel (TV) complications and major adverse events at 30 days were also analyzed.

Results: Sixty-nine patients (mean age: 72 years, males: 94.2%) were included. Repair included 28 (40.6%) juxtarenal, 34 pararenal (49.2%), seven suprarenal (10.1%) and three aortic aneurysms. Fifty-eight patients (84%) were asymptomatic, while two were symptomatic (2.9%) and nine (13.1%) patients presented with rupture. Nine patients (13%) were managed due to failed previous EVAR. Technical success was 100% while the 30-day mortality was 8.7% (6/69 patients). No cases of acute kidney injury (AKI) were observed. Two (2.9%) ischemic strokes and two (2.9%) myocardial infarctions were observed. 142 target vessels (TVs) were successfully stented; 113 (79.5%) renal arteries and 25 (17.6%) superior mesenteric arteries (SMAs). Two TV complications were recorded and managed with relining (1.4%) at 30-day follow-up. In total, 14 endoleaks (20.2%) were observed (Type II (5), Gutter (5), Ia (1), Ib(3)). All gutter endoleaks resolved within 30-days.

Conclusions: ChEVAR is a reliable endovascular option for the management of juxta, para- and suprarenal aortic aneurysms. Early mortality was acceptable while morbidity and TV complications were low at 30-days.

OP14

ENDOVASCULAR REPAIR OF AORTIC ANEURYSMS USING FENESTRATED AND BRANCHED DEVICES; 30-DAY OUTCOMES

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Aim: To report the 30-day outcomes of patients treated with fenestrated or branched endovascular aortic repair (F/BEVAR).

Methods: A single center observational retrospective study of prospectively collected data was executed. All consecutive patients treated with F/BEVAR from February 2018 until December 2022 were included. Baseline data, intra-operative details and peri-operative outcomes were collected and analyzed. The main outcomes included mortality and major adverse events at 30-days. The presence of any endoleak and target vessel (TV) complications were also included and analyzed.

Results: Fifty-one patients (mean age: 69.5±5.7 years; 96% males) were included. Six (12.7%) were treated urgently; two (1.6%) for ruptured aneurysms. Repair included 17 pararenal (33.3%), six juxtarenal (11.7%), and 28 (39.2%), throracoabdominal aneurysms. Nine patients (20%) needed repair due to previous failed EVAR. Twenty-two patients (44%) were treated using FEVAR while 29 patients (51%) using BEVAR. There were two cases of spinal cord ischemia (3.9%), presenting with permanent paraplegia and temporary paraparesis, respectively. Thirty-day mortality was 5.8% (3/51 patients). In total, 185 target vessels (TV) were successfully stented. Technical success was 100%. Six (11.7%) endoleaks were observed; including two type III, repaired using relining and molding balloon, respectively. No type Ia or Ib endoleaks were recorded. No TV complications were observed at 30-days.

Conclusions: The initial F/BEVAR experience presented high technical success, with acceptable peri-operative mortality and low morbidity rates while SCI was less than 5%.

OP15

IMPACT OF ENDOVASCULAR REPAIR OF ABDOMINAL AORTA ANEURYSMS (EVAR) ON ACUTE KIDNEY INJURY (AKI)

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Background/Aim: Acute Kidney Injury (AKI) is a serious post-operative complication that may impact on mortality, morbidity, and cost. The incidence after endovascular aneurysm repair (EVAR) remains unknown and the rapid detection is difficult, but crucial for the treatment. The aim of this study is to assess the incidence of AKI after elective EVAR and examine the role of specific biomarkers in early diagnosis, compared with the eGFR fluctuations.

Methods: This was a prospective cohort study, including 100 consecutive patients undergoing elective EVAR for an infrarenal abdominal aortic aneurysm in our clinic. The primary endpoints were incidence of AKI, as per KDIGO criteria and calculation of eGFR, with CKD-EPI (2021) definition, and biomarkers NGAL (serum and urine), KIM-1, IL-18 and Cystatin-C, with ELISA pre-operative (baseline), 6, 24, 48h and 8days post-operative. Percentage differences were calculated between all possible time points where measurements were taken regarding all five indices and eGFR as well. The Spearman's Rho correlation coefficients that were estimated in all cases.

Results: Measurements showed a statistically significant and negative relationship, regarding the timeframe, between baseline and 48 hours, of eGFR % change and the % change of KIM-1, NGAL Urine and IL-18. Rho= -0.495;p<0001, Rho= -0.383;p<0.009 και Rho=-0.44;p<0.001, respectively. The average of % decrease for eGFR at this timeframe was 10.15%, while the average % increase on KIM-1, NGAL Urine and IL-18 was 33.30%, 252.7% και 32.39% respectively. Regarding NGAL urine, a statistically significant and positive correlation was observed between baseline and 8 days with eGFR (Rho= 0.335;p=0.026). Comparisons were conducted between suprarenal and subrenal grafts in the % changes observed. Differences were not statistically significant according to the Mann Whitney U-test regarding all biomarkers.

Conclusions: Biomarkers and especially NGAL Urine can predict faster than eGFR the incidence of AKI in patients with EVAR and submit effective treatment.

OP16

INVESTIGATION OF INTRAPROCEDURAL DOPPLER ULTRASONOGRAPHY BLOOD FLOW PARAMETERS DURING PERIPHERAL ENDOVASCULAR PROCEDURES FOR CHRONIC LIMB-THREATENING ISCHEMIA

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Aim: To assess feasibility and value of Doppler ultrasound (DUS) blood flow parameters as quantifiable functional endpoints of endovascular arterial procedures for chronic limb-threatening ischemia (CLTI), and prognostic factors of wound healing.

Methods: This was a prospective, single-center, study, investigating intraprocedural DUS parameters (Pulsatility Index; PI and Pedal Acceleration Time; PAT) for the quantification of hemodynamic changes in consecutive CLTI patients with WiFi wound class≥1, undergoing endovascular interventions. Primary feasibility endpoints were pre- and post-endovascular treatment measurements of PI/PAT, quantification of immediate changes of the PI/PAT in the posterior and anterior foot circulation following revascularization, and correlation between PI/PAT and 6-months complete wound healing. Secondary endpoints included 6-months limb salvage, complete and partial wound healing rates.

Results: In total 28 patients (21 male; 75.0%) with 68 vessels were enrolled. Overall mean PAT values significantly decreased from 154 15±70.35 ms baseline to 107.21±49.6 ms, post-intervention ($p<0.01$) and mean PI values significantly increased from 0.93±0.99 to 1.92±1.96 ($p<0.01$). Strong correlation was found between post-procedural PAT at the anterior tibial (r^2 0.804; p=0.346) and the posterior tibial artery (r^2 0.784; p=0.322) and essential correlation between post-procedural PI at the anterior tibial (r^2 0.704; p=0.301) and the posterior tibial artery (r^2 0.707; p=0.369), with 6-month complete wound healing. The 6-month complete and partial wound healing rates were 38.1% and 47.6%, respectively. Limb salvage was 96.4% and 92.4% at 6 and 12 months.

Conclusions: In patients with CLTI, PAT and PI accurately detected immediate post-intervention hemodynamic alterations at the foot and could serve as prognostic factors of wound healing.

OP17

ROTAREX™ MECHANICAL THROMBECTOMY FOR TREATING STENT-GRAFT LIMB THROMBOSIS AFTER ENDOVASCULAR ANEURYSM REPAIR

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Introduction: Stent-graft limb thrombosis after endovascular aneurysm repair (EVAR) is a quite common complication that may affect long-term outcome. We present the outcomes of a case series of stent-graft limb thrombosis treated by mechanical thrombectomy.

Methods: Eight male patients (mean age 71.6 ± 8.5 years) presented with stent-graft limb thrombosis after EVAR. Median time to occlusion from initial EVAR was 9 (range 1-60) months, while median time from occlusion to reintervention was 1.5 (range 1-6) months; 7 occlusions were unilateral and one bilateral. The presenting symptom was intermittent claudication (n = 7) and acute limb ischaemia (n = 1). Mechanical thrombectomy was undertaken using the 10F Rotarex™ Rotational Excisional Atherectomy System (Becton, Dickinson and Company, Franklin Lakes, USA) with subsequent stenting/reline of the affected limb.

Results: Technical success was achieved in all patients. The Rotarex™ catheter achieved debulking of most of the thrombotic material, allowing additional endograft limbs, or covered and bare metal stents to be deployed to support a new healthy lumen surface. Limb relining was used in all patients, main body relining in two patients, while outflow stenting to the external iliac artery was used in 4 patients. Symptoms were relieved in all patients. Median length of stay was 2 (range 1-3) days. All cleared limbs remain patent at median 6 (range 3-18) months follow-up.

Conclusion: Debulking with Rotarex™ rotational atherectomy combined with stent-graft relining appears to be effective and safe in treating stent-graft limb thrombosis after EVAR in acute and subacute phases.

Arterial case presentations

UNDERSTANDING COVID-19-ASSOCIATED COAGULOPATHY IN LONG COVID: TREATING A PATIENT WITH CAC AND OCCLUSION OF BRACHIAL, CUBITAL AND ULNAR ARTERIES FOLLOWING ATTEMPTED A-LINE INSERTION

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Background-Aim: This report presents a comprehensive review of the management approach in a patient with Long COVID, COVID-19-associated coagulopathy (CAC) & arterial thromboembolism following A-Line insertion. Long-COVID or Post-Acute Sequelae of SARS-CoV-2 Infection (PASC): characterized by a broad range of physical & mental symptoms or symptom clusters that develop during or after COVID-19, persist for at least 2 months, impact the patient's life & are not explained by an alternative diagnosis (CDC & WHO). CAC is a hypercoagulable state, which can be explained by Virchow's triad, leading to thromboembolic manifestations.

Methods: A 65-year-old male was admitted 8 weeks post-COVID with severe hypoxemia and signs of ARDS. Further testing revealed that the patient was still positive for COVID. Upon attempted radial A-line, it was found that the radial artery was already occluded, & a brachial A-line was inserted instead. The patient later presented with hand ischemia, and further investigations (Duplex & CT-Angiogram) revealed occlusion of the brachial, ulnar, and radial arteries. Blood work indicated a prolonged PTT, elevated fibrinogen and D-Dimer levels, and normal platelet counts, which suggested arterial occlusion following endothelial injury & CAC. A distal brachial thrombectomy with Fogarty catheter was performed under LA. After extracting the thromboembolic debris, arteriotomy was closed using patch angioplasty.

Results: Completion DSA confirms clearance of the thromboembolic material, patency of the vessels & adequate palmar arch collateral's. During the procedure, 5000 units of Heparin & postoperative PTT-controlled heparin infusion for 24 h was administered. Later on patient was put on DOAC. 2-Weeks follow-up showed good arterial flow & positive Allen test.

Conclusions: In inpatients with COVID-19, routine laboratory testing should include a CBC with platelets , PT & aPTT, fibrinogen ,D-dimer & CRP. Comorbidities, high Sepsis-Induced Coagulopathy score ,elevated levels of D-dimer, CRP & other DIC markers are associated with worse prognosis. Adequate collateral hand circulation should be checked before insertion at the radial, ulnar, cubital, or brachial artery to avoid hand ischemia. Initial anticoagulant treatment with LMWH can reduce mortality & improve arterial oxygen pressure. Clinicians should remain vigilant for this rare but serious complication to prevent permanent tissue damage & loss of function.

A RARE CASE OF NON-IATROGENIC, NON-TRAUMATIC THYROCERVICAL TRUNK ANEURYSM TREATED SUCCESSFULLY BY SELECTIVE EMBOLISATION

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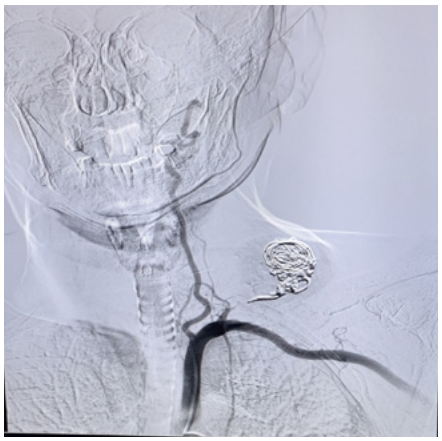
Background-Aim: Aneurysms of the thyrocervical trunk are rare complications of iatrogenic injury or vascular trauma. Clinical symptoms may include a pulsatile mass which can cause mass effect on adjacent structures. True aneurysms are extremely rare. We present a case of non-iatrogenic, non-traumatic aneurysm of the left thyrocervical trunk treated in our department by endovascular means.

Methods: A 83 years-old female presented as a referral by a general surgeon. She had a palpable, pulsatile mass of the left supraclavicular area, concomitant paresthesia and pain when lifting her arm. No history of trauma or catheterization in the area was mentioned. Bilateral brachial, radial and ulnar pulses were present, without any ischemic lesions of the digits. Systolic arterial pressure was measured the same bilaterally. No signs of local hemorrhage were present and the mass was felt mildly pulsating. A diagnostic CT-angiogram (CTA) revealed a saccular aneurysm (~4x4cm) originating from the left thyrocervical trunk with eccentric wall thrombus and no signs of rupture.

Results: The patient was admitted in the vascular surgical department for further evaluation and treatment. Under local anesthesia, the patient underwent left common femoral artery puncture, selective catheterization of the thyrocervical trunk and embolisation of the aneurysmal sac followed. A completion angiogram certified aneurysm exclusion. The patient had an uncomplicated post-procedural course and was discharged after 2 days. A follow-up CTA was scheduled in 1 month.

Conclusions: True aneurysms of proximal subclavian artery and its branches are usually atherosclerotic. Less common causes include fibromuscular hyperplasia, syphilis, neurofibromatosis, arteritis, cystic medial necrosis, tuberculous lymphadenitis, and congenital defects. If left untreated, dysphagia, hoarseness, respiratory distress, vocal cord palsy, brachial plexus compression, thromboembolism, and spontaneous rupture leading to hemothorax or even death can occur. Open surgery has showed good results, however, an endovascular approach may be favorable due to its less invasive nature and excellent results.



NEUROCOGNITIVE PROFILE OF A MALE PATIENT WITH PERIPHERAL ARTERIAL DISEASE

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Background: Peripheral Arterial Disease (PAD) increases the risk for developing coronary artery disease and cerebrovascular disease, which often leads to a heart attack or stroke. PAD patients show decreased performance across a variety of domains of neurocognitive function. The purpose of the present study is to investigate the neurocognitive functions in a male patient with Peripheral Arterial Disease using comprehensive neuropsychological testing.

Aim: We aimed at having an accurate profile of the level of neurocognitive emotional and social functions and the ability to perform daily activities.

Methods: We conducted a neuropsychological assessment of XF a 53 year's old man, with university education. The patient was assessed with a battery of neuropsychological tests normed to Greek population, that examine memory, attention, visual-spatial, executive, and language functions. We had an assessment of anxiety, depression, positive and negative mood as well as quality of life as performance on neuropsychological tests may be influenced by a patient's mood state.

Results: Cognitive decline was defined as a decrease of 1 SD or more in patient's performance on one or more of the neuropsychological tests, relative to Greek normative data ($p<0.001$). Our results revealed neurocognitive deficits, in some neurocognitive functions and good performance in others. Patient's performance showed decline in attention and memory but was in the high average range on visuospatial perception.

Conclusions: Our findings suggest neurocognitive deficits and impaired neurocognitive functions, in a patient with PAD. A comprehensive neuropsychological testing is essential to detect neurocognitive impairment in patients with PAD.

FAILED CAS WITH DISSECTION, DAPT, KINKING OF ICA, HYPERTENSION CRISIS - WHAT ELSE CAN COMPLICATE THE OPERATION OF CEA ON THE FOLLOWING DAY?

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The presentation is about a difficult carotid endarterectomy (CEA) that I performed on a 64-year-old lady who had CAS the day before. CAS was complicated with a dissection of ICA and hypotonia that forced the interventional radiologist to leave the patient without a stent in ICA. She was qualified for an urgent CEA. She was on the dual antiplatelet therapy (DAPT), as every CAS patient. Moreover, she had complicated anatomy of ICA with the full loop and during the operation she had poorly controlled blood pressure rises. During CEA there were technical problems that ended with an implantation of interposition PTFE graft. All ended well and the patient went home without neurological deficits. However, she died on myocardial infarction 36 days after CEA procedure.

SALVAGING INTERNAL ILIAC ARTERIES WITH MECHANICAL THROMBECTOMY AFTER FAILED SURGICAL THROMBECTOMY, CATHETER-DIRECTED THROMBOLYSIS AND BALLOON ANGIOPLASTY TO RESTORE SEXUAL FUNCTION OF A YOUNG MALE

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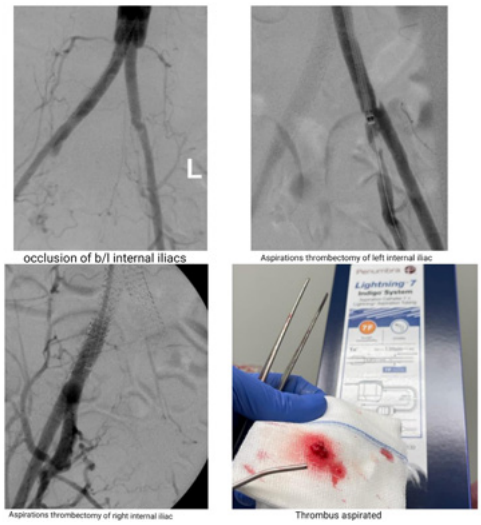
Background-Aim: Acute occlusion of internal iliac arteries is one of the major complications during Fogarty balloon catheter thrombectomy in cases of aortoiliac occlusive disease. Recanalization of internal iliac arteries is important to preserve sexual function in males. In such cases, aspiration thrombectomy acts as a game-changer when catheter-directed thrombolysis and balloon angioplasty fail. Here, we present a case where the Penumbra thrombectomy system was used to treat a young man with claudication and erectile dysfunction.

Methods: A 40-year-old male with Leriche Syndrome underwent open aorticendarterectomy and thrombectomy of the common iliacs with implantation of covered stents after a failed attempt at CERAB. Three months later, patient presented with reocclusion of iliac arteries and infrarenal aorta. During attempted Fogarty thrombectomy of the infrarenal aorta, the common and external iliacs catalyzed the occlusion of internal iliac arteries, which prompted us to perform catheter-directed thrombolysis with actilyse following balloon angioplasty, which left us in vain. After failed recanalization, thrombolysis catheters were left in situ, followed by continuous infusion of actilyse over 24 hours. Second-look angiography the following day persistent impacted thrombus, and to salvage the situation, we attempted a mechanical thrombectomy using Penumbra lightning 7 catheter with simultaneous DCB-PTA of the internal iliacs.

Results: Mechanical thrombectomy with Penumbra lightning 7 catheter and simultaneous angioplasty with a drug-coated balloon and perioperative PTT-controlled heparin infusion achieved complete patency of the internal iliac arteries. A 2- and 6-month follow-up showed not only palpable pulses at the groin and in the popliteal fossae. Sonographically and angiographically both internal iliac arteries were patent. Furthermore, the patient did not display any signs of erectile dysfunction.

Conclusion: Mechanical thrombectomy can be a lifeline when combined with Standard procedures like thrombolytic infusion & Balloon angioplasty.



ROTATIONAL ATHERECTOMY: AN EFFECTIVE ALTERNATIVE TO TRADITIONAL BYPASS SURGERY IN MULTIMORBID PATIENTS WITH TOTAL-LENGTH OCCLUSION OF THE SUPERFICIAL FEMORAL ARTERY

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Background and Aim: Endovascular treatments are commonly regarded as a first choice in patients with femoropopliteal lesions. However, patients with diffuse lesions and occlusion along the total length of superficial femoral artery (SFA) are usually considered as candidates for open bypass surgery. We report the short-term results of rotational atherectomy in multimorbid patients with total length SFA lesions.

Methods: Patients with chronic occlusion along the entire SFA length, ASA class III/IV and Rutherford categories 3 and 4, were treated with Jetstream ™ rotational atherectomy. In all the cases, SFA was found occluded from the origin to the popliteal artery with no proximal stump. The SFA was recanalized with either 0.035 or 0.018 stiff guidewires using the cross-over technique. Rotational atherectomy along the entire SFA length was followed by adjunctive drug-eluting balloon treatment. Patients were re-evaluated clinically and with color doppler ultrasound six weeks after the operation.

Results: A total of seven patients (including 5 males) with a mean age of 73.8±14.8 years were prospectively subjected to treatment between September 2022 and March 2023. Technical success and 6-week primary patency were found to be 100%. There were no reports of access site complications, distal thromboembolization, or perforation. Two patients required bare stent implantation intraoperatively due to a flow limiting dissection at the SFA origin. All the patients reported at least 1 Rutherford category improvement at the 6-week follow-up.

Conclusion: Rotational atherectomy followed by drug-coated balloon-angioplasty is deemed a feasible and effective treatment option and may be a substitute for bypass surgery in patients with a high surgical risk. However, randomized trials with long-term follow-up are warranted to further investigate the efficacy and outcomes of the rotational atherectomy technique in multimorbid patients with total length SFA occlusion.

ENDOVASCULAR REPAIR OF AORTIC BIFURCATION AND BILATERAL COMMON ILIAC ARTERY OCCLUSION USING THE BEBACK CATHETER

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The patient presented with severe intermittent claudication due to aortic bifurcation and bilateral common iliac artery occlusion. The patient was successfully treated by endovascular means using the BEBACK catheter and the kissing stent technique.

HYBRID APPROACH FOR THE MANAGEMENT OF TRAUMATIC FEMORAL ARTERY AVF

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Aortic case presentations I

ENDOVASCULAR REPAIR OF LARGE SYMPTOMATIC SUPRARENAL ABDOMINAL AORTIC ANEURYSM ON THE GROUNDS OF A TYPE IA ENDOLEAK USING THE "OFF-THE-SHELF" T-BRANCH DEVICE

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The patient presented with a large (~10cm), symptomatic, suprarenal abdominal aortic aneurysm following a type Ia endoleak after a previous endovascular repair of an abdominal aortic aneurysm (failed EVAR) using the OVATION stentgraft.

The patient underwent successful endovascular repair by using the "off-the-shelf" T-Branch device and the "kissing-stents" technique for distal sealing.

LOW BACK PAIN FALSELY ATTRIBUTED TO AN AAA, IN A PATIENT WHO UNDERWENT EVAR AND DIED 2-MONTHS POSTOPERATIVELY DUE TO A METASTATIC ANGIOSARCOMA

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Background-Aim: Abdominal and/or low back pain in a patient who is diagnosed with an AAA is frequently attributed to the vascular lesion while alternative pathologies may escape diagnosis.

Methods: A 75-year old patient was urgently referred due to low back pain starting 20-days ago, who was diagnosed with a 9cm AAA.

Results: At presentation he was hemodynamically stable and alert. He was complaining about low back pain which intensified during movements and specific body positions. CT angiography indicated an intact 9cm infrarenal AAA, with no signs of impending rupture. The following day he underwent percutaneous EVAR with the ALTO endograft (Endologix, Irvine, Calif). The operation and the postoperative course was uneventful and he was discharged the 2nd post-operative day.

The patient attended the scheduled 1-month follow-up and he had a CT scan which indicated a type II endoleak, with no other remarkable findings.

Two months postoperatively, he was urgently admitted due to low back pain exacerbation, fatigue and severe anemia. A new CT scan indicated a new Type-II endoleak and a large hematoma of the left psoas muscle with multiple sites of intramuscular extravasation. At that time osseous metastases were found at the head of the left femoral bone and at the iliac bones in both sides. The patient underwent CT-guided biopsy from the femoral head. Patient's anemia was unresponsive to blood transfusion and the 5th day after the admission, the patient died. The pathologic examination indicated a well differentiated angiosarcoma. Retrospective examination of the pre-operative CT scan revealed a small osseous lesion at the left iliac bone, while in the 1-month postoperative CT at least 3 such lesions could be identified, all having gone unnoticed.

Conclusions: In the absence of typical symptoms, alternative pathologies should be sought to explain the clinical condition of patients with incidentally diagnosed AAAs.

CUSTOM MADE FENESTRATED ENDOVASCULAR DEVICE IMPLANTATION FOR RE-LINING PREVIOUS EVAR WITH PROXIMAL DILATATION DUE TO TYPE I ENDOLEAK

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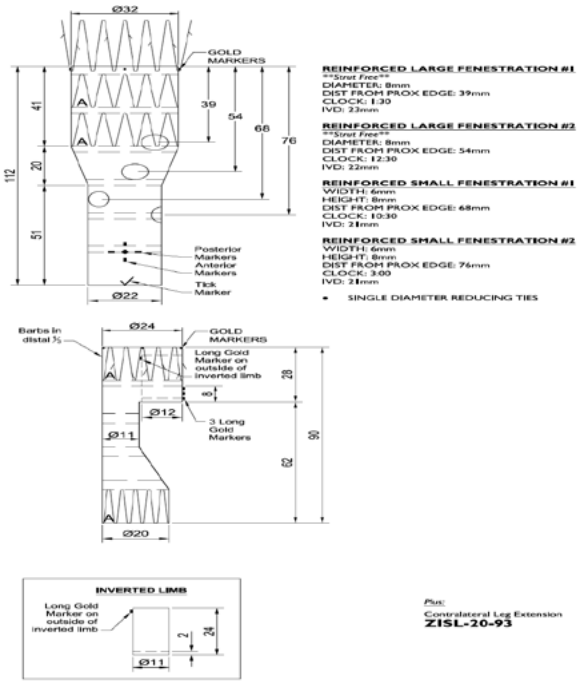
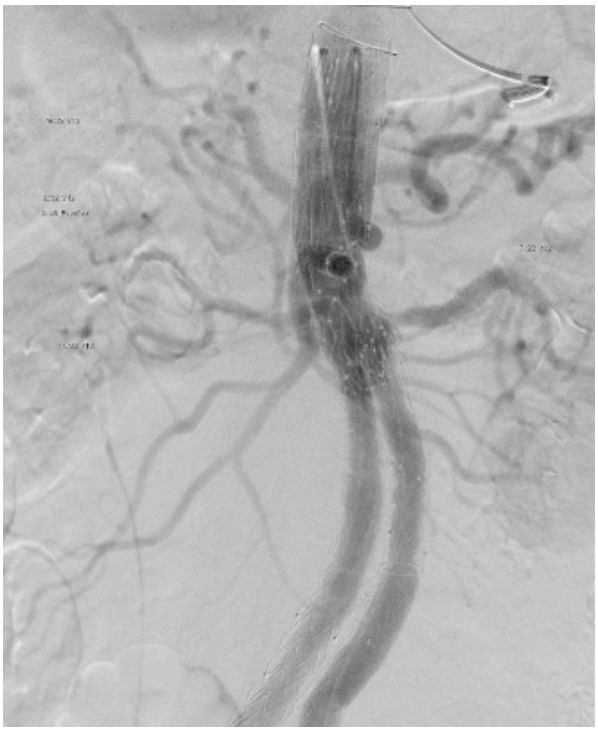
Bakground: 75 years old male patient with previous EVAR due to infrarenal aortic aneurysm. Presenting with proximal neck dilatation due to type I endoleak and risk for graft dislocation.

Methods: A custom made fenestrated endovascular device was designed with a 4 FEVAR configuration. The graft design incorporated an inverted limb in the distal component in order to facilitate the significantly higher EVAR bifurcation compared to the anatomical aortic bifurcation.

Results: The patient underwent successfully a FEVAR operation with excellent results at 6 months, 1 year and 2 years follow up.

Conclusion: Custom made fenestrated grafts can be used for the relining of failing EVAR grafts instead of proximal components utilizing chimney techniques.





ENDOVASCULAR REPAIR OF A PARARENAL ABDOMINAL AORTIC ANEURYSM USING A COMBINATION OF FENESTRATED AND BRANCHED DEVICES DUE TO THE PRESENCE OF THREE RIGHT RENAL ARTERIES

K. Tzimkas-Dakis[1], G. Kouvelos[1], K. Spanos[1], G. Volakakis[1], Ath. Chaidoulis[1], A. Barbatis[1], Ai. Bouzia[2], E. Arnaoutoglou[2], A. Giannoukas[1], M. Matsagkas[1]

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The patient presented with a large, pararenal abdominal aortic aneurysm. The preoperative CT angiogram revealed that the patient had three right renal arteries, of of which arose at the level of the aortic bifurcation. The patient underwent endovascular repair using a combination of custom-made fenestrated and branched endografts, salvaging the two out of the three right renal arteries.

RESULTS OF HYBRID APPROACH TO TREATMENT OF AORTIC ARCH PATHOLOGIES

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Traditional surgical methods to treat of aortic arch pathology are invasive and are often associated with a serious complications. Therefore, patients with multiple comorbidities are often denied open surgery method. The hybrid approach of treating pathology of the thoracic aorta shows a less number of disadvantages of traditional "open" surgery and at the same time has a wider range of applications than the endovascular method.

From 2014 to 2022, 89 patients with thoracic aortic pathology were treated with the hybrid method (open surgery on the vessels of the aortic arch and TEVAR) at the National M.Amosov Institute of Cardiovascular Surgery of the NAMS of Ukraine. Some patients in the general group (n = 25) had a descending aortic aneurysm without dissection or rupture; (n = 51) patients had an aortic dissection (n = 7 - acute, n = 6 - subacute, n = 38 - chronic), PAU (n = 4), postcoarctation aortic aneurysm (n = 3), isolated aortic arch aneurysm (n = 2), enlargement residual aorta after previous ascending aortic grafting causing TAAD) (n = 3), primary aortic thrombosis (n = 1).

Patients who were admitted as elective surgery candidates have had switched aortic arch vessels (debranching) in the first stage and TEVAR in the second stage. If there were admitted emergency: aortic rupture with uncontrolled bleeding, malperfusion syndrome; first TEVAR operation were performed.

Mortality were 3.4%, which is significantly less than in open surgical method. Among the complications were endoleak type I or II (8 and 3); thrombosis of the carotid-subclavian anastomosis, dissection of the left subclavian artery, trauma of the recurrent laryngeal nerve, stroke, paraparesis (all in one case), retrograde TAAD (two case). In the remote period, one patient died after 3 months from an unknown reason. Long-term results of treatment for the rest of patient are satisfactory.

The hybrid technique of aortic pathologyes treatment allows providing an acceptable level of hospital mortality - 3.4%, and a small number of neurological complications.

TEVAR -191

Debranching - 89 (partial - 51, subtotal - 22, total - 9, bilateral carotid-subclavian - 5, visceral - 3)

Without debranching - 102

Complication

Endoleak I - 8, endoleak II - 3, retrograde TAAD - 3, paraparasis - 1, stoke - 1

Hospital mortality - 3

IN SITU NEEDLE FENESTRATION FOR REVASCULARIZATION OF THE LEFT SUBCLAVIAN ARTERY DURING THORACIC ENDOVASCULAR AORTIC REPAIR

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First Department of Vascular Surgery, Attikon University Hospital, Athens, Greece

Backgound: The aim of this study was to present the short-term outcomes of in situ fenestration (ISF) of thoracic aortic stent graft (TEVAR) with overstenting of the left subclavian artery (LSA).

Methods: We performed a retrospective case series on patients who received TEVAR with an ISF for the LSA from Jan 2019 to Feb 2023. Demographic characteristics, operative details, clinical outcomes, and complications were analyzed.

Results: A total of 3 male patients received TEVAR with coverage of the LSA and ISF for thoracic aortic aneurysm (n=1) and chronic type B aortic dissections (n=2). Mean age was 61.7 ± 4.7 years. All patients had a single needle fenestration, due to the lack of landing in aortic zone 3. Technical success rate was 100%. No postoperative complications were recorded. Mean follow-up was 1.9 ± 1.2 years. No endoleak was detected.

Conclusions: In this small case series it appears that ISF is a valuable alternative for LSA revascularization to carotid-subclavian bypass during TEVAR. Long-term results in larger series of patients are needed before definitive conclusions can be drawn.

ENDOVASCULAR REPAIR OF BILATERAL INTERNAL ILIAC ARTERY ANEURYSM WITH THE PARALLEL GRAFT TECHNIQUE

K. Tzimkas-Dakis[1], G. Kouvelos[1], K. Spanos[1], G. Volakakis[1], Ath. Chaidoulis[1], A. Barbatis[1], Chr. Karathanos[1], K. Batzalexis[1], Ai. Bouzia[2], M. Bareka[2], E. Arnaoutoglou[2], A. Giannoukas[1], M. Matsagkas[1]

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The patient presented with bilateral internal iliac artery aneyrsms and underwent endovascular repair using the parallel graft technique with balloon-expandable, covered stentgrafts, providing proximal and distal sealing of the aneurysms.

ENDOVASCULAR TREATMENT OF AN ISOLATED 90MM COMMON ILIAC ANEURYSM IN A HIGH RISK GERIATRIC PATIENT

A. Karkamanis

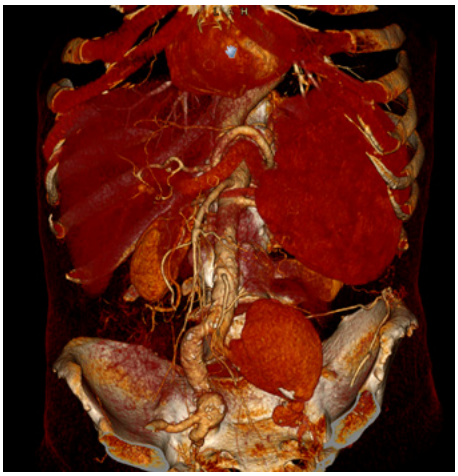
Vascular Surgery, Interbalkan Medical Center & Uppsala University, Thessaloniki, Greece

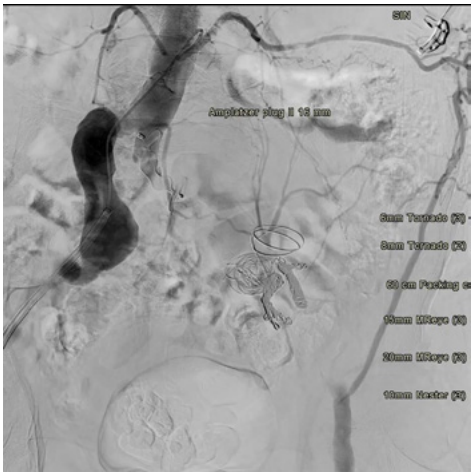
Background: 88-year-old male with symptomatic 90 mm isolated common iliac aneurysm and significant comorbidity.

Methods: The patient underwent endovascular treatment because of high age and significant comorbidity. An Amplatzer plug II and several coils were used, in order to occlude the inflow and backflow to the aneurysm, occluding the left common, internal iliac artery and the external iliac artery. There was no need for a crossover bypass due to significant collateral that the patient hade connecting the infrarenal aorta to the common femoral artery.

Results: The patient underwent successfully endovascular treatment of an isolated 90mm common iliac aneurysm with the intentional occlusion of the common, external and internal iliac arteries.

Conclusion: High risk geriatric patients can successfully be treated endovascularly for isolated common iliac aneurysms





OUTCOMES OF COMBINING STAINLESS STEEL ILIAC BRANCH ENDOPROSTHESES WITH NITINOL AORTIC STENT GRAFTS FOR ENDOVASCULAR REPAIR OF AORTOILIAC ANEURYSM WITH UNFAVORABLE AORTOILIAC ANATOMY

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Background-Aim: Unfavorable aortoiliac aneurysm anatomy anticipates postoperative complications after endovascular repair (EVAR). Specific devices have demonstrated applicability for different morphologies. Customization using various combinations of stent grafts has therefore been proposed to overcome anatomic limitations. We evaluated the outcome of a frequent endograft combination in patients treated with iliac branch devices (IBD) for endovascular aortoiliac repair.

Methods: 804 patients were treated within the European pELVIS registry (pErformance of iLiac branch deVIces for aneurysmS involving the iliac bifurcation) between January 2005 and April 2017. Among this cohort, 41 patients underwent endovascular repair with a combination of different endografts. Cook IBD was combined with the Medtronic Endurant stent graft because of severe angulated aortoiliac anatomy (n=23), or for treatment of common iliac aneurysm after previous EVAR (n=18). Main outcomes were technical and clinical success. Other outcome measures included freedom from aneurysm-related and overall mortality; from type I and III endoleak; from iliac graft occlusion; and from aneurysm-related reintervention.

Results: Intraoperative technical success was 97.6% (40/41). Mortality at 30 days was 4.9%.

There were two early graft thromboses requiring intervention (4.9%). The mean follow-up was 82.8±41.2 months (range 5.4 - 157.1 months).

At 5 years, freedom from aneurysm-related and overall mortality was 95% and 75%, respectively, from type I and III endoleak 97%; from iliac graft occlusion 94%; and from aneurysm-related reintervention 85%.

Conclusions: The combined use of an Endurant Endograft with Cook IBD for challenging aortoiliac anatomy is feasible and showed no adverse effects at the long-term follow-up.

Aortic case presentations II – The case I want to forget

INFECTED EVAR & TEVAR AFTER ENDOVASCULAR REPAIR OF IMPENDING RUPTURE TAAA

S. Koussayer

Surgery, King Faisal Specialist Hospital & Research Centre (KFSH & RC), Saudi Arabia

69 years male presented with severe back pain and large type 3 thoracoabdominal aortic aneurysm 8.5 cm . he was high risk for open repair . He underwent debraching of his renals, celiac and SMA via two bifurcated grafts from Rt and LT external iliac arteries followed with TEVAR and EVAR . his post op course complicated with pancreatitis and abdominal abscess treated with open drainage . couple months later, he presented with infected the left bypass graft only which going to LT renal and SMA which treated with extraction and replacement with two vein bypasses . did well but one year later on he presented with infected of his EVAR and TEVAR which required extraction of both TEVAR and EVAR and bypass with two homografts via thoracoabdominal incision .

TWO INTRIGUING CASES OF MESENTERIC ISCHEMIA THAT I WOULD NOT WANT TO HAVE AGAIN

K. Roditis, A. Antoniou, V. Papaioannou, S. Tzamtzidou, P. Tsiantoula, K. Seretis, N. Bessias

Department of Vascular Surgery, Korgialenio-Benakio Hellenic Red Cross Hospital, Athens, Greece

Background-Aim: We present 2 challenging cases of mesenteric ischemia (MI) of complicated nature & management.

Methods: Case 1: A 52-year-old female was referred with long-lasting postprandial abdominal pain (abdominal angina) reporting significant weight loss (>40kg over 1 year). She had been diagnosed with CMI & had undergone angioplasty of the superior mesenteric artery (SMA) with insertion of 2 stents - 1 at SMA orifice and 1 at mid-SMA - 20 months ago.

Case 2: A 56-year-old male patient presented in the ER with subacute (1 week) abdominal pain, nausea & vomiting, not controlled with metoclopramide, PPIs & analgesics. He had a history of chronic inhaled drug abuse & heavy smoking (>100py).

Results: Case 1: A diagnostic DSA revealed in-stent stenosis >50% of proximal & ~40% of the distal stent, & >80% stenosis of the origin of inferior mesenteric artery (IMA) & patent collateral network. Angioplasty of the IMA was performed successfully under LMWH & dual platelet inhibition. Her symptoms subsided & she is being closely followed-up.

Case 2: An emergent CTA showed dissection & thrombosis of the mid-SMA, a hypoplastic IMA & a suspected stenosis of the origin of the celiac artery. He was admitted at our department, started on LMWH & antiplatelets, fasting & parenteral IV nutrition. A splanchnic arteries DSA was done, but no angioplasty was performed because of total occlusion of distal SMA, & no significant celiac artery stenosis found. Conservative treatment was chosen temporarily, with open SMA reconstruction as the only remaining option, if he deteriorates.

Conclusions: Endovascular therapy is often the first-line treatment for CMI. However, if it fails or it is not an option, the vascular surgeon is truly challenged & may consider open reconstruction. As a final measure, conservative treatment aims in symptoms relief & improvement of intestinal flow. A healthy diet, exercise & smoking cessation may also prevent further complications.

MULTIPLE AORTIC AND VASCULAR PATHOLOGIES - MULTIPLE COMPLICATIONS

R. Dammrau

Helios Klinikum Siegburg, Aortic Center, Siegburg, Germany

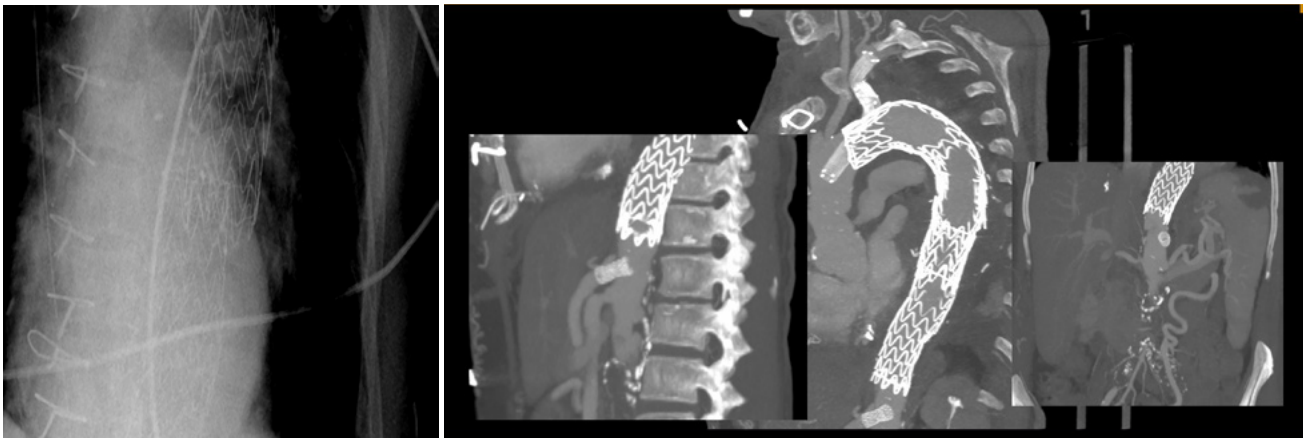
A 55 year old male, heavy smoker showed with claudication. In the angiogram we found infrarenal aortic occlusion (Leriche) and stenosis of the celiac trunc. The following ct scan showed an additional thoracic aortic aneurysm which includes the distal arch. During preoperative evaluation it was diagnosed a coronary 3 vessel disease with preserved left ventricular function.

Surgical treatment planned: 1st endovascular stenting of CT with VBX Viabahn.

2nd Off pump CABG with vein grafts to LAD and CX to preserve ITA´s as collateral vessels, TEVAR with chimney for the LSA.

1st procedure was without problems. During 2nd we first did the CABG, then after TEVAR he had acute right heart failure, we had to establish extracorporal circulation with intraop CPR and added a vein graft to the RCA, at the site of the aortic anastomosis showed a local dissection so we had to replace the ascending aorta with polyester graft. So after stabilization weaning of extracorporeal circulation. He was extubated next day but the post X-ray showed dislocation of the 2 TEVAR Grafts. 2nd day we did revision via right subclavian access with realignment and interposition of Stent Graft. After this intervention he showed a right hemispheric minor stroke with paralysis of the left arm, showing good recovery.

Peripheral perfusion was unchanged after surgery but he developed on his right lower leg a superficial necrosis which was treated with necrectomy and negative pressure dressing.



TREATMENT OF A SYMPTOMATIC GIANT SUPRARENAL AAA WITH A T-BRANCH DEVICE AND PRESERVATION OF RIGHT ILIAC BIFURCATION: AN UNEXPECTED EVENT

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Patient with a symptomatic suprarenal abdominal aortic aneurysm (AAA) 10 cm in diameter was treated urgently with a low-profile T-Branch device. The right common iliac artery was aneurysmatic and the internal iliac was preserved with the use of two parallel covered stents, in the internal and the external iliac artery respectively.

Despite the patient's hemodynamic stability throughout the operation, with no significant blood loss and the preservation of both internal iliac arteries, the patient developed paraplegia 30 minutes after the extubation, while the sensation in both legs was maintained. Preoperative and intraoperative factors that may predict and affect paraplegia after endovascular suprarenal AAA repair will be discussed.

THE CASE I WANTED TO FORGET...EXTREME ILIAC ARTERY TORTUOSITY x2

G. Koudounas, M. Mitka, I. Papoutsis, A. Sotiriou, C. Papadimitriou, N. Asaloumidis, I. Giagtzidis, C. Karkos, K. Papazoglou

Vascular Unit, 5th Department of Surgery, Hippokratio Hospital, Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece

Case: Ruptured abdominal aortic aneurysm (rAAA) represents an important cause of death worldwide and should be treated in case of suitable anatomy by endovascular means over open surgical options. We present a case of a 66-year-old man with a rAAA, extreme bilateral iliac artery tortuosity and severe neck angulation who underwent endovascular repair (EVAR) twice within a month. This case report highlights the technical difficulties of EVAR in such a case.

RECURRENT AORTO-ENTERIC FISTULA AFTER EVAR: WHEN NIGHTMARE NEVER ENDS

S. Koussayer

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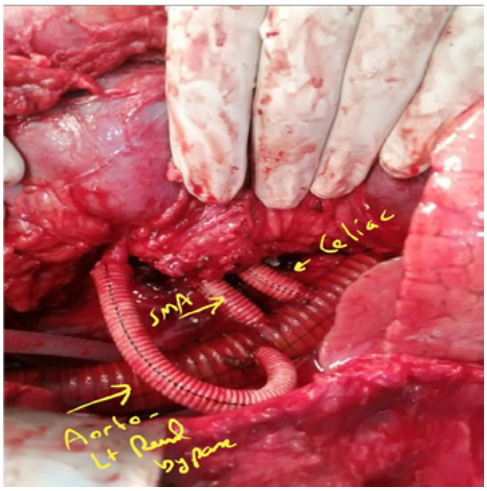
38 years male presented with lower abdominal pain . CTA revealed multiple infrarenal aortic aneurysm treated with tube graft . later on he developed endoleak treated with extraction of EVAR and aortobifemoral bypass . Later on he developed aortoenteric fistula which treated in another hospital with removal of the graft, suturing the aortic stump and no bypass . did well with mild claudication . after 2 years he developed another UGI bleed treated with coiling of the aortic stump which complicated with RT Renal artery occlusion . his UGI bleed recurs, so he referred back to us. our work up was positive for Bechet disease and EGD revealed Dieulefoy lesion treated with coiling the left gastric artery . later on he presented with LT brachial artery pseudoaneurysm from puncture site which treated with surgery, then recurs twice and finally treated with covered stent . Then he presented with enlarging his suprarenal aorta and pain required open repair of his thoacoabdominal aortic aneurysm. finally he did well .



Aortic case presentations III

CONTAINED RUPTURE OF COMMON ILIAC ARTERY CONCOMITANT WITH CONTRALATERAL FEMORAL MYCOTIC ANEURYSM; CASE OF NEGATIVE CULTURED INFECTIVE ENDOCARDITIS

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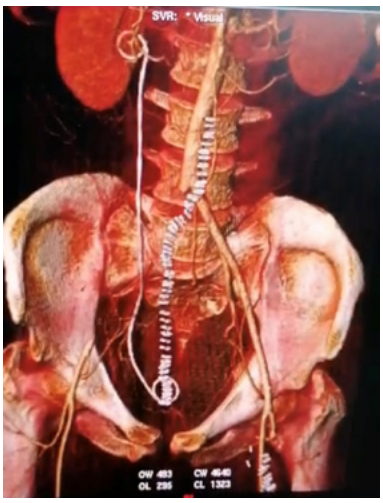
[3] Cardiovascular Surgery Department, Prince Mohammed bin Nasser Hospital, Jazan, Saudi Arabia

Peripheral mycotic aneurysms are a severe life-threatening complication of infective endocarditis. Mortality is estimated around 40%, but increasing in ruptured presentation. We report a case of contained rupture of a common iliac artery aneurysm concomitant with a contralateral femoral artery aneurysmal dilatation. This is a 34-year-old male with a history of mitral valve replacement two months back post a negative culture infective endocarditis, presented with a right lower extremity intermittent claudication. Work-up revealed a contained rupture of right common iliac artery mycotic aneurysm with a symptomatic 3 cm left profunda femoris aneurysm discovered suddenly. He had an open surgical repair through aneurysmal resections, tissue debridement, ligation of right common iliac artery, right hypogastric artery and left profunda femoris associated with intra-operative right ureteral injury managed by ureteral double J stent implantation. Patient recovered without limb threatened ischemia, and he was discharged home on a long-term broad spectrum antibiotics and an anticoagulant. Patient followed in outpatient clinic with an improvement of walking distance. A contained rupture of peripheral mycotic aneurysm can lead to a serious hemodynamic compromise when it becomes uncontained, hence it is prudent that it should be managed immediately after it is diagnosed. Most authors recommend prompt surgery for all patients irrespective of the size of the aneurysm. Young-aged patient is a factor to be considered in choosing a repair approach despite the complications associated with both open surgical and endovascular repair. Prolonged antibiotic therapy improve survival with favorable outcome.

Photo1 Pre-OP showed contained rupture of right common iliac artery mycotic aneurysm with a symptomatic 3 cm left profunda femoris aneurysm.

Photo2 Post-OP 1st week showed revascularization of right and left lower extremities after intervention. Double J ureteral stent.



LONG-TERM RESULTS OF SURGICAL TREATMENT OF POST COARCTATION ANEURYSMS OF THE THORACIC AORTA

V.I. Kravchenko, Yu.M. Tarasenko, V.E. Duplyakina, K.K. Sarnatska, I.M. Kravchenko, O.A. Tretyak

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Summary: Post coarctation aneurysm (PCoAn) is one of the most dangerous complications in the remote period of operated coarctation of the aorta. The formation of it is accompanied by a high risk of aneurysm rupture anddeath of the patient's. Considering the high risk of this pathology, it is necessary to carefully study the results of surgical treatment and the quality of life in follow up period, to understand measures to prevent the formation of aneurysms.

Objective: To present and analyze the immediate and long-term results of treatment of post coarctation aortic aneurysms.

Materials and methods: An analysis of the results of treatment aortic aneurysm after correction of aortic coarctation was carried out from 1995 to 1.01.2023: 96 patients were included in the study. All patients were divided into two groups. Group I included 69 (71.8%) patients who operated on with standard surgical strategy;21 (28.1%) patients are included in the II group, which we divided into two subgroups: II-A group (7 patients), who underwent endovascular intervention, and II-B group (14 patients), who received hybrid treatment. In addition, 6 patients were not operated on for various reasons: 3 died from rupture of the aorta, one died in a road accident, and the fate of two is unknown.

Results: As a result of the study it is determined PCoAnwas most often formed in patients operated on for CoA using the method of indirect isthmoplasty - 53.5% (n=31)with synthetic patch. The better result of surgical treatment was noted in group II patients. The mean time from initial correction of coarctation to postcoarctationaneurysm correction was 22 years. The rate of postoperative 30-day mortality in all operated patients -7.7%. The causes of death were: bacterial complications and sepsis in 4 patients (57.1%), bleeding in 3 patients (42.9%). We studied the long-term results in the period of 1-20 years, mean 62±6.2 months in 93.5% (n= 84). The result of treatment was good in 59 (70.2%), satisfactory in 16 (19.0%), unsatisfactory in 7 (8.3%), 2 (2.3%) patients died.

Conclusions: After indirect isthmoplasty, the mostly cause of formation of postcoarctation aneurysm was rupture of the lower edge of the patch. It has been established that the younger the patient is at the time of coarctation correction, the longer is the period until the moment of surgical treatment of postcoarctationaneurysm. The better result of surgical treatment was noted in group II patients, all patients from this group still alive after surgery.

ENDOVASCULAR REPAIR OF A SUBACUTE TYPE B DISSECTION USING IN-SITU FENESTRATION

G. Volakakis[1], A. Haidousis[1], K. Tzimkas-Dakis[1], A. Barbatis[1], K. Batzalexis[1], P. Nana[1], C. Karathanos[1], K. Spanos[1], G. Kouvelos[1], E. Arnaoutoglou[2], A. Giannoukas[1], M. Matsagkas[1]

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[2] Anesthesiology, Department of Anesthesiology, Faculty of Medicine, University of Thessaly, University Hospital of Larissa, Larissa, Greece

The patient presented with an acute type B dissection originating at the orifice of the left subclavian artery and was treated conservatively initially. The patient underwent endovascular repair after one month using a Valiant thoracic stent graft placed at the orifice of the left carotid artery, while an in-situ fenestration, using the BeBack catheter, was made to revascularize the left subclavian artery.

THE USE OF CUSTOM-MADE BOVINE BIFURCATED GRAFTS FOR THE TREATMENT OF AORTIC GRAFT AND ENDOGRAFT INFECTIONS

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Background: Aortic graft and endograft infections consist serious complications after aortic surgery with large perioperative mortality and morbidity. Tube configuration custom-made grafts from bovine pericardium have been used for the treatment of isolated graft infections with acceptable results. The aim of the study is to present our experience in patients with aortic graft / endograft infections treated with bifurcated configured custom-made bovine pericardium grafts.

Methods: We performed a retrospective case series study on patients with aortic graft / endograft infections treated with this method in our department.

Results: Four patients (3 males) with aortic graft (3) or endograft (1) infections were treated with an on-table custom-made graft, on a bifurcated configuration, made by bovine pericardium. All cases were technically succesful, and perioperative mortality was zero. The perioperative morbidity included temporary renal failure (one patient needing temporary dialysis). In mid-term follow-up (1-12 months) the mortality was zero without serious complications.

Conclusions: The bovine pericardium can be tailored in a bifurcated configuration succesfully, and presents acceptable results perioperatively and in mid-term follow-up.

EN BLOC RESECTION OF RETROPERITONEAL MASS ALONG WITH INFRARENAL AORTA AND INFERIOR VENA CAVA

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[1] Vascular Surgery Clinic, Department of Vascular Surgery, University Hospital of Larissa, Faculty of Medicine, School of Health Sciences, University of Thessaly, Larissa, Greece
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The patient presented with a retroperitoneal mass involving the infrarenal aorta and the inferior vena cava. The patient underwent an open surgical en bloc resection of the retroperitoneal tumor including the infrarenal aorta and the common iliac arteries as well as the inferior vena cava and the common iliac veins following reconstruction using synthetic grafts.

ENDOVASCULAR REPAIR OF A SYMPTOMATIC THORACOABDOMINAL TYPE II ANEURYSM

G. Volakakis[1], A. Haidousis[1], K. Tzimkas-Dakis[1], A. Barbatis[1], K. Batzalexis[1], P. Nana[1], C. Karathanos[1], K. Spanos[1], G. Kouvelos[1], E. Arnaoutoglou[2], A. Giannoukas[1], M. Matsagkas[1]

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The patient presented with a giant (Dmax~9cm) thoracoabdominal type II aneurysm due to acute thoracic pain. The patient underwent endovascular repair in an acute setting using two thoracic stent grafts and the "off-the-shelf" T-Branch device.

ENDOVASCULAR TREATMENT OF POST-DISSECTION THORACOABDOMINAL ANEURYSM

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Background: Aortic dissection is the second most common etiology of aortic aneurysms after atherosclerotic degenerative aneurysms, accounting for 15-20% of all thoracoabdominal aortic aneurysms. Endovascular aortic repair using fenestrated and branched stent-grafts to incorporate target vessels offers a less invasive approach and may potentially reduce the rate of perioperative morbidity and mortality. However, outcomes of post-dissection endovascular therapies may differ from those of degenerative aneurysms due to anatomic complexity and intraoperative challenges.

Aim: Case presentation of endovascular repair of post-dissection thoracoabdominal aneurysm with "off-the-shelf" branched stent-graft.

Methods: A 61-year old male patient presented with an enlarging 9 cm post-dissection type III thoracoabdominal aneurysm. The patient underwent thoracic endovascular repair six months prior to presentation. Computed tomography angiography demonstrated that the right renal artery was perfused by the false lumen, while the celiac trunk, superior mesenteric and left renal artery were perfused by the true lumen.

Results: The patient underwent extension of the thoracic endovascular repair to the level above the celiac artery, followed by an "off-the-shelf" branched stent-graft (t-Branch, COOK Medical). Endovascular fenestration of the dissection septum was performed using a re-entry catheter (GoBack re-entry catheter, Upstream Peripheral Technologies) to access the false lumen, followed by balloon angioplasty and right renal artery catheterization. The patient presented uneventful postoperative period and was discharged on post-operative day five, on dual antiplatelet therapy.

Conclusions: Although open surgery is the first-choice treatment for post-dissection aortic aneurysm, there is a need for alternate therapeutic options since open surgery is associated with high mortality and morbidity. Endovascular repair shows early benefits and low morbidity. However, there is a scarcity of literature regarding the comparative outcomes of endovascular repair in post-dissecting aneurysms.

CUSTOM MADE FENESTRATED DEVICE IMPLANTATION IN A CHALLENGING AORTIC CASE WITH SINGLE KIDNEY, EARLY RENAL ARTERY BRANCHING AND EXTRA RENAL ARTERY TAKEOFF FROM THE ANEURYSM

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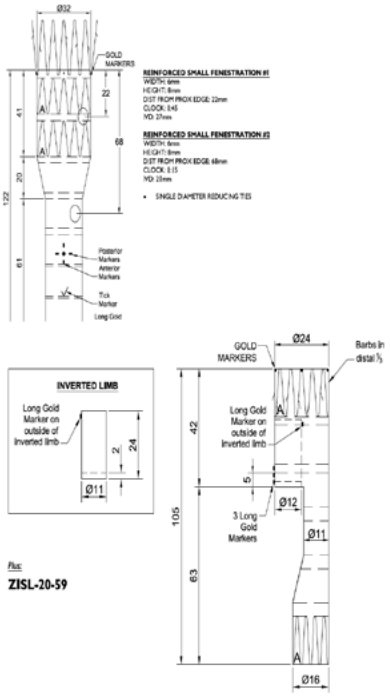
Background: 72-year-old male with AAA 65mm. Previous nephrectomy, single left kidney. 2 renal arteries, the proximal one with early branching and the distal one arising from the infrarenal aneurysmatic segment.

Methods: A custom made fenestrated endovascular device was designed with a 2 FEVAR configuration. The proximal graft was oversized in order to avoid endoleak and facilitate for a fenestration with no need for stent extension in to the renal artery, in order to save the early branch of the proximal renal artery. The distal take off of the second artery presented a challenge since it did not allow for a standard distal component bifurcation, moving the bifurcation significantly lower. The graft design incorporated an inverted limb in the distal component in order to facilitate for the fenestration for the extra renal artery arising from the aortic aneurysm.

Results: The patient underwent successfully a FEVAR operation with excellent results at 6 months, 1 year and 2 years follow up.

Conclusion: Custom made devices can be used in challenging anatomies with limited distance to the intended bifurcation, utilizing an inverted limb design.



Venous Abstracts and Case Presentations

A META-ANALYSIS OF DIALYSIS ACCESS PATENCY IN PATIENTS OVER 75 YEARS OLD

A. Ntemka[1], Chr. Argyriou[2], M. Lazarides[2], G. Georgiadis[2]

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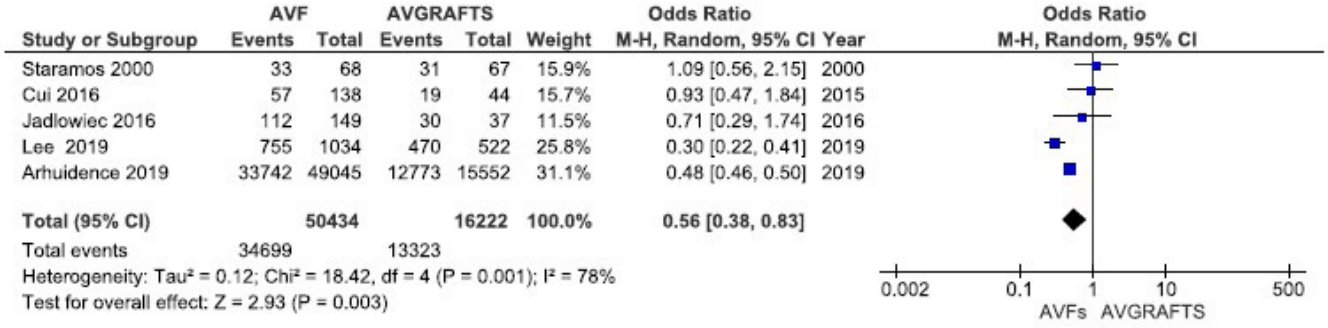
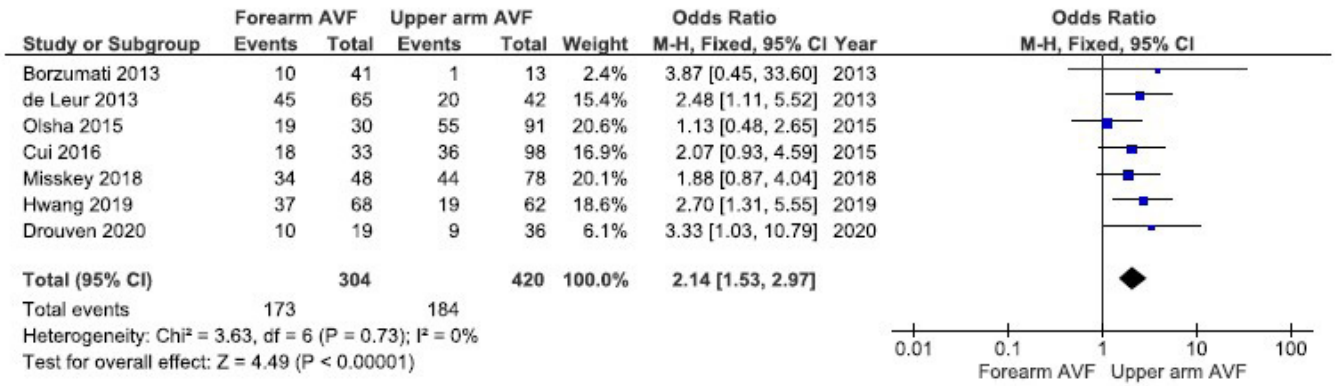
Background: A review of the available literature reveals limited data regarding the best access choice in elderly hemodialysis patients especially in those over 75 years old. A meta-analysis was performed in hemodialysis patients over 75 years old to assess (1) the outcomes of autologous arteriovenous fistulas (AVF) vs. prosthetic arteriovenous grafts (AVG) and (2) the primary risk failure between distal vs. proximal AVFs.

Methods: A literature search was performed using the MEDLINE and SCOPUS electronic databases. Eleven eligible articles fulfilled the inclusion criteria and were finally selected in the meta-analysis.

Results: Primary failure rate at 24 months was in favor of autologous AVFs (OR: 0.56, 95% CI: 0.38-0.83, p= 0.003, Fig.1). The 12-month primary failure rate was by far in favor of proximal upper arm autologous AVFs (OR: 2.14, 95% CI: 1.53-2.97; p<.00001, Fig.2).

Conclusion: This study shows that patients ≥75 years old should not be excluded from creation of a proximal AVF.





CORRECTION OF THE POSITION OF A DIALYSIS TUNNELED CENTRAL VEIN CATHETER USING INTRAVENOUS ELECTROCARDIOGRAPHY

M. Bakou, C. Bantis, A. Atalla, G. Spanos, S. Fragkidis, L.K. Armentzoiou, G.I. Bamichas

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During intravenous electrocardiography (IVECG) through a central venous catheter (CVC) the P wave morphology changes providing information regarding the position of the catheter tip in relationship to the right atrium. We present a case in which a misplaced dialysis tunneled central vein catheter was corrected using this method.

We report the case of a 54-year-old man with morbid obesity, type II diabetes, coronary artery disease and marked peripheral arteriopathy with amputation of both lower extremities and fingers of the right hand. Due to infection, a tunneled CVC in the right jugular vein was removed and a non-tunneled catheter was placed in the left jugular vein. After eradication of the infection, a tunneled CVC was placed in the left jugular vein. This catheter had sufficient blood flow, but chest x-ray showed that its tip was located in the right jugular vein (facing upwards). Due to technical failure of the catheterization laboratory and due to the necessity for dialysis, we attempted to correct the position of the CVC not under angiographic control but using IVEG as real time guidance. We used the C3 WAVE® TIP LOCATION system, which had been originally designed for the positioning of peripherally inserted central catheters (PICCs). The CVC was retracted and, while looking for the characteristic high P-wave in IVEG, it was gradually advanced and successfully inserted into the entrance of the right atrium.

Intravenous electrocardiography appears to be an alternative for the correction of upper body central vein dialysis catheters when angiographic guidance is not available.

TOTAL ENDOVASCULAR REPAIR OF A GIANT ILIAC VEIN ANEURYSM: A CASE REPORT AND REVIEW OF LITERATURE

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We report a case of total endovascular repair of a giant iliac vein aneurysm and review the literature

MANAGEMENT OF CHRONIC VENOUS ULCER

A. A. Mahmoud

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TREATMENT OF CHRONIC FEMOROPOPLITEAL POST-THROMBOTIC SYNDROME WITH ACOUSTIC PULSE THROMBOLYSIS AND SEQUENTIAL BALLOON ANGIOPLASTY; ASSESSMENT OF FIBRIN REMODELLING

M. Dumantepe

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Background: The current standard of care for chronic DVT is to prevent clinical progression rather than restore the flow of venous segments. However, more than one-third of patients with DVT will develop post thrombotic syndrome (PTS), and up to 10% of patients develop severe PTS, which can manifest as venous ulcers. We report the technical and clinical outcomes in patients treated for chronic femoro-popliteal PTS with Acoustic Pulse Thrombolysis and sequential balloon angioplasty.

Methods: A single center review of patients suffering from chronic femoro-popliteal PTS (Villalta score ≥8) who received minimum 6 months of anticoagulation and underwent endovascular intervention. The primary efficacy outcome was a reduction of ≥6 points in the Villalta score 30 days after procedure and increase in blood flow in calculated by “time to washout” in the affected segments. The patients’ clinical characteristics, procedural information, immediate technical outcomes, symptomatic improvement, quality of life to 1 year and ultrasound follow-up at 1, 3, 6, and 12 months and yearly thereafter also collected.

Results: A total of 305 limbs were treated (age, 45.4 ± 16.7 years; 73.4.% men; mean Villalta score, 16.2 ± 2.4). 289 of 305 occlusions (94.7%) were successfully crossed and venous flow established after EkoSonic fibrin remodeling. The primary end point was met in 83.2% (254/305) at 30 days. 18 patients were lost to follow-up at 1 year and 77.3% of limbs continued with a Villalta reduction ≥4. Compared with baseline, the time to washout was significantly improved after acoustic pulse effect from 4.5 ± 0.4 to 2.6 ± 0.3, respectively. Iliofemoral venous stenting was performed in 32 (10.4%) patients and 18 patients (5.9%) had recurrent thrombosis. 14 patients (4.5%) developed minor bleeding and no additional major adverse events and death were noted.

Conclusion: For patients suffering PTS from chronic femoro-popliteal venous obstruction, combined Acoustic Pulse Thrombolysis and sequential balloon angioplasty interventions result in improvement in clinical PTS, as measured by the Villalta scale and VCSS as well as durable venous patency. Endovascular intervention also resulted in significant improvement in QOL

ILIAC VEIN STENTING WITH IVUS GUIDANCE

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NON-THROMBOTIC VENOUS STENOSIS: NUTCRACKER SYNDROME AND CONCURRENT MAY-THURNER SYNDROME AND THE SIGNIFICANCE OF HYPERMOBILITY RELATED DISORDERS

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Background: Patients with abdominal compression syndromes (ACS) are often affected by hypermobile EHLERS-DANLOS syndrome (hEDS) (1). We hypothesized, that in patients with concurrent NCS and MTS, hEDS is the underlying disorder and directs collateral flow pattern in regard to symptoms and treatment.

Material and Methods: From 01.01.2019 -31.03.2023, 125 patients (female 109; male 16) underwent surgery for NCS (5), MTS (4), for both (27) and for both while undergoing surgery for ACS (89) simultaneously. Both, USD-duplex (Th.Sch.) and imaging (CTA, MRI) had confirmed symptomatic concurrence of NCS and MTS. Sixteen patients arrived stented: NCS (8), MTS (7) or for both (1) and in 5 patients left kidney auto-TX had been performed elsewhere, all of which without clinical success. Due to paraparesis 7 patients arrived wheelchair bound. For treatment of NCS we applied our modified BARNES technic, (3), for MTS we used our original technic due to vein wall anomalies and irregular anatomy. Stented cases underwent segmental resection, interposition tube grafting and shielding to protect against perforating hooks.

Results: Ninety-nine patients (female 88, male 11), mean age 31 years, were affected by hEDS (BEIGHTON (3) score 2-9). No deaths, no infections, no kidney loss. In five cases PTFE tubegrafts had to be prolonged and in three to be replaced due to vein diameter. In stented cases complications were avoided, but hemodynamics not always restored. Clinical success rate was 97 % despite concomitant treatment of ACS in the greater majority of patients. Six of seven paraparetic patients walked home on their own feet.

Conclusion: Our hypothesis was confirmed. Surgical treatment was successfully adjusted to hEDS. Intravenous stenting and kidney autoTX are damaging and inappropriate, because stenting forces to maximal diameter but treats not the compression and kidney autoTX is destabilizing in the presence of hEDS.

THE MULTIDISCIPLINARY APPROACH FOR THE MANAGEMENT OF A PATIENT WITH GLOMUVENOUS MALFORMATION

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Background-Aim: Glomulin is the protein encoded by the GLMN gene, essential for the normal development of the vasculature. Mutations in such gene have been associated with glomuvenous malformation. The aim of this presentation is to report the need for multidisciplinary approach in diagnosis and treatment of glomuvenous malformations, the genetic and hereditary background, as well as the raise of awareness regarding the pre-reproduction procedures that should be followed, as they usually are young fertile individuals.

Methods: A 28year old male with diffuse vascular lesions since birth underwent diagnostic imaging and exome genetic analysis which revealed glomuvenous malformation with a pathogenic heterozygous variant GMLN:c.108C>A in the GMLN gene. The patient underwent 28 foam sclerotherapy sessions.

Results: Improvement of the malformation and resolution of the symptoms post sclerotherapy are reported. Additionally, preimplantation genetic testing for monogenic disorders and the collaboration of the IVF unit and genetic laboratory, led to pregnancy with a fetus presenting no abnormality.

Conclusion: This is the first case of glomuvenous malformation reported in Greece. The multidisciplinary approach in rare and difficult conditions, such as glomuvenous malformations is very important for the diagnosis and treatment. Moreover, taking into consideration the patients' need to become parents due to the young of their age, is essential.

LONG-TERM RESULTS OF TINZAPARIN FOR THE TREATMENT OF SUPERFICIAL VEIN THROMBOSIS OF THE LOWER LIMBS

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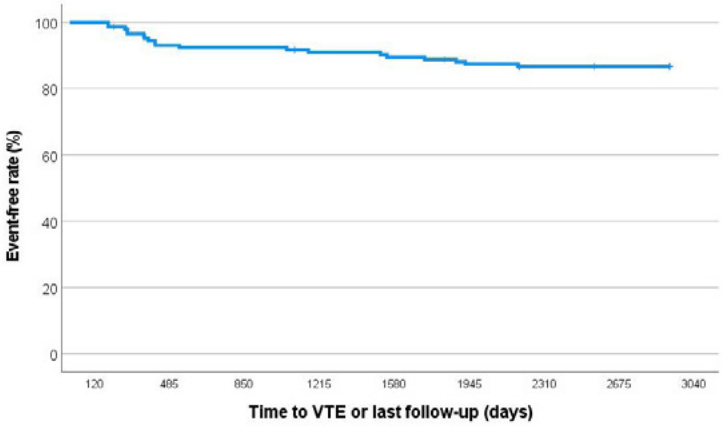
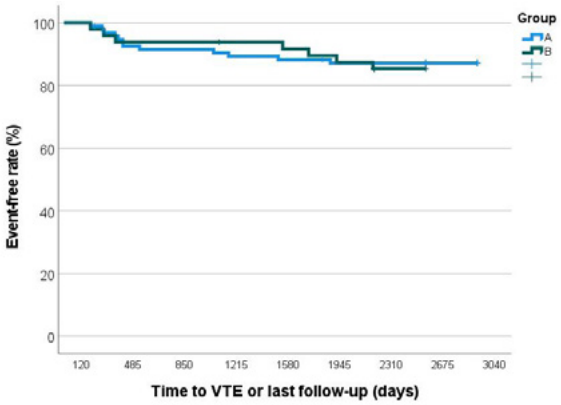
Background/Aim: Superficial vein thrombosis (SVT) of the lower limbs is associated with an increased risk of recurrent venous thromboembolism (VTE) during an initial period, but long-term risks are largely unknown. The aim of our study is to identify the frequency of recurrent VTE in patients with lower limb SVT during a follow-up through eight years.

Methods: Consecutive patients with SVT were treated with subcutaneous tinzaparin (Innohep™, LEOPharma, Denmark).Patients were stratified into two groups: group A (up to 60days), where patients received mostly an intermediate or therapeutic dose, and a subsequent group B where patients received an intermediate dose (131iu/Kg) for 90 days. The composite primary endpoint was recurrent VTE.

Results: A total of 147 patients with a median age of 58.2years were treated (group A, n=98 and group B, n=49).Two patients died before day120 and the remaining 145 patients were followed-up for a maximum of eight years. Fifteen patients had an early VTE event. Another 19 patients had late VTE events (recurrent SVT, n=14, deep-vein thrombosis, n=4, and pulmonary embolism, n=1), for an eight-year rate of 13.4%(Fig.1).Beyond the initial 120-day period, there was a similar rate for late events between the two treatment groups(Fig.2,p=0.80).

Conclusions: Long-term recurrent VTE rates in patients presenting with SVT are not negligible, with the risk persisting for nearly a decade. Most events were recurrent SVT and there was no effect of initial anticoagulation duration on isolated late events. Our results support the notion that SVT is not a benign disease, not only in the short term but also in the long-term. Further research to identify risk factors for late VTE recurrence is required.





ROLE OF TUMESCENT FLUID INFILTRATION DURING SAPHENOUS STRIPPING AND LIGATION OPERATION OF VARICOSE VEINS TO REDUCE POSTOPERATIVE COMPLICATIONS

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Vascular Surgery, Ain Shams University, Cairo, Egypt

AMBULATORY ENDOVENOUS-ASSISTED INVAGINATED STRIPPING OF THE GREAT SAPHENOUS VEIN

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Department of Surgery - Vascular Surgery Unit, Faculty of Medicine, University of Ioannina, PGN Ioanninon, Ioannina, Greece

High ligation and stripping (HLS) of the great saphenous vein (GSV) has been the gold standard treatment of varicose veins for many years. Nowadays, it has been largely replaced by minimally invasive endovenous ablation (EVTA). Surgical techniques can be easily adapted to mimic the new technologies, without their high costs. With a creative approach, we have tried to revisit stripping as it can be done in the modern era. We present a technique that combines the ease and flexibility of endovascular techniques with the benefits of open surgery and tries to get the best of both worlds. This is a detailed technical presentation of "how we do it" supported with videos, images, and figures. There are no revolutionary changes to what has already been described and done over decades of venous insufficiency surgery. However, we strongly believe that the Ambulatory Endovenous-assisted Invaginated Stripping (EVIS) of the GSV may have some considerable advantages over standard HLS and EVTA. EVIS is a smart and cheap combination of standard vascular and endovascular techniques that may prove valuable in managing patients with chronic venous insufficiency. It is an ambulatory minimally invasive procedure that revisits the way saphenous vein stripping can be done. A clinical trial is warranted to further study EVIS clinical outcomes and complications.

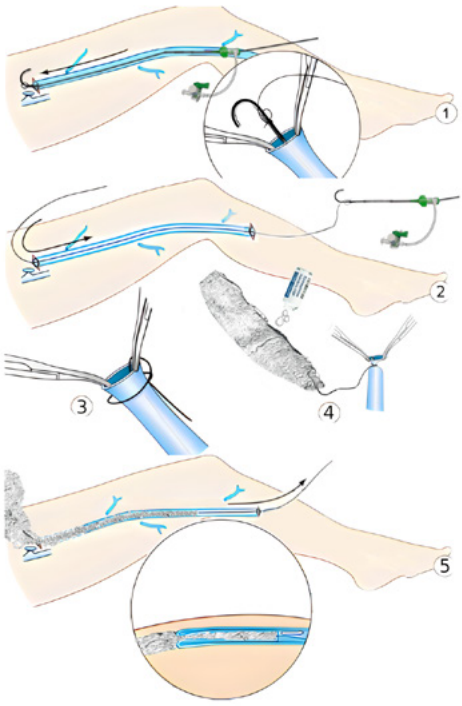

Figure. Schematic drawing of the Endovenous-assisted Invaginated Stripping (EVIS) of the Great Saphenous Vein (GSV)

1: Percutaneous access at knee level. The guidewire is recovered at the groin and a braided thread is fixed at its tip.

2: The guidewire carrying the thread is retracted out of the access site. The sheath is removed.

3: Tying the thread on the GSV stump

4: An epinephrine-soaked gauze pack is tied at the proximal end of the thread

5: Traction of the distal end of the thread pulls down the packing within the saphenous vein, causing its invagination

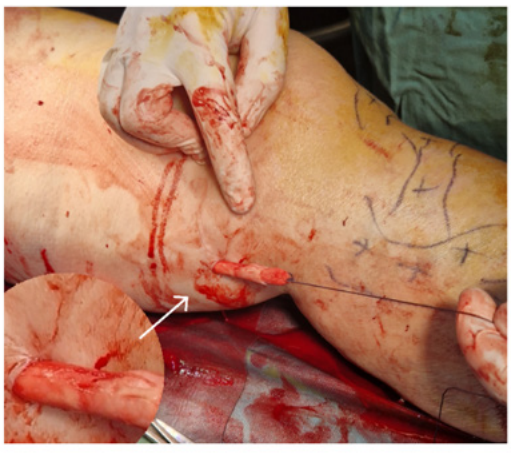

Image. Invaginated stripping of the Great Saphenous Vein (GSV) through the site of percutaneous access at knee level (arrow).

CHALLENGING IVC FILTER RETRIEVAL - A CASE REPORT, TECHNIQUES AND CONSIDERATIONS

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Inferior vena cava (IVC) filter placement is indicated for the treatment of venous thromboembolism (VTE) in patients with a contraindication to or a failure of anticoagulation. With the advent of retrievable IVC filters and their ease of placement, an increasing number of such filters are being inserted for prophylaxis in patients at high risk for VTE. Available data show that only a small number of these filters are retrieved within the recommended period, if at all, prompting the FDA to issue a statement on the need for their timely removal. With prolonged dwell times, advanced techniques may be needed for filter retrieval. We present a challenging and advanced IVC filter retrieval case performed in our center. Patient had the filter (Cook Medical, Celect) placed 5 years ago. The initial placement was uncomplicated but in the recent preoperative CT scan the filter presented angulated and 2 of its legs bent upwards, out of the IVC, without any symptoms. We chose to proceed with jugular access and have the femoral access prepped. After the failure of the standard retrieval kit to engage the filter hook, we proceeded with the use of snare and a parallel wire, through a large 16Fr sheath. Eventually, we created a single wire loop around and in between the filter legs which effectively facilitated the straightening and removal of the filter ("hangman" or "loop snare" technique). Many techniques including single-access, dual-access, and dissection techniques have been described by various intervention centers. Complicated filter retrievals carry a non-negligible risk for complications such as filter fragmentation and resultant embolization of filter components, venous pseudoaneurysms or stenoses, and breach of the integrity of the caval wall. Careful pre-retrieval assessment of IVC filter position, any significant degree of filter tilting or of hook, and/or strut epithelialization and caval wall penetration by filter components should be considered using dedicated cross-sectional imaging for procedural planning. In complex cases, the risk for retrieval complications should be carefully considered. The decision to remove an embedded IVC filter using advanced techniques should be individualized to each patient and made with caution, based on the patient's age and existing comorbidities.

ANTICOAGULATION. MANAGEMENT AFTER VENOUS STENTING

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Will discussed extensively about etiology, indications, efficacy of stenting , use of intravascular ultrasound in diagnosis and optimization of stent placement, when to stent and when not to stent.

VENOUS STENTING AND THE DAY AFTER - OTHER HIDDEN ASPECTS

E. Hussein

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Background: Venous stents are no exception from the biologic inflammatory response of vessel wall and consequently can induce thrombosis hence the rationale for using post stenting antiplatelet and anticoagulation 1 . However there is no consensus yet as to the duration and type of post-procedural pharmacotherapy 2. The following study highlights the acute outcome of bare metal stents in the venous system , patency rates on short term , with reference to the literature as well as our own series over the last 12 years .

Methods: Seventy nine venous stents were deployed in 73 patients in both centers during the period from March 2009 till August 2021 . Our cohort of patients were classified into 2 groups post stenting . Group A (32) received dual antiplatelets + anticoagulation and Group B (47) were given anticoagulation alone . Mean follow up was 14.6 months , and included clinical evaluation , a QOL questionnaire , duplex and CT venography whenever needed.

Results: Primary patency at 12 months for Group A (Clopidogrel + Asprin 4 weeks in addition to anticoagulation) was 90.6 % and 89 % for Group B (anticoagulation alone) P = 0.85 which was not statistically significant However patients in Group A showed a better QOL and longer symptom free interval. Stents used included Wall stents and Venovo and were deployed in iliac , femoropopliteal , IVC and axillosubclavian veins We had no procedure related complications but TLR was 6 / 79 (7.6 %) during the follow up period.

Conclusion: No venous stent is fully biocompatible and hence the need for pharmacologic adjuvant therapy post stenting There is currently no consensus on post stenting antithrombotic therapy and obvious need for further large trials and longer follow up.

CONSERVATIVE TREATMENT OF POST-THROMBOTIC SYNDROM STILL REMAINS AN ALTERNATIVE OPTION IN SELECTIVE PATIENTS

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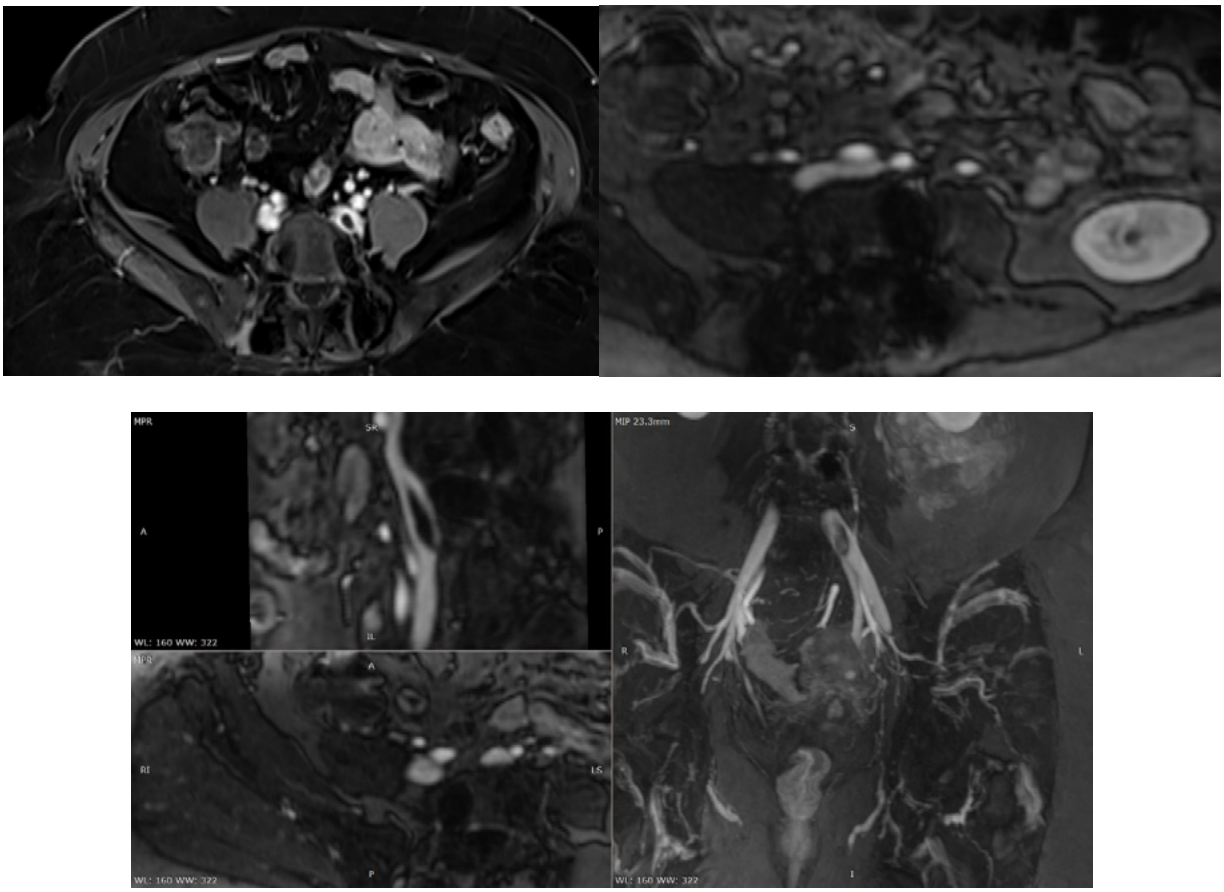
Deep vein thrombosis (DVT) is a prevalent disease. About 20 to 30% of patients with DVT will develop postthrombotic syndrome (PTS) within 24 months after the initial diagnosis of DVT.

Nowadays due to the development of dedicated venous stents angioplasty of a stenotic iliac vein is in most cases the first line treatment to provide prompt symptoms recovery.

I would like to present you a case of a 57 y.o female patient with mild PTS (Villalta Score 6) suffering from Crohn's disease and thrombophilia (heterozygous XIII, PAI homozygous, heterozygous V Leiden), with a history of left iliofemoral DVT . Due to high bleeding risk the patient was treated conservatively and the 3 years follow up shows remission of the symptoms.(Villalta Score 4).



MRV showing mural thrombus after 3 years of iliofemoral DVT without flow obstruction or significant compression of the left iliac vein

STAGED SURGICAL TREATMENT OF THE RENAL CANCER WITH METASTATIC THROMBUS IN THE INFERIOR VENA CAVA AND RIGHT ATRIUM. CLINICAL CASE

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[2] Robert Van Gestel" Vascular Surgery Clinic of the "Sfântul Spiridon" Hospital, University of Medicine and Pharmacy Gr. T. Popa, Iasi, Romania
[3] Fundeni Clinical Institute, Bucharest, Romania
[4] Institute of Cardiovascular Diseases "Prof. Dr. George IM Georgescu" Iasi, Romania
[5] Cardiovascular Surgery Department, Republican Clinical Hospital,, Cardiovascular Surgery Department, Republican Clinical Hospital

Background-Aim: Kidney cancer is one of the most common types of cancer with a mortality rate of 4%. A characteristic of malignant renal tumors is the fact that they can spread to the level of the venous system through tumor thrombus.

Methods: Patient X., 48 years, attended to the Vascular Surgery Department of the Republican Clinical Hospital with weight loss, macroscopic hematuria, general weakness, right flank pain. Patient was diagnosed with right kidney tumor mass with metastatic thrombus in the inferior vena cava and right atrium with the help of abdominal AngioCT, USG, echocardiography and duplex ultrasound oth deep venous system.

Results: Surgical treatment was divided into two stages. 01.12.2015 median laparotomy was used with radical nephrectomy. 29.01.2016 Leclerc (Mercedes) relaparotomy was performed with the liver mobilization on the left and ligation of the Makuuchi ligament. Then the sternotomy was used with the connection to the extracorporeal circulation in order to perform thrombectomy from the inferior vena cava and right atrium. The morphopathological analysis detected nephrocellular carcinoma with clear cells.

Conclusions: Involvement of the inferior vena cava represents a complicated aspect of renal cancer, being the only type of tumor that infiltrates the wall of this vessel, also demonstrated histologically. The evolution of surgical techniques and the extensive collaboration of different specialists allow the extensive implementation of aggressive renal extirpation tactics with the subsequent restoration of the vena cava through various methods and materials. Inferior vena cava nephrectomy and thrombectomy for renal cancer with metastatic thrombus in the inferior vena cava can be performed safely with a high rate of long-term patient survival.

ENDOVASCULAR TREATMENT OF ACUTE ILIOFEMORAL VENOUS THROMBOSIS

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Background: Ilio-femoral deep vein thrombosis has a high rate of long-term morbidity, mainly in the form of the postthrombotic syndrome. Endovascular interventions of acute deep vein thrombosis using thrombolysis and mechanical thrombectomy have received increased focus in the literature as a safe and effective therapeutic modalities.

Aim: To report endovascular repair of acute iliofemoral venous thrombosis in 2 young female patients using ClotTriever Thrombectomy System (Inari Medical).

Methods: A 23-year old female patient presented with worsening left lower extremity edema and skin discoloration. The patient was diagnosed two days prior to admission with acute left femoral deep vein thrombosis treated with rivaroxaban 15mg twice daily. Computed tomography venography demonstrated occlusive thrombus within left common iliac vein and external iliac vein and partially occlusive thrombus of femoral vein, while indicating external compression of left common iliac vein by the right common iliac artery. A 30-year old female patient presented with right lower extremity pain and edema one-month post-partum. Computed tomography venography demonstrated occlusive thrombus within right common iliac vein extending to inferior vena cava.

Results: Both patients were treated with endovascular mechanical thrombectomy, via popliteal vein access. Mechanical thrombectomy was carried out with the ClotTriever Thrombectomy System (Inari Medical, Irvine, California). Repeated venography demonstrated residual filling defects, treated with venous stenting. The patients presented uncomplicated postoperative course. Within 3 days the edema had completely resolved, and the patients reported complete symptom relief. At 6-month follow-up, the patients remained free of symptoms and were able to return to their normal daily activities.

Conclusions: The ClotTriever thrombectomy system is an effective and safe treatment option for patients with acute iliofemoral deep vein thrombosis. Nonetheless, further research is warranted to help determine appropriate criteria for the application of mechanical thrombectomy for proximal deep vein thrombosis.

ENDOVASCULAR TREATMENT OF UPPER LIMB PHLEGMASIA CERULEA DOLENS IN A HEMODIALYSIS PATIENT

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Backgroud-Aim: Phlegmasia cerulea dolens (PCD) represents a rare but limb-threatening complication of acute deep vein thrombosis. The main causes include malignancy, trauma, hypercoagulable states and pregnancy. This case is the first reported upper limb PCD which was associated with the presence of a hemodialysis catheter and a well-functioned AVF which may aggravate PCD symptoms.

Methods: A 72-year-old male patient presented with a 12-hour history of right upper limb pain, extensive swelling and cyanosis (Fig. 1A). His medical history was remarkable for hypertension and stage 5 chronic kidney disease. A brachiocephalic arteriovenous fistula was created 1 month ago but hemodialysis was performed via a hemodialysis catheter which was placed as a bridge device. The patient underwent CECT which revealed the presence of extensive thrombosis of right subclavian and brachiocephalic vein.

Results: The hemodialysis catheter was removed and patient was treated with anticoagulation therapy. However, 6 hours later his clinical condition was worsening with early signs of venous gangrene. The patient was transferred to IR department, cephalic vein was punctured and venography confirmed CT findings (Fig.2A). The thrombotic occlusion was transversed and patient underwent percutaneous mechanical thrombectomy (PMT) with Angiojet Thrombectomy System followed by percutaneous transluminal angioplasty (PTA) with a high pressure PTA balloon catheter. Final DSA revealed significant flow restoration (Fig.2B). After the procedure, limb pain was significantly improved and swelling and cyanosis were relieved (Fig.1B).

Conclusions: Upper limb PCD can be developed in hemodialysis patients with well-functioned AVF. Endovascular treatment with PMT and PTA may be a limb-saving procedure for rapid revascularization in patients with PCD.

CONTEMPORARY TREATMENT OF PAGET-SCHROTTER SYNDROME

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Background: Paget-Schrotter syndrome (PSS) or subclavian/axillary vein effort thrombosis consists an uncommon entity usually affecting relatively young and active patients. Proper treatment increases the possibility of successful restoration to complete extremity functionality.

Methods: A retrograde case series study including the patient that were treated with PSS in our department from 2019 to 2023 was designed. Perioperative morbidity, and anatomic / functional outcome evaluation were the aims of the study. Data were retrieved from HEVAR, the Hellenic Vascular Registry.

Results: Five patients (4 male) were treated, median age 33 years. The treatment included a multi-faceted approach when feasible, based on the time-lapse of symptoms appearance on admission. In 3 patients, who were admitted shortly after the deep vein thrombosis, a catheter-based thrombolysis was performed until complete thrombus resolution. All 5 patients underwent a first rib resection. The approach was infraclavicular in 3 patients, and paraclavicular in the other two. Operations were successful without serious morbidity. In 1-36 months follow up patients were free of symptoms with complete restoration of their previous activities. One patient needed a postoperative balloon angioplasty of the partially recanalized subclavian vein.

Conclusions: The treatment of PSS requires a multi-disciplinary approach. Resection of the first rib is necessary to achieve acceptable upper extremity functional results without recurrence at a mid-term follow-up.

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