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SCVE | Société de Chirurgie Vasculaire et Endovasculaire de Langue Française

THE SCVE "HUMAN CARE" LABEL: TOWARDS ENHANCED WELL-TREATMENT FOR VASCULAR CARE PROVIDERS AND PATIENTS IN A DETERIORATED CARE SYSTEM

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Objectives: The hospital sector faces many challenges. The length of hospital stays decreased, the burden of care increased and the relationship of professionals to work has profoundly modified since the pandemic of COVID-19. This leads to a shortage of health care workers and to increasing difficulties in stabilizing paramedical teams that can impact health care safety. Furthermore, these constraints compromise the ability of health facilities to meet the requirements of well-treatment for patients, which is closely linked with the well-being of the caregivers and the patients. It is in this context that the French Society for Vascular and Endovascular Surgery (SCVE) in association with the Persomed© company created a label promoting the well-treatment of caregivers and patients in vascular surgery services through the "SCVE - Human Care" project. This label is based on specific assessment tools and practical criteria designed to strengthen human care practices, thus meeting the expectations of well-treatment in care.

Material and methods: To structure well-treatment, Persomed developed three reference indices aiming to provide a basis for guaranteeing a respectful and human working and care environment: ISB© (Structural Index of well-treatment, which evaluates the capacity of the facilities to implement an effective well-treatment for caregivers and patients. IPBS© (Personal Well-treatment Index) and IPBP© (Personal Index for Patients' Well-treatment), which measure the individual feelings of caregivers and patients. In 2022, in partnership with Persomed, the SCVE created a Label Committee composed of 14 hospitals, public and private, which made it possible to define specific criteria of well-treatment in vascular surgery, including the working and training conditions of the caregivers, but also to prioritize 12 specific criteria of well-treatment of vascular surgery patients.

Results: Feedback from the centers allowed to develop precise criteria adapted to the real-world situation in terms of well-treatment in the facility (Structural Index of Well-treatment /100), and well-treatment for vascular patients including 12 criteria: Full concerted of patients - Systematized and consensual information of the patient in case of modification of the treatment - Patient access and comfort in the operating room - Patient's bed comfort - Controlled feed management - Patient comfort in unit of care - Specific human resources training - Early postoperative rehabilitation project - Prediction of disability - 24/7 pain management - Psychologic support, particularly for patients at risk of geriatric syndrome - Patient autonomy, supervision and self-monitoring). These specific criteria were then associated with the benchmark criteria of the French High Health Authority (HAS) regarding generic well-treatment of patients, including four criteria: The user co-author of his pathway - The quality of the relationship between professionals and users - Personal and collective perspectives, hospital capabilities - Support for professionals in the well-treatment process, and criteria for well-treatment of caregivers, including: Professional integrity, expression and experience - Structural conditions and operational frameworks for the well-treatment of patients - Personal and community perspectives for well-treatment - Exchange dynamics and concrete support of the structure to the professionals. The process for obtaining the "SCVE - Human Care" label is based on three specific successive steps in each center including the initial evaluation of the structure (ISB) then an audit with an action plan and a certification of each criterion, including the patient evaluations on the impact of the implementation of the criteria. The label is delivered annually. In partnership with the SCVE, Persomed

ensures the deployment of the evaluations and training, notably through CME modules dedicated to well-treatment and humanization of care. Financing options include the facilities, in particular through the continuing education funds, professional liability insurers and Regional Health Agencies.
Conclusion: The ''SCVE - Human Care'' label project aims to address the crucial need to guarantee human care in a changing hospital context, supporting both caregivers and patients in an environment of well-treatment and respect. After validating the label with the SCVE, a pilot experience in three facilities will be implemented to evaluate the effects on the well-being of the caregivers, the quality of care, and the sinistrality.
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PLACE OF ''ATYPIC'' DISTAL ARTERIOVENOUS FISTULA IN THE STRATEGY OF CREATION OF HEMODIALYSIS ACCESSES

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Objectives: The guidelines on arteriovenous fistulas (AVFs) favor a principle of distality in order to preserve the venous capital in view to create other AVFs and to avoid the undesirable effects of proximal AVFs. In France, radio-cephalic AVF in the snuffbox is often neglected. In addition, when a radio-cephalic AVF is not possible, a proximal AVF is often created despite the possibility of creating other distal AVFs. The purpose of our study was to evaluate the use of these fistulas, their results in our practice, and thus to study their place in the strategy of creating a vascular access.
Material and methods: We conducted a single-center retrospective study including all the AVFs created over a 22-month period. 76 AVFs were created. Primary, assisted primary, and secondary patency rates were analyzed at 6 and 12 months with Kaplan-Meier survival curves and log rank tests. Dialysis performance criteria were also analyzed with Fischer and Mann-Whitney-Wilcoxon tests as secondary criteria.
Results: No significant difference was observed between the 20 atypical and the 56 conventional AVFs in terms of patency and analysis of the secondary criteria. After six months, the primary, assisted primary, and secondary patency rates of atypical distal fistulas were 58.2%, 64.6% and 79.7% respectively, compared with 65.8%, 73.3% and 78.6% for proximal AVFs and 54.0%, 78.4% and 78.4% for radio-cephalic AVFs ($p=0.84$, $p=0.83$ and $p=0.79$ respectively).
Conclusion: The 6-month and 12-month patency rates of "atypical" distal AVFs and conventional AVFs are similar. This result suggests that snuffbox AVFs should not be neglected and that other distal atypical AVFs should be created before the use of proximal AVFs.
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STRESS OF VASCULAR SURGERY RESIDENTS AT FIRST AUTONOMOUS SURGERY

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Objectives: Stress management among surgeons in training is an area of increasing importance, especially before the first autonomous intervention. In vascular surgery, the challenges are considerable, and it is crucial to understand the mechanisms of this stress and to identify its triggering factors to improve the performance and the safety of the interventions. Preoperative stress can interfere with decision-making, technical dexterity and complication management. The main objective of this study was to analyze the stress levels experienced by vascular surgery residents before their first autonomous intervention, by highlighting the specific factors experienced by them. We also tried to identify the impacts of stress on surgical performance and evaluate the effectiveness of stress management strategies.
Material and methods: A prospective study was conducted with the residents of vascular surgery performing their first autonomous intervention over a period of six months. Stress levels were measured using the Perceived Stress Scale (PSS) and a personalized questionnaire was used to identify the specific stressors for vascular surgery. We also explored the underlying psychological mechanisms of these stress levels, including the perception of time pressure, the management of clinical uncertainty, and fears related to critical decision making.
Results: The results showed that a significant percentage of residents had moderate stress levels. Among the factors identified, the uncertainty about the management of vascular complications, the lack of experience in handling complex techniques, and the apprehension about the unpredictability of postoperative evolution were the most significant. The study also showed that mentor support and theoretical and practical preparation had a significant impact on the reduction of stress, especially when direct exchanges with an experienced surgeon are possible during the procedure.
Conclusion: This study highlighted the need for a structured approach to manage the stress of residents before their first autonomous vascular surgery. The results suggest that the implementation of simulation and psychosocial support programs focusing on technical skills and the management of clinical uncertainty could reduce stress and improve surgical performance. Support strategies

dedicated to vascular surgery including a closer follow-up by mentors during the first procedures are potential levers to ensure the safety of patients and the well-treatment of surgeons in training.

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EXPERIMENTAL EVALUATION OF HIGH INTENSITY FOCUSED ULTRASOUND (HIFU) IN THE SONICATION OF ARTERIAL ENDOFIBROSIS: TOWARDS ENCOURAGING PROSPECTS

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Objectives: To date, only laser or mechanical atherectomy technique allows to eliminate some arterial stenoses. Among these diseases, arterial endofibrosis is a paucicellular stenosing lesion with a known homogenous tissular character. The treatment of certain cancers and the administration of drugs use high intensity focused ultrasound (HIFU). These applications are based on the controlled formation, growth and implosion of microbubbles under the effect of US waves. HIFU-induced mechanical cavitation allows the destruction of certain tissues. The objective of this original experimental study was to verify the feasibility, the security, and the efficacy of using HIFUs in the resorption of endofibrosis arterial plaques.

Material and methods: The retained models were fragments of external iliac endofibrosis plaques collected peroperatively from five patients according to an accepted protocol. Anatomopathological analysis of the samples confirmed a structure composed of fibroblasts and myofibroblasts in a fundamental substance (mucopolysaccharides, proteoglycans, elastic fibers and collagen.) Each of the five fragments was divided into two equal square samples (nE1=US exposure and nE2=control, areas: 0.4-0.9 cm^2, mass: 41-118 mg, mean= 65±27mg). nE1 and nE2 were positioned in a comparable manner in a tubular nacelle patent to US. The nacelle was immersed in a tank of filtered physiological water. It was placed at the focus of a focused US transducer. The bursts (1MHz, 0.3s cycles, 8.3MPa) were repeated on the focus during 15 minutes. Tissue destruction was evaluated visually, and quantified by measurement of mass loss after vacuum suction, with a 25 μm filter porosity.

Results: All the procedures were successful. Acoustic parameters guaranteed the security of targeted tissue destruction and the control of microbubble diffusion. No nE2 deformation was observed. The five nE1s were deformed. Two nE1s were perforated. Mass loss of nE2s was 0-10 mg (mean loss: 7 mg, 7%). Mass loss of nE1 ranged from 19 to 89 mg (mean loss: 40 mg, 54%) (p=0.03).

Conclusion: This study is the first which suggests the efficacy of the secure destruction of endofibrosis plaques by HIFUs, which offers promising perspectives in extracorporeal arterial ultrasonic treatments.

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STORAGE OF HUMAN ARTERIAL ALLOGRAFTS AT +2/+8°C: IMPACT ON THE 12-MONTH MECHANICAL PROPERTIES

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Objective: The objective of this study was to evaluate the consequences of cold storage (+2/+8°C) in the long term on the mechanical properties of arterial allografts in comparison with cryopreserved allografts.

Material and methods: Femoro-popliteal arterial samples were collected from tissue donors for scientific research and stored at +2/+8°C for 12 months in a saline solution with the addition of antibiotics. The mechanical characterization was determined using two tests, cyclical deformation and then continuous linear deformation, in order to finalize the physiological module as well as the maximum stresses and maximal deformations supported by the sample before rupture. These characterizations were determined after 0, 6 and 12 months of storage for each donor (T0, T6 and T12). The same tests were performed on cryopreserved femoropopliteal segments after thawing.

Results: Twelve refrigerated allografts (RA) divided into three segments (T0, T6 and T12) and 10 cryopreserved allografts (CA) were characterized. The median Young's modulus was not significantly different between the different storage durations for refrigerated allografts (RAT0: 164 kPa [150-188], RAT6: 178 kPa [141-185], RAT12: 177 kPa [149-185]). The median Young's modulus of the CA group (153 kPa [141-185]) showed no significant difference with the RA groups, regardless of the storage duration. The median stress and deformation values were not significantly different between the different RA or CA groups: 1.58 MPa [1.08-2.09] (RAT0), 1.74 MPa [1.55-2.36] (RAT6), 2.25 MPa [1.87-2.53] (RAT12) and 2.25 MPa [1.77-2.61] (CA) versus 64% [50-90] (RAT0), 79% [6-66] (RAT6)] (RAT12) and 67% [50-95] (CA), respectively.

Conclusion: Human arterial allografts stored at +2/+8°C up to 12 months seem to have the same mechanical characteristics as thawed cryopreserved arterial allografts. Therefore, this conservation method which could facilitate

access to biological grafts in routine care appears feasible. A clinical study is underway to study the results of these refrigerated allografts in septic revascularization.
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PULMONARY PROTECTION DURING PERCUTANEOUS ENDOVASCULAR THROMBECTOMY FOR ACUTE FEMORO-ILIO- CAVAL DEEP VENOUS THROMBOSIS

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Objectives: The techniques of thrombus removal are recommended for the treatment of femoro-iliac (FI) acute deep vein thrombosis (DVTa) in selected patients (grade IIa, level A of the 2021 ESVS guidelines). The purpose of this study was to report our experience of lung protection during percutaneous endovascular therapy.
Material and methods: Between August 2013 and October 2024, 68 consecutive patients (54 women, median age 36.5 years (16-76) had a percutaneous endovascular thrombectomy for FI DVTa after a 5-day median evolution (2-14). Of these 26 necessitated embolic protections with a vena cava filter in 4 cases and an occlusion balloon in 22 cases. The indication was the presence of a vena cava thrombus in 18 cases, in the right iliac vein in 7 cases and in the left external iliac vein in 1 case, including 11 cases with pulmonary embolism (PE).
Results: The rate of technical success was 100% and no patients presented clinical or hemodynamic signs of PE before operation or in the postoperative period, whereas all the procedures were performed under local anesthesia. In cases of using an occlusive balloon, no hemodynamic repercussions occurred and thromboaspiration was performed in contact with the balloon before deflation in all cases. Two of the four vena cava filters thrombosed during operation and were thromboaspirated, which lead to a switch of the filter in one case. One filter was retrieved at D2. The median operative and hospitalization durations were 110 minutes (50-180) and 2 days (1-17), respectively. During a median 24-month follow-up (1-93), two filters were retrieved at 2 months. The last one could not be removed due to switching and became partially thrombosed under anticoagulant treatment during the follow-up. One patient died at 3 months of pancreatic cancer. Primary, primary-assisted and secondary patency rates were 88%, 96% and 100% respectively at 24 months with median Villalta, VDS and VCSS scores at the end of follow-up of 1, 2 and 1, respectively, without any post-thrombotic syndrome.
Conclusion: Pulmonary protection during endovascular treatment of a FI DVTa +/- vena cava extension is clinically effective. The use of an occlusion balloon has no hemodynamic impact and avoids leaving potentially thrombogenic material in place while eliminating the risk of PE. These data should be confirmed by a study including a pre- and a postoperative pulmonary angio-CT.
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TREATING PELVIC CONGESTION CORRECTLY: SHOULD WE RELY ON A NEW ACTOR?

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Objectives: Pelvic congestion syndrome (PCS) is a pathological entity at the crossroads of many specialties. This is why the teams taking care of these patients using modern methods combine vascular surgery, gynecology, urology, gastroenterology and algology. However, despite optimum visceral care, some patients still experience pain, which is then poorly understood. What if the response was in the painful imprint left by years of diagnostic wandering? And should we treat these patients more globally, adding the musculoskeletal plan?
Material and methods: We analyzed retrospectively a cohort of patients treated in 2024 in our department. Their physical examination was carried out by a physician specialized in physical and rehabilitation medicine. It consisted of an evaluation of normal and pathological articular and muscular mobility and an examination of the muscle tone of the limbs and trunk.
Results: A total of 17 patients (mean 34.3 years, mean duration of diagnostic error 7.2 years) were studied. On the postural side, the most prominent clinical features were low back pain (88% of cases), abdominal tone weakness (65%), paravertebral contracture (65%), abdominal dyssynergia (53%), and postural stiffness of lower limbs (53%). In addition, a thymic inflection occurred in 1/3 of patients. There appears to be a secondary dysfunctional staturo-postural adaptation to pelvic pain, leading to chronic musculoskeletal pain developing on its own in parallel to the PCS.
Conclusion: Chronic pain syndrome is a difficult concept for the surgeon. Nevertheless, its management is crucial to effectively manage patients with pelvic congestion syndrome. In fact, due to the duration and complexity of pelvic pain, as well as its impact on the intracerebral pathways of regulation of the painful perception, an overall assessment and a multimodal educational management must accompany our medical and surgical treatments.
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INFERIOR VENA CAVA RESECTION WITH OR WITHOUT RECONSTRUCTION FOR CANCER. SHORT- AND MEDIUM-TERM RESULTS

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Objectives: Various abdominal neoplastic diseases can lead to inferior vena cava (IVC) involvement. The surgical strategy depends on the extension of the lesion, the development of the collateral circulation, and the possibilities of restoring the venous circulation. For the reconstruction of IVC, biological substitutes such as bovine pericardium or venous autografts are preferred due to their antithrombotic and antibacterial properties. The main objective of our study was to evaluate the clinical and functional consequences VCI resection, with or without reconstruction. Secondary objectives were the patency of the reconstructions, survival, local tumor recurrences and the occurrence of complications.
Material and methods: From January 2014 to April 2024, we enrolled patients undergoing IVC resection. The demographic characteristics, the type of neoplasia, the level of resection and the material used for reconstruction were studied. 30-day, 12-month, and 24-month physical examinations and imaging studies were performed. We also recorded the occurrence of postoperative complications.
Results: 44 patients were enrolled in this study, including 32 men. The average age was 59 years (27-81), and median follow-up duration was 34 months (8-112). The type of neoplasia encountered was renal in 48% of cases (N=21), a leiomyosarcoma in14% of cases (N=6), and a testicular cancer in 14% of cases (N=6). Partial resections were performed in 15 patients and total resections in 29 patients (including 15 cases without reconstruction and 14 bypass grafts). The substitutes used were bovine pericardium (N=14), femoral vein autografts (N=5), or other autologous veins (N=2). Eight postoperative complications $\geq$2 according to Clavien were observed. No patients presented a serious IVC syndrome during follow-up. The overall 30-day, 1-year, and 2-year IVC patency was 96%, 95% and 93%, respectively. 30-day, 1-year and 2-year survival rates were 100%, 92% and 85%, respectively. The local tumor recurrence was 0% after 30 days, 6% after 1 year and 10% after 2 years.
Conclusion: The reconstruction of IVC with biological materials after IVC resection for neoplasia seems to provide good clinical and functional results. IVC resection in selected patients has a low complication rate, if radiological and hemodynamic criteria are respected.
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ROBOTIC MINIMALLY INVASIVE NUTCRACKER SYNDROME SURGERY: TECHNICAL ASPECTS AND RESULTS

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Objectives: Transposition of the left renal vein (LRV) into the inferior vena cava (IVC) is one of the most common techniques to treat the nutcracker syndrome (NCS), but it requires a laparotomy. The objective of this study was to demonstrate the feasibility and effectiveness of a new robotic surgical technique for the treatment of NCS by transposition of the left renal vein with inferior vena cava plasty, as a minimally invasive alternative to open surgery.
Material and methods: All symptomatic NCS cases, whether or not associated with pelvic congestion syndrome or varicocele, were prospectively and consecutively included from February 2022 to April 2024, and operated by robotic surgery (Da Vinci). The technical innovation combined LRV transposition with a plasty of the IVC. Primary outcome was the feasibility measured by the technical success. The secondary outcome was the effectiveness evaluated by symptom resolution and left renal vein patency.
Results: Fifteen patients, 13 women and two men, with an average age of 31±8 years, were operated. Two cases were reoperations, with a previous LRV transposition in another center. The average operating time was 273±39 minutes, with an average time for LRV anastomosis and IVC plasty of 38±15 minutes. The immediate technical success was 100%, without any surgical conversion. Two cases necessitated a complementary stenting of the LRV on the 5th postoperative day. One balloon angioplasty without stenting was performed on the 3rd postoperative day. One patient required the laparoscopic evacuation of a lymphocele on the 5th postoperative day. One renal autotransplantation was done two months after the operation for functional insufficiency of the left renal vein. Embolization of associated pelvic varicose veins was performed postoperatively in nine cases, and preoperatively in three cases. It was not needed in three cases. The average duration of hospitalization was 5±1.7 days. The average follow-up was 14.5 months. Two-month primary and assisted primary patency rates were 66.7% and 80%, respectively. 2-, 6- and 12-month Secondary patency rates were 93.3%, 100% and 100%, respectively. Symptoms resolved in all the patients six months after surgery.
Conclusion: These results suggest that totally robotic LRV transposition with IVC plasty is a feasible and effective technique, offering a minimally invasive alternative to open surgery.
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EXPERIMENTAL MODEL OF PREVENTIVE EMBOLIZATION OF INTERCOSTAL AND MEDULLARY ARTERIES WITH AN INNOVATIVE, ECO-RESPONSIBLE, AND BIOLOGICAL EMBOLIC AGENT: CAN PET SCANNING BE A NEW DIAGNOSTIC TOOL FOR SPINAL CORD ISCHEMIA?

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Objectives: Extensive lesions of the thoracoabdominal aorta represent a technical challenge due to the high risk of perioperative morbimortality. Paraplegia resulting from the ischemia of the spinal cord are a major concern. Preconditioning by the previous partial sacrifice of spinal cord vascularization is one of the solutions to prevent this dramatic complication. The purpose of this study was to validate the preventive embolization of lumbar and intercostal with an innovative, ecological, and biologic embolic agent, and to validate fluorodeoxyglucose positron emission tomography (FDG-PET) as a helpful tool to diagnose spinal cord ischemia.
Material and methods: Three pigs were studied. Embolization of the intercostal and lumbar arteries was performed in two stages (D0 and D14) with a solid embolic agent (AGAR AGAR). A daily clinical evaluation was done, and an FDG-PET was obtained in preoperative and at D0 and D14. Blood samples were collected for hematological and biochemical analyzes. The animals were humanely euthanized at D28 for aortic and spinal cord pathological evaluation (hematoxylin-eosin staining).
Results: The results demonstrated no complications or adverse effects after both embolic stages. All animals survived through the duration of the follow-up. The three pigs did not show any sign of paraplegia or paraparesis after the two embolization stages. No significant changes were observed in the hematological and biochemical analyzes on Days 0, 14 and 28. Kinetics of the binding profiles were similar for the three animals. For all embolized levels between T4 and L4, a significant increase in fixation was observed at D0 post embolization compared to the basal time (0.001 %ID/g±0.0004). At Day 14, values returned to the levels observed in the baseline condition. After explantation of the spinal cord, macroscopic analysis revealed no lesions. Pathology analysis did not reveal any sign of cord necrosis.
Conclusion: Our study demonstrated the reproducibility and the feasibility of preventive embolization with Agar. The inflammation increase detected by FDG-PET could be correlated with a minor spinal injury induced by the preventive embolization underlying a neoangiogenesis of the cord vascularization protecting from the sacrifice of intercostal and lumbar arteries. FDG-PET could be used in clinical practice to more accurately track symptomatic infraclinical or paucisymptomatic spinal cord lesions.
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RESULTS OF THE FASCAT STUDY: PERSONALIZED BIOMECHANICAL STUDY OF THORACIC ENDOVASCULAR REPAIR (TEVAR)

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Objectives: The aim of this work was to evaluate the aortic wall's biomechanical properties, particularly in terms of compliance, the aortic flow and the cardiac function before and after thoracic endovascular aortic repair (TEVAR).
Material and methods: FASCAT is a prospective single center cohort study in which all patients who had the indication of TEVAR for aneurysm or dissection of the descending thoracic aorta were eligible. Before and 3 months after the operation, patients had a 4D flow magnetic resonance imaging (MRI), a transthoracic echocardiography (TTE), and blood tests. 3D numerical twins of the pre- and postoperative aorta of each patient were created for the compliance analysis. The principal outcomes were radial aortic compliance, defined as the variation of the aortic diameter between diastole and systole, the velocity of the pulse wave, the fraction of retrograde flow (FRF) in the ascending aorta, defined as the ratio between the retrograde flow and the anterograde flow, the fractions of ejection of the left (LV) and right (RV) ventricles and the NT-proBNP rate.
Results: Between April 2022 and March 2024, 23 TEVAR procedures were analyzed in 22 patients (14 aneurysms and 8 dissections). Our analyzes of pulse wave velocity and radial aortic deformation found a significant increase in the rigidity of the implantation zone of the stentgraft whereas a significant increase of elasticity was observed upstream of the stentgraft in the native ascending aorta. The flow analyzes showed a significant decrease in the retrograde flow in the ascending aorta, suggesting reduced turbulences upstream of the graft. The study of cardiac function did not find any significant difference in left or right ventricular function. A significant increase in LV mass, a decrease in the RV ejection fraction and an increase in cardiac biomarkers (NT-proBNP) suggested the implementation of adaptive mechanisms and the risk of deterioration in cardiac function in the long term.
Conclusion: Our study found a significant mechanical impact of TEVAR not only in the stented zone but also upstream, in the native ascending aorta. A follow-up of these long-term parameters will be necessary to better understand the impact of stentgrafts and adapt their design accordingly.
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ENDOVASCULAR TREATMENT OF AORTIC ARCH LESIONS WITH DOUBLE -FENESTRATED STENTGRAFTS MODIFIED BY THE SURGEON: PROSPECTIVE STUDY ON RADIATION AND LOCAL ANESTHESIA WITH SEDATION

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Objectives: Endovascular treatment of aortic arch lesions is experiencing a significant increase in recent years. However, there are few publications on radiation exposure

during these procedures, and even fewer publications on anesthetic procedures. The aim of this report was twofold: to quantify the radiation exposure of people present in the operating room, and to show the feasibility of using local anesthesia and sedation for endovascular treatment of aortic arch lesion with double-fenestrated stentgrafts modified by the surgeon.

Material and methods: The data were collected prospectively in a single university center between January and May 2024, for all endovascular treatment procedures treating aortic arch lesions with a modified double-fenestrated stentgraft modified by the surgeon. For the radiation exposure, data were collected from the machines (emission and patient's exposure) and from active dosimeters placed under the surgeon's and the operative nurses' and the anesthesiologist's aprons. An active dosimeter positioned outside the lead apron made it possible to simulate the dose at the level of the unprotected lens of the eye. Availability of dedicated active dosimeters was a limiting factor. Regarding the feasibility of local anesthesia and sedation (monitored anesthesia care, MAC), the short-term results analyzed were technical success, operating time, duration of hospitalization, mortality rate, complications, and interventions. Exclusion criteria included general anesthesia. MAC consists of injection of local anesthetic (2% lidocaine) by the surgeon at the puncture sites after deep sedation induced by the anesthetists with a controlled infusion of Propofol and Remifentanil (target-controlled infusion, TCI) adapted to the characteristics of the patient (weight, size, age, gender) and the chosen level of sedation. No orotracheal intubation (OTI) was required. MAC was offered first, except in cases of small and tortuous iliac arteries, hemodynamic instability, neurological disorders, or difficult cooperation.

Results: In this university center, 20 patients had an endovascular treatment of the aortic arch with a double-fenestrated stentgraft modified by the surgeon. For the study of the exposure to radiation, the data were obtained for 15 procedures. Of these, 53% were done in a hybrid theater. Ten patients were treated for aneurysms, and five for dissections. The mean body mass index (BMI) was 26.3 kg/m^2. On average, the duration of exposure was 8.88 minutes, the irradiation reached 295 dGy.cm^2 (SD = 73), and the kerma air product (KAP) reached 78.1 mGy (SD = 73). The doses received at the level of the lens of the eye by the operator, the assistant surgeon and the anesthetist were 6.24 μSv (SD=5.72), 0.95 μSv (SD=1.04) and 2.89 μSv (SD=2.84), respectively. The injected dose of iodine was always 40 mL. Exposure to radiation was significantly increased for a BMI above 27 kg/m^2 and during hybrid-room procedures (Artis zee with Pure, SIEMENS Healthineers, Courbevoie, France) compared to conventional-room procedures (OEC Elite CFD 31 cm Super C-arm, GE Healthcare). Fourteen procedures (70%) were performed under local anesthesia and sedation (MAC). The rate of technical success was 100%. 71% of these interventions were programmed. Various types of pathologies sere treated: aneurysms, acute and chronic dissections, traumas. The approach was percutaneous in 93% of the cases and no conversion to orotracheal intubation (OTI) was necessary despite one surgical conversion. The average duration of the procedure was 54 minutes (29-108 minutes). At the 30-day follow-up, no major endoleak necessitating reintervention or stent occlusion were observed. No death was reported. One patient developed an asymptomatic retrograde dissection of the skin shown by the one-month follow-up scan. This patient has a subsequent uncomplicated replacement of the ascending aorta without complication. No cases of pulmonary, myocardial, renal or mesenteric ischemia were observed. The average duration of hospital stay was 4.9 days (2-23 days), while the average duration of ICU stay was 1.1 days (0-23 days).

Conclusion: Radiation exposure is an essential factor to consider with the multiplication of complex endovascular procedures, as it can lead to undesirable effects, especially in the lens of the eye. This study is one of the first to explore anesthesia modalities for aortic arch stentgrafts. Double-fenestrated stentgrafts modified by the surgeon allow the treatment of aortic arch lesions with reduced radiation exposure for staff and patients. These procedures can be carried out under local anesthesia and sedation, with satisfactory results in the short term.

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SHORT- AND MID-TERM RESULTS OF LEFT SUBCLAVIAN REVASCULARIZATION IN THE ENDOVASCULAR TREATMENT OF DISTAL ARCH PATHOLOGIES WITH ZONE 2 ANCHORING

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Objectives: This study aimed to evaluate the short- and mid-term results of the revascularization of the left subclavian artery (LSCA) during zone 2 TEVAR.

Material and methods: Patients who had TEVAR in zone 2 between 2018 and 2023 were included in this one-center retrospective. The pre and postoperative data collected in an e-CRF included local complications, the rate of reintervention, and the short- and mid-term patency. The 30-day occurrence of a stroke or spinal cord ischemia was compared between patients having LSCA revascularization (group 1) or not (group 2). A logistic regression was adjusted for the presence of an initial aortic rupture and the length of aortic coverage.

Results: 237 patients had TEVAR between 2018 and 2023 in our department, 80 of them in zone 2, included in our study: 50 patients in group 1 (47 carotid-subclavian bypasses, three subclavian-carotid transpositions), and 30 patients in group 2. In group 1, revascularization of the

LSCA and TEVAR were carried out in two distinct operating phases in 76.0% (n=38) of the cases. The patency rate of carotid-subclavian bypass was 97.9% in the mid-term (average follow-up: 18.6±18.5 months). The rate of proximal endoleaks was lower in group 1 (8.0%, n = 4 vs. 16.7%, n = 5; p = 0.284). Four patients (13%) in group 2 necessitated a secondary LSCA revascularization. The incidence of strokes and ischemia was 8% vs. 23.3%, (p = 0.09) with an OR of 0.83 (95% CI: 0.69-1.01; p = 0.06) in group 1 and group 2, respectively. 30-day mortality rate was 6.1% (n=3) in group 1 and 25.0% (n=7) in group 2 (p=0.031).

Conclusion: The prior revascularization of the LSCA before TEVAR in zone 2 reduces neurological complications and proximal endoleaks.

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IMPORTANCE OF POST-TEVAR AORTIC VOLUME ANALYSIS

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Objectives: To evaluate the capacity of the volume of the aortic aneurysm (AAV), of the volume of the aneurysmal lumen (ALM), and of the volume of the aneurysm thrombus (ATV), to predict the need of a new aortic intervention, using the maximum diameter of the aorta as a reference.

Material and methods: This single center retrospective study included 31 consecutive patients who underwent TEVAR to treat an atheromatous thoracic aortic aneurysm. All patients were followed clinically and by CT angiography (CTA) for 3 years after TEVAR. Patients were divided into two groups. In group 0 no new aortic procedures were required during the follow-up period, and patients of group 1 presented type I or III endoleaks or an increase in the aneurysmal diameter requiring a procedure. The maximal diameter of the aneurysmal sac as well as AAV, ALM and ATV were calculated from the CTA images obtained before operation (T0), then between 6 and 12 months (T1), 24 months (T2), and 36 months (T3) after the operation. Their evolution over time was evaluated. The correlations between the diameter and the variations of AAV, ALM and ATV were evaluated, and the association between the changes in diameter and volume and the need of a new intervention was also evaluated. Threshold values for predicting the need for a new intervention were predicted using the ROC curve. The changes in volume compared to the changes in diameter were analyzed.

Results: No CTA significant difference in terms of average aneurysmal diameter, AAV, ALM or ATV was observed between groups between groups in preoperative or after one year of follow-up. Average ATV was higher in group 1 than in group 0 after 2 years (187.6±86.3 mL vs 114.7±64.7 mL; p = 0.057) and after 3 years (195.0±86.7 mL vs 82.1±39.9 mL; p = 0.013). The 3-year maximum diameter was greater in group 1 than in group 0 (67.3±9.5 mm vs 55.3±12.6 mm; p = 0.044). The rate of change in the AAV between T0 and T1 was significantly greater in group 1 (7±4.5%) compared to group 0 (-6±6.8%; p < 0.001). The rate of change of ATV between T1 and T3 was significantly greater in group 1 than in group 0 (34±40.9% vs -13±14.4%; p = 0.041). Similar results were observed for the rate of change of ATV between T2 and T3 (27±50.1% for group 1 vs -8±49.5% in group 0; p < 0.001). According to our multivariate analysis, the annual rate of growth of AAV between T0 and T1 was the only independent factor significantly associated with aortic interventions (AUC = 0.84, OR = 1.57, p = 0.025; optimal threshold +0.4%). An increase in the annual growth rate of the ATV between T0 and T3 was independently associated with a new aortic procedure (AUC = 0.90, OR = 1.11, p = 0.0347; optimal threshold +10.1%).

Conclusion: Aortic volume analysis predicts the need of a new aortic procedure more precisely and earlier than the maximum diameter of the aorta.

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IMPACT OF A SHORT LENGTH OF PROXIMAL FIXATION (<20MM) IN THE TREATMENT OF AORTIC DISSECTIONS WITH STENTGRAFTS

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Objectives: To evaluate the mid-term morbimortality associated with TEVAR in patients with aortic dissection (AD) as a function of the quality of the proximal fixation zone of the stentgraft (healthy aortic wall ≥ or < 20 mm).

Material and methods: Patients treated by TEVAR for AD between 2012 and 2023 were retrospectively reviewed. Those with pre- and postoperative scanners for which the central line distances between the proximal extremity of the AD and the proximal extremity of the stentgraft were measurable were retained for this study. Two groups were constituted according to the length of the proximal fixation zone of the stentgraft: <20 mm (Short Neck: SN) and ≥20 mm (Optimal Neck: ON). The occurrence of an aortic adverse event (AAE), combining retrograde dissection, type Ia endoleak, stentgraft migration >10 mm, dilation of the thoracic aorta >5 mm and/or aortic rupture, was recorded during follow-up.

Results: In 164 patients enrolled, 127 (77%) stentgrafts were anchored in a short proximal neck < 20 mm (SN), and 37 (23%) in an optimal collar ≥20 mm (ON). 106 patients were treated during the acute phase, a majority (83%) of these in the SN group (n=88 p<.05), and 58 were treated in the subacute and chronic phases. The theoretically optimal release zone (length≥20 mm) would have been in zone 0 or 1 for 80% of patients in the SN group (102/127), and in zone 2, 3 or 4 for 92% of patients

in the ON group (34/37). Only 8 patients in the series finally had a stentgraft implanted in zone 0 or 1, out of the 105 who should have been implanted there to obtain an anchoring of theoretically optimal length. This attitude allowed to avoid a heavy debranching procedure (LCC±BCA) in 97 patients (59%). The 30-day mortality rate was 5.5% in the two groups. The 30-day stroke, paraplegia and retrograde dissection rates were 1.5%, 1.8%, and 0% in the SN group vs 2.7%, 5.4%, 5.4% in the ON group, respectively, NS. With an average follow-up of 35±30 months, 2-year overall survival and AIE-free survival rates were comparable in the two groups: 82% and 78% in the SN group vs 89% and 76% in the ON group, respectively, NS.
Conclusion: A healthy proximal anchorage length <20 mm in ADs does not seem to affect TEVAR's short- and mid-term results, while allowing to avoid of a significant number of complex debranching procedures (LCC±BCA).
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ADJUVANT EMBOLIZATION OF THE LEFT SUBCLAVIAN ARTERY IS A SAFE AND EFFECTIVE TECHNIQUE TO REDUCE THE MORBIDITY OF TEVAR DEBRANCHING IN ZONES 1 AND 2

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Objectives: The debranching of the left subclavian artery (LSCA) with reimplantation or carotid-subclavian bypass requires the occlusion of the prevertebral LSCA, whose surgical dissection exposes to neurological and hemorrhagic risk. An alternative is the use of a vascular plug (Amplatzer®). We didn't find studies comparing the two approaches. The objective of this work was to compare the postoperative morbimortality following surgery by embolization versus surgical ligation of the LSCA during debranching in patients treated by TEVAR.
Material and methods: All patients having zones 1 and 2 TEVAR in our center with isolated debranching of LSCA between September 2009 and December 2024 were included and analyzed retrospectively. Other surgical debranching procedures (left common carotid or BCA), chimney or branched LSCA stentgrafts were excluded. The patients were divided into 2 groups, the embolization group (AE) and the surgical ligation group (SL) according to the technique used. Clinical data, complications and mortality were collected. A comparative statistical analysis was done upon admission, then at 1 month, 1 year and at the latest follow-up.
Results: 51 patients (35 men, 16 women) were included: 38 (74.5%) cases of surgical ligation (SL group), and 13 (25.5%) cases of embolization of the LSCA (AE group). The clinical characteristics were comparable between the two groups. The average age was 64±14 years. 16 patients received were treated in emergency and 35 patients underwent elective surgery. 28 (55%) cases presented type B aortic dissections, 17 (33%) patients were treated for a thoracic aortic aneurysm, 5 (10%) for a traumatic rupture of the aortic isthmus, and 1 (2%) for a penetrating aortic ulcer of the aortic root. 30-day mortality was 3.9% (1 case of ruptured thoracic dissection and 1 case of aortic dissection with delayed digestive malperfusion). Four patients (7.8%) presented a postoperative neurological event, including one TIA, two regressive strokes, and one settled stroke with a remaining lateral homonymous hemianopsia. There were no cases of paraplegia, phrenic paralysis, or Horner's syndrome. 30-day neurological morbidity in the SL group (5.9%) was significantly higher (p=0.001) than in the AE group (2%). Local complications were also more frequent in the SL group (6% vs. 2%; p=0.001), with three hematomas and one lymphorrhea. There were two unrelated deaths, but no cases of secondary occlusion, infection, diaphragmatic paralysis, or stroke occurred in either group at 1 year or after a median follow-up of 43 months (1-185).
Conclusion: Adjuvant embolization of prevertebral LSCA before debranching is a reproducible, safe, and effective technique to reduce the morbidity in patients treated by TEVAR in zones 1 and 2.
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EMERGENCY TREATMENT OF AORTIC ARCH LESIONS: COMPARISON OF SINGLE VS. DOUBLE-FENESTRATED STENTGRAFTS

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Objectives: The treatment of aortic arch pathologies is complex due to anatomical constraints, technical challenges and associated risks, especially in the emergency. Advances in endovascular techniques have made it possible to propose reliable solutions applicable to patients at high surgical risk. In this context, homemade stentgrafts develop, offering a less invasive alternative. The efficiency of the technique has been established by previous studies. The objective of this study was to evaluate the results of single and double-fenestrated homemade stentgrafts in an emergency context, and then to compare their early and mid-term results.
Material and methods: This single center retrospective analysis included all patients with an indication for emergency treatment of the aortic arch between July 2014 and March 2023. In each case, the most distal fenestration was placed in front of the left subclavian artery, the only stented artery. For the double fenestrated grafts, a large proximal fenestration integrated the brachiocephalic artery and the left common carotid artery.
Results: 86 patients were treated. 74% were men, with an average age of 69 years. 63% received a single-

fenestrated stentgraft and 37% a double-fenestrated stentgraft. The main indications for treatment were complicated acute type B aortic dissections (54%), ruptures of the aortic isthmus (19%), penetrating ulcer (9%), degenerative aneurysms (6%), false aneurysms (4%), and aortic floating thrombus (2%). Technical success was 91%. The median time needed to modify the stentgraft was 10±3 minutes for the single-fenestrated and 23±5 minutes for the double-fenestrated grafts (P=0.77). The 30-day mortality was 19%, with no difference according to the technique (single or double) ($p > 0.99$). Three patients (3%) presented a neurological event, including stroke and paraplegia. Peroperative retrograde dissection occurred in 3 patients (3%). 5% of the patients developed a type 1 endoleak and 2% had type 3 endoleak. No type 2 endoleak was observed. Eight patients (9%) necessitated reintervention. All supra-aortic trunks remained patent. During a follow-up of 27±6 months, no patients had aortic rupture or a new neurological event.

Conclusion: Single- and double-fenestrated homemade stentgrafts are an adapted and reproducible treatment for urgent lesions of the aortic arch, with comparable results, regardless of the area of aortic fixation and the number of fenestrations.

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LONG-TERM OUTCOMES OF THE ENDOVASCULAR TREATMENT OF TRAUMATIC RUPTURE OF THE THORACIC AORTA

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Objectives: Over the years, the endovascular treatment of aortic isthmus ruptures has emerged as the primary treatment of these serious patients, often with contraindications to extracorporeal circulation. For the long-term follow-up of these patients, it is recommended to perform an annual CT-scan for life. In this study, we evaluated the relevance of this follow-up.

Material and methods: This was a single-center retrospective analysis of data collected in an automatized database allowing the prospective long-term follow-up of the patients. Pre-, per-, and postoperative data were collected. The analysis of demographic and peroperative data was descriptive. Overall survival and survival without secondary procedures were determined with the Kaplan-Meier method.

Results: Between 2001 and 2024, 38 consecutive patients suffered from a traumatic rupture of the thoracic aorta. Median age was 35 years (21-80). In-hospital mortality rate was 5.2% (2/38), 38.9% of patients were treated for a grade 2 rupture and 44.4% for a grade 3 rupture. In 91.7% of the cases, a single thoracic module allowed to obtain a satisfactory sealing and 8.3% of the patients required 2 modules. Debranching with carotid-subclavian transposition was carried out in 11.4% of the cases. The rate of technical success was 100%. The average duration of hospital stay included 6 days (2-55) in ICU and 11 days (4-56) for the index hospitalization. The rate of postoperative paraplegia was 11.1%. The average follow-up was 125 months. Survival was estimated to be 91.2% after 72 months and 88.9% after 130 months. We analyzed 213 follow-up CT-scans. We found no endoleaks, no migration and no prosthetic infections. The aortic diameter was most often stable (72.4%) or decreased (27.6%). Only one secondary procedure was required during follow-up to treat chronic upper limb ischemia. Survival without intervention was 87.7% after 85 months and 82.6% after 130 months.

Conclusion: In this series of aortic isthmus ruptures with a 125-month follow-up, no secondary aortic procedure was needed. A multicenter study could make it possible to reduce clinical monitoring of these patients.

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VASCULAR COMPLICATIONS OF PERCUTANEOUS AORTIC VALVE REPLACEMENT PROCEDURES: PREDICTIVE FACTORS AND PROGNOSTIC IMPACT

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Objectives: The aim of this study was to highlight the link between the occurrence of a vascular approach complication during TAVI procedures and the risk of short- and mid-term morbimortality.

Material and methods: Between January 2015 and December 2021, we included 622 patients in this monocentric retrospective study. We took into account the patients' data, their anatomical characteristics (diameter of the arteries, tortuosity, calcifications, aneurysms, stenoses, thrombosis, dissection), their antiplatelet and anticoagulant treatments, their symptomatology, the type of anesthesia carried out, the type of valve implanted and the choice of the primary and secondary approach. The primary outcome was the occurrence of a vascular complication according to the VARC-2 criteria (failure of the closure system, bleeding or hematoma requiring management, arterial rupture, stenosis, dissection, arteriovenous fistula, occlusion, false aneurysm, approach disunion, infection of the operative site). Secondary outcomes were the other complications classified according to the VARC-2 criteria up to one year after the procedure.

Results: The rate of vascular complications was 18.3%, of which 2.9% were major complications. Secondary approach was the source of major complications in 0.5% of cases and minor complications in 2.7% of cases. The

failure of the percutaneous closure system played a crucial role in the occurrence of a major or minor vascular complication ($p < 0.001$). The occurrence of a major vascular complication was significantly linked to inhospital mortality ($p < 0.001$), to one-year mortality ($p < 0.001$), and to post-procedural renal failure ($p = 0.004$). In addition, a major complication was linked on average with a 5-day increase in the duration ($p = 0.001$).

Conclusion: Our study reflects the evolution of practices regarding the choice of the primary and secondary approaches, the operative technique and the leading role of major vascular complications.

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APPLICABILITY OF PREDICTIVE MODELS OF SURGICAL COMPLICATIONS AFTER KIDNEY TRANSPLANT

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Objectives: Chronic end-stage renal failure requiring renal support increases in frequency, and renal transplantation is the optimal treatment in terms of survival, quality of life, and costs. Obesity (BMI $\geq$ 30 kg/m^2) is a risk factor associated with cardiovascular disease, the leading cause of death worldwide and is significantly increasing in incidence. The simultaneous presence of these pathologies makes the medico-surgical management of the patients more complex, which complicates their inclusion on the transplant list, even if kidney transplantation offers a higher benefit in terms of morbimortality compared to dialysis. This study aimed to evaluate the generalization of the predictive scores of early surgical complications developed by Kuntz et al. « Computed-tomography-based predictive scores of surgical complications to help decision-making in enrolling obese patients in kidney transplantation list » in transplanted patients, independently of their BMI.

Material and methods: This retrospective study included all the kidney transplant recipients operated between January 2020 and December 2022 at the Strasbourg University Hospital, with non-inclusion criteria (minor patients, combined transplantation, bilateral kidney transplant) and exclusion criteria (previous iliac revascularization, urinary tract reconstruction, previous approach to the iliac fossa, peroperative indication of a specific urological procedure, graft perfusion abnormality on machine), to obtain the population most generally concerned by kidney transplant. Preoperative data, CT-scan analyzes (distance from the iliac vessels to the skin, waistline, total fatty surface, under the skin, and visceral), peroperative data (operating time, cold and warm ischemia), and postoperative data (vascular, urological and parietal complications) were recorded and analyzed.

Results: 73 of our 290 patients were obese (25.17%). Fifty-one patients had early surgical complications, of which 18 were obese. Predictive scores were applied to both the whole cohort and the obese subgroup. The 5-variable score showed a sensitivity of 27% and a specificity of 85% for the entire cohort, while in the obese subgroup, the sensitivity was 41% and the specificity was 76%. The 1-variable score based on the waistline showed a 45% sensitivity and a 75% specificity for the total cohort, and an 82% sensitivity and a 23% specificity for obese patients.

Conclusion: Our study demonstrates the evolution of the practices regarding the choice of the primary approach, the secondary approach, the operative technique and the leading role of major vascular complications.

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PROPOSAL OF A MORBIMORTALITY SCALE IN ACUTE ARTERIAL MESENTERIC ISCHEMIA

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Objectives: Acute mesenteric ischemia (AMI) is a serious pathology associated with a high mortality rate. The description of the patients' fate is often limited to short-term survival criteria, not fully reflecting their fate. A morbimortality scale would allow to refine this description and could serve as a primary judgment criterion in future therapeutic trials. Our goal was to propose a morbimortality scale to characterize in a standardized way the fate of patients with arterial occlusive AMI.

Material and methods: This single center retrospective study included patients admitted for an occlusive arterial AMI in a vascular intestinal emergency structure from January 2016 to September 2024. Clinical, biological and computed tomography data, as well as patient management and outcomes, were analyzed. A 4-level morbimortality scale was developed depending on status of patients a distance remote from their AMI: 1/ living without gastrointestinal resection. 2/ digestive resection without short bowel syndrome (SBS). 3/ short bowel syndrome without (3a) or with (3b) home parenteral nutrition (HPN). 4/ death. The 3-, 6- and 12-mont distribution of this scale was described.

Results: 256 patients were included (women, 44%). Level 4 (death) was 23% after three months, 26% after six months, and 31% after twelve months. Revascularization rate was 86%. Intestinal resection rate was 58%. The 3-

month evaluation allowed to discriminate three groups of patients with a significant difference in 3-year survival: survival without resection (level 1), resection SGS- (level 2), resection SGS+ (level 3). Levels 1 and 2 were stable during the first year, around 30% and 20% respectively. Level 3a was rarely observed (2%, 4% and 6% at 3, 6, and 12 months). Level 3b decreased from 22% at 3 months to 15% at 12 months.

Conclusion: This new morbimortality scale offers a standardized, simple and relevant description of the fate of patients with AMI.

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RESULTS OF FEMORAL VEIN BYPASSES TO VISCERAL ARTERIES

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Objectives: Despite the development of endovascular techniques, digestive arterial bypasses retain an important place. The presence of peritonitis or infectious aneurysms requires the use of autologous substitute. The greater saphenous vein may be unavailable. The superficial femoral vein (SFV) is an alternative. The main purpose of our study was to evaluate the primary and secondary patency. The analysis of the graft's degradation on CT-scan and complications at the site of harvesting were evaluated.

Material and methods: From January 2015 to March 2024 all patients receiving a SFV bypass to a visceral artery were included. The characteristics of the population, the indications and the involved arteries were recorded. 3- and 12-month graft patency was evaluated by CT-scan. The analysis of the lower limb morbidity was determined by clinical examination and ultrasound.

Results: We included 35 patients with an average age of 66 years (48-86) including 7 women. Indications for revascularization were infectious aneurysms (22.9%, n=8), acute mesenteric ischemia (22.9%, n=8), atheromatous aneurysms (17%, n=6) chronic mesenteric ischemia (20%, n=7), neoplastic diseases (8.6%, n=3) and prosthetic infections (8.6%, n=3). 30-day mortality was 28.6% (10 deaths between 8 and 30 days) The average duration of follow-up was 21.2 (3-93) months. The 3-month and 1-year primary patency rates were 100% and 94.3%, respectively. The 3-month and 1-year secondary patency rate was 100%. Two patients necessitated anastomotic stenosis angioplasty at 11 and 12 months. No bypass reinfection was observed. The morphological study of the grafts by CT-scan showed a difference of the proximal and distal Δ diameters at 3 months and 1 year respectively of 0.48 (σ 1.01) and 0 .06 (σ 1.1) on average. Five patients had deep vein thrombosis, and three were complicated by minor pulmonary embolism. Three patients presented edema later than 3 months. The circumference measurement of the limb showed an average difference in thigh and calf of 1.375 cm (σ 1.64) and 1.21 cm (σ 3.2), respectively.

Conclusion: SFV is an excellent autologous substitute to revascularize digestive arteries with good 1-year patency rates. It is resistant to infection and always available. The morbidity of the harvested limb is acceptable when respecting adapted techniques.

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RENAL ANEURYSMS: CHARACTERISTICS OF THE POPULATION, TREATMENT MODALITIES, AND 1-YEAR FOLLOW-UP

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Objectives: Aneurysms of the renal arteries (ARA) are rare vascular lesions associated with a risk of rupture, renal ischemia, or renovascular hypertension. Although endovascular techniques became particularly important in recent years, open surgery usually allows for ad integrum reconstruction of more distal lesions. The objective of this study was to evaluate the results of invasive management of the renal aneurysms according to their anatomical characteristics.

Material and methods: This was a multi-center retrospective study involving patients treated for ARA in five French centers between 2006 and 2024. The demographic and follow up data were collected from medical records; a study of the anatomy of the ARAs was obtained with the Terarecon™ software from the preoperative CT-scan. The surgical technique could be either endovascular (stenting, embolization) or open surgery (ex or in vivo technique, reconstruction of the urinary tract). The strategy was discussed in multidisciplinary clinical meeting with urologists and vascular surgeons. The following criteria were included in the assessment: mortality, morbidity, renal functional outcomes, and one-year postoperative complications.

Results: A total of 117 patients were treated for 121 ARAs, 24% (N=29) by endovascular route and 76% (N=92) by open surgery. The average age of patients was 59±13 years. 62% (N=72) were women and the mean operative GFR was 89±18 mL/min/1.73 m^2. 58% (N=67) of the patients were hypertensive. The main etiology was atheroma (14%, N=17). The average diameter of the ARA was 21.4±5.7mm. According to Rundback classification, 42% (N=51) of the aneurysms were Type I, 17% (N=21) Type II and 41% (N=49) Type III. The surgical technique included ex vivo reconstruction in 22% (N=20) of cases, including 11 urinary reconstructions. Technical success was obtained in 94% of cases. In the post-operative period,

eight early reinterventions were needed. No early death was observed. At 1 year, the average GFR was 82.7±19.9 mL/min/1.73 m^2 and the overall primary patency rate was 97.5%.

Conclusion: This study showed that the invasive management of ARAs by a double team is safe and effective at one year whatever the type of technique used. The preoperative analysis of the anatomical characteristics allows to guide the treatment strategy.

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ENDOVASCULAR RECONSTRUCTION OF THE AORTIC BIFURCATION USING THE BERAB TECHNIQUE. 10-YEAR RESULTS

Simon Roisin, Raphaël Cohen, Adriane Mage, Florent Briffa and Thierry Reix, Amiens, France.

Objectives: The aim was to evaluate the efficacy and the long-term durability of a trifurcated assembly using a nitinol bare aortic stent associated with a kissing iliac covered stent (barestent, BERAB) as an alternative to a covered stent (CERAB). This technique was chosen to treat complex aortoiliac occlusive lesions (TASC-II C and D).

Material and methods: This single-center retrospective study included 92 patients treated between 2012 and 2023. 86 patients with a successful recanalization had a reconstruction by triple stenting, combining a self-expanding bare aortic stent (Sinus XL, Optimed, 6F) and at least two covered primary iliac stents. The average median clinical and ultrasound follow-up was 48 months. The primary outcome was the patency (primary, primary assisted, or secondary). Secondary outcomes were mortality and early and late complications (MALE, MACE).

Results: The majority of the treated lesions were classified as TASC-II D (91%), of which 38.4% were a complete aorto-bi-iliac occlusion. The majority of patients (68.5%) were Rutherford II or III. A totally percutaneous approach was used in 45 patients (51.1%), while 29 (31.5%) had an associated femoral endarterectomy and 17 (18.4%) had a complementary axillary approach. Technical success was 93.5% and the 30-day mortality was 1.1%. The 1-, 2-, and 5-year primary patency was 88.2%, 82.9%, and 68.8%, respectively. 1-, 2, and 5-year primary assisted patency rates were 91.7%, 90.6%, 80.7%respectively. The secondary patency was 96.5% after 1 and 2 years, and 89.5% after 5 years. Patency losses were due to iliac intrastent restenoses or downstream evolution. Seven patients underwent surgical conversion during follow-up with an extra-anatomical bypass (N=5) or from the aorta (N=2). Limb salvage rate was 98%. The overall 5-year death was 15% (N=16), with only 3 cases attributable to patency loss.

Conclusion: The BERAB technique is an effective and efficient alternative to CERAB for the management of complex occlusive lesions of the aortic bifurcation, in particular complete thromboses. It employs a better profile and less expensive stent that preserves aortic collat.

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EFFICACITY AND SECURITY OF THE BEGRAFT AORTIC COATED STENT FOR THE TREATMENT OF AORTIC PATHOLOGIES: A PROSPECTIVE SINGLE CENTER STUDY

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Objectives: Covered stents are used for the endovascular treatment of aortoiliac occlusive diseases according to commercial recommendations (IFUs), but can also be proposed outside the IFUs for aortic syndromes (sacciform aneurysms and penetrating ulcers). The main objective of this study was to evaluate the effectiveness of the Begraft Aortic covered stent, with secondary objectives being to evaluate its safety and clinical results in a prospective single-center cohort.

Material and methods: A prospective single-center study included exhaustively between August 2022 and October 2024 all the patients with either a complex occlusive pathology (CERAB group) or an aortic syndrome (AoSd group) accessible to an endovascular procedure but could not be treated with a conventional stentgraft or open surgery. The data collected included demographic data including initial symptomatology, computed tomography results (TASC classification, aortic bifurcation diameter), and infrarenal aortic length. The primary outcome was immediate technical success. Secondary outcomes included 1-, 3- and 6-month patency for the CERAB group, the exclusion of the lesion without endoleak for the AoSd group, and overall mortality.

Results: Twenty-one patients (mean age 72 years) were enrolled, of whom 12 (57.1%) in the CERAB group and 9 (42.9%) in the AoSd group (19% for a sacciform aneurysm, 23.8% for an ulcer). The average aortic degree of calcification was moderate to severe. The mean diameter of the aortic bifurcation was 14.6 mm and the mean length of the infrarenal aorta was 89.7 mm. Immediate technical success was obtained in 100% of patients. After an average follow-up of 376 days, stent patency was 91.6% at 1, 3 and 6 months in the CERAB group, and 100% for the same intervals in the AoSd group, with complete exclusion of lesions without endoleaks at 6 months. The overall death rate was 9.52%.

Conclusion: The Begraft Aortic coated stent is effective and secure to treat complex aortic pathologies. Its patency performances to treat occlusive pathologies and exclude complex aortic lesions confirms its usefulness as an "off the shelf" solution in situations where

open surgical alternatives cannot be retained. Larger cohort studies and a longer follow-up will validate these results.

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ENDOVASCULAR TREATMENT OF CORAL REEF AORTA AFFECTING THE VISCERAL ARTERIES WITH THE CHIMNEY TECHNIQUE

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Objectives: Coral reef aorta (CRA), is a rare form of limestone protrusion in the aortic lumen. Patients with this condition may not be eligible for conventional surgery due to multiple comorbidities. The endovascular treatment of this condition is poorly documented. It poses as a problem the risks of aortic rupture, distal embolism or occlusion of the visceral arteries. Here we report the indications, feasibility and safety of using the chimney technique to treat visceral CRAs.

Material and methods: The patients included in this study had to present a symptomatic CRA next to the ostia of the visceral arteries (celiac trunk, superior mesenteric artery, and renal arteries). They had to be at too high surgical risk for conventional surgery, based on their history and the American Society of Anesthesiologists (ASA) score. The proximal and distal sealing zones had to be acceptable on 10 mm of healthy aorta. Patients who required more than two chimneys were not eligible for this procedure. Pre- and postoperative clinical and imaging data were studied.

Results: Between May 2020 and March 2024, 11 of 19 patients presenting visceral CRA were treated using the chimney technique. One (9%) patient was classified ASA 2, 8 (73%) were ASA 3, and 2 (18%) were ASA 4. The median age of the patients was 75 years (65-89) and most were women (n=7, 64%). Clinical presentations included severe claudication (<20m) or lower limbs rest pain (n=7, 64%), critical bilateral ischemia (n=3, 27%), renovascular hypertension (n=3, 27%), congestive heart failure (n=2, 18%) and/or chronic mesenteric ischemia (n=2, 18%). Two (18%) procedures were carried out under potentialized local anesthesia. Five (45%) patients necessitated the deployment of one chimney, and 6 (55%) required two chimneys. Aortic lesions were treated with an aortic cuff (n=7; 64%) or a covered aortic stent (n=4, 36%). The rate of technical success was 100%. We did not observe mortality or postoperative major complication. The follow-up duration was 14 months (248). One patient died of a non-surgical cause during follow-up, and one patient was lost to follow-up. Secondary superior mesenteric stenting due to the evolution of the CRA was carried out in one patient. The remaining nine patients experienced a complete resolution of their clinical signs and their last imaging control shows satisfactory aortic repair.

Conclusion: This series is the largest specifically using the chimney technique to treat CRA next to the visceral arteries. It demonstrated the feasibility and security of this strategy as an alternative to conventional surgery in selected patients.

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DO THE TECHNICAL CHARACTERISTICS OF CAROTID VERSION AFFECT EARLY RESTENOSIS? A PROSPECTIVE MULTICENTER STUDY (TREC)

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Objectives: Restenosis due to myointimal hyperplasia occurs in 6% of the cases after carotid endarterectomy (CE). Tobacco, HBP, the female gender, diabetes, dyslipidemia, and the small diameter of the carotid artery were identified as risk factors for restenosis. The main objective of this multicenter prospective study was to determine whether the eversion technique has an influence on restenosis.

Material and methods: After agreement of the Ethical Committee (2021-133), we included prospectively between September 2021 and November 2022 all the patients treated by eversion CE in 8 French hospitals. The data collection included the following: the demographic data, the surgical indications and the technique of eversion carried out based on the carotid bulb's more or less complete circumference (types A, B or C). Clinical complications and ultrasound results quantifying possible restenoses (<50% or 70%) were collected at 1 and 12 months. A Chi^2 test was used with $p<0.05$ as a significance level.

Results: We enrolled 595 patients, including 417 males (70%) aged 73±9 years. Cardiovascular risk factors in the population were: hypertension 66%, dyslipidemia 44%, tobacco 19%, diabetes 18%. Patients were treated for symptomatic carotid stenoses in 31% of cases. CEs were carried out according to the TREC A, B and C techniques in 183 (35%), 28 (5.3%) and 300 (57.7%) of the cases respectively. We observed a 1.8% overall CMM rate. There were 73 missing data (47 lost to follow-up, 19 deaths and 7 unknown). At 1 year we observed 46 (9%)

and 11 (2.2%) > 50 and 70% restenoses, including 15 (8%), 7 (24%) and 24 (8%) > 50% restenoses and 3 (1.6%), 2 (7%) and 6 (2%) > 70% restenoses for TREC A, B and C, respectively. Only TREC B presented a significantly higher rate of > 50% restenoses ($p<0.045$).

Conclusion: We did not demonstrate a possible influence of the more or less complete and circumferential nature of the endarterectomy on the carotid bulb on the rate of restenoses by myointimal hyperplasia. However, the overall rate of restenoses observed in this study lower than that reported in the literature is probably responsible for an insufficient sample calculation to observe this potential influence.

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IMPACT OF ARTIFICIAL INTELLIGENCE ON THE SEGMENTATION OF ANGIO-CT IMAGES WITH "DEEP LEARNING" APPROACHES TO DETECT CAROTID STENOSES PRESENTING VULNERABILITY CRITERIA

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Objectives: The detection, prevention and management of carotid stenoses represents a major challenge not only on an individual scale but also in terms of public health, in view of the serious neurological conditions that the disease can generate. The precise characterization of vulnerable and unstable plaques is crucial, but manual analysis is time-consuming, operator-dependent, complex, and subject to the risk of human error. An imaging analysis based on artificial intelligence (AI)was developed, with the aim of providing a more precise, objective, rapid and reproducible analysis using deep learning (DL) approaches. This research aimed to evaluate the capacity of a software based on AI to segment the carotid plaque in an automated way in order to detect vulnerability criteria.

Material and methods: Preoperative angio-CTs of 156 patients operated from carotid surgery between February 2019 and February 2022 were analyzed with PRAEVAorta©2 (Nurea), an automatic segmentation software based on AI and DL. The software results were compared with the reference segmentation provided by human experts using the Dice Similarity Coefficient (DSC), the volume similarity (VS), and sensitivity (Se) and specificity (Sp).

Results: The segmentation analysis found a lumen DSC of 0.73, a VS of 0.80; a sensitivity of 0.92, a specificity of 0.98. For thrombus, DSC was 0.27, VS was 0.69, with a sensitivity of 0.24, and a specificity of 0.95. For calcifications, DSC was 0.49, VS was 0.52, with a sensitivity of 0.33 and a specificity of 0.98. For the plaque, DSC was 0.78, VS was 0.92, with a sensitivity of 0.81 and a specificity of 0.94.

Conclusion: The PraevAorta©2 software allowed for a precise automatic segmentation of the carotid plaques. It provides an innovative, objective, rapid and reproducible method of carotid plaque segmentation and could be a valuable decision-making tool helping with risk stratification.

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MANAGEMENT OF EXTRACRANIAL CAROTID ARTERY STENOSIS IN THE FRENCH NATIONAL HEALTH DATA SYSTEM

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Objectives: Carotid stenoses are responsible for 20-30% of ischemic strokes. Their management is based on old randomized studies. Carotid endarterectomy (CE) remains the treatment of reference, while carotid stenting (CAS), a less invasive technique, offers controversial results. Advances in secondary prevention with drug treatments could yield comparable results to those of carotid revascularization, especially in asymptomatic patients. In France, the management of these stenoses appears to depend on local surgical practices. This study analyzes the invasive strategies for treating carotid arteries in France between 2011 and 2020.

Material and methods: This retrospective study was carried out on the data of the SNDS (French National Health Data System). We included patients treated by CE or CAS for symptomatic or asymptomatic carotid stenosis between 2011 and 2020. The demographic and health care consumption data were collected with an anteriority of 3 years before the intervention. Patients were divided into two groups: symptomatic and asymptomatic stenosis, and then stratified by type of procedure. The primary outcome was the occurrence of a stroke/TIA and/or death within 30 days following the operation.

Results: A total of 150615 patients were included (85%, n=127416 asymptomatic and 15%, n=23199 symptomatic). The average age of patients treated by CAS was 70 years, compared with 72 years for those treated by CE. Of the asymptomatic patients, 5% (n=6,123) had CAS and 95% (n=121, 293) had CE. Among symptomatic patients, 3% (n=804) had CAS and 97% (n=22, 395) had CE. Charlson's co-morbidity index was higher in the CAS patients. The 30-day rate of stroke/TIA or death in the cohort was 3.6% (n=5, 357). The rate was 1.9% in asymptomatic patients and higher after CAS (3.2%, n=191) than after CE (1.8%, n=2,162) ($p<0.001$) and 12% in

symptomatic patients. The 5-year overall survival rate was 78%, significantly higher in asymptomatic patients (78.7%) than in symptomatic patients (74.6%) ($p<.001$). Five-year stroke-free survival was 91.3% (93.5% for asymptomatic patients vs 79% for symptomatic patients).

Conclusion: Carotid surgery is still mostly performed for asymptomatic stenoses in France, compared to the rest of the world. CAS remains marginal but preferred in specific cases, especially for more co-morbid patients. Postoperative stroke rates remain higher in symptomatic patients than in asymptomatic patients.

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CLINICAL IMPROVEMENT AFTER ARTERIAL REVASCULARIZATION IS ASSOCIATED WITH THE RESULTS OF DYNAMIC OXIMETRY

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Objectives: Transcutaneous measurement of the oxygen pressure during exercise (Ex-TcpO2) is used to argue for the vascular origin of the lower limbs pain, or to evaluate the walking perimeter. The objective of this study was to describe the association between the measurement of Ex-TcpO2 and the perioperative clinical and morphological results after revascularization in patients suffering from intermittent claudication (IC).

Material and methods: A prospective single center prospective observational study was conducted between January and December 2022 among patients presenting with IC. Patients were referred for Ex-TcpO2 by vascular surgeons due to diagnostic doubts. The perioperative clinical and morphological results were evaluated with the Rutherford Baker's classification and Doppler ultrasound examination. Primary patency rate and sustained primary clinical improvement were evaluated in the 1-month period following revascularization.

Results: Eighty-two patients (64% males) underwent Ex-TcpO2 and entered the study, 65% of whom were Rutherford's category III. The indication for Ex-TcpO2 was to evaluate the origin of the symptoms of IC in 65% of cases. Sixty-seven (81%) patients had a positive Ex-TcpO2, and 15 (18%) had a negative Ex-TcpO2. Patients with a positive Ex-TcpO2 were older (65 ±13 vs. 58 ± 20, $p = 0,43$), had a significantly lower ankle systolic pressure index (API) compared to the negative group (0.65 ± 22 vs. 0.92 ± 22; $P<0.001$) and a shorter maximum walking distance (MWD) (200 m (150-300) vs. 525 m (500-872), $P<0.001$). Forty-two patients underwent revascularization (Ex-TcpO2 positive [n=35/67]; Ex-TcpO2 negative [n=7/15]). The technical success of revascularization and the primary patency rate were 100% in both groups. The clinical improvement was significantly greater in the Ex-TcpO2 positive group (97%, n = 34/35 vs 0%, n = 0/7, $P < 0.001$). Multivariate analysis showed a positive association between pain in the buttocks and a drop $\leq$ -15 mmHg in the buttocks with iliac lesions.

Conclusion: This was the first prospective study evaluating the post-revascularization clinical improvement for patients who had previous Ex-TcpO2 evaluation that led to the operative decision in a vascular surgery department. Our study highlights the potential benefit of the use of Ex-TcpO2 in the diagnosis of patients with IC, particularly in patients with atypical IC. The Ex-TcpO2 test appears to significantly improve diagnostic performance, particularly for proximal claudication.

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HYBRID VERSUS ENDOVASCULAR SURGERY IN SEPTUAGENARIANS: A COMPARATIVE ANALYSIS OF CLINICAL AND FUNCTIONAL OUTCOMES

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Objectives: With the aging of the population, endovascular treatment has become the treatment of choice for arterial revascularizations in septuagenarians. Femoral tripod lesions are often associated with iliac or femoropopliteal lesions. Literature data do not allow to conclude or conclude whether the exclusive endovascular treatment is associated with better results than hybrid surgical revascularization in patients older than 70 years. The objective of this research was to analyze and compare the clinical outcomes of exclusive endovascular therapy and hybrid surgery in this aging population.

Material and methods: This was a single-center retrospective study that included all septuagenarian patients who had surgical revascularization (hybrid group H) or endovascular revascularization (endovascular group E) of the femoral tripod associated with iliac or femoropopliteal endovascular revascularization between June 2016 and June 2024. The primary outcome was primary clinical improvement. Secondary outcomes were mortality, primary patency, and reintervention rate.

Results: A total of 186 patients were included (Group H n=104, Group E n=82). The demographic data were comparable between the two groups. The characteristics of the lesions were comparable with the exception of the Azema score (Azema III: 51 (62%) in group E vs 81 (78%) in group

H, p=0.04). In the hybrid group, more associated iliac lesions were reported (43% vs 71%; p<0.001) and less femoropopliteal lesions were reported (54% vs 29%; p=0.006). La durée de suivi moyenne était de 16 mois dans le groupe E et de 31 mois dans le groupe H. A 24 mois, l'amélioration clinique primaire était de 85% dans le groupe E et de 89% dans le groupe H (p=0,16). Aucune différence n'a été retrouvé entre les 2 groupes pour la survie (P=0,9), la survie sans amputation majeure (P=0,7), la perméabilité primaire (p=0,07) et le taux de réintervention (p=0,7).

Conclusion: The difference between surgical techniques does not appear to affect clinical outcomes in the mid-term. Therefore, endovascular treatment does not necessarily have a more unfavorable prognosis than hybrid surgery. Individual risk stratification should precede the selection of the most appropriate surgical technique.

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PERIPHERAL ARTERIAL OCCLUSIVE DISEASE AND DEPRESSION: WHAT ASSOCIATION?

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Objectives: Peripheral arterial occlusive disease (PAOD) is a common, often symptomatic pathology, the evolution of which affects the functional prognosis of the limbs. It can lead to chronic pain and limited mobility, altering the patient's quality of life, and can lead to psychological disorders, including depression. The purpose of this study was to examine the impact of PAOD on mental health, particularly depression.

Material and methods: This prospective study was conducted in our center between 2022 and 2024, including 50 patients with symptomatic PAOD. Patients were evaluated with the Patient Health Questionnaire-9 (PHQ-9) to track depression. The statistical analysis allowed to evaluate the association between depression and clinical data, treatment and amputations of patients.

Results: Of the 50 patients, 64% had moderate to severe depressive symptoms. Patients with trophic disorders and critical ischemia were more likely to have a moderate to severe depression (p=0.029). A low SPI (<0.5) was associated with a more severe depression (p=0.032). Open surgery was more frequently associated with persistent depression six months after the intervention, although no significant difference between endovascular and surgical treatments was observed in terms of depression. Finally, major amputations were associated with higher depression scores (p<0.001).

Conclusion: PAOD affects both physical and mental health, with a high prevalence of depression, especially in the advanced stages and in amputated patients. This study highlights the need for support to improve the quality of life of patients.

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IMPACT OF THE VOLUME OF FEMOROPOPLITEAL CALCIFICATIONS ON THE MORBIMORTALITY OF PATIENTS SUFFERING FROM PERIPHERAL ARTERIAL OCCLUSIVE DISEASE (PAOD)

Paul Bertucat, Bordeaux, France.

Objectives: The evaluation of vascular calcifications and their involvement in major cardiovascular and vascular events is a crucial issue in the management of PAOD patients. While calcifications are recognized as a marker of the disease, their role in the prediction of vascular events, in particular amputations (MALE) and major cardiovascular events (MACE), remains to be clarified. This study aimed to assess the association between the volume of arterial calcifications and the occurrence of MACEs and MALEs.

Material and methods: A quantitative analysis of vascular calcifications was carried out on the preoperative angio-CTs of 98 patients receiving endovascular surgery of the lower limbs between January and December 2020. The volumes of the arterial lumen and calcifications were measured with the ITK-SNAP software. The results were compared between patients with MACE or MALE and those without MACE or MALE, in order to identify any significant associations.

Results: Patients with MACE had significantly higher femoropopliteal calcification volumes than those without MACE ($p < 0.0001$) with a very high OR (OR: 1316; 95% CI: 212.8-2418). The same was true for the Rutherford's classification ($p = 0.03$ and OR: 647.9; 95%CI: 71.1-1225), suggesting a strong and independent association between the more advanced stages of Rutherford's classification and higher volumes of calcification. On the other hand, no significant association was found between the volume of femoropopliteal calcifications and MALEs (p=0.4713). The luminal volumes showed no significant difference in the prediction of either MACEs or MALEs. The ROC curves showed a good predictive capacity of calcifications for MACEs (AUC = 0.77), but a poor performance for MALEs.

Conclusion: The volumes of femoropopliteal calcifications offer a good predictive capacity for the occurrence of MACEs in patients suffering from PAOD. However, they do not seem to play a significant role in the prediction of MALEs. These results suggest that the evaluation of vascular calcifications may improve the stratification of

cardiovascular risk in patients with PAOD in order to improve management.
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WILL THE PERCUTANEOUS BYPASS TECHNIQUE ELIMINATE THE TRADITIONAL SURGICAL BYPASS SURGERY?

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Objectives: In the cases of long femoropopliteal occlusion, the technique of percutaneous bypass allows to carry out a bypass without surgical opening and without vascular suture. With the objective of reducing the impact of the procedure, this technique must be compared with open surgery, the results of which are well known, with 30-day complications >30%.
Material and methods: The technique of percutaneous bypass consists of three puncture points under ultrasound guidance, on both sides of the occluded vascular segment, allowing the exit of the vessel upstream of the occlusion, the extravascular passage through the tissues, then the reentrance downstream of the occlusion. The passage of a guide, then a long introducer, allows the deployment of a self-expandable covered stent constituting the bypass.
Results: A retrospective evaluation of the 6 years of the realization of percutaneous bypasses was carried out, including 80 bypasses. Technical success was obtained in 98% of cases (1 case required a short popliteal incision). The 30-day suites confirmed the absence of infection, discharge, or hematoma requiring reoperation, as well as a marked decrease in pain and a possible resumption of walking at D1 and a possible hospital discharge at D1 or D2. At the end of the 6 years, we noted two deaths of unrelated cause, one junctional false aneurysm due to an insufficient overlap and treated with a covered stent, 16 occlusions (20%), and two major amputations (2.5%). Secondary patency was maintained in 64 patients (80%), with a 95% limb salvage rate.
Conclusion: This 6-year experience of percutaneous bypasses suggests a significant impact on the 30-day follow-up in terms of results and complications compared to open surgical bypass data, with mid-term results that are not lower. If ongoing prospective randomized studies confirm these data, the percutaneous technique could become a first-choice operation to treat femoropopliteal lesions.
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COMPARISON OF 2-YEAR RESULTS BETWEEN AUTOGRAFTS AND ALLOGRAFTS IN DISTAL VENOUS BYPASS GRAFTS FOR CRITICAL ISCHEMIA

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Objectives: The use of an autologous vein is the reference for distal bypasses carried out for critical ischemia (CLI). However, in 20% of cases, it is not usable. Venous allografts are an alternative. The objective of this study was to compare the 2-year results of the two grafts.
Material and methods: All patients operated with a venous bypass for CLI between 2017 and 2021 in our center were included. The criteria for non-inclusion were composite bypasses. Bypass grafts for aneurysm or infection were excluded, and autologous venous bypass grafts were reversed great saphenous vein bypass grafts. The primary outcome was the two-year limb salvage rate and secondary outcomes were mortality and primary and secondary patency rates.
Results: Sixty-seven patients were included, 35 allograft (G1) and 32 autograft (G2) bypasses (44 exclusions). All patients had one or more prior endovascular procedures. There was no significant difference between groups for demographic characteristics. There was a difference ($p<0.01$) in the location of the distal anastomosis: lower popliteal artery for 31% of allografts and 78% of autografts. In the other cases, it was located on a leg artery. Two-year limb salvage rates were similar in G1 and G2: 85% vs 90% ($p=0.50$). Primary patency rates were 46% vs. 32%, respectively ($p=0.52$), and secondary patency rates were 59% vs. 61% ($p=0.61$). Twenty patients had bypass angioplasty, 8 in the allograft group and 12 in the autograft group. Bypass desobliteration was needed in 13 patients, 7 in G1 and 6 in G2. A new bypass operation was performed in 9 cases, 6 in G1 and 3 in G2. The rate of reintervention was not different between the groups ($p=0.75$). Overall two-year survival was 77.6% (CI=68.2%; 88.3%) with no significant difference between groups.
Conclusion: Allograft venous bypass grafts provide limb salvage and patency rates comparable to autografts in this 2-year study. Allografts are an alternative that should be considered in the absence of autologous graft and could a second-line graft for subgonal bypass grafts. However, regular monitoring is necessary for early detection of restenoses in view of the number of interventions observed during monitoring.
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EVALUATION OF AN AMPUTATION PROGNOSTIC SCORE IN COMPLEX LIMB TRAUMA

Antoine Caunes, Hassen Djmal, Anaïs Peran and Fabrice Schneider, Poitiers, France.

Objectives: The decision of primary amputation in complex limb trauma remains a challenge despite the existence of prognostic score such as the Mangled Extremity Severity Score (MESS). A MESS score ≥ 7 as an indicator of first intention amputation remains controversial. The purpose of our research was to

investigate the prognostic factors of the amputation and to test the value of the score.

Material and methods: This was a bi-centric retrospective study of 114 patients managed between 2003 and 2023 for at least one vascular injury due to a complex trauma of the limbs. Group 1 patients were amputated (N=15) and group 2 were not amputated (N=99). The variables that were studied were clinical and radiological. The significant variables in univariate analysis were included in a multivariate declining step by step analysis. A Kaplan Meier survival analysis for the occurrence of the amputation was also carried out.

Results: The MESS scores in Group 1 and Group 2 were 8±3 and 4±2, respectively ($p<0.05$). Following multivariate analysis, the predictive factors of amputation were the existence of a venous lesion (OR: 9.09; 95% CI: 1.93-42.78; $p<0.05$), the presence of an acute ischemia (OR: 6.96; 95% CI: 1.21-39.85; $p<0.05$) and a severe kinetic (OR 13.71; 95% CI: 2,87-65.42; $p<0,05$). The survival analysis showed a 1-month amputation rate of 59% for patients with a baseline MESS $\geq$7 and 39% for MESS<7 patients, respectively ($p<0.05$). There was no significant difference between proximal or distal vascular lesion, nor between the proximal or distal type of vascular lesion.

Conclusion: Our study suggests that the presence of venous lesion and of 2 MESS criteria (limb ischemia and a severe kinetic) are predictive factors of amputation during complex limb trauma. Our study confirmed that an initial MESS score $\geq$7 is associated with a risk of amputation. This confirms the MESS score's interest as a decision aid in the management of complex limb trauma. A larger supply study is needed to confirm our data.

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TREATMENT OF LONG AND COMPLEX FEMOROPOPLITEAL LESIONS WITH COVERED STENTS: ANALYSIS OF THE FRENCH MEDICALIZED INFORMATION SYSTEM PROGRAM (PMSI) DATABASE

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Objectives: Endovascular treatment and open surgery are two alternatives to the treatment of long and complex femoropopliteal lesions. The main objective of this study was to compare patients treated for femoropopliteal lesions in France with a covered stentgraft or by open surgery.

Material and methods: This population-based, retrospective study used the French Medicalized Information System Program to evaluate the treatment of peripheral arterial occlusive disease (PAOD). Patients with PAOD hospitalized between January 2018 and December 2022 were identified from a combination of diagnostic codes, stentgraft types and procedures types, and divided into two groups: dedicated vascular covered stentgrafts (group 1) and open surgery (group 2). To ensure comparability between groups, we carried out a pairing (1:3) using a propensity score based on the demographic and clinical characteristics of the index hospital day (such as age, gender, disease severity, Charlson score). The criteria of evaluation were the postoperative hospital mortality, the amputation rate and the direct costs (perspective of the national health insurance) during the index stay.

Results: After pairing, the study included 2246 (72.3±12.0 years old; males: 70.9%) and 6738 patients (71.6±11.3 years old; males: 75.5%) in groups 1 and 2, respectively. The proportion of patients with severe disease was similar in both groups. All-cause hospital mortality was 1.4% in group 1 versus 3.4% in group 2 (OR: 0.39, [95%CI: 0.27-0.58]). Amputation rate was 6.6% vs 8.3% in Groups 1 and 2 (OR: 0.78, [95% CI: 0.64-0.94]), respectively. The associated costs were 6954 € (IQR: 5569- 9587) in Group 1 and 8575 (IQR: 6577-12957) in Group 2 (no significant difference).

Conclusion: In this national cohort obtained from the PMSI, patients with PAOD treated with dedicated covered stents had lower rates of major amputations than patients treated with open surgery, with lower costs.

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TREATMENT OF FEMORAL TRIPOD OCCLUSIVE LESIONS BY ROTATIONAL ATHERECTOMY

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Objectives: Symptomatic atheromatous femoral tripod lesions are usually managed by thromboendarterectomy or bypass surgery. However, surgical approaches to the inguinal folds have their own morbidity, combining pain, delayed healing, lymphorrhea and infection of the operative site, justifying the rise of percutaneous techniques such as angioplasty/stenting of the tripods. Rotational atherectomy is an alternative technique allowing a totally percutaneous treatment of these lesions without the implantation of any material.

Material and methods: This was a single-center, retrospective study, conducted between August 2022 and November 2024, and evaluating the security and efficacy of rotational atherectomy in the management of symptomatic atheromatous lesions of the femoral tripods.

Results: Forty-eight limbs were treated in 47 patients (76.6% of men, average age 73 years [min-max: 49-92]). The majority of the patients presented intermittent claudication (85.4%), with a median Rutherford score of 3 (range 2-6). The median operating time was 70 minutes (IQ75% 60-95). The median volume of contrast was 53 mL

(IQ75% 40-70 mL). The technical success, defined as the capacity to cross the lesion with the guide and to reopen the target artery was 100%. In 72.3% of the procedures, a complementary procedure was carried out on at least one other artery (iliac 32.6%, superficial femoral 56.5%, or leg artery, 10.9%. There was one postoperative complication (2.1%) in a patient who presented a retroperitoneal hematoma due to the arterial puncture, which necessitated a surgical reintervention. There was no embolic event, but two patients had immediate petechiae with a complete progression within an hour of the event. Median follow-up was 5 months (min-max 1-26). At the end of the follow-up, the median Rutherford Score was 0 (min-max 0-5), with a clinical success (defined by an improvement of at least 3 points on the Rutherford Score, or the achievement of healing without reintervention on the target artery) of 92.1% in claudicants and 66.7% in patients with critical ischemia (p=0.04). Survival without reintervention on the target lesion was 95.6%, but two patients required surgical thromboendarterectomy for recurrent symptoms at 8 and 18 months, respectively. The rate of reintervention on other arterial territories was 24.4% with an 8-month, with an intervention-free survival of 86.1% for claudicants and 33.3% for patients with critical ischemia (p=0.001).

Conclusion: Rotational atherectomy appears to be a reliable and effective alternative to thromboendarterectomy and angioplasty/stenting in patients with symptomatic atheromatous femoral tripod lesions, particularly in claudicants. This impression must be confirmed by a multicenter prospective register.

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INTRAVASCULAR LITHOTRIPSY AND STENTING FOR THE TREATMENT OF CALCIFIED LESIONS OF THE COMMON FEMORAL BIFURCATION

Clément Rouviere, Boris Postaire, Maribel Hupelier, Mélanie Carret, Bénédicte Albert and Bahaa Nasr, Brest and La Roche sur Yon, France.

Objectives: The preparation of the femoral common artery by intravascular lithotripsy (IVL) followed by active balloon angioplasty has shown encouraging results in the treatment of CFA calcified contamination. The TECCO study also demonstrated very good results of CFA angioplasty and stenting. Nevertheless, no research study evaluated the clinical results of CFA by IVL followed by a systematic angioplasty stenting. This study reports the 12-month IVL results with stenting angioplasty of the calcified FCA.

Material and methods: This was a retrospective, bi-centric, single-arm study. All patients treated by IVL and stenting for a CFA calcified lesion between February 2023 and October 2024 were included. The primary outcome was the primary patency. The technical success of the procedure (stenosis <30%), the lack of revascularization of the target lesion (TLR), and the clinical improvement of the procedure were also analyzed.

Conclusion: Angioplasty with stenting preceded by intravascular lithotripsy of the calcified CFA lesions appears to be associated with satisfactory 12-month clinical results and low risks of peroperative complications and reinterventions.

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COMPARISON OF INTRAOPERATIVE RADIATION OF ENDOVASCULAR PROCEDURES BY TYPE OF ANESTHESIA

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Objectives: Exposure to ionizing radiation produces adverse effects on health. Dose reduction is necessary. During endovascular procedures, movements under local (LA) and locoregional (LRA) anesthesia may require additional intraoperative imaging and contrast agent injections compared to procedures carried out under general (GA) or regional (RA) anesthesia. We have asked ourselves the question of the influence of the type of anesthesia on the dose of intra-operative radiation and the volume of contrast agent.

Material and methods: We conducted a single-center retrospective study involving 320 patients who had an endovascular peripheral revascularization procedure of the lower limbs, and were divided between 2 groups of anesthesia. Patients treated by endarterectomies or bypass were excluded. We evaluated the average dose area product (DAP) between the two groups as well as the time of fluoroscopy, the operating time, and the volume of contrast used during the intervention.

Results: There was no significant difference in the mean DAP between the group of patients operated under local and locoregional anesthesia and the group operated under general or spinal anesthesia (p=0.28). There was also no difference between the two groups for the volume of contrast agent used (p=0.39), the fluoroscopy time (p=0.82) and the operating time (p=0.082). The independent variables correlated with an increase in the DAP were a high BMI and the proximal location of the lesions. The subgroup analysis of the TASC II aorto-iliac classification revealed a difference between groups B and C according to the type of anesthesia. The dose difference of DAP reversed between the two groups and the DAP did not increase with the TASC II class.

Conclusion: There was no significant difference in mean DAP according to the type anesthesia during endovascular revascularization procedures of the lower limbs. The volume of contrast also did not vary between the two groups. Multicenter studies or studies analyzing more homogeneous lesions appear necessary to confirm our results.
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COMPARISON OF EXPLAINED AND UNEXPLAINED FEVERS IN THE POSTOPERATIVE PERIOD OF OPEN AORTIC SURGERY: A RETROSPECTIVE SINGLE CENTER STUDY

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Objectives: Despite the advent of endovascular aortic surgery, open aortic surgery always has its place according to the European recommendations concerning occlusive or aneurysmal lesions. One of our rare but very morbid concerns is prosthetic infection, which can manifest itself by the occurrence of a postoperative fever. On the other hand, fever is a classic symptom in the postoperative period and to our knowledge there is no study which exclusively shows the rate of fever in the postoperative period of an open aortic surgery and no study which explores the differences between the explained (infections, pulmonary embolism…) and unexplained fevers.
Material and methods: All patients treated by open aortic surgery between March 2018 and April 2023 in our center were included retrospectively. The patients with preoperative fever, aortitis, prosthetic infections, ruptured/painful aneurysms, and Leriche syndrome with trophic disorders were excluded. The primary outcome was the rate of postoperative fever ($\geqslant$ 38.3°) after open aortic surgery. Patients were then classified into two groups: explained fevers (urinary, pulmonary infection, pulmonary embolism/phlebitis, wound infection, etc.) (eF) and unexplained fevers (uF). Secondary outcomes included the characteristics of the fever (date of onset, duration, maximum value), the duration of hospitalization, and 30- and 90-day mortality.
Results: 105 patients were enrolled. The rate of postoperative fever was 23.8% (25/105) and 52% (13/25) of the fevers were unexplained. Groups (eF) and (uF) were statistically comparable. The median time to onset was approximately 3.3 days in the (uF) group versus 7.8 days in the (eF) group (p=0.0051). Sixty-six percent of patients in the (eF) group had pneumonitis. The duration of hospitalization was longer in the group (eF) compared with the group (uF), 25 vs. 15 days (p=0.02). No differences in mortality were observed. After a mean follow-up of 806 days in the group (uF) no prosthetic infection occurred.
Conclusion: Fever occurred after open aortic surgery in a quarter of cases and remained unexplained in half of these cases. Unexplained fever occurs earlier.
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LONG-TERM OUTCOMES OF LAPAROSCOPIC AORTO-BI-FEMORAL BYPASS SURGERY

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Objectives: The objective of this study was to evaluate the long-term results of laparoscopic aorto-bi-femoral bypasses for occlusive lesions.
Material and methods: This was a retrospective single-center study involving the patients treated by laparoscopic aorto-bi-femoral bypass between 2003 and 2015 for aorto-iliac occlusions. Surgically converted patients (n=2) and patients with missing data for certain variables (n=9) were not included.
Results: Sixty patients were included in this study. Median age was 57 years [IQR 54-63]. Three patients presented critical ischemia; the others presented intermittent claudication. The aortic approach was retro-colic and retro- renal in the vast majority of cases (n=58). Median operating time was 220 [IQR 200-260] minutes with a median duration of aortic clamping of 60 [IQR 40-70] minutes. The median duration of stay was 6 [IQR 5-7] days. Intrahospital mortality was zero. In the postoperative period, six patients had an early prosthetic leg thrombosis and one patient had complete bypass thrombosis. They were treated with thrombectomies in four cases and two femoro-femoral crossover bypass procedures were done after thrombectomy failure. Median follow-up was 83 months [IQR 32.9-141.7]. Twenty-five patients died during follow-up, one of whom after an acute prosthetic limb thrombosis. The estimated 1-, 3-, and 5-year primary patency rates were 88.3% [80.6%-96.8%, 95% CI], 75.1% [64.0%-88.1%, 95% CI], and 72.8% [61.4%-86.3%, 95% CI], respectively. The estimated secondary patency rates were 95.0% [90%-100.0%, 95% CI] at 1 year and 85.8% [76%-96.3%, 95% CI] at 3 and 5 years. There were 37 iterative revascularization procedures in 20 patients during follow-up, on 15 left limbs (including 14 occlusions) and 12 right limbs (including 10 occlusions).
Conclusion: This single-center experience of laparoscopic aorto-bi-femoral bypass grafts reports primary patency rates lower than those obtained by open

reconstruction, despite a low morbimortality. These results are also within the lower limit of the reporting data in the literature, with a high rate of limb thrombosis and interventions. Secondary patency was satisfactory, but these results cannot compete with modern endovascular methods.
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CAN ROBOTIC SURGERY DO BETTER THAN OPEN SURGERY? SINGLE-CENTER PROSPECTIVE STUDY COMPARING SHORT-TERM OUTCOMES OF AORTOILIAC RECONSTRUCTIONS

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Objectives: Open surgery for abdominal aortic aneurysm (AAA) or aortoiliac occlusive lesions (AoIOD) have better long-term outcomes than endovascular treatment, but with a higher 30-day morbimortality. A minimally invasive robotic assisted laparoscopic (MICRA) alternative would combine the short-term benefit of the endovascular approach with the long-term benefits of open surgery without parietal complications. The purpose of this study was to verify whether the robot offers better short-term results than open surgery.
Material and methods: This single-center, prospective and comparative study between November 2021 and November 2024 included all the patients with good life expectancy and low comorbidities scheduled for non-endovascular surgical indication for AAA and AoIOD and operated by MICRA (robot group). In the event of the robot unavailability, the patient was operated by conventional surgery (open group). The primary outcome was composite: 30-day mortality and morbidity (cardiac, pulmonary, renal and digestive complications including ileus). Secondary outcomes were technical success, average durations of stay in ICU and conventional hospitalization (CHMDS), parietal disunions, and surgical site infections. A propensity score with weighting was carried out by assigning a sample weight to each patient to obtain a comparable power between the two groups.
Results: Forty-four patients enrolled in the robot group versus 86 in the open group with 74 AAA and 56 AoIOD. Weighting of the two groups made it possible to make the two groups comparable regarding age, BMI, diabetes, tobacco, ASA score, surgical indication, the type of bypass carried out (52 aorto-bi-iliac, 65 aorto-bifemoral and 13 aortic tubes) and the type of clamping (40.7% suprarenal). 30-day mortality was not significantly different between the two groups, as were the rates of renal, cardiac or pulmonary complications. There was a significant difference in favor of the robot for parietal disunions, ileus, operative site infections, duration of stay in ICU (2.13 days vs 4.72 days) and CHMDS (4.69 days vs 10.34 days). The rate of technical success was not different between the two groups.
Conclusion: The robot is as effective as open surgery for prosthetic aortoiliac reconstruction. 30-day morbimortality is not different but the robot offers a minimally invasive approach allowing a significant reduction of the duration of stay.
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LONG-TERM OUTCOMES OF AORTIC CORAL REEF SURGERY: A 20-YEAR RETROSPECTIVE SINGLE CENTER STUDY

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Objectives: Coral reef aorta (CRA) is a rare and serious pathology (prevalence: 0.006-0.6%). Recommendations for its management are poorly documented but favor open surgical treatment that remains complex. Thus, for the past few years, cases of endovascular treatment have emerged in the literature but remain isolated. Our study is part of this context in order to report the short- and long-term results of the open surgical treatment of CRA.
Material and methods: In this single-center retrospective study, the patients operated between 2001 and 2023 from open surgery for symptomatic CRAs were included. The outcome criteria were intrahospital mortality, major short- and long-term complications, clinical improvement, and primary patency of the target arteries.
Results: 45 patients were included, with 55% of women. Median age was 63 years [56-71] and 95% of patients (n=43) had a smoking history. Preoperative symptoms were lower limbs claudication (68%), critical ischemia (11%), mesenteric angina (49%), and refractory arterial hypertension (7%). All the patients were treated by endarterectomy of the visceral aorta. A transperitoneal approach was used in 87% of cases with supra-celiac clamping in 95% of cases. Aorto-bi-femoral bypass was carried out in 78% of cases (n=35). The inhospital death rate was 11% (n=5). The rates of early MACE excluding death and of definitive dialysis support were 6% (n=3) and 8% (n=4). The rate of digestive ischemia was 15% (n=7). The median follow-up duration was 39 months [15-63]. One- and five-year survival rates were 85% [75-96] and 52% [38-73], respectively. 90% of the patients who survived presented a clinical improvement on follow-up. The one-year primary patencies of the superior mesenteric artery, the renal

arteries, and of the celiac trunk were respectively 100%, 98% [93;1] and 87% [82;1]. At 5 years they were 87% [75;1], 98% [93;1], 91% [82;1]. The one- and 5-year primary patencies of the limbs were 89% [77;1] and 78% [58;1], respectively.

Conclusion: Surgical treatment of symptomatic CRA is complex and associated with a high morbimortality rate, but with good clinical and patency results. This was one of the largest studies in terms of number of cases and evaluated data.

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LONG-TERM RESULTS OF CALIBRATED ILIO-FEMORAL VENOUS BYPASS SURGERY IN THE MANAGEMENT OF COMPLICATED ILIAC ENDOFIBROSIS IN HIGH-LEVEL ATHLETES

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Objectives: Endofibrosis of the external iliac artery (EEIA) is a non-atherosclerotic stenosing arterial disease that affects the high-level athletes practicing endurance sports. Saphenous calibrated bypass (SapCB) is carried out in the event of a long, circumferential stenosis, of arterial occlusion, or after the failure of an interventional procedure. We evaluated the patency of SapCB and the satisfaction of high-level athletes during long-term follow-up.

Material and methods: This was a retrospective single center cohort study. We identified the athletes treated consecutively by SapCB for EEIA between 1991 and 2018. The patients were included in the study if they had completed a specific satisfaction questionnaire in 2023. The patients had a resting echo-Doppler (ED). The diagnosis of thrombosis was established in the presence of the mention of a thrombosis in the patient file or the results of an ED, or in case of a new surgical procedure for thrombosis. If the patency could not be proven, the SapCB was considered as patent in asymptomatic patients without clinical ischemia history. The primary outcome was the long-term patency of the SapCB. The primary, assisted and secondary actuarial patencies of the SapCBs were calculated. Secondary outcomes were overall satisfaction and current sports activity.

Results: 119 patients were treated by SapCB for complicated EEIA between 1991 and 2018. 73 patients were enrolled (61%, 14 women=19%, 89 bypass grafts, 16 bilateral cases). The average year at the time of intervention and of follow-up were 38±6 and 60±5 years, respectively. The average follow-up was 17±5 years. The primary, primary assisted, and secondary actuarial patency, were 83%, 100% and 90% after 25 years, respectively. One chronic thrombosis was observed at 5 years (follow-up = 22 years). 5/13 SapCB (38%) thrombosed in the immediate postoperative period, with no new secondary thrombosis. No patient had stenting. 66 patients (90%) were satisfied. 65 patients (89%) practiced sports: 59 (81%) without limitation, 26 (36%) in competition. The average duration of sport activity was 6 hours/week.

Conclusion: In the long term, the SapCB surgery of EEIA guarantees the patency of the arterial restoration. It is associated with an acceptable level of satisfaction among high-level athletes.

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BOVINE PERICARDIAL PATCH VERSUS CRYOPRESERVED ARTERIAL ALLOGRAFTS AS ARTERIAL SUBSTITUTES IN CASE OF PARAPROSTHETIC-ENTERIC FISTULA: A COMPARATIVE MULTICENTER STUDY

Aurelien Hostalrich, Thibaut Boisroux, Lucas Battistella, Ramla Kireche, Benoit Lebas, Jean Segal, Xavier Chaufour and Ludovic Canaud, Toulouse and Montpellier, France.

Objectives: While anatomical aortic reconstruction became the reference over time for the management of paraprosthetic-enteric fistula, the ideal substitute is not clearly defined. Cryopreserved arterial allografts (CAA) are recognized as infection-resistant but present problems of availability, particularly in emergencies. They are also associated to the development of false aneurysms. Tubuled pericardial patches (TPP), available "off the shelf" appear to offer promising results in the recent literature in this indication. We propose a comparative study of these two substitutes in this indication.

Material and methods: We carried out a bi-centric observational study including retrospectively from January 2010 to July 2023 all patients operated on for a paraprosthetic-enteric fistula with reconstruction by CAA, and prospectively the reconstructions by PP from July 2018 to July 2023. The diagnosis of infection was established according to the MAGIC criteria. Patients' preoperative co-morbidities were collected to compare the groups. The postoperative morbimortality was then compared. The mid-term evaluation was done with the Kaplan Meier method and compared postoperative mortality, patency, infection, and reintervention rates.

Results: 41 patients were included with a mean age of 71.3 years (±9.15). 22 (53.6%) patients had a bypass graft of occlusive disease, 7 (17%) for aneurysmal disease, and 9 (21.9%) had EVAR. The median time before reintervention was 46.1 months [8.3-114.9]. 27 patients had

reconstruction with CAA (65.9%) and 14 with PP (34.1%). The type of fistula was comparable between the 2 groups with 80% of duodenal fistulas and 20% of colonic fistulas. The two populations were comparable in terms of preoperative cardio-respiratory co-morbidity and type of surgery. 14 patients (34.1%) died in postoperative, 5 in the PP group (35.7%) and 9 in the CAA group (33.3%) $p>0.05$. The causes of death were comparable in the two groups with 55% of deaths attributable to septic shock and 45% to hemorrhagic shock. The follow-up of patients who survived the initial intervention was 26.53 months [13.4-49.8]. In this population, the 6- and 12-month survival was stable at 88.9% in the CAA group versus 77.8% and 64.8% respectively in the PP group without significant difference ($P=0.25$). Survival without reinfection was 82.6% and 76.7% after 6 and 12 months in the CAA group versus 87.5% and 70% in the PP group ($p=0.88$).

Conclusion: In this particular context of paraprosthetic-enteric fistula, TPP offers a possibility of reconstruction in one time without problem of availability© with comparable results in terms of survival and resistance to reinfection compared to CAA in the mid-term. Longer-term follow-up is necessary to validate this comparability over time.

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PHAGO-VASC: EVALUATION OF PHAGOTHERAPY IN A PORCINE EXPERIMENTAL MODEL OF AORTIC VASCULAR PROSTHETIC INFECTION

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Objectives: Aortic vascular prosthetic (API) infection is a complication of vascular surgery. These infections are difficult to treat because of the increase in antibiotic resistance, especially to methicillin, and result in a high mortality. Phagotherapy, which uses bacteria-specific viruses, is emerging as a promising complementary solution to antibiotics. This study sought to evaluate the effectiveness of phagotherapy in this indication.

Material and methods: The study was carried out on 24 pigs divided into five groups: a non-infected group, a non-treated group, a group treated with Daptomycin, a group treated with phages only, and group treated with a combination of Daptomycin and phages. An aortic prosthesis was implanted in each animal, then inoculated with a strain of MRSA. The phages were administered by CT-guided injection at the site of the infection and intravenously. Daptomycin was administered intravenously. The primary outcome was the assessment of the bacterial load on the prosthesis after explantation.

Results: 16 of the 18 operated animals survived until the end of the protocol. In the group treated with phages and Daptomycin, a complete sterilization of the bacterial samples was observed in two animals. The results showed a significant reduction of the bacterial load in the groups treated with Daptomycin and by the combination of phages + Daptomycin compared with the non-treated group and the group treated with phages only.

Conclusion: This study validated a preclinical model of MRSA aortic prosthetic infection in the pig. The preliminary results show a trend in favor of the combination of phages and Daptomycin to reduce the bacterial load. Additional studies with a larger workforce are needed to confirm these observations and refine the therapeutic strategies.

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IMPACT OF SUPRACELIAC CLAMPING ON THE KIDNEY PROGNOSIS OF DIRECT SURGERIES FOR JUXTA-RENAL ANEURYSMS: A RETROSPECTIVE SINGLE-CENTER COHORT STUDY

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Objectives: Celiac clamping may be required during the repair of an aneurysm in presence of a short neck or juxta-renal, but its use is controversial notably due to renal risk. This study reports the results of its routine use for the surgery of these complex aneurysms.

Material and methods: 207 patients were treated of a short neck or juxta-renal aneurysm between January 2008 and November 2024. The data were analyzed retrospectively and included the demographics, the characteristics of the aneurysms, the preoperative and early morbimortality data. The primary outcome was the occurrence of postoperative renal failure according to RIFLE, and the secondary outcome was morbimortality.

Results: During the period of the study, 114 patients necessitated infrarenal clamping and 93 a supra-celiac clamping. The median was 67 years. The average duration of supraceliac clamping was 22.08 ±11.18 minutes. Morbimortality data were compared between infrarenal clamping and supraceliac clamping. We did not highlight a renal over-risk in the supraceliac clamping group (30/93 vs 26/114; $p=0.14$). There was no significant difference between the two groups (according to RIFLE) concerning the severity of acute renal failure. Three patients in each group necessitated postoperative dialysis ($p=1$). The 30-day long-term death rate was 2% and did not differ according to the clamping site. In multivariate analysis, both a history of chronic renal failure, an increase in blood loss, and the presence of atheroma in the proximal neck, were independently associated with the occurrence of an acute

postoperative renal failure regardless of the proximal clamping site.

Conclusion: The routine use of supraceliac clamping for the management of short-neck or juxta-renal aneurysms is an effective and rapid maneuver and does not seem to worsen the renal prognosis, nor the overall prognosis.

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MULTIMODAL SCREENING BEFORE OPEN AORTIC SURGERY: WHICH PATIENTS NEED PREHABILITATION BEFORE SURGERY?

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Objectives: The multimodal prehabilitation (MP) before conventional aneurysmal aortic surgery (AAAc) offers interesting results with a decrease in postoperative morbidity and an improvement in the quality of life. However, MP is still difficult to organize in everyday practice. In this context, it seems essential to identify which patients would unquestionably benefit from such care.

Material and methods: We conducted a prospective study that included all the patients operated for AAAc between January 2024 and November 2024. In addition to the conventionally recommended cardio-respiratory and anesthetic evaluation, we carried out an overall assessment of fragility the day before the intervention involving the search for an anxiety-depressive syndrome, undernutrition and anemia, an assessment of physical capacities and sarcopenia, the management of addictions and a study of the socio-environmental framework. The set of criteria was recognized as improvable by the implementation of a MP protocol. An ideal postoperative pathway (IP) was defined as the absence of mortality, the absence of severe medical complication, and a duration of hospital stay lower than 10 days. We were thus able to evaluate how the presence of isolated and/or combined of anomalies of the fragility assessment resulted in a deviation from the IP by comparing with patients who did not feel fragile.

Results: 87 AAAc were carried out during this period. Six patients refused to perform the preoperative tests and 14 patients were operated in emergency, which allowed to include 68 patients. 54 patients (79.4%) had an IP. Among the 14 patients who left treated out of the ideal pathway, two died (2.9%) in the postoperative period, one from peritonitis due to a gastro-duodenal ulcer and one from a multimetastatic cancer of rapid evolution. The main reason for an exit of the IP was a duration of hospital stay >10 days, with an average of 7.2 days (± 1.2) in the IP group and 16.7 days (± 5.2) in the IP failure group. The only severe medical complication was the reintubation of the patient who died of a gastro-duodenal ulcer. The patients in the IP and IP failure groups were comparable in terms of cardiovascular risk factors and in terms of medical risk factors. The distribution of the types of aneurysms was comparable between the two groups with 71% of infrarenal or juxta-renal aneurysms in the "failure of IP" group vs 77% in the "IP" group ($p>0.05$). The presence of sarcopenia was the only significantly different result between the two groups with seven patients (50%) of the "failure of IP" group who had a positive screening vs 14 of the "IP" group (25.9%) ($p<0.03$).

Conclusion: Our study provides an innovative vision of the optimization before open surgery for AAA. The simple preoperative screening of sarcopenia surgical during the first consultation would guide the patient towards a protocol of pre-habilitation to optimize his postoperative course.

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OVERALL 2-YEAR SURVIVAL AFTER THE TREATMENT OF UNRUPTURED ABDOMINAL AORTA ANEURYSMS IN ELDERLY PATIENTS: A NATIONAL STUDY FROM THE FRENCH NATIONAL HEALTH DATA SYSTEM (SNDS)

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Objectives: Asymptomatic abdominal aortic aneurysms are often discovered in elderly patients. The preventive nature of the treatment, the operative risks and the limited life span of these patients complicate the therapeutic decision. The objective of this study was to evaluate all-cause mortality of all patients older than 75 years operated from AAA in France over 10 years.

Material and methods: This was a cohort study from the French National Health Data System (SNDS) including all patients aged 75 years and over treated for a first AAA by open or endovascular surgery in France between 2013 and 2022. Patients previously operated for AAA before 2013 and peroperative conversions were excluded. The score of physical fragility (Gilbert 2019) was calculated using hospital diagnoses and long-term-illness during the 2 years preceding the operation.

Results: A total of 25177 patients enrolled (12.3% women, median age 81 years): 4803 were treated by open surgery (19.1%) and 20374 (79.9%) by endovascular techniques. Patients presented an average of 6.6 chronic co-morbidities (SD=3.7) and 28% were at risk of physical fragility. The 30-day, one-year, and 2-year mortality rates were 3.2% (7.3% for open surgery vs. 2.2% for endovascular), 10.7% (12.3% vs. 10.4%), and 17.6% (16.7% vs. 17.8%), respectively. In detail, by age group and by technique, 30-day mortality was 6.2%, 8.2%, 10% and 17.8% for open surgery, and 1.2%, 2.2%, 3.1% and 5.6% for endovascular, for patients of 75/<80, 80/<85, 85/<90 and $\geq$90 years, respectively. 25% of the 5259 patients $\geq$85

years treated by endovascular route died within 2 years, with a significant gradient according to the risk of physical fragility (19% in low-risk patients, 34% in moderate-risk patients and 49% in high-risk patients). The difference in mortality rate after open surgery in patients ≥85 years vs <85 years was 3.7% [95% CI 0.8-6.6%] after 30 days (10.8% vs. 7%), and 6.7% [2.8-10.7%] after 2 years (22.8% vs. 16%).

Conclusion: The 30-day mortality after open surgery for AAA is not negligible in elderly patients and this risk of excess mortality induced by the surgery should be taken into consideration in the therapeutic decision. Two-year mortality rates are similar between the two approaches.

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IMPACT OF LONG-TERM SURVEILLANCE ON MORTALITY AFTER EVAR FOR INFRARENAL ANEURYSMS

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Objectives: EVAR is now the first-line treatment of abdominal aortic aneurysms (AAA), but it requires long-term follow-up with a high rate of patients lost to follow-up. This study evaluated the impact of the quality of the follow-up on the long-term outcomes of EVAR.

Material and methods: It was a retrospective study involving all patients treated by EVAR in our center between 2000 and 2020. The demographic, intraoperative, postoperative and follow-up data were collected prospectively. Patients were divided into two groups based on post-operative follow-up quality: Group 1 included patients with full follow-up (≥ 50 months annual follow-up or last visit ≤ 18 months) and Group 2 included patients with an incomplete follow-up. The primary outcome was death from all causes according to Kaplan Meier (KM). Secondary outcomes included intervention-free survival, major intervention-free survival (for type I or III endoleak, component thrombosis or explantation) and survival without aneurysmal growth.

Results: A total of 1237 patients (Group 1, n=937 (76%) and Group 2, n=300 (24%)) were included (median age: 72 years, [interquartile range (IR) 65-78], male gender: 96%). The median duration of follow-up was 79 months [IR 46,116], with no difference between the two groups. The KM survival analysis showed no significant difference in the overall 5-year survival (Group 1: 71% ±SE 0.01 vs Group 2: 75%±SE 0.03; log Rank p=0.92); nor for intervention-free survival (p=0.95). The 5-year survival without major reintervention was significantly higher in Group 1 (84%±SE 0.01) compared to Group 2 (81%±SE 0.04), log Rank p=0.048. The 60-month survival without aneurysmal growth was significantly higher in Group 1 (88%±SE 0.03 vs. 69%±SE 0.01, p=0.034).

Conclusion: In our cohort, long-term follow-up did not improve patient survival after EVAR, although the risk of major reintervention and expansion of the aneurysmal sac appeared to be lower. This could strengthen the idea to propose a monitoring schedule based on the individual patient's risk (presence of an endoleak, initial diameter, quality of landing zones).

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PREDICTION OF ANATOMICAL DEFORMATIONS BY ARTIFICIAL INTELLIGENCE FOR IMAGE FUSION DURING AORTIC ENDOVASCULAR PROCEDURES

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Objectives: Implantation of an aortic stentgraft leads to anatomical changes, especially at the iliac level, in connection with the introduction of rigid material. The anticipation of these deformations would enable a better preoperative sizing and a smoother navigation. With the help of deep learning algorithms, it is possible to predict them using a sizing software that is used in everyday practice. The objective of this study was to measure the precision of the 3D fusion mask distorted in anticipation.

Material and methods: This was a prospective monocentric study conducted in our center between June and October 2024. All patients treated with an aortic stentgraft were included. The sizing was obtained with EndoSize (Therenva) and the generated fusion masks were then exported to the EndoNaut fusion station. In order to quantify the precision of the distorted fusion mask vs. non distorted, the intraoperative angiography was used as a reference. Four criteria were evaluated to compare certain points of the 3D masks, distorted (Def) and not distorted (Nodef) with the angiography (Art): the position of the renal and hypogastric ostia, the percentage of wire that passed through the iliac (%wir) and the Hausdorff distance (Hd) (average of the minimum distances) between the iliac arteries.

Results: 24 patients were included (9 EVAR, 4 branched iliac, 11 FEVAR). The time required to generate the (Def) mask in EndoSize was <45 sec/patient. The distance of position of the renal ostia between (Art) and (Nodef) was 5.8±4.4 mm and 3.0±2.7 mm between (Art) and (Def) (p<0.001). The distance of position of the hypogastric ostia between (Art) and (Nodef) was 8.7±7.8 mm and 7.9±8.1 mm between (Art) and (Def) (p=0.4). %wir was 36.5±22.9% on the (Nodef) mask and 59.3±18.9% on the

(Def) mask ($p<0.001$). Hd was 2.6±0.7 mm on the (Nodef) mask and 2.3±0.4 mm on the (Def) mask ($p<0.001$).
Conclusion: This study showed that with an algorithm integrated in a sizing software, it is possible to easily generate an image fusion mask more precise than the usual non distorted fusion mask. A variety of anatomically more complex cases will improve the performance of this anticipation.
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AMBULATORY ENDOVASCULAR TREATMENT OF ABDOMINAL AORTIC ANEURYSMS

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Objectives: Ambulatory EVAR is almost non-existent in France. However, it is widely reported in other countries. Following a feasibility study and then a pilot study simulating the ambulatory treatment in 10 patients, we initiated the ambulatory management of EVAR (AMBU-EVAR).
Material and methods: Between December 2018 and April 2024, 369 patients had EVAR in our center. Patients eligible for AMBU-EVAR were required to: (1) have an anatomy compatible with EVAR according to the instructions for use, (2) have a low surgical risk, (3) have iliofemoral accesses consistent with a percutaneous procedure, (4) live in the vicinity and have an accompanying person, and (5) be motivated for outpatient management. The patient pathway involved a first position in the operative program, ultrasound-guided punctures, a sedation-based anesthesia, the absence of urinary catheterization, a 2-hour monitoring in the post-intervention monitoring room with biological assessment, the absence of ultrasound control of the puncture points, and a first rise in the presence of the surgeon.
Results: During the study period, 12 patients had AMBU-EVAR (3% of all EVARs during the period but 11% of EVARs in 2023-2024). All of them were men, with a median age of 72 years (59-87). Ten patients (83%) were ASA 2 and 2 (17%) were ASA 3. The maximum aortic diameter was 52 mm (50-65). Eleven procedures (92%) were carried out under local anesthesia and sedation. The complementary intraoperative procedures were branched iliac stentgrafts, kissing stenting, and chimney stents in 3 (25%), 3 (25%), and 1 (8%) patients, respectively. The durations of operation and fluoroscopy were 83 (38-309) and 19 (7-60) min, respectively. Peroperative dissection of the left ilio-femoral axis was observed in one patient (8%) and required a femoral approach and conventional hospitalization (discharge at D4). The other patients ($n=11$, 92%) had an uneventful stay in the postoperative monitoring room and were able to return home in the evening without complications. They were fine at last follow-up.
Conclusion: AMBU-EVAR is feasible and safe in selected patients. The major current limitations AMBU-EVAR are patient's apprehension related to a feeling of severity due to the pathology and the upstream information received before the vascular surgery consultation.
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LEAKDYN: A PROSPECTIVE CHARACTERIZATION STUDY OF POST-EVAR ENDOLEAKS BY DYNAMIC ANGIO-CT

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Objectives: Follow-up examinations after EVAR, such as three-phase angio-CT and Doppler ultrasound, frequently encounter difficulties in visualizing endoleaks, especially when they are complex, without very obvious mechanisms. This poor evaluation of endoleaks is the origin of often unsuccessful endovascular interventions (embolization, realignment, extensions). The objective of this study was to evaluate the diagnostic performance of the dynamic angio-CT (d-CTA) for the characterization of post-EVAR endoleaks, and to compare the results to conventional monitoring methods.
Material and methods: This prospective single center study included 28 patients since March 2024. The inclusion criteria were the presence of an endoleak and/or an increase in the volume of the aneurysmal sac >5 mm within a 6-month period, observed during standard follow-up examinations. Each patient underwent a dynamic angio-CT associated to a contrast enhanced ultrasound (CEUS). The primary outcome was the characterization of the endoleak type by d-CTA compared to standard examinations, including CEUS. The dynamic CT acquisition was carried out on a REVOLUTION CT APEX scanner (GE Healthcare, Milwaukee, USA), with a dynamic arterial sequence centered on the area of interest (16 cm). The images obtained were analyzed using dynamic cine mode and treated by multiplanar reconstruction by a radiologist.
Results: 28 patients enrolled, and d-CTA confirmed 13 type II endoleaks, 6 of which were identified with a better precision in the dynamic mode. It also reclassified 10 endoleaks, including 6 high-grade leaks. In addition, a discrepancy was observed in the characterization between CEUS and d-CTA in 7 patients. Among the 6 patients reoperated, all leaks visualized by the d-CTA were confirmed during the operation. A satisfactory clinical success was observed 12 months after the conventional surgery reintervention or endovascular realignment.
Conclusion: d-CTA is an essential tool for in-depth

understanding and planning of treatment for persistent or post-EVAR endoleaks. It allows for improved diagnostic accuracy and more reliable guidance of therapeutic interventions.

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QUALITY OF LIFE AFTER SURGERY FOR ABDOMINAL AORTIC ANEURYSM: COMPARATIVE STUDY OF OPEN SURGERY VERSUS ENDOVASCULAR TREATMENT

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Objectives: EVAR to treat infrarenal abdominal aortic aneurysms (AAA) is re-discussed nowadays, in view of the many necessary interventions due to the persistence of the aneurysmal sac. Open surgery (OS) by aneurysmectomy ensures a curative treatment with a higher postoperative morbidity. That said, few studies have been carried out to evaluate the impact on the post-operative quality of life of these two types of procedures. We therefore carried out a study comparing the post-operative quality of life of patients treated for an AAA by EVAR or by OS.
Material and methods: We conducted a prospective monocentric study including all the patients operated for AAA between January 2021 and October 2024. The choice of the technique was left to the operator and validated by a multidisciplinary meeting. For patients treated by EVAR, the IFUs were scrupulously respected. Cardiovascular risk factors and postoperative morbimortality data were collected. The quality-of-life analysis was obtained through a questionnaire recognized for the evaluation of postoperative recovery, the QOR15 questionnaire. This 15-item questionnaire, which gives a score on 150 was filled out by the patients the day before operation, the day of discharge, and 1 month and 6 months after the operation.
Results: Over the period, 245 open aortic surgeries and 101 endovascular exclusions were carried out. 139 patients were treated for AAA with 72 EVAR and 67 OS. Patients had a mean age of 74.3 years (±12.4) in the EVAR group and 68.3 years (±8.2) in the OS group ($p=0.001$). 37.1% of the EVAR population had a LVEF <60% compared to 8.8% in the OS group (p:0.0025). Likewise, ischemic heart disease and COPD were statistically more common in the EVAR group than in the OS group: 41.43% vs 19.4% (p:0.0052) and 40% vs 23.9% ($p=0.04$). The postoperative mortality was zero in the two groups. More respiratory complications (17.9% vs 0% $p=0.002$) and transient renal failure (19.4% vs 1.4% $p=0.004$) More respiratory complications (17.9% vs 0% $p=0.002$) and transient renal failure (19.4% vs 1.4% $p=0.004$) were observed in the OS group. The median duration of stay was longer in the OS group (8 days [7-10] vs 2.4 days [1-2] in the EVAR group $p<0.0001$). 89.2% of patients in the OS group returned home vs 94.3% in the EVAR group ($p=0.3$). In terms of quality of life, there was no significant difference on the admission questionnaire with an average score of 127.9 (±17.1) in the EVAR group compared to 120.5 (±21.3) in the OS group ($p=0.11$). On the day of discharge, the average score of the EVAR group was 120 (±20.3) vs 100.5 (±25.7) ($p=0.00006$) with the most significant decrease observed for item 5: "able to wash yourself and do hygiene care without help" and item 8: "able to return to work or carry out your usual tasks at home". One month after operation during the control consultation, the mean score of the EVAR group remained stable at 125.3 (±16.5), and the mean score of the OS group rose at 123.1 (±26), i.e. the same than in preoperative. This improvement persisted at the 6-month evaluation, with an EVAR group score of 123.2 (±21.3) and an OS group score of 119.3 (±33.9).
Conclusion: Our study confirmed a good postoperative recovery after OS for AAA, with a quality of life returned to the initial value from the first postoperative month, authorizing the resumption of activities, comparable the results of patients managed by endovascular techniques. A study with more patients is currently being carried out.

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REFERENCE DOSES OF IRRADIATION DURING THE IMPLANTATION OF INFRARENAL AND FENESTRATED AORTIC STENTGRAFTS

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Objectives: The International Commission on Radiological Protection (ICRP) stressed the importance of defining standard doses of x-rays. Vascular surgery is one of the most concerned specialties with an increasing number of endovascular procedures, including abdominal aortic procedures. The objective was to evaluate radiation exposure, measured by cumulative air kerma (CAK) and dose-area product (DAP) during infrarenal aortic procedures (EVAR) with or without complementary embolization and branched iliac modules, and during complex procedures with custom-made stentgrafts (F/BEVAR).
Material and methods: This was a prospective study. The data were collected from the DoseWatch application. They included all aortic endovascular repair procedures performed between January 2014 and February 2024 in our center. The main outcomes were diagnostic reference

levels (DRLs) for F/BEVAR. We defined DRLs as the 75th percentile of the median values of radiation measurements, and the achievable doses (ADs) were fixed at the 50th percentile (median), conforming to the current ICRP guidelines. The procedures were all carried out in a hybrid room (Discovery IGS 730; GE HealthCare, Buc, France).
Results: 694 patients (84% of men; mean age 70.4±5.8 years) were treated for AAAs by either EVAR (N=269) or F/BEVAR (N=425). The mean DAS and KAC for EVAR procedures were 61.1±36.9 Gy·cm^2 and 679.1±463 mGy, respectively. The mean DAS for F/BEVAR was 79.5±37.1 Gy·cm^2, and CAK was 968.6±496.7 mGy. The distribution of CAK and of the DAS was analyzed according to four groups: 1/ in the EVAR group without associated gestures, the DRL and AD for the CAK were 323 mGy and 191 mGy and 32 Gy.cm^2 and 20 Gy.cm^2 for the DAP. 2/ in the EVAR group with branched iliac modules, the DRL and AD for the CAK were 735 mGy and 493 mGy and 78.5 Gy.cm^2 and 36 Gy.cm^2 for the DAP. 3/ in the F/BEVAR group with less than three fenestrations/branches, DRL and AD for CAK were 1001 mGy and 613 mGy and 86 Gy.cm^2 and 62.5 Gy.cm^2 for DAP. 4/ in the F/BEVAR group with at least four fenestrations/branches, DRL and AD for CAK were 1196.5 mGy and 805 mGy and 100 Gy.cm^2 and 68 Gy.cm^2 for DAP.
Conclusion: This large cohort study allows to propose average reference levels of exposure to x-rays.
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LATE RUPTURE OF ABDOMINAL AORTIC ANEURYSMS AFTER ENDOVASCULAR TREATMENT. EXPERIENCE OF 22 FRENCH UNIVERSITY CENTERS (AURC)

Sarah Bartlomiejczyk, Camille Salomon, Nicla Settembre, Lucas Morin, Éric Steinmetz, Camil-Cassien Bamde and Sergueï Malikov, Nancy and Dijon, France.

Objectives: The number of patients treated stentgraft for an aortic abdominal aneurysm is steadily increasing. However, the stentgrafts do not always prevent aneurysmal rupture and few data are available on survival in this eventuality. The primary outcome was to analyze the mortality rate. Secondary outcomes were to analyze mortality according to the type of endoleak, the type of management and the hemodynamic condition of rupture.
Material and methods: This retrospective multicenter study included patients from 22 French teaching hospitals admitted for AAA rupture occurring despite a stentgraft between June 2007 and July 2022. The 30-, 90-, and 365-day survival was estimated according to Kaplan-Meier.
Results: 118 patients were included (104 men and 14 women), with an average age of 79.6 (±8.5) years at the time of rupture. The median time between aneurysmal exclusion and aortic rupture was 50 months. At the time of rupture, the average aneurysmal diameter was 84 (±21) mm and 56 patients (47%) had hemorrhagic shock. 60 (51%) patients presented a type I endoleak and 39 (33%) and 23 (19.5%) a type II or III endoleak. Nine patients (7.6%) died without operation, 67 (56.8%) had open surgery, 39 (33.1%) were treated by endovascular route, and 3 (2.5%) had hybrid surgery combining open and endovascular surgery. The 30-, 90-, and 365-day death rates were 32%, 39% and 46%, respectively. Neither the type of surgical management, nor the type of endoleak found at the time of rupture were associated with the 1-year risk of rupture. Postoperative complications were mainly renal (42%), hemorrhagic (22%), digestive (19%), and respiratory (18%).
Conclusion: Our study is the first large multicenter cohort of patients admitted for the rupture of a AAA previously treated with a stentgraft. Despite the technological advances, if a rupture occurs, aortic endoprostheses do not improve the prognosis with a survival rate comparable to that of native aortic ruptures in the literature.
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THREE-YEAR ANALYSIS OF THE AORTIC NECK AFTER THE IMPLANTATION OF INFRARENAL STENTGRAFTS WITH ENDOANCHOR FIXATION (ESAR)

Raffaele Pio Ammollo, Nicolas Mauchien, Alexandre Oliny, Marine Bordet, Nellie Della Schiava and Antoine Millon, Lyon, France.

Objectives: Implantation of aortic stentgrafts with the EndoAnchors fixation system (ESAR) has allowed to extend the indications of the endovascular treatment of AAAs to patients with short necks (<10 mm). The long-term outcomes have shown satisfactory results in terms of prevention of proximal endoleaks and of regression of the aneurysmal sac. However, the data remain limited regarding the behavior of the infra- and supra-renal aortic neck above and below the aorta after ESAR.
Material and methods: We analyzed the behavior of the infra- and supra-renal aortic neck and the results of the ESAR procedures in our department between September 2017 and August 2020 in patients with a short infrarenal neck non-eligible to a conventional surgical treatment for AAA, and with anatomical characteristics (iliac tortuosity, target vessels) or logistical constraints (unreasonable manufacturing time) unfavorable to stentgraft implantation.
Results: 23 patients were included (22 men; median age, 75 years), with a median follow-up of 36.49±16.31 months. The rates of technical and procedural success were 100%. No rupture or dissection were found in peroperative. The

median number of EndoAnchors was 7. No drop defect or migration were observed. The median operating time was 145±40.2 minutes. The diameter of the infra- and supra-renal necks did not significantly change during the 3-year follow-up, and no open or endovascular reintervention for type 1A endoleak was needed. 30-day mortality was 0%. Six unrelated deaths (26.08%) were observed during follow-up. Overall 1-, 2-, and 3-year survival was 100%, 100% and 73.92%, respectively.

Conclusion: The endovascular ESAR strategy appears associated with good results in the treatment of short neck infrarenal AAAs, with in particular a mid-term stability of the supra- and infra-renal necks. In addition, it offers good results in terms of aneurysmal sac regression, endoleak prevention and reintervention. This therapeutic option is particularly interesting for patients with a short neck infrarenal AAA non-eligible to open surgery or the implantation of a fenestrated stentgraft.

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MID-TERM RESULTS OF ANTEROGRADE LASER FENESTRATIONS ASSISTED BY IMAGE FUSION FOR THE TREATMENT OF COMPLEX ABDOMINAL AORTIC ANEURYSMS

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Objectives: The aim of this study was to evaluate the mid-term results of anterograde laser fenestrations assisted by image fusion for the treatment of complex abdominal aortic aneurysms.

Material and methods: This was a retrospective single center. All patients with complex aortic aneurysms treated with laser fenestrated stentgrafts (LFS) between September 1, 2016 and January 1, 2022 were included. Primary outcomes included the intraoperative adverse events (IOAEs), inhospital mortality, reinterventions, the patency of the target arteries, and the 36-month results (survival, reinterventions, patency of the target arteries). The 36-month results were estimated by the Kaplan-Meier method with 95% CI. This study was approved by the local ethics committee (#00011558).

Results: 60 patients with contraindications to open surgery were treated with LFS during the period. LFS cases included painful aneurysms (n = 12), aneurysms over 65 mm considered at high risk of rupture (n = 33), anatomical contraindications to a custom fenestrated stentgraft (n = 14), and rupture on type 1 endoleak. The median aneurysm diameter was 65.5 mm (IQR 13). 170 fenestrations were created (average of 2.8 per patient). The IOAE rate was 35% (n = 21). Technical success was 98%. Inhospital mortality was 5% (n = 3). The median duration of follow-up was 37 months. The 36-month rates of survival and freedom from reintervention were 70.8% (95% CI: 56.7-81.1) and 65% (95% CI: 48.5-77.4), respectively. Three target arteries occluded in the postoperative period and three during the follow-up. The 36-month target arteries patency was then of 93% (CI 95% 82.2-97.4). Two LFS were explanted (infection and persistent endoleak). The 36-month freedom for aortic mortality was 98% (CI 95% 86.9-99.7).

Conclusion: In patients at high surgical risk who cannot benefit of a custom-made fenestrated stentgraft, LFSs may give satisfactory results in the mid-term. These results are tempered by IOAEs and frequent reinterventions, necessitating close follow-up.

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MID-TERM RESULTS OF THE TREATMENT OF THORACOABDOMINAL AND PARARENAL ANEURYSMS WITH THE ANACONDA FENESTRATED STENTGRAFT

Alexandre Oliny, Marine Bordet, Nellie Della Schiava, Rafaelle-Pio Ammollo, Matthieu Arsicot and Antoine Millon, Lyon, France.

Objectives: F/BEVAR is the most used treatment for complex aneurysms, mainly with the Cook Zenith Fen platform that has shown a long-term sustainability. However, some patients are difficult to treat because of significant aortic angulations, and the reintervention rate is high. The fenestrated Anaconda stentgraft (FAS) may facilitate the treatment of some complex anatomies, but there are few data regarding its use for thoracoabdominal aneurysms (TAA) and supra-renal aneurysms (SRA). The purpose of this research was to evaluate the mid-term effectiveness and safety of FAS to treat TAAs and SRAs.

Material and methods: All of our patients treated with FAS between 2018 and 2023 for a non-ruptured TAA or SRA were included in a prospective register. The strategy could include staging, and the implantation of the AFS into thoracic modules for TAAs and SRAs whose proximal neck was not favorable. The primary outcomes were overall survival, target vessels patency (TVP), and reintervention-free survival. Secondary outcomes were the technical and early clinical success, the evolution of the sac, the instability of the target vessels (TVI), and the endoleaks.

Results: 57 patients (72% of men, median age 70 years) were included, 32 (56.1%) with an SRA and 25 (43.9%) with a TAA. Nineteen patients (33.3%) had staging, and the technical success was 94.7%. Three (5.3%) early deaths, 1 (1.8%) paraplegia, and 1 (1.8%) type IIIc

endoleak occurred, leading to a 93.0% early clinical success rate. The average follow-up was 31.6 months. A total of 12 patients (21.1%) died, resulting in an overall survival rate of 87.5% at 1 year and 78.1% at 4 years. TVP was 95.9% after 1 year and 95.2% after 5 years, and the TVI free survival was 84.7% after 1 year and 72.2% after 3 years. Seventeen patients (29.8%) required reintervention, resulting in 1-year and 3-year reintervention-free survival rates of 76.6% and 61.1%, respectively. One (1.8%) type 1a endoleak, 1 (1.8%) type 1b endoleak, and 5 (8.8%) type 3c endoleak occurred during the follow-up and were treated.

Conclusion: AFS appears to show satisfactory security and effectiveness in treating TAAs and SRAs. Despite a significant reintervention rate, the mid-term overall survival and target vessels patency validate its use for these aneurysms.

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