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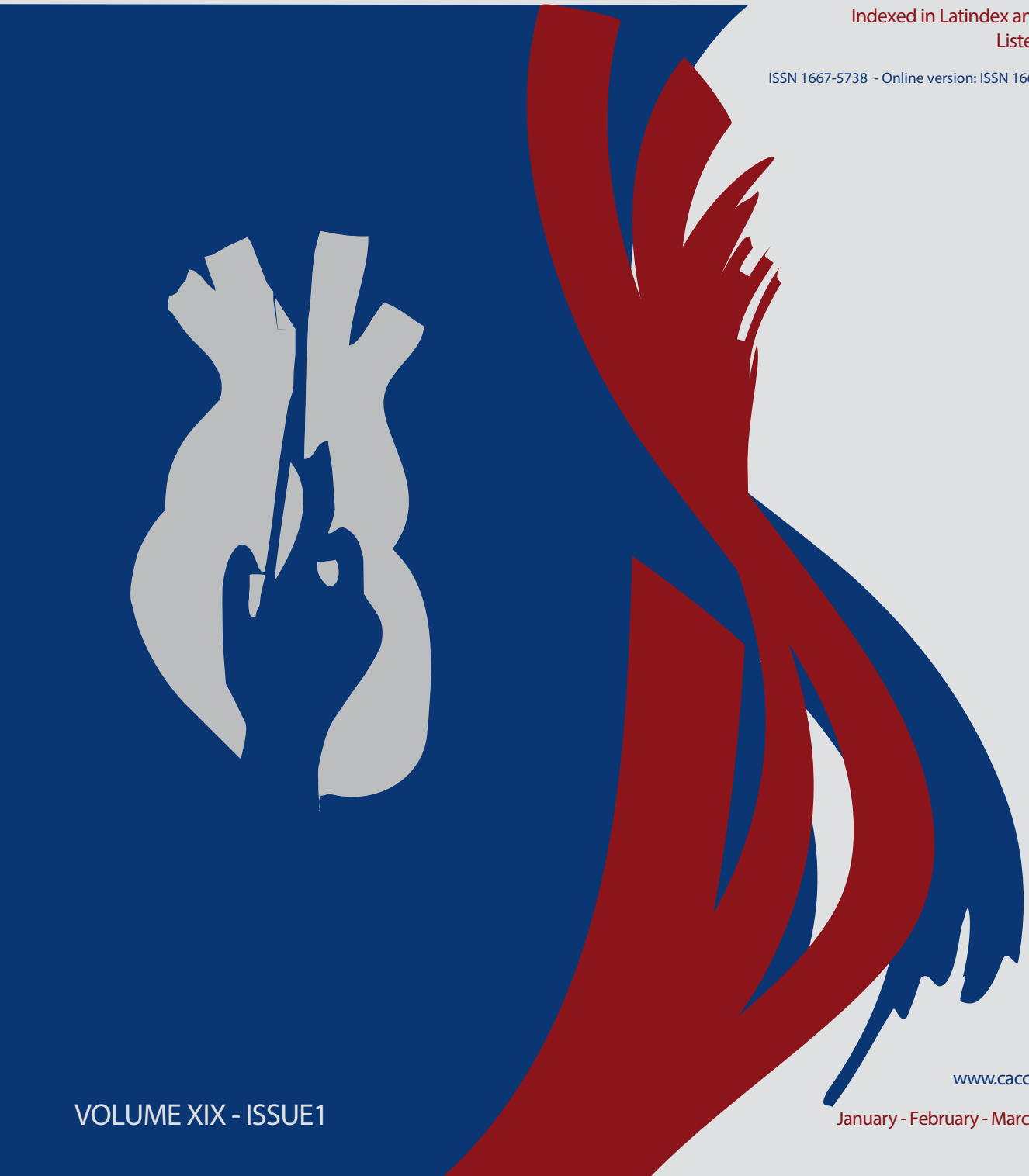

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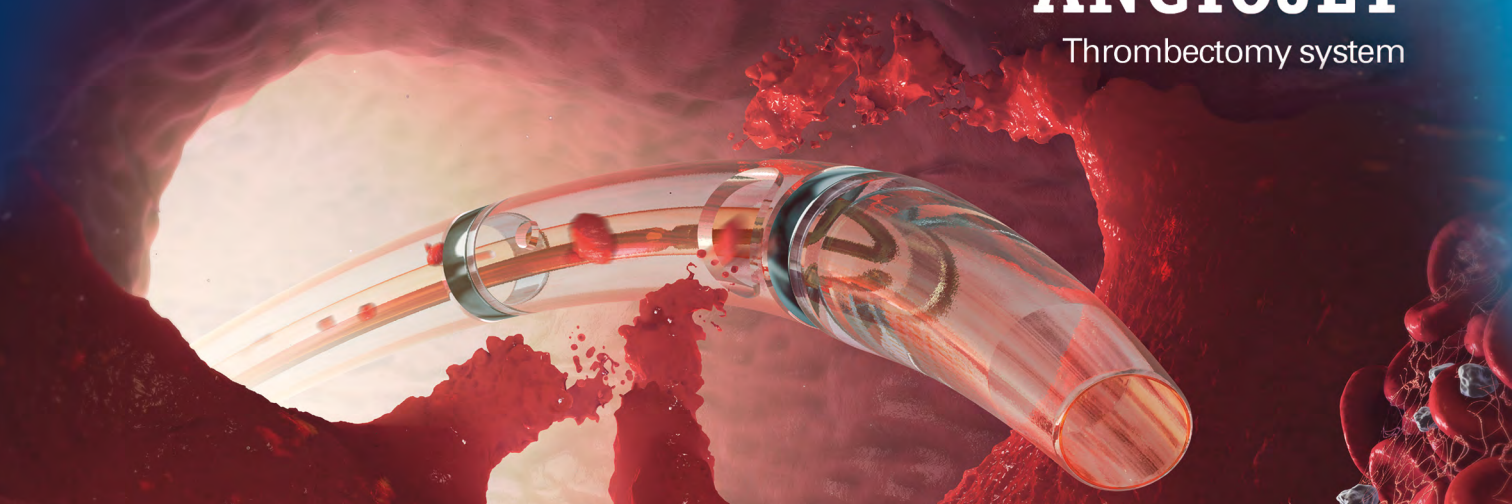

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The *Argentine Journal of Cardiovascular Surgery* is the official journal of the Argentine College of Cardiovascular Surgeons. The first issue was published back in 2003. Our goal is to disclose and present updated information through studies conducted and manuscripts written by specialists across the world on different surgical techniques, and historic articles on significant physicians and surgeons. Also, pivotal moments in the history of our country and the rest of the world both on our medical specialty and other specialties like Cardiovascular Surgery, Endovascular Surgery, Cardiac Surgery, Circulatory Support, Phlebology, Lymphology, up to the latest tendencies by incorporating technological innovations like stem cell therapies and others. This journal is focused on surgical issues and is published on a four-month basis.

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SUMMARY

STATEMENT

THE LATIN AMERICAN ASSOCIATION OF CARDIAC AND ENDOVASCULAR SURGERY STATEMENT REGARDING THE RECENTLY RELEASED 2020 ACC/AHA GUIDELINES FOR THE MANAGEMENT OF PATIENTS WITH VALVULAR HEART DISEASE

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Scientific evidence in the cardiological arena has progressed enormously in the last couple of years. It is a huge challenge for respected societies such as AHA and ACC to undertake the burden of providing to the world their recommendations for clinical practice based on this evidence. The Latin American Association of Cardiac and Endovascular Surgery (LACES) would like to thank the authors involved in such a task.

As a growing association that represents an economic and healthcare reality that is different from others, we have decided to carefully select guidelines that consider our socio-economic situation. As such, in this statement, we will highlight the aspects of the recently released AHA/ACC Guidelines for the Management of Patients with Valvular Heart Disease 2020 with which we disagree intending to support Latin-American surgeons in their practice(1).

AORTIC STENOSIS

Trials on TAVI and SAVR have been constructed based on surgical risk; for this reason, the previous AHA/ACC Guidelines for the Management of Patients with Valvular Heart Disease based its recommendation for the type of intervention on surgical risk.

Although we support the concept that age, expected survival and valve durability are the cornerstone for Patient-Heart Team discussion, trials have not evaluated outcomes based on age.

Furthermore, the age range used to support TAVI is well below the mean age of the low-risk trials (73 years old for PARTNER 3 and 74 years old for EVOLUT Low Risk) and there is absolutely no reference to support this range defined by the authors.

Therefore, LACES considers an important methodological flaw subject to high risk of reversal, to recommend as Class of Recommendation (COR) I Level of Evidence A (the highest imprimatur of guideline recommendations) any indication for TAVI or SAVR based on age. We consider this discrepancy of utmost importance since AHA/ACC recommendations will guide treatment and provide legal framework in several countries of thousands of patients which in this case is devoid of scientific evidence.

LACES does not support any COR I level of evidence A recommendation, which is NOT supported by large randomized control trials. Large randomized control trials have been constructed based on surgical risk. Therefore, we do not support any recommendation on TAVI or SAVR based on age.

The authors have clearly stated the importance of life expectancy and valve durability to help decide the best strategy.

Nonetheless, there is no mention about the long-term risk of paravalvular leak or permanent pacemaker implantation on long-term survival in low-risk and young patients. PARTNER 2 trial has shown patients with a mild paravalvular leak to have worse survival at 5 years (P = 0.06) than patients with none or trace[2]. We believe this issue to be as important as valve durability and therefore be seriously incorporated in the decision for patients with longer than 5 years life expectancy. Until there are no data on its detrimental effect, we do not believe that it is safe to recommend TAVI in patients with >5 years of life expectancy.

Since there is no evidence longer than a median of 5 years of follow-up, to support the safety of TAVI in intermediate- and low-risk patients and also regarding the detrimental effect of paravalvular leak, LACES does not support any COR I for TAVI in patients with a life expectancy longer than 5 years.

Surgical risk defined by the current guidelines is another novel topic in which this association has a different view. High risk has been defined by the current guidelines as any of the following:

- STS >8%,
- > or =2 indices in frailty,
- 1 to 2 organ system compromise not to be improved postoperatively

and

- possible procedure-specific impediment.

Organ system compromise has been defined as cardiac dysfunction (severe LV systolic or diastolic dysfunction or RV dysfunction, fixed pulmonary hypertension); kidney dysfunction (chronic kidney disease, stage 3 or worse); pulmonary dysfunction (FEV1 < 50% or DLCO2 < 50% of predicted); central nervous system dysfunction (dementia, Alzheimer's disease, Parkinson's disease, cerebrovascular accident with persistent physical limitation); gastrointestinal dysfunction (Crohn's disease, ulcerative colitis, nutritional impairment or serum albumin <3.0); cancer (active malignancy); and liver dysfunction (any history of cirrhosis, variceal bleeding or elevated INR in the absence of VKA therapy).

There is no reference to support defining high surgical risk under these conditions and we consider the organ system compromise definition to be very broad resulting probably in a high percentage of patients in this category who will receive a treatment for which there is no evidence to support superiority.

LACES considers that surgical risk stratification should continue to be based on validated scores that result from complex statistical methods and therefore do not support defining high surgical risk based on criteria that do not derive from big data adjusted survival analyses.

Current guidelines have excluded completely the option of SAVR in patients at high surgical risk. Even more, the authors have provided similar recommendations for high surgical risk and prohibitive surgical risk. We consider that this recommendation is unacceptable and our association will not support nor endorse it for the following reasons. Trials have specifically evaluated separately each of these surgical risks (PARTNER 1A and 1B), providing strong and solid evidence based on the population of patients included. PARTNER 1A compared SAVR with TAVR in patients at high risk and PARTNER 1B compared medical treatment and TAVR in patients with prohibitive surgical risk.

Therefore, the conclusion and subsequent guideline recommendations should be based on the population and comparative groups involved. We support palliative care in patients with prohibitive surgical risk in whom TAVI is not feasible.

In patients at high surgical risk, no evidence shows that TAVI is superior to SAVR. The actual evidence is that TAVI is not inferior to SAVR in high risk and, therefore, guidelines recommendation giving Level of Evidence A should reflect this.

Current evidence shows TAVR to be non-inferior to SAVR in patients at high risk; therefore, LACES considers both options to have the same level of recommendation. LACES does not support giving the same recommendation in patients at high and prohibitive risk.

FUNCTIONAL MITRAL REGURGITATION

After careful consideration of the new 2020 AHA/ACC clinical guidelines for valvular heart disease, we have found several points concerning the recommendations for using transcatheter edge-to-edge mitral valve (MV) repair, as a treatment in the setting of functional mitral regurgitation (FMR), with which we are totally at odds. If CABG is needed, then surgery is indicated as the COR IIA. However, the main disagreement is concerning patients not undergoing CABG.

In these new guidelines, transcatheter edge-to-edge MV repair is considered as a COR IIA, if the case has severe mitral regurgitation (MR) stage D (Rvol >60 ml, RF >50%, EROA >0.4 cm2), left ventricular ejection fraction (LVEF) <50%, if symptoms persist on optimal GDMT, with MV anatomy as favourable, LVEF 20-50%, left ventricular end diastolic diameter (LVEDD) >70 mm, pulmonary systolic arterial pressure (PSAP) <70 mmHg. Recommendation has been based mainly on data from the COAPT trial.

First, we need to say is that FMR is not a valvular disease, but a final LV condition leading to heart failure. Every single one of the attempts on the

MV (surgical as well as percutaneous) will be just a palliative measure to alleviate the MR. Prognosis remains unaltered, while the quality of life or freedom from symptoms can be improved using any treatment directed to mitigate or even eliminate MR, regardless of the approach. MR repair using restrictive annuloplasty is the more reproducible technique for this purpose. Nevertheless, there has been a great concern because of the MR recurrence in the short term.

While it is true that surgical annuloplasty might not be optimal for cases with FMR, it is also true that there are some other surgical options on the MV, which can be highly recommended, as a definite treatment directed to stop the further dilation and remodeling of the LV. MV replacement is another surgical choice.

However, 1 consideration of paramount importance is that all these foregoing facts apply the same, regardless of whether the approach is surgical or percutaneous.

Moreover, when comparing the results of the COAPT trial (Abbott Funded) with the MITRA-FR trial (French Ministry of Health and Research National Program Funded), both trials differed considerably in the primary outcome[3,4]. Besides, a recently published post hoc analysis of a subgroup of patients from the MITRA-FR trial who met COAPT inclusion criteria, transcatheter edge-to-edge MV repair, failed to show superiority over optimal medical therapy. Therefore, longer-term outcomes are required, as well as additional trials.

In the light of the aforementioned details, LACES does not support COR IIA for transcatheter edge-to-edge MV repair, in thepresence of FMR. The contradicting outcomes between the only 2 trials, which have evaluated this technique and the limited 2-3 years of data from the COAPT trial, do not justify the wide expectations of a COR IIA for the percutaneous approach.

Concerning FMR, all the available long-term information is coming from surgical experience, with a significant long-term follow-up of up to 14 years or even longer. From this experience, it has been so very clear that the most powerful predictor for failure after edgeto-edge MV repair is the lack of an annuloplasty ring.

As it stands now in the current version, the transcatheter edgeto-edge MV repair therapy is a ringless technique and therefore longer-term outcomes are needed before we are able to evaluate the safety of a ringless technique.

In regard with comparison to mitral surgery, the EVEREST II trial included 27% of patients with FMR[5]. The primary outcome (freedom from death, surgery in the percutaneous group, MR 3+ or 4+, surgery in the repair group) at 1, 2 and 5 years was significantlyworse for percutaneous edge-to-edge group. There is no other RCT, which evaluates long-term outcomes of surgery versus transcatheter edge-to-edge.

Considering the worse long-term outcomes of the transcatheter edge-to-edge (EVEREST II trial) and absence of long-term safety using a ringless technique, LACES does not support a higher level of COR for the percutaneous approach compared with surgery. We believe that careful evaluation of surgical risk by a Heart Team should define the best approach.

Finally, we believe that one of the main drivers of big societies like AHA, ACC, ESC and EACTS is to thrive to achieve excellence in the treatment of cardiovascular disease worldwide. Scientific societies should acknowledge this to be worldwide leaders in the field.

When guidelines start to diverge from a critical assessment of the scientific evidence with unsupported extrapolations, they lose reliability, practice turns arbitrary and leaders are lost.

This statement has been submitted to several journals to achieve worldwide diffusion of the position of our Association.

Conflicts of interest
Authors report no disclosures.

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EDITORIAL

A PARADIGM SHIFT IN VASCULAR TRAINING AND ITS IMPACT IN THE UNITED STATES

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In the United States, vascular surgery became a distinct specialty of surgery on March 17, 2005. A Primary Certificate in Vascular Surgery was permitted when the American Board of Surgery (ABS) received approval from the American Board of Medical Specialties (ABMS) and removed the requirement for 5 years of training and certification in general surgery. The ABS is an independent, nonprofit organization which certifies surgeons who have met a defined standard of education, training, and knowledge. The ABS certifies graduates of the Residency Review Committee (RRC) approved programs through a process of written (qualifying) and oral (certifying) examinations. The Accreditation Council for Graduate Medical Education (ACGME) has been created to oversee the administrative, policy, and business aspects of the accreditation. The RRC monitors their performance[(1)].

The rapid expansion of endovascular therapies in the early 2000s led to formalization of the training criteria and eventual progression to a two-year accredited Vascular Fellowship, previously only one year. The 7-year commitment extended post-graduate training leaving concerns about recruitment among trainees of delay in the ability to repay school loans and poor lifestyle. In 2004 and 2005; there were not enough applicants to fill training positions leaving some unfilled. The development of shorter training programs was spurred by an interest in expanding the qualified applicant pool. The aging of the population and concerns about the increased demand for Vascular Surgeons became a focus. This then facilitated the development of different training paradigms for a certificate in vascular surgery. Various different options exist including the original 5 + 2 year (Vascular Fellowship), 0-5 year (Integrated) and 4+2 year (Early Specialization) programs.

In 2008, the 0-5 integrated residency pathway increased to 9 programs as the number of positions in the 5-2 pathway remained stable, with approximately 120 positions available each year[(2)]. In 2009, Schanzer et al. assessed the applicant pool and found that the number of integrated vascular resident applicants increased dramatically, with 152 applicants seeking to match into 19 available positions. The fact that 88% of integrated vascular residency applicants did not match, while 16% of traditional fellowship positions went unfilled demonstrated that this new paradigm was much needed and encouraged the expansion of the training programs to meet this need[(3)]. Other institutions and nationwide data have independently confirmed that this trend towards interest in the 0-5 vascular surgery residency training paradigm continues to significantly increase. Zayed, et al. felt that there is a significant difference between the cohorts of 0-5 residency and 5-2 fellowship program applicants at the completion of medical school; suggesting that 0-5 integrated vascular surgery residency program attracts a different type of medical student population to the specialty[(4)].

Further data was needed to determine if this novel training program would produce equally well-trained vascular surgeons compared to the Traditional Pathway. A review of recent literature looked at the 5+2 Fellowship as compared to the integrated (0-5) vascular surgery training programs with respect to case volume. Integrated trainees were finishing with higher total case volumes in particular among endovascular procedures while open case numbers remained similar[5,6]. These authors also analyzed published data regarding trainees from these 2 different types of programs. There were expected differences in training residents fresh out of medical school compared to those who had already completed five years of general surgery residency. Differences in age, having rotated on a vascular service, having a vascular mentor as well as more vascular publications were all identified as significant differences attributed to the integrated 0-5 cohort. The three most common reasons noted for pursuing integrated vascular training rather than a traditional fellowship were the desire for a more focused training, interest in catheter-based therapies, and preference of a shorter training period[6,7]. Another study found that the integrated programs attracted a higher percentage of females, applicants with secondary degrees, higher standardized testing scores, and applicants who were more often in the top quartile of their medical school class compared to their fellow counterparts[4].

One 0-5 resident described his training experience as adequately preparing him for vascular practice. He also commented that although he was new graduate, he was often called in to assist on emergencies for other services such as otolaryngology, neurosurgery, trauma surgery, colorectal surgery, surgical oncology, and breast and endocrine surgery. He was well received and treated with respect despite being younger. However, he wisely noted that the further out from training these surgeons were, the more inexperienced they were with problems outside of their own specialty[8].

Survey data in 2013 from 2 cohorts of trainees, 0-5 and 5-2, was evaluated with respect to job search experiences. Eleven integrated residents and 25 traditional fellows were queried with an 81% response rate. Similar to prior studies, there was no significant difference between residents and fellows in the operative experience obtained as measured by the number of open and endovascular cases logged. Most graduates were extremely satisfied with their training and had described positive experiences during their job searches. This included starting salaries, numbers of offers, and desired practice type. In this small group, more integrated residents chose academic and mixed practices over private practices compared with fellowship trained graduates[9].

As of 2021, there are 77 traditional training programs which includes 5 years of general surgery followed by 2 years of vascular fellowship. There were 136 applicants for 129 positions. The applicant number is stable with a slight increase of 2% from the previous year. However, the number of programs has increased to 100 in 2021. In comparison, the number of applicants for the 0-5 Integrated Vascular Residency has increased greatly with the number of programs increased by five over two years to 79 in 2020 with 181 applicants; 94 of which are US MD graduates[10]. The 0-5 program accepts applicants directly from medical school. The integrated residency must be at least 60 months in duration, and in both training pathways the trainees must perform more than 250 major vascular reconstructive procedures[2].

More recently, a web based curriculum, approved by the American Board of Surgery, called VSCORE (Vascular Surgical Council on Resident Education) has been formulated to standardize vascular trainee education. Links to academic resources are present with each topic. Learning is assessed annually through a written Vascular Surgery in Training exam. Each program additionally provides clinical and basic science lectures based upon the Association for Program Directors of Vascular Surgery (APDVS) curriculum, journal club, and simulation opportunities for open and endovascular skills.

The APDVS is now encouraging awareness about burn out. Efforts are being made to minimize burnout during surgical training. Trainees and practicing vascular surgeons are being educated about noted symptoms, importance of mentorship, self-care, and access to resources for stress reduction. In addition, mechanisms for maintaining a positive outlook and a sense of meaningful work are described including faculty entrustability, receptive leadership, celebrating small wins, and recognition that resiliency is a skill that can be developed[11]. Limitations of work hours and a well-organized education curriculum have helped in the reduction of burn-out.

In conclusion, vascular training in the United States is positively evolving paradigm. A unified effort to streamline education in an efficient and effective manner is underway to produce confident, skilled surgeons and decrease training time to facilitate well-being. The 0-5 training paradigm has been very successful from the trainee and program director's perspective. The shortened training has increased the quality and number of applicants for vascular training.

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ORIGINAL ARTICLE

FIRST NATIONAL REGISTRY OF TRANSVENOUS LEAD EXTRACTION (RENEDI) PRELIMINARY RESULTS

ABSTRACT

Introduction: RENEDI ("Registro Nacional de Extracción de Dispositivos") is the first inter-societary, prospective, multicenter and observational cohort study for patients undergoing transvenous lead extraction (TLE) performed in Argentina. **Objectives:** To provide realworld data of current practice in our country, characterize the population of patients and personnel involved and analyze, with an interdisciplinary and internstitutional focus, the results obtained. **Methods:** An online database platform active from January 2018 to December 2019 was designed. Data provided by specialists was compiled, verified and reviewed by a Committee. **Results:** A total of 621 leads (325 patients - average age: 59 years; 71%: male) were extracted. The targeted leads included 379 (61%) pacemakers, 174 (28%) implantable cardioverter-defibrillator and 68 (11%) cardiac resynchronization therapy Devices. Two hundred and thirty-three (38%) were atrial leads, 367 (59%) ventricular leads, and 21 (3%) were in the coronary sinus. The average lead dwell time was 105.9 months. The commonest indication for removal was infection (68%). Vascular or cardiovascular surgeons were usually the primary operators (81%). The majority of interventions were performed in standard operating theatre (79%). The presence of stand by was reported in 65% of cases. Percutaneous approach (98%) was predominant. Hybrid approaches were performed in 7 patients (16 leads). A total of 158 (25%) leads were extracted using simple traction (median dwell time: 33.3 months). Additional and specified tools were used in 74% of cases. Overall complications rate were 4% (major: 0.3%; minor: 3.7%). Complete procedural success was 96.3%. Incomplete extraction was obtained in 23 leads. No deaths were reported. **Conclusions:** TLE is a safe and effective procedure associated with a low incidence of complications and high success rate when it is performed in well-trained hands. In our county, few specialists are dedicated to this practice. An extensive training and sufficient prior experience in performing these techniques are essential to minimize the risk of complications and obtain successful outcomes.

Keywords: *multi centre registry, prospective clinical trial, lead extraction, outcomes, training*

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INTRODUCTION

Over the past years, a higher number of pacemakers, cardioverter defibrillators and cardiac resynchronization therapy devices implantation for the treatment of bradyarrhythmias and tachyarrhythmias as well as for the primary prevention of sudden death and cardiac insufficiency has been noted. Similarly, the number of leads extractions (LE) due to several causes such as pocket infection, endocarditis, catheter or electrode dysfunction or up-grade has also been registered. The development of new percutaneous lead extraction systems together with the major experience of the surgical team have lead to wider indications for surgical removal. However, leads extractions remain being a complex procedure related to several complications. Hence, the existence of specialized centers and well-trained operators in performing these techniques are essential to minimize the risk of unnecessary and unexpected events.

The aim of this first national registry of lead extraction is to provide data on our realworld practice, characterize the population of patients and personnel involved and analyze, with an interdisciplinary and interinstitutional focus, the results obtained.

METHODS

A prospective, multi center and observational national cohort study for patients undergoing transvenous lead extraction (TLE) was performed. Data were obtained for 325 patients with lead (pacemaker, cardioverter-defibrillator or cardiac resynchronization therapy Device (CRTD) indication for extraction. An online database platform active from January 2018 to December 2019 was designed. An Executive Committee composed of members from Argentinian College of Cardiovascular Surgeons (CACCV), Argentinian College of Cardiac Electrophysiology (SADEC), Argentinian College of Cardiology (SAC) and Argentinian Federation of Cardiology (FAC) provided the study design. Definitions published in the guidance documents by HRS (2009), EHRA (2012) and EHRA (2018) were used to define procedural approaches, techniques and outcomes[1-3].

Data referred to patients (age, gender), leads (types of devices, leads localization, average implant time, indications for removal, re-implant during the same procedure, complications, success rates) and extraction procedures (facilities, equipment and personnel) were compiled, verified and reviewed by the Committee.

RESULTS

Data were obtained for 325 patients (average age of 59 years, 71% male) and 621 targeted leads (atrial: 38%; n=233; ventricle 59%; n=367; coronary sinus;3%; n=21). The mean dwell time of the targeted leads averaged 105.9 months. Sixty-one percent of the targeted leads were pacemaker leads, 28% implantable cardioverter defibrillator leads and 11% cardiac resynchronization therapy Devices (CRTD). The mean number of leads extracted per device was 1.9.

The commonest indication for TLE was infection informed in 68% (222/325) of patients. Pathogens were identified in only 32% of cases. Bacterial culture data showed that staphylococcal infection was the most frequent (71%).

Leads removal for non-infective indications (32%) included lead dysfunction, abandoned lead dysfunction or other reasons (venous stenosis, access to magnetic resonance imaging, cardiac failure and arrhythmia). Demographic data including details on patients, leads and indications for removal are reported in *Table 1*.

Most procedures were performed by vascular or cardiovascular surgeons (81%) working in the majority of cases in standard operating theatre (79%). The remainder was performed by cardiologists or electrophysiologists, generally working in an electrophysiology laboratory (21%). Procedures performed by a cardiologist or electrophysiology with cardiac surgical stand-by were reported in 65% of cases. In the majority of TLE interventions, general anaesthesia (92%; n=299) was preferred.

Most lead extractions were performed using a percutaneous approach (98%). The majority began via identical route of lead implantation. Superior approach (subclavian/jugular/cephalic) was performed in 315 patients. Only in three cases, combined approaches (superior-femoral or inferior access) with additional snares or baskets were required. Simple traction without the use of specified tools (other than a standard stylet) was sufficient for removing 25% (158/621) of leads with a median dwell time of 33.3 months. For leads that could not be removed using simple traction (75%; n=463), a multistep approach was performed. Locking stylet (Liberator® Beacon® Tip Locking Stylet) was generally used in these steps. Additional equipment preferred by operators were quite variable from dilator sheaths, snares, baskets or mechanical rotational dilator sheaths (Evolution and Evolution RL, Cook Medical, USA) and most of them used in combination with others. A small minority of leads (7 patients=16 leads) were extracted by a simultaneous "hybrid approach" using a minithoracotomy/sternotomy (three patients with active endocarditis) including extracorporeal circulation and perfusionist. No laser extractions were performed.

Re-implant devices (leads + generator) during the same procedure was reported in 57% (185/325) of cases (permanent device: 65%=120/185).

Overall complications rate were 4%. The investigators reported only one major complication (outcome related to the procedure involving disability, life threatening or death) in a patient who suffered a temporary ventricular fibrillation and sudden cardiac arrest with immediate cardiopulmonary resuscitation and recovery at 24 hours. No procedural mortality occurred in our cohort study. Minor complications (outcome which did not limit patient`s function, life threatening or death) were observed in 12 patients (3.7%). Infection was the indication for lead extraction in more than half of these patients. Two patients experienced local haematoma related to lead extraction procedure due to extensive fibrosis. Vascular repair was informed in one patient with lead disruption during extraction and a femoral approach using a snare was required. Only one patient experienced an haemothorax which did not require intervention and an epicardial pacing was re-implanted at 24 hs.

Complete procedural success rates (removal of all targeted leads and material) were achieved for 96.3% (598/621) of leads. Procedural failure rates (inability to achieve a complete procedural) were 3.7%. Twenty-three leads were incompletely extracted and more than half of them were related to infection. The mean dwell time was 134 months. Extensive fibrosis, presence of calcification and venous stenosis or occlusion were commented by investigators. At hospital discharge, lead fragments did not result in any undesired outcomes. No permanent disabling complications or procedure-related death were reported.

COMMENTS

In Argentina, the first TLE was performed in 1993 at the Pirovano Hospital[4,5]. Despite long experience, our country has not had a global and institutional clinical investigation on real-world patients.

RENEDI is the first intersocietary, prospective and observational registry of leads extraction designed in Argentina. Our preliminary results agree with other similar worldwide experiences that TLE

TABLE 1. Demographic data

PATIENTS		
Patient number		325
Age		average 59 years
Gender		
	Male (n=231)	71%
	Female (n=94)	29%
LEADS		
Number of targeted leads		621
		61% (n=379) pacemaker leads 28% (n=174) implantable cardioverter defibrillator leads 11% (n=68) cardiac resynchronization therapy leads
Implant duration		average 105.9 months
Localization of leads		
	Atrium (n=233)	38%
	Ventricule (n=367)	59%
	Coronary sinus (n=21)	3%
Mean lead extracted per device		1,9
INDICATIONS FOR REMOVAL		
Infection		68% (222/325)
Local	71% (n=158)	
Local + systemic	25% (n=55)	
Systemic	4% (n=9)	
Lead dysfunction		26% (84/325)
Abandoned lead dysfunction		3% (11/325)
Other reasons		3% (8/325)

is a safe and effective procedure associated with a low incidence of complications and high success rates when it is performed in well-trained hands[6-14]. Comparisons of TLE complications and success rate in current literature is informed in *Table 2*.

This report describes for the first time the indications, role of the operators, procedures, different operating environments and safety and effectiveness of mechanical extraction including tools and techniques. More than 600 procedures were performed over a mean of two years which represent the reflection of our current practice. The results as detailed above provide an useful resource for research and improvements in care.

Few specialists are dedicated to this practice developing a high quality training and remarkable experience. As for all interventional procedure an appropiate learning curve is essential to become a competent operator, we emphasize the necessity for extended training and sufficient prior experience in performing these techniques in order to minimize the risk of complications and obtain successful outcomes.

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TABLE 2. Complications and success rate reported in literature

	MAJOR COMPLICATIONS	MINOR COMPLICATIONS	PROCEDURE RELATED-DEATH	COMPLETE PROCEDURAL SUCCESS	CLINICAL PROCEDURAL SUCCESS
RELEASE 2021[6]	2.6%	18%	0	96.3%	98.7%
PROMET 2020[7]	1%	3.1%	0.18%	96.5%	97%
ELECTRA 2017[8]	1.7%	5%	0.5%	95.7%	96.7%
LEXICON 2010[9]	4%	1.8%	1.86%	96.5%	97.7%
CENTELLA ET AL. 2007[10]	2.5%	2.1%	0.5%	96.8%	99.04%

Conflicts of interest

Authors report no disclosures.

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SCIENTIFIC LETTER

AORTIC ROOT DILATION SURGERY AFTER CORRECTIVE REPAIR OF TETRALOGY OF FALLOT

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ABSTRACT

Two patients who underwent corrective repair of tetralogy of Fallot later developed aortic root aneurysms that required surgery 19 and 26 years after their index surgeries. Both patients were found to have the aneurysm wall intimately attached to the internal table of the sternum. Therefore, resternotomy was performed using deep hypothermic circulatory arrest. This facilitated the use of a mediastinal approach without damage to the aneurysm. Surgery consisted of a classic Cabrol's procedure.

Keywords: *Tetralogy of Fallot; aneurysm; aorta; heart defects; congenital*

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INTRODUCTION

Aortic root dilation is patients treated with corrective repair of tetralogy of Fallot (TOF) has been discarded for quite some time now after isolated cases of patients eventually requiring aortic valve replacement.

Several theories have tried to explain the origin of such dilation: aortic hyperflow due to congenital malformations has been proposed as one of the predisposing factors. Also, the coexistence of a bicuspid aortic valve or trauma sustained during corrective repair[1].

Similarly, the anatomical association between such dilation and the sternum is nothing but surprising, a situation probably triggered by the persistence of open parietal pericardium. This adds risk to the whole procedure due to the possibility of massive bleeding following sternal reopening for aortic surgery[2,3].

We present the cases of 2 patients treated with corrective repair of TOF during their childhood who had to go undergo surgery again 19 and 27 years later due to the presence of two 11-cm and 8-cm aortic root aneurysms, respectively.

CASE #1

We present the case of a 22-year-old male patient treated with TOF at 3 years old who underwent the closure of the interventricular communication (IVC), pulmonary valvuloplasty, and bicuspid aortic valve repair. The patient remained asymptomatic during his childhood and adolescence until, 3 months prior to this consultation, he started showing signs of dry cough, and bronchospasm, both refractory to treatment. After performing the corresponding imaging modalities, the coronary computed tomography angiography confirmed the presence of an 11-cm aneurysm in both the aortic root and the ascending aorta compressing both primary bronchi *(figure 1 and figure 2)*. Due to the presence of laryngeal stridor the patient was referred for emergency treatment.

FIGURE 1. Coronary computed tomography angiography with 3D reconstruction showing a giant aneurysm of root and ascending aorta. The marks left by the metal stitches left by the closure of the sternum on the aneurysm wall become evident.

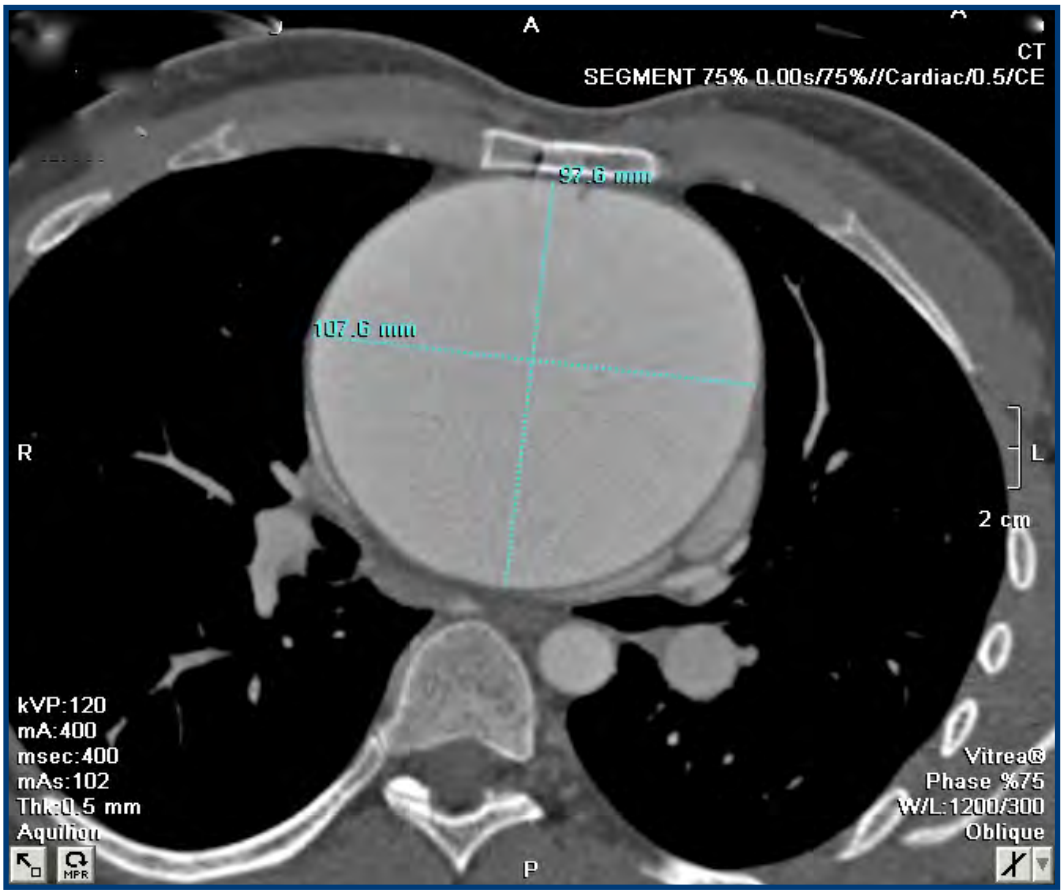

FIGURE 2. Axial projection showing the intimal correlation between the aneurysm wall and the internal table of the sternum.

Given the anatomical proximity of the aneurysm wall to the sternum, femoro-femoral cannulation, and extracorporeal circulation (EC) were performed followed by induced hypothermia down to 64.4°F. Hypothermic circulatory arrest, and median sternotomy followed with the depressurized aneurysm without any damage to its wall. The procedure was performed longitudinally up to 1 cm from the brachiocephalic trunk emergency where distal anastomosis was performed with a separate piece from a 28-mm Dacron graft. Eighteen minutes after circulatory arrest, EC was restarted with graft clamping and temperature was raised to 89.6°F. Myocardial protection was performed with antegrade cold blood cardioplegia through the coronary ostia, and retrograde cold blood cardioplegia through the coronary sinus intermittently. The next stage consisted of aortic valve resection, that was bicuspid, followed by Carbomedics 25/28 aortic valved conduit implantation. Given the significant distance between the coronary ostia and the conduit and the existing fibrosis due to previous surgery, a decision was made to perform bypass surgery between both ostia and the conduit using a 10 mm intervascular Dacron graft using the Cabrol technique to avoid excessive tension in both anastomoses. Finally, prostheto-prosthetic anastomosis was performed from the valved conduit towards the anastomosed prosthesis and the distal ascending aorta.

The histopathological finding of the aortic wall was cystic necrosis of the tunica media.

The patient progressed without complications and his respiratory symptoms disappeared immediately. The patient was discharged from the hospital 8 days after surgery and remained asymptomatic at the 12-year follow-up. Figure 3 shows the coronary computed tomography angiography performed 1 year after surgery.

CASE #2

This is the case of a 30-year-old male patient with a past medical history of corrective repair of TOF at 4 years of age. It included the closure of the IVC followed by pulmonary valvuloplasty.

The patient remained asymptomatic during his growth and development, which were both normal. A routine x-ray check-up revealed the presence of mediastinal widening. A transthoracic echocardiogram was performed in the first place, and it revealed the presence of a 6-cm aortic root and an 8-cm ascending aorta with mild aortic regurgitation. These findings were confirmed on the thoracic coronary computed tomography angiography performed *(figure 4)*.

FIGURE 3. Coronary computed tomography angiography with 3D reconstruction 1 year after surgery showing the aortic valved conduit with the prosthesis between both coronary ostia and the conduit.

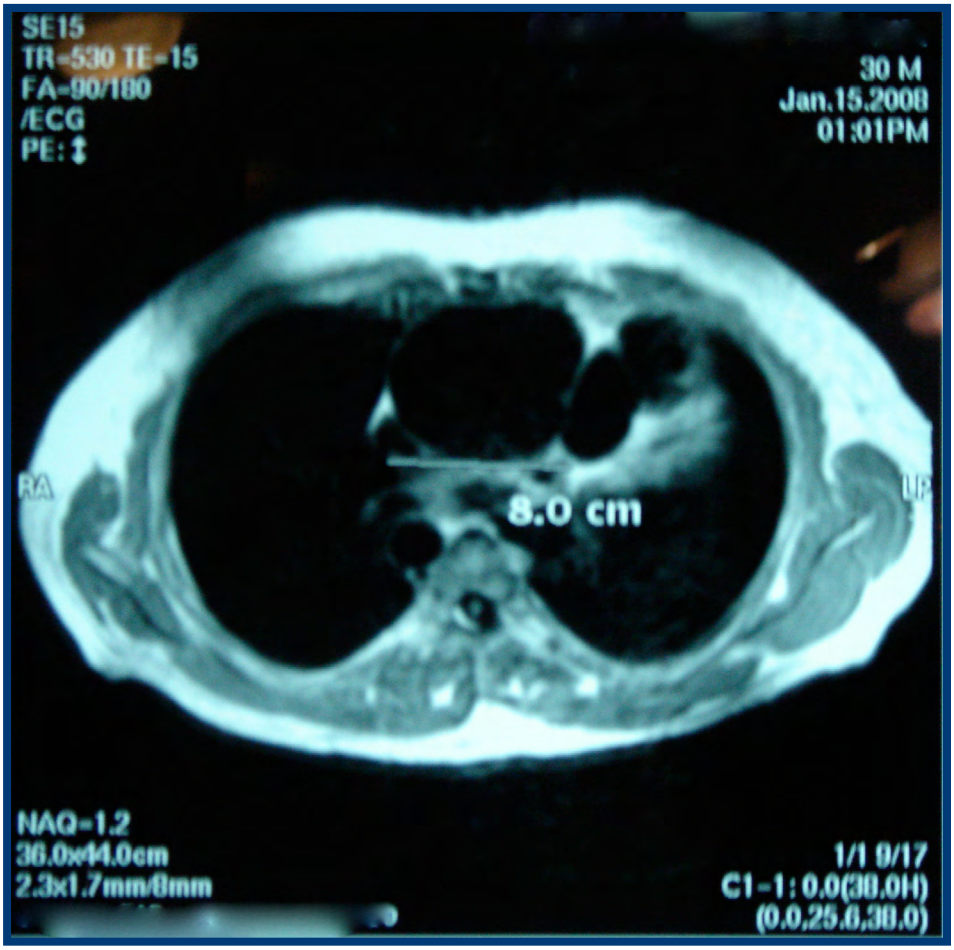

FIGURE 4. Axial projection showing the intimal correlation between the aneurysm wall and the internal table of the sternum.

With this diagnosis a decision was made to remove the aneurysm that, as in the former case, was also attached to the internal table of the sternum.

Femoro-femoral cannulation and EC were performed followed by induced hypothermia down to 64.4ºF. Hypothermic circulatory arrest was followed by median sternotomy with the depressurized aneurysm without damage to its wall. EC was restarted after a 3-minute pause. Afterwards, the distal ascending aorta was clamped immediately proximal to the brachiocephalic trunk where there was a 30 mm neck The aortic valve, root, and ascending aorta were replaced by a Carbomedics 27/30 aortic valved conduit with interposition of a 10-mm intervascular Dacron graft between both coronary ostia with latero-lateral anastomosis to the conduit using the Cabrol technique.

The immediate postoperative was satisfactory and the patient was discharged on day 9.

The histopathological finding was focal hyalinosis with discrete calcification of the valve and the aortic wall.

The patient remained asymptomatic at the 11-year follow-up. The coronary computed tomography angiography performed is shown on figure 5.

DISCUSSION

Very few studies have been published on the association between the appearance of aortic dilation and corrective repair of TOF.

Back in 2001, Niwa found that 32 patients out of a series of 218 patients treated during their childhood developed this condition later in life. This happened more frequently in male patients with pulmonary atresia and presence of a right-sided aortic arch[1].

Also, a high incidence rate of extracellular matrix disorders like cystic medial necrosis associated with Marfan syndrome and/or bicuspid aortic valve has been reported.

Other authors have published isolated cases with the same condition[4,5].

Tan y col. conducted a bibliographic search to try to understand the mechanisms involved in this phenomenon. They also studied their own series of 17

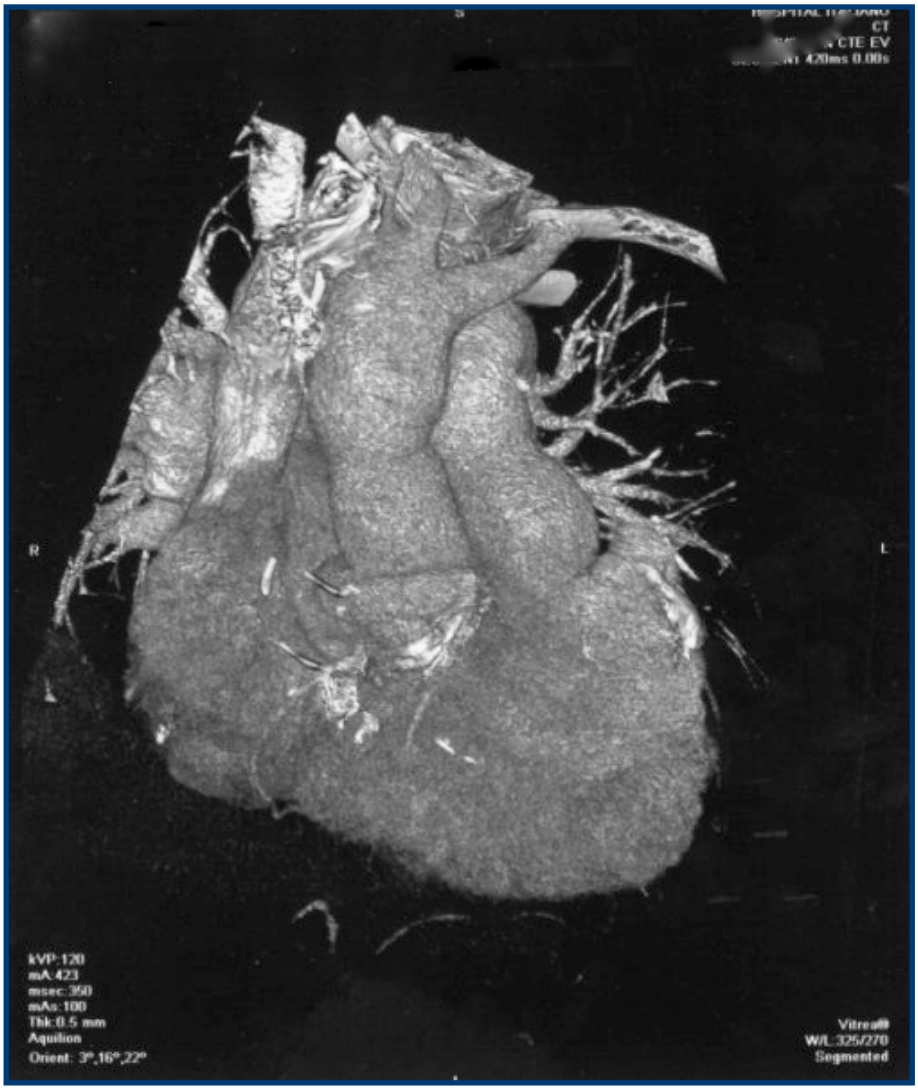

FIGURE 5. Coronary computed tomography angiography with 3D reconstruction 1 year after surgery showing the aortic valved conduit with the prosthesis between both coronary ostia and the conduit.

postmortem patients to eventually find a correlation between this complication and the index between the measurement of the left ventricular outflow tract and the sinotubular junction of the aorta[6].

On the other hand, the significant diameter reached by the aorta in its growth creates an anatomical correlation with the chest wall that turns open surgery into a true surgical challenge. Therefore, to this date, it is essential to use a postoperative coronary computed tomography angiography with preoperative contrast to plan the surgical strategy in general and proceed to open up the sternum in particular[7].

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SCIENTIFIC LETTER

THORACOSCOPIC REPAIR OF WOUND IN CARDIAC INFUNDIBULUM

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ABSTRACT

Cardiac trauma is an entity with high mortality, an accurate diagnosis in the emergency room allows us to choose the most suitable treatment for every patient. Patients with hemodynamic instability have an immediate surgical indication. However, patients with hemodynamic stability require additional studies to detect an underlying cardiac injury. When a pericardial window is indicated, the surgical approach could be either subxiphoid or through videothoracoscopy; if the outcome of the pericardial window is favorable, a surgical thoracotomy or sternotomy will be needed to repair the underlying cardiac injury. This is the case of a 65-year-old male patient with multiple precordial stab wounds with ultrasound signs of pericardial effusion treated with pericardial window through videothoracoscopy. A cardiac infundibulum wound was revealed that was successfully treated through surgery. As far as we knowledge, to this day, no cases in the medical literature available have been reported of a cardiac injury induced by a blunt object repaired through videothoracoscopy.

Keywords: *Thoracoscopy, Cardiac tamponade, heart injuries, fibrin tissue adhesive*

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INTRODUCTION

El traumatismo del corazón y los grandes vasos es una entidad con elevada mortalidad, en algunas series alcanza hastaCardiac and great vessel injury is an entity with a high mortality rate. In some series it is as high as 66%[1], which is why it is very challenging for the medical team. Patients with injuries to the percordial region who are hemodynamically stable not always show the typical clinical findings of cardiac tamponade, which is why additional studies are required.

The introduction of the ultrasound into the emergency setting has been crucial because it allows the diagnosis of hidden cardiac injuries, the conservative management of some injuries, and the correct classification of stable patients who are eligible for surgery[2]. In the presence of pericardial effusion, a pericardial window is required. This procedure can be performed through the traditional subxiphoid approach or through videothoracoscopy if the heart team is experienced enough[3]. If the pericardial window is negative, the presence of cardiac injuries is discarded. If positive, open surgery is required to correct the underlying cardiac injuries.

Similarly, patients with an injury located in the precordial region who are hemodynamically unstable have an immediate surgical indication. In this context, conventional approaches include thoracotomy or sternotomy that facilitate access to both the heart and the major vessels to perform the necessary corrections. As far as we know, no cases have been reported in the medical literature available on how to correct trauma-induced cardiac injuries through vodeothoracoscopy. Ours is the very first case ever reported that we know of.

CASE REPORT

This is the case of a 65-year-old male admitted to the ER after sustaining 3 stab wounds in the precordial region: left infraclavicular and left and right parasternal regions. The patient's vital signs were BP, 116/84; HR, 90; RR, 22; and O2Sat, 90%.

An early thoracic x-ray was performed that confirmed the presence of bilateral pneumothorax. The follow-up ultrasound performed at the ER revealed the presence of pericardial effusion.

It was decided to attempt a bilateral thoracostomy that produced air flow and a left hemothorax of 200 cc. According to the center protocols and due to the finding of pericardial effusion and the presence of hemodynamic stability, the patient was considered eligible to perform a pericardial window. The Cardiovascular Surgery unit and the Trauma unit both agreed to perform a videothoracoscopy in the presence of bilateral thoractostomy.

Surgery started and the femoral vessels were exposed in the right inguinal canal. Tobacco-pouch suture sac was performed for an eventual fast cannulation. The catheters were ready to go as well as the extracorporeal circulation system (with two active rolls) to start the cardiopulmonary bypass if necessary. Also, the equipment necessary to perform a sternotomy was ready too.

During the surgical act, the patient was monitored on a transesophageal echocardiography that confirmed the presence of a pericardial effusion only in the posterior and lateral space in a position adjacent to the left ventricle with a 1.5 cm separation from the pericardial leaflets.

A left videothoracoscopy was performed with one 10 mm-port (that was placed in the 5th intercostal space at anterior axillary line level) and two 5 mm-ports (that were placed in the intercostal space at parasternal line level, and in the 2nd intercostal space at midclavicular line level). The early examination of the pleural cavity confirmed the presence of an 800 mL residual hemothorax, a healthy subclavian artery, and a tense pericardial sac. A pericardial window was performed on the lateral wall. The hemopericardium was initially drained under pressure *(Figure 1)*. A wider pericardiectomy was performed using an ultrasonic dissector that drained a 400 mL hemopericardium. A diagnostic pericardioscopy was performed to assess the intrapericardial major vessels and heart chambers. It revealed the presence of a 5 mm laceration at the infundibulum of the pulmonary artery with sheet-like bleeding *(Figure 2)*.

Given the patient's hemodynamic stability, sheet-like bleeding, and availability of an extracorporeal circulation system, it was decided to perform mechanical compression for 5 minutes *(Figure 3)* to stop the bleeding. Additionally, the hemostasis was reinforced with fibrin sealants.

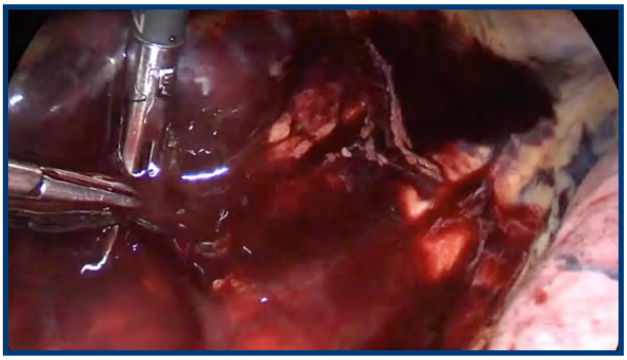

FIGURE 1. Hemopericardium removal.

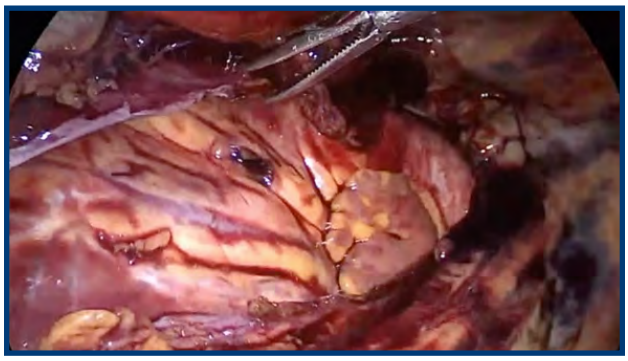

FIGURE 2. Wound to the subpulmonary infundibulum.

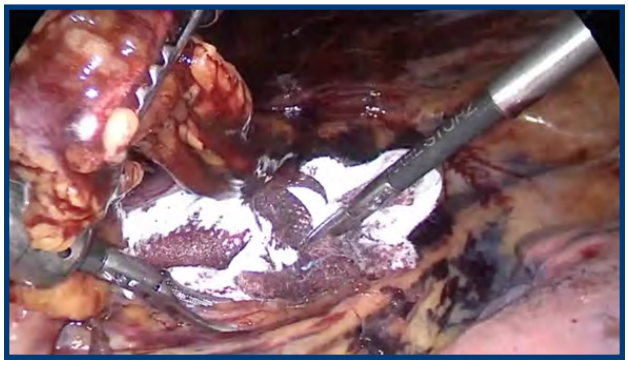

FIGURE 3. Mechanical compression with common gauzes.

The intraoperative echocardiography performed revealed the proper drainage of the hemopericardium and no other injuries in neighboring cardiac structures were found.

The patient was extubated in the operating room and transferred to the intensive care unit. He remained hemodynamically stable with low cardiac output through the pleural drainage catheters.

A transthoracic echocardiogram was performed at the 24-hour follow-up that revealed a proper ventricular function and no residual pericardial collections. The thoracic drains were removed 48 hours later. The patient was discharged from the hospital 72 hours later without any complications.

DISCUSSION

The use of videothoracoscopy has become very popular for the management of acute traumas because it allows us to identify thoracic injuries and correct small pulmonary, diaphragmatic, and esophageal injuries[3]. Its benefits have also been confirmed in a variety of complications after thoracic trauma such as to prevent coagulated hemothorax or empyema[4]. Similarly, it can be used to perform pericardial windows and eventually diagnose cardiac injuries. However, until just a few years ago, suspected cardiac injuries were considered a contraindication to perform videothoracoscopies[5].

Goodman y col.[6] published their results with the use of videothoracoscopy in 23 patients with acute thoracic trauma. There was no need for conversion to open surgery in any of the cases, not even after performing pulmonary wedge resection surgery due to pulmonary lacerations in 6 patients. We should mention, though, that none of the patients had cardiac injuries.

In our case, the patient had multiple injuries in the precordial region and given his hemodynamic status and pericardial effusion confirmed on the ultrasound with an indication to perform a pericardial window, the possibility to perform a videothoracoscopy was discussed, which allowed the detection of the site of the bleeding. Also, the proper hemostasis was achieved through mechanical compression and fibrin sealants.

Fibrin sealants are human thrombin and fibrinogen compounds that simulate the formation of a clot in its final stage regardless of the patient's coagulation system, which allows the sealing and reinforcement of the hemostasis; it is often used in different types of surgery including cardiovascular surgery. Its benefit in selective surgery has been confirmed in a meta-analysis by reducing the risk of hematomas (OR, 0.62, 95%CI 0.44-0.86; P = .01) without any significant adverse events[7]. To this date, their use for the management of acute traumas has not been assessed yet. However, in our case, fibrin sealants were used to complement the process of hemostasis with favorable results.

Finally, we should stress out the importance of interdisciplinary management between the trauma and the cardiovascular surgery units, which facilitated this approach. One of the potential advantages of videothoracoscopy is that it can detect the exact site of the bleeding. Also, if the injury is not exsanguinating, it has the resources and capabilities to solve the bleeding using the same access site, thus avoiding the morbidity and mortality associated with thoracotomy or sternotomy.

Similarly, these patients should be treated in centers with cardiothoracic surgical instruments available in case their cardiac injuries may need repair with extracorporeal circulation systems. The clinical case presented here showed the use of videothoracoscopy to correct cardiac injuries, a strategy that had not been assessed up until now.

Conflicts of interest
Authors report no disclosures.

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SCIENTIFIC LETTER

HYBRID TREATMENT OF JUXTARENAL AORTIC ANEURYSM
THE VASCULAR SURGEON AND HIS KNOWLEDGE OF THERAPEUTIC OPTIONS

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ABSTRACT

The management of juxtarenal aneurysms is challenging. In general, the indication for endovascular repair often becomes complicated due to the anatomy and unfavorable characteristics of its proximal neck or because it compromises visceral arteries. In these cases, open surgery is associated with significant morbidity and mortality especially in the immediate postoperative period. In selected patients, visceral aortic debranching can improve the proximal aneurysm neck and facilitate endovascular exclusion. We present a clinical case of aortic juxtarenal aneurysm solved using a hybrid technique, hepatorenal bypass through conventional surgery, and endovascular repair in two surgical stages.

Keywords: *Hybrid surgery, hybrid treatment, juxtarenal aneurysm, hepatorenal bypass*

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CLINICAL CASE

We present the case of a 79-year-old male patient. Former smoker with high blood pressure, chronic venous failure previously treated with bilateral saphenectomy.

Also, he had chronic kidney disease, and creatinine levels of 1.4-1.9. The patient also had chronic obstructive arteriopathy, intermittent claudication of his left lower limb, and remained on medical therapy.

While on medication, a juxtarenal aortic aneurism with a maximum diameter of 68 mm was found at the 2-year outpatient follow-up.

The coronary computed tomography angiography performed revealed the presence of a 68 mm juxtarenal aneurysm in its maximum diameter. Other findings were single left kidney, stenosis due to calcium deposits originated at renal artery level, a 9 mm infrarenal aortic neck due to a circumferential annular calcification. The length of the superior mesenteric artery until the left renal artery was 18 mm. Also, presence of left iliac artery occlusion.

After considering the options available, a hybrid approach was decided: hepatorenal bypass via laparotomy (Dacron® given the lack of venous capital). The renal arterial stenosis is solved with a modified neck as the anchor site at the origin of the SMA. The aortic stenosis was treated with CP stent implantation for a correct delivery and positioning of the device. A PTFE graft (expanded polytetrafluoroethylene) was implanted through femorofemoral crossing bypass surgery in a two-stage surgical approach.

During the first-stage surgical approach, a hepatorenal bypass via transperitoneal access was performed (in the supraumbilical region) followed by common hepatic artery dissection through the pars flaccida of the lesser omentum. The 10 mm Dacron graft was tunneled through the retro-duodenal portion until the renal access. No complications were reported.

The patient remained hemodynamically stable at the intensive care unit for 48 hours without ventilatory support with serum creatinine levels of 1.2 mg/dL, and preserved diuresis.

Given the patient's respiratory status while in his home, he was readmitted to undergo the second-stage surgical approach. A 28 mm x 14 mm x 102 mm Endurant® AUI stent graft system was implanted via right side before the angioplasty of the CIA lesion at superior mesenteric artery ostium level followed by the ipsilateral implantation of a 16 mm x 13 mm x 156 mm Endurant® stent graft close to the iliac bifurcation. Afterwards, a 28 mm Numed® CP stent mounted on a BIB balloon was advanced.

The patient improved without complications and was discharged from the hospital after 72 hours.

In our case, open surgery was ruled out due to the magnitude of the surgery and presence of a fenestrated device. Although the aortic diameter at proximal anchorage level was between 22 mm and 23 mm, the presence of a 9 mm infrarenal stenotic annular calcification and right iliac artery occlusion complicated the technique even more. In addition, the long-term patency of the renal branch was dubious. Similarly, the chimney graft technique was not proposed given the aforementioned anatomy, the origin of the renal artery perpendicular to the aorta, its severe calcific aortic stenosis, and high risk of disruption between the endovascular prosthesis and the renal stent, which could jeopardize the long-term patency of the chimney.

DISCUSSION

Conventional surgery of juxtarenal aneurysms often requires suprarenal or supraceliac aortic clamping, which is associated with a higher mortality and morbidity and due to visceral ischemia. The rate of renal failure increases significantly after conventional surgery both in juxtarenal and type

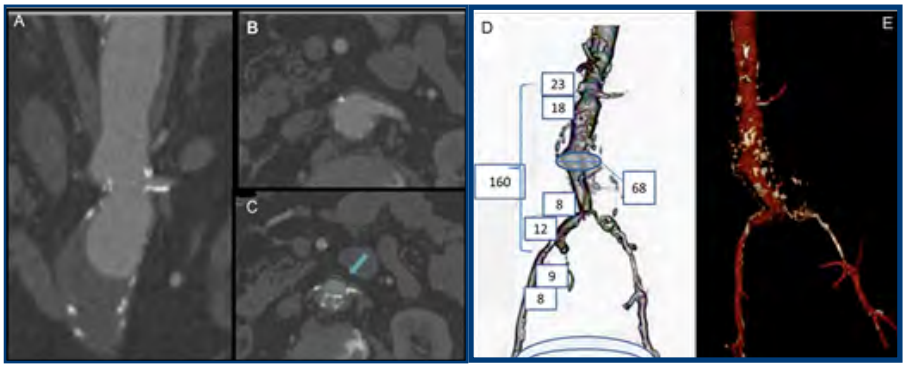

FIGURE 1-A. Preoperative coronary computed tomography angiography. Juxtarenal aneurysm (sagittal projection) without infrarenal neck. **1-B.** Left renal artery. **1-C.** Presence of a 9 mm infrarenal stenotic annular calcification (arrow). **1-D.** Surgical plan. Measures in mm. Presence of a 68 mm maximum aortic diameter. Segment to be covered of 160 mm. 23 mm aortic diameter at superior mesenteric artery (SMA) level. Proximal anchorage neck at inferior mesenteric artery (IMA) level of 18 mm in length. Presence of an 8 mm stenosis at right common iliac artery (CIA) level. Femorofemoral crossing bypass surgery for PTFE graft implantation. **1-E.** 3D reconstruction of the case.

IV thoracoabdominal aneurysms. Also, significant hematic losses have been reported as well as longer stays at the intensive care unit[1].

Surgical planning and taking into consideration the exclusion criteria of the simple techniques to perform endovascular repairs paved the way for complex alternative techniques.

Given the anatomical limitations of the proximal neck, endovascular repair is only possible if the proximal release and implantation site changes.

It can be achieved through endovascular approach by placing fenestrated devices, expanding the proximal seal zone, and keeping visceral arteries patent through the fenestra created with the stents. Modules can be accessed via bilateral femoral and iliac access. Also, there needs to be enough arterial lumen to be able to insert a 20-Fr to 22-Fr introducer sheath, lack of excessive angulations with calcium, and sealing zone external diameters > 19 mm and < 32 mm[2,8].

The chimney graft technique, used in visceral or supra-aortic branches, was introduced to handle conventional endoprostheses and treat lesions with difficult proximal or distal anchorage sites[8]. However, it is ill-advised in the presence of calcific stenosis of some aortic segment like at the origin of target vessels. Complications like apposition defects of the endoprosthesis on the aortic wall (fabric wrinkling and proximal stents) have been reported. Also, dissections due to false routes or residual stenoses due to incorrect visceral stent release[3].

CP stent implantation —a metal balloon-expandable stent with high radial strength— is a bail-out technique to treat aortic stenosis and hostile necks. Its release prevents stent graft infolding and allows a correct coaptation between the aortic wall and the device. It is used to treat aortic stenoses and for the correct delivery of the stent in cases of aortic stenosis[6].

Regardless of technology and costs involved, "hybrid surgery" is the solution in complex situations and extends the applicability of the existing endovascular technology[4], an option for patient who, due to associated morbidities, are at high risk of undergoing conventional surgery[7].

It avoids thoraco-phreno-laparotomy, monopulmonary ventilation, prolonged visceral ischemia, and aortic clamping. It reduces the time on intensive therapy and the short and mid-term morbidity and mortality.

Direct visceral surgery requires training and is associated with a short and controlled ischemia time. These procedures have proven satisfactory for the management of occlusive disease, and for the revascularization of renal mesenteric and celiac arteries[6].

Treatment can be performed in 1 or 2 surgical acts, being the patency of visceral reconstruction and endovascular exclusion both satisfactory. The drawback of the two-staged surgical approach is the risk of ruptured aneurysm in between procedures. However, the advantage of the one-staged procedure is the immediate control of the integrity and patency of the system[1,4,5].

We should mention that the hybrid approach can only be performed by trained vascular surgeons experienced in the use of all possible therapeutic options. Similarly, the indications of the manufacturer regarding endovascular surgery should be observed for the safety of the patients. Nonetheless, the training of young surgeons in conventional surgeries of the aorta and its branches is a matter of concern; alternative training methods, whether simulated methods or cadaver-based surgeries should be provided; still, these methods are not the topic of discussion of this article.

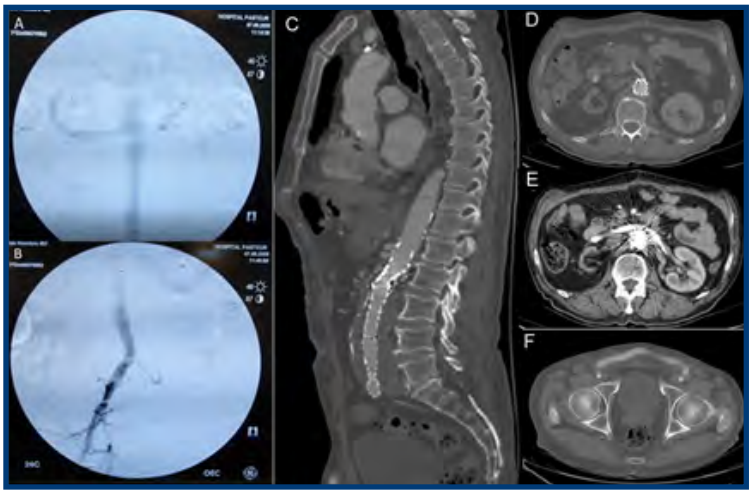

FIGURE 2-A. Patent hepatorenal bypass. **2-B.** Lack of endoleaks and patency of devices implanted. **2-C.** 7-day follow-up coronary computed tomography angiography (sagittal projection): correct device apposition, aneurysmatic sac thrombosis, patency of modules, lack of endoleaks. **2-D.** Proximal neck anchoring at the beginning of the patent superior mesenteric artery. **2-E.** Patent hepatorenal bypass, metal artifact due to endovascular devices. **2-F.** PTFE graft implanted through femorofemoral crossing bypass surgery.

CONCLUSIONS

Hybrid surgery offers the possibility of treating this type of aneurysms successfully without aortic clamping, extracorporeal circulation or thoracotomy. At the same time, the duration of visceral ischemia is reduced.

Although no study has confirmed yet that that it can reduce postoperative morbidity and mortality significantly compared to traditional open surgery, these theoretical advantages make it a non-negligible option in frail patients.

Results depend on the meticulous previous surgical planning, knowledge of access routes to visceral arteries, the transposition techniques available, and the correct outcome of the endovascular stage.

Peripheral vascular surgery dominates all the options known to this date for the management of this entity bringing safety and good results to the patients.

Vascular surgery training programs should guarantee that these skills are kept and nurtured.

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CARLOS A. PRESA, MD (1960-2021)

Fly high, my friend, leave your luggage behind you, and rest in the quiet peace of the universe

We are truly saddened by the unexpected passing of our dearest colleague Dr. Carlos Presa last April 29, 2021. Over the last two years, his health started to fail on several occasions. However, he was a warrior who fought back and made a comeback to his true passions: teaching, pediatric cardiovascular surgery, and cardiology.

He started his training at the city of La Plata Medical School that he loved so much. He took his first steps in Physiology at Dr. Cingolani Chair where he started his love affair with cardiac anatomy and physiology, a passion he transmitted to residents and students alike. Also, he taught us that embryology was the foundation to be able to understand the dynamics and physiology of congenital heart diseases.

His noble intellectual ambition rested on his inextinguishable curiosity and love for accurate diagnoses, a legacy he had received from his mentors that he unselfishly transmitted often against the dominant mainstream scientific opinion. He was a thinker and knew how to build up a fair conversation despite his stubborn personality, but always with honesty and uncommon shrewdness. Always as the simple man he was.

He was an organized and methodical man who hated improvisations and ambiguous goals, and who loved his profession. He was the first resident in Pediatric Cardiovascular Surgery at the Hospital de Niños Sor María Ludovica together with Dr. Antelo, Dr. Mon, and Dr. Gutiérrez.

Back in 1988, he won a scholarship in Osaka, Japan.

In 1992, he held a fellowship in Loma Linda University, United Sates where he was trained on neonatal heart transplant.

Between 1992 and 1993, he decided that neonatal heart transplant would be his specialization and was admitted to the Favaloro Foundation where he was trained in the use of ventricular assist devices in the heart transplant and congenital heart disease setting under the direct supervision of Dr. Roberto Favaloro and his team.

He was a member of the Argentine College of Cardiovascular Surgeons in Buenos Aires where he became a source of inspiration organizing congresses and designing the exams of the pediatric cardiovascular surgeons of the futre.

However, he never lost contact with his origins, the city of La Plata or with Hospital de Niños Sor María Ludovica. In 2007 and under the management of Dr. Antelo Carlos he came back to this hospital joining its healthcare personnel.

He improved the professional relation among different units, was involved in training activities, and envisioned a residency in Pediatric Cardiovascular Surgery with excellent results.

We wish to express publicly our gratitude and admiration for his unrelentless service, generosity, and academic achievements.

Gracias por tus virtudes morales, en lo personal, amigo y compañero de ruta, un hasta siempre.

Thank you for your moral virtues. On the personal level, my friend, so long. Many of us, doctors, technicians, and nurses here at Hospital de Niños Sor María Ludovic will always remember you and carry you in our hearts. I hope these few words pay tribute to my friend and partner in crime. Rest in peace, Charly.

Mónica Loyarte, MD

Hospital de Niños Sor María Ludovica, La Plata, Buenos Aires.

RAÚL A. BORRACCI, MD (1958-2021)

A unique surgeon

There is no doubt that Raúl was a unique surgeon. Born in the city of Buenos Aires and raised in the neighborhood of Palermo, he felt so in tune with the city that it was almost impossible for him to leave. He did not travel physically, but most of his papers did actually travel across the world. Proud of his Italian citizenship, he studied the language of Dante Alighieri. But this was not enough for him, and he studied German in the Goethe Institute.

If we look at his career, we will find a number of characteristics that are not easy to find in our profession. He liked numbers and studied Math before starting Medicine. This was the basis of his teaching adventure at Universidad Austral where he held the Chair of Statistics becoming one of the university most distinguished professor until he died. His early departure and obsession for perfection stopped him from writing a treaty on this specialty. However, his colleagues will probably publish it posthumously though.

He was a distinguished student of Medicine and he graduated cum laude. He started practicing General Surgery at Hospital Español, and he eventually joined the Hospital de Clínicas where he completed his residency. The very first day of his residency, he claimed that cardiac surgery was his ultimate goal, and he completed his medical training at the Hermenegilda Pombo de Rodríguez Foundation Cardiology Institute of the National Academy of Medicine.

We enjoyed working together as surgeons for many years. He was always willing to help me whenever I'd need it, and many residents admired him and valued his unconditional support.

Following his thirst for knowledge, he graduated as a System Analyst. This added to his knowledge as a statistician and innate skills for research built the perfect set of skills for him to become the director of the Argentine Journal of Cardiology, and become a significant contributor to the Argentine Journal of Surgery and the Argentine Journal of Cardiovascular Surgery of the Argentine College of Cardiovascular Surgeons.

He used to call the restaurants close to the Medical School and Hospital de Clínicas his true office. As a matter of fact, he was always around writing or editing papers.

There were times that the Italian in him led to bitter confrontations. However, he was always a passionate collaborator with everyone both in the surgical field and in medical research. His position in academic discussions was solid, difficult to refute, and revealed his true personality. He always expressed deep thoughts under a cloak of political correctness.

His main hobby was to read, and his huge library was his pride and joy. His family probably missed his participation in worldly distractions because what he loved the most was to spend hours of his time reading his books.

He spent his spare time studying the art of combining sounds and music, especially European classic composers like Beethoven. Actually, this does not really paint a fair picture because the truth is that whenever he was not at the operating room or writing papers, he could be found listening to music. Holidays were a waste of time according to him and he rather spend his time alone surrounded by the magic of his books.

He transmitted his passion for music to his daughters who learned how to play several instruments as kids. He always said he took great pride in this. His wife Fernanda was his greatest support as she tolerated such a special personality focused in studying all the time.

He had a knack for communication and empathy with the people around him. He could make the most bitter comments to his relatives, but he knew how to make them in such a way that nobody would ever feel offended or hurt.

His personality was completely different from other surgeons I have known, and he became Head of Cardiovascular Surgery of Hospital Alemán after a long and fair public competition.

Over the last few years, he used to brag about the fact that he was immortal. He also said he had become a legend as if he was expecting an early departure. He was wrong about the former because he has gone before his time. However, all those who spent time with him truly believe he was right about the latter.

Miguel Rubio

SELECTED ARTICLES

We hereby present comments on a selection of articles recently published in internationally acclaimed medical journals. We believe these papers deserve special attention due to the quality and importance of the conclusions reached by the studies. Our objective is to keep an open look on new aspects of scientific research or review articles that may, in turn, update aspects of our own medical specialty.

Also, the Editorial Committee will consider suggestions on recent articles that the readers think deserve to be commented in this section (revista@caccv.org.ar).

UPDATE ON CHRONIC MESENTERIC ISCHEMIA

HUBER TS Y COL., CHRONIC MESENTERIC ISCHEMIA CLINICAL PRACTICE GUIDELINE FROM THE SOCIETY FOR VASCULAR SURGERY

Journal of Vascular Surgery (2020), https://doi.org/10.1016/j.jvs.2020.10.029

As head of the writing committee, Huber TS, and his staff from the Society for Vascular Surgery have just published their clinical practice guidelines for the management of chronic mesenteric ischemia.

The authors focus on 6 specific areas: diagnostic assessment, indications for treatment, treatment selection, perioperative assessment, revascularization methods (endovascular/open), and postoperative follow-ups.

Chronic mesenteric ischemia, often a cause of atherosclerosis at the origin of mesenteric arteries, often starts with postprandial pain, fear of eating, and weight loss. The diagnosis can be delayed due to the large spectrum of GI disorders that are associated with these symptoms. To exclude the possibility GI neoplasms, the authors report that patients with symptoms compatible with chronic mesenteric ischemia should be studied immediately including esophagogastroduodenoscopy, colonoscopy, computed tomography, and abdominal ultrasound. Diagnosis is confirmed by the significant occlusion (> 70%) of the celiac trunk and the superior mesenteric artery or some of these structures only with the corresponding clinical signs. The Doppler echocardiography of the mesenteric artery is the screening procedure recommended. The definitive images are acquired on the computed tomography. However, in the presence of unusual anatomical characteristics a catheter angiography should be performed.

The targets of treatment should be to alleviate the symptoms, avoid disease progression towards acute ischemia, and improve the patient's quality of life. The first-line treatment is the revascularization of the superior mesenteric treatment; both the celiac trunk and the inferior mesenteric artery are secondary targets because they can improve the symptoms when the superior mesenteric artery is not eligible for surgery or in cases of unacceptable treatment outcomes. Parenteral nutrition is not recommended due to the risk of clinical deterioration, intestinal infarction, and catheter-related complications. In asymptomatic patients with severe superior mesenteric occlusions, revascularization should be discussed between the patient and the heart team as a valid therapeutic option to reach agreed decisions. Endovascular revascularization with expandable balloon and intraluminal stent is advised as the first-line therapy. Open surgery is often spared for young and selected patients as well as for those who are not eligible to undergo endovascular procedures.

Long-term follow-up periods are recommended after revascularization as well as in asymptomatic patients with severe mesenteric occlusion. Revascularized patients should be monitored 1 month after the procedure, and then twice a year within the first 2 years followed by 1 annual check-up. As it happens with primary cases, in patients with recurring symptoms after revascularization, the endovascular treatment should be prioritized. Also, in cases of restenosis on the Doppler echocardiography, the diagnosis should be confirmed on a CT scan or through catheterization.

BLUNT TRAUMA OF THE FEMORAL ARTERY: CASE REVIEW IN A TRAUMA CENTER

RAYAMAJHI S Y COL., PENETRATING FEMORAL ARTERY INJURIES: AN URBAN TRAUMA CENTRE EXPERIENCE

European Journal of Trauma and Emergency Surgery, 2019 Oct;45(5):909-917 https://doi.org/10.1007/s00068-018-0951-6

This is a case review of blunt traumas of the femoral artery conducted in Hospital Groote Schuur, South Africa that updates an issue that has always been on the spotlight: the blunt trauma of the femoral artery. Rayamajhi et al. conducted a review of cases admitted to the trauma center of this hospital from January 2002 through December 2012. They collected demographic data, injury mechanisms, perioperative data, and information on the surgical techniques used.

The authors identified a total of 158 patients with femoral injuries, 91% were males and the mean age was 28 years. A total of 76% of the patients showed hard signs of vascular injuries, and 14 patients (22%) had motor deficits with suspected advanced muscle ischemia (Rutherford IIb). Soft vascular signs were non-pulsatile hematomas (n = 31) and a reduction of distal pulses (n = 49). The superficial femoral artery was the vessel most often damaged (87%) and the most common types of injury were tears (39%), and dissections (37%). Regarding the type of repair, the authors attempted primary repairs in 51% of the cases, used interposition vein grafts in 33% of the cases, and implanted prostheses in 10% of the cases. A control procedure with a temporary shunt was required in 12 cases. Also, in this group, secondary amputations were more common (n = 4). Associated venous injuries were confirmed in 78 patients (51%) that required repair in 12 cases. A total of 22% of the patients was admitted to the hospital with signs of compartment syndrome (n = 34). A total of 4 primary (2.5%) and 10 secondary amputations (6.5%) were reported. No deaths were reported. The risk factors for amputation that reached statistical significance were limbs with threatened feasibility at admission, the use of a temporary shunt, and the lack of distal pulses in the postoperative. While analyzing the cases that ended up in amputation, the authors described other potential risk factors although these did not reach statistical significance in this retrospective analysis. Also, they recommend speeding up in-hospital times until surgery, assessing compartment syndrome to avoid delayed fasciotomies, and the angiographic control of patients who do not recover distal pulses in the immediate postoperative period.

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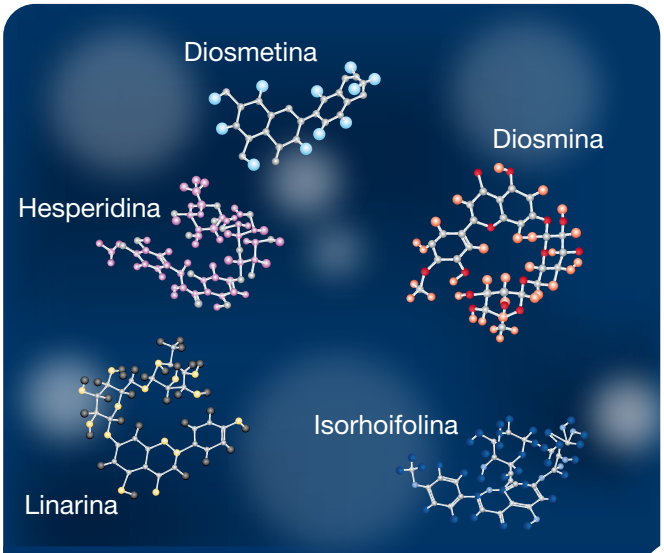

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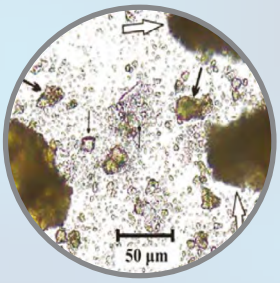

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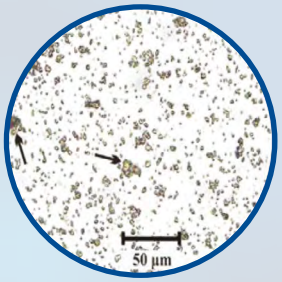

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*Estudio realizado por el Dpto. de Farmacología Clínica y Farmacia Clínica, Universidad Nacional de Farmacia, Jarkov, Ucrania comparando dos productos similares a Daflon en dicho país.

DAFLON 1000 mg comprimidos recubiertos y DAFLON 1000 mg Suspensión Oral
Composición Daflon 1000 mg comprimidos recubiertos: Cada comprimido recubierto de Daflon 1000 mg contiene: Fracción flavonoide purificada y micronizada: 1000 mg (Correspondiendo a: Diosmina 90 %: 900 mg y Flavonoides expresados en hesperidina 10%: 100 mg). **Excipientes**: Carboximetilalmidón sódico, celulosa microcristalina, gelatina, estearato de magnesio, talco. **Recubrimiento:** dióxido de titanio (E 171), glicerol, laurilsulfato de sodio, macrogol 6000, hipromelosa, óxido de hierro amarillo (E 172), óxido de hierro rojo (E 172), estearato de magnesio. **Composición DAFLON 1000 mg Suspensión Oral:** Cada sachet de 10 ml de Daflon 1000 mg contiene: Fracción flavonoide purificada micronizada: 1000 mg (Correspondiendo a: Diosmina 90%: 900 mg y Flavonoides expresados en Hesperidina 10%: 100 mg). **Excipientes:** Malitol en polvo, goma xantan, benzoato de sodio, aromatizante de naranja, ácido cítrico, agua purificada. **Acción terapéutica:** Vasculoprotector. **Indicaciones:** Tratamiento de las manifestaciones de la insuficiencia venosa crónica de los miembros inferiores, funcional y orgánica. Sensación de pesadez, dolor, calambres nocturnos. Tratamiento de los signos funcionales relacionados con la crisis hemorroidal. Contraindicaciones: Hipersensibilidad a las sustancias activas o a alguno de los excipientes. **Advertencias y precauciones de empleo:** La administración de este producto no imposibilita el tratamiento específico de otras enfermedades anales. Si los síntomas no disminuyen rápidamente, debe practicarse un examen proctológico y el tratamiento debe ser revisado. Embarazo: No hay datos o estos son limitados relativos al uso de fracción flavonoide purificada micronizada en mujeres embarazadas. Los estudios realizados en animales no han mostrado toxicidad para la reproducción. Como medida de precaución, es preferible evitar el uso de Daflon durante el embarazo. Lactancia: Se desconoce si el principio activo/los metabolitos se excretan en la leche materna. No se puede excluir el riesgo en recién nacidos/niños. Se debe decidir si es necesario interrumpir la lactancia o interrumpir el tratamiento tras consideran el beneficio de la lactancia para el niño y el beneficio del tratamiento para la madre. **Reacciones adversas:** Trastornos del sistema nervioso: Raras: mareos, dolor de cabeza, malestar. Trastornos gastrointestinales: Frecuentes: diarrea, dispepsia, náuseas, vómitos. Poco frecuentes: colitis. Frecuencia no conocida: dolor abdominal. Trastornos de la piel y del tejido subcutáneos: Raras: erupción cutánea, prurito, urticaria. Frecuencia no conocida: edema aislado de la cara, labios y párpados. Excepcionalmente, edema de Quincke. P**osología y forma de administración:** Posología usual: un comprimido recubierto/ sachet por día preferiblemente por la mañana. Crisis hemorroidal: 3 comprimidos recubiertos/ sachets al día durante los primeros cuatro días y después 2 comprimidos recubiertos/sachets al día durante tres días. La ranura sirve únicamente para fraccionar y facilitar la deglución pero no para dividir en dosis iguales. MAMS Cert Nº 40.987. Daflon 1000 comprimidos: Elaborado en Les Laboratoires Servier Industrie, Gidy, Francia. Daflon 100 mg suspensión oral: Elaborado en 1-3 allée de la Neste - COLOMIERS Francia. Importado por: SERVIER ARGENTINA S.A. Av. Castañares 3222 (C1406IHS) C.A.B.A. - Tel.: 0800-777-SERVIER (7378437) Directora Técnica: Nayla D. Sabbatella - Farmacéutica. Versión: Enero/2020

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