

Comunicazioni orali

CORONARY: ACUTE CORONARY SYNDROME, GENERAL – 1

C1

PHYSIOLOGY-GUIDED COMPLETE REVASCUARIZATION IN OLDER PATIENTS WITH MYOCARDIAL INFARCTION AND COMPLEX NON-CULPRIT LESION: A FIRE TRIAL SUBANALYSIS

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Introduction

The Functional Assessment in Elderly MI Patients With Multivessel Disease (FIRE) randomized clinical trial showed that physiology-guided complete revascularization was superior as compared to culprit-only strategy in older (≥ 75 years) with multivessel disease patients admitted to hospital for myocardial infarction (MI). Older MI patients tend to have more complex coronary artery disease (CAD) as compared to younger ones. Accordingly, it would be interesting to understand if the benefit of physiology-guided complete revascularization was consistent across simple and complex CAD. The aim of the present analysis is to investigate if the benefit of physiology-guided complete revascularization vs a culprit only strategy was consistent in patients with complex non-culprit lesion (NCL).

Methods

This was a sub-analysis of the Functional Assessment in Elderly MI Patients With Multivessel Disease (FIRE) randomized clinical trial data. FIRE was an investigator-initiated, open-label, multicenter trial. Patients 75 years or older with MI and multivessel disease were enrolled at 34 European centers from July 2019 through October 2021. Patients were randomized to receive either physiology-guided complete or culprit-only revascularization. For the scope of the present analysis, patients were divided into patients having at least one NCL meeting CHIP criteria vs others. CHIP criteria of interest were: angiographic heavy calcification, true bifurcation lesions involving side-branches > 2.5 mm, in-stent restenosis, long-lesions (estimated stent length > 28 mm), being left main disease and chronic total occlusion exclusion criteria. The primary endpoint was the 3-year occurrence of all-cause mortality, stroke, reinfarction or ischemia-driven revascularization. Secondary endpoints were the singular components of the primary endpoint.

Results

Among 1445 patients, 641 (44%) patients had at least one NCL meeting CHIP criteria. At univariate analysis patients with complex NCL were at higher risk for the primary endpoint (hazard ratio [HR], 1.29; 95% CI, 1.05-1.58; $p = 0.013$), cardiovascular death or MI (HR, 1.41; 95% CI, 1.07-1.85; $p = 0.013$), MI or ischemia-driven coronary revascularization at 3 years [(HR, 2.37; 95% CI, 1.47-3.82; $p < 0.001$), (HR, 2.26; 95% CI, 1.45-3.51; $p < 0.001$) respectively]. After adjustment for potential confounding factors, patients with at least one complex NCL remained at higher risk of MI and ischemia-driven coronary revascularization at 3 years. No signal of interaction was noted between revascularization strategy and presence of at least one complex NCL for the primary endpoint. On the contrary, we observed significant interaction between randomization arm and complex NCL in terms of secondary endpoint MI and ischemia-driven revascularization. Physiology-guided complete revascularization as compared with culprit-only strategy reduced the risk of MI at 3 years significantly only in patient with complex NCL (p for interaction 0.021). Physiology-guided complete revascularization as compared with culprit-only strategy reduced the risk of ischemia-driven coronary revascularization at 3 years significantly in patient with complex NCL (p for interaction 0.0002).

Conclusions

Complex coronary anatomy status is frequent among older patients with MI, significantly increasing the likelihood of adverse events. Physiology-guided complete revascularization emerges as an effective strategy, in comparison with culprit-only revascularization, for mitigating adverse events in patients having NCL meeting CHIP criteria, in particular reducing MI and ischemia-driven coronary revascularization.

C2

GRACE SCORE FOR RISK STRATIFICATION AND COMPLETENESS OF REVASCUARIZATION IN OLDER PATIENTS WITH MYOCARDIAL INFARCTION

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Introduction

The GRACE score is a well-established tool for predicting mortality outcomes in patients with myocardial infarction (MI). However, its prognostic role and interaction with revascularization strategies in older patients with MI remains unclear. This study aimed to assess whether the GRACE score was predictive of adverse events in the FIRE trial cohort and whether the benefits of complete revascularization were consistent across the spectrum of the GRACE score.

Methods

The FIRE trial randomized 1445 patients aged 75 years or older with MI and multivessel coronary artery disease to receive either culprit-only or complete revascularization. In this sub-analysis, patients were stratified according to GRACE score tertiles: the first tertile (GRACE 92.6–128.0), the second tertile (GRACE 128.1–146.5), and the third tertile (GRACE 146.6–236.0). The primary endpoint was all-cause mortality at one-year. Other key endpoints included cardiovascular (CV) death and a composite of CV death or MI at one-year.

Results

According to GRACE score tertiles, 487 patients were in the first tertile (33.7%), 477 in the second tertile (33.0%), and 481 in the third tertile (33.3%). Patients in the third tertile were more compromised in terms of cardiovascular risk factors and comorbidities. At one-year, all-cause mortality was significantly higher in the third tertile ($p < 0.0001$), as well as CV death ($p < 0.0001$) and the composite of CV death or MI ($p < 0.0001$). However, the effect of physiology-guided revascularization did not differ across GRACE score tertiles (p for interaction > 0.05 for all the outcomes of interest). Survival analysis confirmed that the GRACE score was significantly associated with increased all-cause mortality (HR 1.027, 95% CI 1.021–1.033, $p < 0.001$), CV death (HR 1.031, 95% CI 1.023–1.039, $p < 0.001$), and the composite of CV death or MI (HR 1.020, 95% CI 1.013–1.026, $p < 0.001$). Again, no interaction was found between revascularization strategy and GRACE score (all p for interaction > 0.05). The best discriminative value of the GRACE score for all-cause mortality at one year was 137.

Conclusions

The GRACE score was confirmed to be predictive of adverse outcomes even in older MI patients. The benefits of physiology-guided complete revascularization were maintained across the entire spectrum of GRACE score. Older patients with MI and multivessel disease should receive complete physiology-guided revascularization, regardless of the severity of their GRACE score.

C3

EARLY SST2 AND ANGIOGRAPHY-DERIVED MICROCIRCULATORY RESISTANCE FOR PREDICTING CLINICAL OUTCOMES IN STEMI PATIENTS TREATED WITH PPCI

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Introduction

Despite a marked improvement in clinical outcomes in the era of timely primary percutaneous coronary intervention (pPCI), patients with ST-segment elevation myocardial infarction (STEMI) remain at high risk of subsequent cardiovascular events. Therefore, early recognition of high-risk patients has become a key clinical priority. Soluble suppression of tumorigenicity 2 (sST2), a biomarker of myocardial stress and inflammation, and angiographic microcirculatory resistance (AMR), an angiography-derived index of microvascular function, have emerged as potential predictors of clinical outcomes and ventricular remodeling. However, their combined prognostic value remains unexplored.

Methods

This single-center retrospective study included consecutive STEMI patients undergoing successful pPCI. sST2 levels were measured within 2 hours post-procedure, and AMR was derived from post-pPCI angiogram. Patients were dichotomized based on the median values of sST2 and AMR. The primary endpoint was the occurrence of major adverse cardiovascular events (MACEs) during follow-up, including all-cause death, recurrent myocardial infarction, and hospitalization for heart failure. The secondary endpoint was long-term left ventricular (LV) remodeling, defined as a left ventricular ejection fraction (LVEF) <50% measured ≥ 3 months post-event.

Results

A total of 114 patients were included. During a median follow-up of 884 (IQR 488-1081) days, 34 patients (32%) experienced a MACE. MACE-free survival was significantly lower in patients with sST2 >32.6 ng/mL vs. sST2 ≤ 32.6 ng/mL (log-rank $p = 0.003$; HR 2.77, 95% CI: 1.29-5.95), while no significant difference was observed for AMR >2.3 mmHg/s/cm vs. ≤ 2.3 mmHg/s/cm. Among 76 patients with echocardiographic follow-up, 21 (30%) developed LVEF <50%. AMR >2.3 mmHg/s/cm was independently associated with an increased risk of developing LVEF <50% (OR 3.42, 95% CI: 1.15-10.2), whereas sST2 showed no significant association with this endpoint.

Conclusions

Early post-pPCI sST2 is a predictor of long-term clinical events in STEMI patients, whereas AMR is associated with late ventricular dysfunction.

C4**SPONTANEOUS CORONARY ARTERY DISSECTION: CARDIOVASCULAR EVENTS INCIDENCE AND QUALITY OF LIFE EVALUATION IN A SINGLE CENTRE 10 YEARS' EXPERIENCE**

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Introduction

Despite recent advancements in the recognition and diagnosis of spontaneous coronary artery dissection (SCAD), pathophysiologic mechanisms, predisposing and precipitating factors, risk of recurrences remain poorly understood and evidence-based treatment strategies are still unavailable. The goals of the study are to assess the characteristics of SCAD patients highlighting the predisposing and precipitating factors, to analyse the therapeutic management in the acute phase, to evaluate the incidence of SCAD recurrence and cardiovascular events during the follow-up and to assess the factors influencing the quality of life of patients after a SCAD event. We also aim to introduce our experience about the use of intra-aortic balloon pump (IABP) in acute SCAD setting in order to support the percutaneous coronary intervention (PCI) or its use as part of a conservative management.

Methods

We performed a retrospective, single-centre, observational cohort study of patients with non-atherosclerotic, non-iatrogenic SCAD presenting to our Cath Lab in Santa Maria Annunziata Hospital (Bagno a Ripoli, Florence, Italy) with acute coronary syndrome (ACS). We enrolled 84 patients who presented with acute coronary syndrome and SCAD documented by coronary angiography or intracoronary imaging, from January 2015 to December 2024. We excluded patients with iatrogenic dissection and coronary atherosclerotic disease.

Results

Mean age was 56.2 ± 11.6 years and 79 (94%) patients were women. At baseline, 40% had hypertension, 38.8% dyslipidaemia, 29.4% was current smoker, only 2.4% had diabetes mellitus. The most frequent hospital presentation was non ST-segment elevation myocardial infarction (NSTEMI) (70.6%), followed by ST-segment elevation myocardial infarction (STEMI) (28.2%) and ventricular tachycardia or ventricular fibrillation (3.5%). Majority of SCAD involved a single coronary artery territory (89.3%), and the most common coronary artery dissected was the left anterior descending artery and its branches (40.5%). Majority of patients (82%) were treated conservatively as initial strategy; fifteen patients (18%) underwent myocardial revascularization with percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). In nine cases (10, 6%) IABP was implanted to perform a protect PCI (4.8%), as bridge to emergency CABG in course of hemodynamic instability (2.4%) or as part of conservative management (3.6%) avoiding coronary instrumentation and PCI with positive long-term outcome. During the follow up period (median follow-up 2.6 years with interquartile range 1.1-5.4 years) the primary endpoint, defined as major adverse cardiovascular events (MACE) incidence and new onset or recurrence of atrial fibrillation (AF), occurred in 18 patients (21.4%). Hypertension emerged as independent predictor of primary outcome ($p < 0.001$, HR 7.965) and low-dosage aspirin at discharge appeared to be protective reducing risk of primary outcome ($p < 0.001$, HR 0.0034). The secondary outcome was to evaluate quality of life (QoL) of patients who suffered SCAD using EQ-5D-5L questionnaire and Seattle Angina Questionnaire-7. No significative differences emerged between patients treated by PCI and patients treated conservatively.

Conclusions

In SCAD patients, hypertension increases risk of primary outcome while low-dosage aspirin reduces risk during follow-up period. In terms of quality of life and post-SCAD chest pain, no significative differences emerged between patients treated by PCI and patients treated conservatively.

CORONARY: ACUTE CORONARY SYNDROME, PCI**C5****FIRST ASSESSMENT OF THE PRECISE-HBR SCORE FOR BLEEDING RISK STRATIFICATION IN PCI PATIENTS RECEIVING CANGRELOR: RESULTS FROM THE ICARUS REGISTRY**

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Introduction

Cangrelor is recommended for the prevention of periprocedural thrombotic complications in P2Y12 inhibitor-naïve patients undergoing percutaneous coronary intervention (PCI). However, its safety profile in high bleeding risk (HBR) patients remains poorly defined. This study aims to provide the first assessment of the performance of the PRECISE-HBR score for bleeding risk stratification in PCI patients receiving cangrelor.

Methods

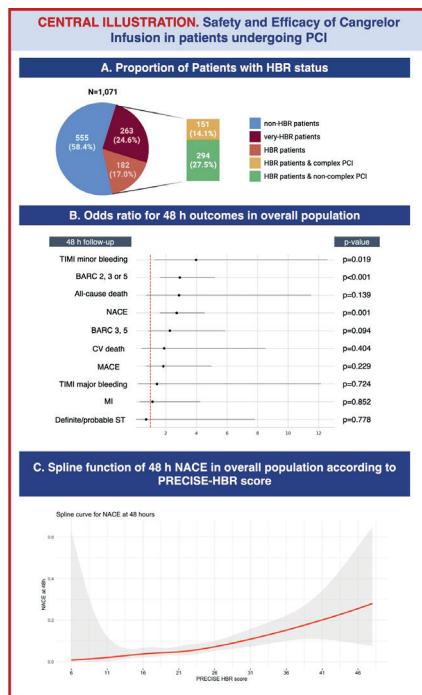
Consecutive patients undergoing PCI with cangrelor were enrolled from the Italian, prospective, multicenter ICARUS registry (Intravenous CAn-grelor in high-bleeding Risk patients Undergoing percutaneous coronary intervention; NCT05505591) and stratified by HBR status, assessed using the PRECISE-HBR score (<https://precise-hbr.eoc.ch/>). The primary endpoint was Bleeding Academic Research Consortium (BARC) 2, 3, or 5 bleeding 48 hours post PCI. Secondary endpoints included net adverse clinical events (NACE) and major adverse cardiovascular events (MACE) at 48 hours. The association between the PRECISE-HBR score and NACE at 48 hours was evaluated using logistic regression with natural splines.

Results

A total of 1,071 consecutive patients were included in the analysis. 445 subjects (41.6%) were classified at HBR (PRECISE-HBR score ≥ 23), of whom 263 (24.6%) were very HBR (PRECISE-HBR score ≥ 27). Among HBR patients, 151 (14.1%) underwent complex PCI. At 48 hours after PCI, the rates of BARC 2, 3 or 5 (7.9% vs. 2.9%; odds ratio [OR]: 2.91, 95% confidence interval [CI]: 1.63-5.21; p -value <0.001) and NACE (9.8% vs. 3.8%; OR: 2.71, 95% CI: 1.62-4.53; p -value <0.001) were higher in the HBR group compared to non-HBR group. HBR status, femoral access, and acute coronary syndrome at presentation were found to be independent predictors of both BARC 2, 3 or 5 bleeding events and NACE at 48 hours. The association between the PRECISE-HBR score and NACE at 48 hours was nonlinear, and the estimated risk progressively increased with higher scores.

Conclusions

This study provides the first evaluation of the PRECISE-HBR score in a contemporary real-world cohort of patients undergoing PCI with cangrelor. Higher rates of BARC 2, 3, or 5 bleeding and NACE at 48 hours were observed in the HBR group. HBR status, femoral access, and acute clinical presentation were independently associated with both bleeding and ischemic complications at 48 hours post-PCI.



C6

IMMEDIATE VERSUS STAGED COMPLETE REVASCUARIZATION IN A REAL-WORLD COHORT OF PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AND MULTIVESSEL DISEASE
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Introduction

Complete revascularization (CR) with percutaneous coronary (PCI) as compared with infarcted-related artery (IRA)-only in patients with STElevation infarction (STEMI) and multivessel disease (MVD) has been consistently associated with lower risk of major adverse cardiac events (MACE). Whether CR should be performed in single or multi-stage procedures is still debated.

Methods

We sought to assess among a real-world ACS population enrolled in the prospective multi-center Special-Program-University-Medicine (SPUM, NCT01000701) the impact of staged CR (sCR) on 1-year MACE (myocardial infarction, stroke and all-cause mortality). MVD was defined as significant stenosis (>70%) in two or more major epicardial coronary arteries.

Results

Out of 4787 ACS-patients, 721 (15.1%) had STEMI with MVD; of these 505 (70.0%) underwent sCR. Baseline characteristics did not differ between groups, except for increased LDL-cholesterol (3.5±1.1 vs 3.2±1.1 mmol/l; p<0.001) in sCR-patients. Cardiac necrosis (hs-TnI 1259.9±3724.4 vs 798.8±1891.3 ng/l) and inflammatory indexes (NLR 6.8±5.9 vs 5.8±5.1) were more pronounced in iCR-patients. Patients who underwent sCR compared with iCR had lower rates of in-hospital MACE (2.6% vs 6.5%, p=0.013), only numerical reduced at 1 year (4.8% vs 7.9%, p=0.072).

Conclusions

In real-world ACS patients with STEMI and MVD, sCR is associated with a lower rate of in-hospital MACE compared to iCR, without differences in the long term. These data have to be confirmed in larger and dedicated trials.

CORONARY: CHRONIC CORONARY SYNDROME, PCI

C7

IMPELLA VERSUS STANDARD OF CARE FOR HIGH-RISK PCI: A SINGLE CENTER EXPERIENCE

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Introduction

Percutaneous ventricular assist devices are frequently used in patients with complex cardiovascular disease, previously declined for surgical revascularization, to prevent hemodynamic deterioration and to improve clinical outcome. However, current data on the benefit of Impella in non-emergent high risk PCI are controversial. We aimed to assess the clinical outcomes of Impella-supported high-risk PCI compared to standard of care high-risk PCI (IABP or no mechanical circulatory support).

Methods

All patients who underwent high-risk PCI at our institution between January 2017 and May 2025, were included in this retrospective analysis. Patients treated with IABP were deemed appropriate to be included in "the standard of care" group, given the burden of evidence documenting its scarce efficacy. High-risk PCI was defined according to the inclusion and exclusion criteria for PROTECT II and III. The need for Impella protected-PCI was assessed based on local heart-team discussion; whereas the decision to use IABP rather than no circulatory support was left to discretion of experienced operators. The primary endpoint was the composite of major adverse cardiac events in-hospital and at 1 year; the secondary endpoints included the individual primary endpoint components (death, AMI, target vessel revascularization), stroke, acute kidney injury, major vascular complications and bleeding (BARC 3a and 3b). We also investigated the effect of reasonable complete revascularization (residual Syntax-score ≤ 8) according to revascularization strategy.

Results

Between January 2017 and May 2025, 247 patients met high-risk criteria: 69 patients underwent Impella-assisted PCI and within the standard of care group 71 patients received IABP-supported PCI and 107 had no circulatory support. Inverse propensity weighting was performed to balance baseline clinical and procedural characteristics of standard of care group with Impella group.

Before adjustment, the non-Impella group was older, had a greater prevalence of hypertension and anemia; in Impella-group LVEF was significantly lower (28 ± 9 vs 32 ± 8, p= 0.04), more patients had acute heart failure (63% vs 42%, p= 0,02) and electrical instability (14% vs 3%, p= 0,01) at clinical presentation. STS score and Euroscore II were comparable between groups. Coronary anatomy complexity was equally distributed (Syntax score 31,5 ± 7,4 vs 30,5± 8,1 p= 0,51) as well as extent of jeopardized myocardium (BCIS-J score 12 in both group, p= 0,61). Combining clinical and procedural factors, patients in Impella-group had a greater risk of in-hospital and at 1 year major cardiac events as shown by an higher UK-BCIS CHIP score (8±2,5 vs 6,85±2,9 p= 0,01). Procedural characteristic showed equal rates of left main (53% vs 45%, p= 0,46) and 3-vessel disease intervention; Impella group had higher rate of debulking technique (25% vs 19%, p= 0,02) and left descending artery CTO attempted (23% vs 8%, p= 0,02); in 93% of cases Impella was placed before the PCI. Reasonable complete revascularization was obtained equally in both group (63% vs 70%, p= 0,33). There were no significant differences in terms of MACEs, death, AMI, stroke, target vessel revascularization, acute kidney injury and major vascular complications between Impella and standard of care group in-hospital and at 1 year of follow-up; however BARC 3a-3b bleeding were more frequent in Impella-group.

Complete revascularization was associated with better survival both in Impella group (56,3% vs 92,3% p= 0,006) and in standard of care group (54,8% vs 72,6% p= 0,05) at a median follow-up of 13,5 months. When we analyzed patients in whom a complete revascularization was obtained, the Impella device confers a further benefit in terms of significant better survival and the curves continue to diverge with time compared with standard of care group (72,6% vs 92,3% p=0,05). In the multivariate analysis, Impella-assisted PCI (OR 0,25. 95% CI 0,08 a 0,96 p = 0,04) and reasonable complete revascularization (OR 0,15. 95% CI 0,04 a 0,51 p < 0,05) were both independent predictors of survival at follow-up.

Conclusion

In our experience, Impella-assisted PCI had the same rate of MACE both at short and medium term compared to standard of care group despite an higher clinical and procedural complexity at admission. Complete revascularization and Impella use were associated with improved survival at follow-up.

C8

SEX-RELATED LONG-TERM PERFORMANCE OF DRUG COATED BALLOON FOR DE NOVO DISEASE: INSIGHTS FROM THE ANDROMEDA PATIENT-LEVEL META-ANALYSIS

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Introduction

Although drug-coated balloon (DCB) treatment has been shown to be an attractive alternative to drug eluting stents for the treatment of de novo small vessel coronary artery disease, the influence of sex on long term clinical outcomes remains unknown. This study aimed to investigate the clinical impact of DCB treatment in patients with de novo small vessel (SV) coronary lesions according to sex. The ANDROMEDA study was a collaborative, investigator-initiated, individual patient data (IPD) meta-analysis comparing 3-year clinical outcomes between PCB angioplasty and DES implantation for the treatment of de novo SV-CAD.

Methods

Multiple electronic databases (PubMed, Scopus, ScienceDirect, and Web of Science) were searched from May 2010 to June 2024 to identify eligible trials. All the following eligibility criteria were required: (i) random allocations of treatment; (ii) patients with coronary artery disease involving small vessels; (iii) treatment with PCB vs. DES; and (iv) clinical follow up at least 36 months. The primary and co-primary endpoints were major adverse cardiac events (MACE) and target lesion failure (TLF), respectively. The protocol was registered with PROSPERO (CRD42023479035). A total of 1154 patients (278 females vs. 876 males) randomly assigned to PCB angioplasty (582 patients, 663 lesions) or DES implantation (572 patients, 697 lesions) were combined.

Results

At 3 years, PCB PCI was associated with a lower incidence of MACE compared with DES implantation (18.7% vs 24.5%, HR_{ME} 0.67, 95% CI 0.47-0.96), due to reductions in myocardial infarction and target vessel revascularization. This benefit was consistent in females (12.7 vs 20.2%, HR_{ME} 0.57, 95% CI 0.31-1.05, p=0.071) and males (20.2 vs 25.6%, HR_{ME} 0.71, 95% CI 0.47-1.07; p=0.097; p for interaction 0.276). At 3 years, TLF was comparable between PCB and DES groups (14.7% vs 17.6%; HR_{ME} 0.78, 95% CI 0.55-1.12, P=0.185). This benefit was consistent in females (11.1 vs 16.9%, HR_{ME} 0.63, 95% CI 0.32-1.24, p=0.185) and males (15.8 vs 17.9%, HR_{ME} 0.79, 95% CI 0.49-1.29; p=0.354; p for interaction 0.415).

Conclusions

In patients undergoing PCI for de novo SV-CAD, PCB angioplasty is associated with a reduction in MACE and a non-significant difference in TLF at 3-year follow-up compared with DES implantation. No significant interaction according to sex was documented. Larger trials comparing contemporary devices at a more prolonged follow-up are warranted to confirm these findings.

C9

MECHANICAL CIRCULATORY SUPPORT WITH MICROAXIAL FLOW PUMP FOR HIGH-RISK PCI: A COMPARATIVE ANALYSIS IN LEFT MAIN DISEASE

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Introduction

Mechanical circulatory support (MCS) has emerged as a potential adjunct to improve outcomes in High-risk percutaneous coronary interventions (HR-PCI). However, data comparing MCS to standard-of-care (SOC) remain limited. This comparative analysis of outcomes from two large registries in high-risk patients undergoing coronary revascularization evaluated the impact of microaxial flow pump (mAFP)-supported HR-PCI in left main (LM) disease, in terms of achievement of complete revascularization and mortality at follow-up.

Methods

The SOC cohort was derived from the Delta (Drug Eluting Stent for Left Main Coronary Artery) 2 Registry and included all patients who underwent elective PCI of distal LM bifurcation disease and left ventricular ejection fraction (LVEF) <40%. The mAFP population was obtained from the IMP-IT (IMPella Mechanical Circulatory Support Device in Italy) Registry and comprised patients with severe LM stenosis who underwent HR-PCI with mAFP support (Figure 1A). Baseline characteristics were compared to assess key differences between the two populations. The primary endpoint was completeness of revascularization, defined as treatment of all identified diseased vessels. Mortality was assessed at follow-up using Kaplan-Meier analysis.

Results

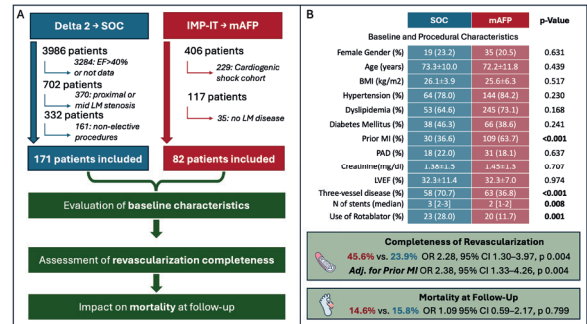
A total of 253 patients were included in the analysis (171 from the Delta 2 and 82 from the IMP-IT Registry). Baseline characteristics were comparable

between the two cohorts. Baseline creatinine and LVEF did not differ (1.38±1.5 vs 1.45±1.3mg/dl and 32.3±11.4 vs 32.3±7%). SOC patients had more frequently suffered from myocardial infarction (36.5 vs 63.7%, p<0.001) (Figure 1B).

Upon coronary angiography, the rate of three-vessel disease was higher among the mAFP patients (70.7 vs 36.8%, p<0.001). Despite a higher burden of coronary artery disease, patients in the mAFP cohort were more likely to achieve complete revascularization, and this association remained significant after adjusting for prior MI (45.6% vs. 23.9%, OR 2.71, 95% CI 1.62-4.55, p<0.001). M-AFP patients were more frequently treated with rotablation (28.0% vs 11.7%, p=0.001) and received a higher median number of stents. Mortality at a median follow-up was comparable between the two cohorts (Figure 1B).

Conclusions

Despite a greater burden of coronary artery disease, mAFP-supported HR-PCI was associated with a significantly higher rate of complete revascularization compared to standard care. Mortality at follow-up, however, remained similar between the two groups.



C10

CONTRAST-ASSOCIATED ACUTE KIDNEY INJURY PREDICTION USING ACADEMIC RESEARCH CONSORTIUM FOR HIGH BLEEDING RISK IN A COHORT OF PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION

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Introduction

Contrast-associated acute kidney injury (CA-AKI) is one of the most common and serious complications following percutaneous coronary intervention (PCI). Different scoring systems, such as the Modified Mehran score (MMS), have been proposed for predicting this outcome, enabling the identification of patients at the highest risk and informing preventive strategies. Additionally, patients undergoing PCI can be stratified for high bleeding risk using scores from the Academic Research Consortium for High Bleeding Risk (ARC-HBR). Notably, some clinical factors that predict CA-AKI are also included in the ARC-HBR score. Thus, our aim is to investigate the potential predictive value of the ARC-HBR score in identifying patients who are at the greatest risk of developing CA-AKI.

Methods

We retrospectively analyzed 819 patients who underwent PCI at our institution. For each patient, we calculated the MMS and the ARC-HBR score. CA-AKI was defined as an increase in serum creatinine ≥0.3 mg/dl or >50% calculated from baseline within 48-72 hours after contrast exposure.

Results

The overall incidence of CA-AKI was 4.3%. Patients who developed CA-AKI revealed higher MMS (8.54±4.1 vs 5.53 ± 4.2 in patients without CA-AKI; p<0.001) and ARC-HBR values (p<0.001). As expected, patients with a higher MMS value (MMS ≥ 8) exhibited an increased incidence of CA-AKI (p<0.001). Similarly, those with ARC-HBR scores >1 showed a significantly higher occurrence of this complication (p<0.001). A moderate positive correlation was found between the ARC-HBR score and the MMS values (R = 0.650 p < 0.001). Both the MMS and ARC-HBR demonstrated good sensitivity and specificity in predicting the occurrence of CA-AKI, with an AUC of 0.754 (95% CI: 0.658-0.849, p < 0.001) for the MMS and an AUC of 0.749 (95% CI: 0.649-0.849, p < 0.001) for the ARC-HBR score. In logistic regression analysis, patients with an ARC-HBR score ≥ 1 had a significantly higher risk of developing CA-AKI compared to those with ARC-HBR < 1 (OR 8.03, 95% CI: 2.72 - 23.72, p < 0.001).

Conclusions

In conclusion, the ARC-HBR score effectively identifies patients at risk of developing CA-AKI, with a predictive ability similar to that of the MMS. These findings stem from the inclusion of variables in the HBR-ARC criteria that significantly increase the risk of bleeding and may also

lead to additional renal damage following contrast administration. Importantly, promptly recognizing high-risk patients for CI-AKI and identifying modifiable risk factors is essential.

C11

VAL-CTO REGISTRY: INSIGHTS FROM A TERTIARY CENTER IN SPAIN

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Introduction

Chronic total occlusions (CTOs) represent one of the most challenging scenarios in percutaneous coronary intervention (PCI), requiring highly specialized approaches and advanced technical strategies for effective treatment. Over the past 20 years, significant improvements in operator skills, optimization of recanalization techniques, and the development of specialized devices for CTO PCI have all played a key role in markedly increasing procedural success.^(1,2)

Herein, we present of real-world experience from a high-volume tertiary center in Spain with insights on the evolution of CTO management in daily clinical practice.

Methods

We did include in our registry 411 consecutive patients which underwent CTO-PCI procedures at Hospital Clínico Universitario de Valladolid between May 2015 and April 2024. The cases were performed by different operators. All patients were selected based on the presence of symptoms, viability, and significant inducible ischemia in the CTO artery territory, as demonstrated by functional imaging tests. Among asymptomatic patients, CTO PCI indication was based on the presence of a large area of inducible ischemia and significant viability in those patients with reduced left ventricular ejection fraction.

Results

The population was divided into two groups: procedures performed before 2020 (n=189) and from 2020 onwards (n=222). Patients treated after 2020 had significantly higher SYNTAX scores (mean 20.2 vs 14.2; $p < 0.001$), indicating a greater anatomical complexity and also ejection fraction (LVEF) was significantly lower in the post-2020 group (mean 42.5% vs 52.8%; $p < 0.001$), suggesting that more functionally compromised patients were treated in recent years. For what concern the complexity of the occlusions, there was a notable increase in calcified and tortuous lesions in the post-2020 cohort ($p = 0.027$ and $p = 0.002$, respectively) and although no differences in terms of collaterals and Rentrop classification were detected, we can assume an increased complexity of cases tackled in recent years. Marked differences emerged in procedural planning and techniques. The use of intravascular ultrasound (IVUS) increased dramatically post-2020 (from 54.5% to 78.7%, $p < 0.001$), reflecting more intravascular imaging-guided strategy. The adoption of dual injection (contralateral contrast) increased significantly post-2020 (from 71.5% to 83.7%, $p = 0.029$) and accordingly the use of retrograde techniques and specialized devices also increased significantly ($p < 0.001$), particularly evident in the use of guidewire externalization following CART and reverse CART. Despite this complexity, fluoroscopy time decreased significantly ($p = 0.015$) and the volume of contrast was significantly lower ($p < 0.001$) suggesting improved procedural efficiency. The overall procedural success rate improved in the post-2020 cohort (from 75.1% to 82.2%, $p = 0.013$) and the periprocedural complications decreased slightly ($p = 0.009$) reflecting the operators learning curve either in terms of procedural skills or knowledge about the dedicated materials.

Conclusions

Our real-world experience confirms that the evolution of techniques and the adoption of advanced strategies have enabled successful treatment of increasingly complex CTOs. The increased use of intravascular imaging, retrograde techniques, and dedicated devices has significantly improved procedural success rates. These results highlight the importance of continuous training and learning in CTO-PCI to achieve progressively optimal outcomes.

CORONARY: CHRONIC CORONARY SYNDROME, PHARMACOLOGY

C12

GLIFLOZINS IN THE PREVENTION OF CONTRAST ASSOCIATED NEPHROPATHY: THE GLICINE REGISTRY

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Introduction

Sodium-glucose cotransporter-2 inhibitors (SGLT2-I) have shown to improve cardiovascular and renal outcomes of patients with heart failure, diabetes mellitus and chronic kidney disease. However, despite these conditions display an established increased risk of contrast-associated acute kidney injury (CA-AKI), the role of SGLT2Is in the prevention of post-contrast nephropathy has been assessed, so far, only in small studies restricted to selected high-risk population. Aim of the present study was to evaluate the impact of chronic therapy with SGLT2-I on the occurrence of CA-AKI in patients undergoing coronary angiography and/or percutaneous coronary intervention (PCI).

Methods

Patients exposed to contrast media for coronary procedures and chronically (> 7 days) treated with SGLT2-I were retrospectively identified and matched 1:1 with a comparable population of patients not receiving gliflozins. Paired-matching was performed according to gender, age, percutaneous coronary intervention and Mehran Risk Score. Primary endpoint was the occurrence of CA-AKI within 72 hours after contrast media exposure

Results

A total of n=724 patients were enrolled (n=362 treated with SGLT2-I and n=362 controls). Among them, 18.5% were females, 60.5% with diabetes mellitus and 43.1% with acute presentation.

Active smoke, hyperlipemia, diabetes, previous cardiovascular events and lower ejection fraction were more common among gliflozins treated patients, whereas acute presentation and contrast volume were inversely related. CA-AKI occurred in 71 patients (10%), with a significantly lower rate of events in the SGLT2-I treated group (6.4% vs 13.9%, OR[95%CI]=0.42[0.25-0.71], $p=0.001$).

The benefits of SGLT2-I pre-treatment were confirmed at multivariable analysis (adjusted OR[95%CI]= 0.40[0.19-0.84], $p=0.015$), after correction for baseline differences. Lower proportional variation of creatinine within 24h ($p=0.004$) and higher post-exposure values of GFR were observed in SGLT2-I users ($p=0.003$ and $p=0.03$, at 24 and 48h respectively).

Conclusions

The present study shows that in unselected patients undergoing coronary angiography and/or PCI, the chronic use of SGLT2-Inhibitors is associated with a significant, >50% reduction in the rate of CA-AKI, as compared to untreated patients.

CORONARY: DEB

C13

BAIL-OUT STENTING AND TARGET-VESSEL FAILURE AFTER DRUG-COATED BALLOON PERCUTANEOUS CORONARY ANGIOPLASTY FOR DE NOVO LESIONS: THE BOSS STUDY

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Introduction

Drug-coated balloon (DCB) percutaneous coronary intervention (PCI) for de novo lesions represents a valid alternative to latest-generation drug-eluting stents (DES) in different settings. Bail-out stenting (BOS) might be applied to manage acute vessel recoil or dissections, however, its impact on clinical endpoints remains unclear. This study sought to investigate the 1-year outcomes of BOS compared to DCB-only PCI.

Methods

The present study was a multicenter, prospective and retrospective, investigator-initiated all-comer study enrolling PCI patients treated with DCB at 11 participating hospitals. Patients were divided into two groups: those who received DCB-only treatment and those who required BOS. Primary endpoint was 12-months target vessel failure (TVF) defined as a composite of target vessel-myocardial infarction (TV-MI), ischemia driven-target vessel revascularization (ID-TVR) and angiographic restenosis.

Results

The study included 1085 patients and 1236 lesions. BOS occurred in 11.1% of patients. The two study groups were well balanced in terms of clinical characteristics, and angiographic features. Most of the lesions involved small vessels (median RVD 2.5 mm [IQR 2.0 – 2.5 mm]) and were classified as intermediate-high anatomical complexity (41% type B2/C). At 12-month, the occurrence of TVF was 3.4%. The primary endpoint occurred more frequently in BOS group (6.7% vs 3.0%, $p = 0.04$; log-rank chi-square = 4.35; $p = 0.037$), mostly due to TV-MI (4.2% vs 0.9%, $p = 0.01$). On multivariable analysis, BOS was still independently associated with the risk of the primary endpoint. (HR 2.45; 95% CI: 1.11 – 5.40).

Conclusions

After DCB-PCI the need for BOS is an independent risk factor of TVF at 1 year. This finding should be taken in account if DCB-PCI is planned.

Table 1 Patients Characteristics

	DCB only (965)	BOS (120)	Total (1085)	P value
Clinical and procedural data				
Age	70 (60 – 77)	71 (63 – 78)	70 (61 – 76)	0.18
Male	80 (770/965)	81 (96/120)	80 (886/1085)	0.80
Hypertension	76 (722/965)	72 (86/120)	75 (808/1085)	0.42
Hypercholesterolemia	71 (681/965)	76 (90/120)	72 (771/1085)	0.33
Smoke	49 (470/965)	51 (61/120)	49 (531/1085)	0.67
Diabetes	35 (329/965)	32 (38/120)	34 (367/1085)	0.59
Clinical presentation				
Stable angina	32 (303/965)	34 (41/120)	32 (344/1085)	0.71
Unstable angina	11 (103/965)	11 (13/120)	11 (116/1085)	
NSTEMI	32 (306/965)	31 (37/120)	32 (343/1085)	
STEMI	23 (216/965)	23 (28/120)	23 (244/1085)	
Subacute MI	3 (29/965)	1 (1/120)	3 (30/1085)	
LVEF	55 (45 – 60)	55 (46 – 60)	55 (45 – 60)	0.38
Severe valvulopathy	10 (96/965)	8 (9/120)	10 (105/1085)	0.39
Hemoglobin	14 (12 – 15)	14 (12 – 15)	14 (12 – 15)	0.80
Creatinine	1.0 (0.8 – 1.2)	1.0 (0.8 – 1.2)	1.0 (0.8 – 1.2)	0.80
Angiographic data				
Stent in another lesion	67 (649/965)	66 (79/120)	67 (728/1085)	0.78
Vessel disease				
1	34 (332/965)	42 (50/120)	35 (382/1085)	
2	41 (398/965)	37 (44/120)	41 (442/1085)	
3	24 (235/965)	22 (26/965)	24 (261/1085)	
Syntax score	14 (8 – 22)	14 (9 – 24)	14 (8 – 22)	0.86
Pharmacological therapy				
ASA	97 (938/965)	95 (114/120)	97 (1052/1085)	0.19
Clopidogrel	54 (520/965)	55 (66/120)	54 (586/1085)	0.82
Ticagrelor	34 (327/965)	31 (37/120)	34 (364/1085)	0.50
Prasugrel	9 (85/965)	11 (13/120)	9 (98/1085)	0.47
Beta-blocker	82 (782/965)	76 (90/120)	82 (872/1085)	0.08
Hypercholesterolemia therapy	97 (933/965)	96 (115/120)	97 (1048/1085)	0.63
RAAS inhibitors	76 (726/965)	76 (90/120)	76 (816/1085)	0.91

Values are median (IQR) or % (n/N).
DCB = drug coated balloon; BOS = bail-out stenting; NSTEMI = Non ST-elevation myocardial infarction; STEMI = ST-elevation myocardial infarction; MI = myocardial infarction; LVEF = left ventricular ejection fraction; ASA = acetylsalicylic acid; RAAS = renin-angiotensin-aldosterone system

Table 2 Procedural features

	DCB-only	BOS	Total	p value
PCB	93 (1033/1114)	82 (100/122)	92 (1133/1236)	< 0.01
Dissection > type A*	10 (113/1114)	42 (51/122)	13 (164/1236)	< 0.01
AHA/ACC classification				
A	15 (164/1114)	7 (8/122)	14 (172/1236)	
B1	46 (512/1114)	35 (43/122)	45 (555/1236)	
B2	28 (308/1114)	40 (49/122)	29 (357/1236)	
C	12 (129/1114)	18 (22/122)	12 (151/1236)	
Bi/trifurcation	66 (737/1114)	69 (84/122)	66 (821/1236)	0.51
Distal disease	15 (166/1114)	19 (23/122)	15 (189/1236)	0.25
Tortuosity	2 (25/1114)	5 (6/122)	3 (31/1236)	0.07
Lesion preparation				
Nothing	7 (82/1114)	5 (6/122)	7 (88/1236)	0.32

Semi-compliant balloon	70 (779/1114)	77 (94/122)	71 (873/1236)	0.10
Non-compliant balloon	23 (253/1114)	23 (28/122)	23 (281/1236)	0.95
Cutting/scoring balloon	1 (10/1114)	0 (0/122)	1 (10/1236)	0.29
IVL	0.2 (2/1114)	0 (0/122)	0.2 (2/1236)	0.64
Rotational atherectomy	0.4 (4/1114)	0 (0/122)	0.3 (4/1236)	0.51
Imaging (IVUS/OCT)	3 (32/1114)	6 (7/122)	3 (39/1236)	0.17
DCB diameter	2.5 (2.0 – 2.5)	2.5 (2.2 – 2.5)	2.5 (2.0 – 2.5)	0.03
DCB length	20 (15 – 25)	20 (15 – 30)	20 (15 – 25)	0.14

Values are % (n/N) or median (IQR).

DCB = drug coated balloon; BOS = bail-out stenting; PCB = paclitaxel coated balloon; NHLBI = National Heart, Lung and Blood Institute; AHA/ACC = American College of Cardiology and American Heart Association; IVL = intravascular lithotripsy; IVUS = intravascular ultrasound; OCT = Optical Coherence Tomography.

*Coronary dissection before DCB PCI according NHLBI classification

Table 3. Clinical outcomes

	DCB only	BOS	P Value
TVF (%)	29 (3)	8 (6.7)	0.04
TV-MI (%)	9 (0.9)	5 (4.2)	0.01
ID-TVR (%)	17 (1.8)	3 (2.5)	0.48
AR (%)	20 (2.1)	4 (3.3)	0.33
Death (%)	38 (3.9)	8 (6.7)	0.16

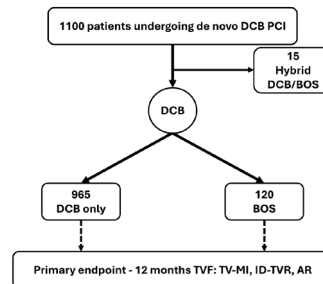
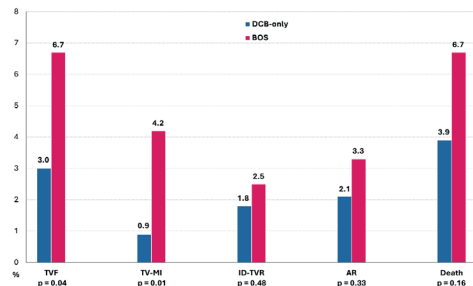
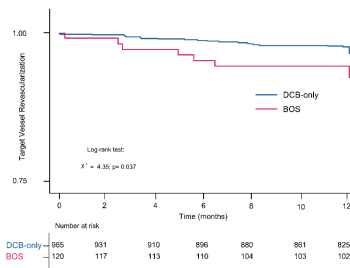
Values are n (%).

DCB = drug coated balloon; BOS = bail-out stenting; TVF = target vessel failure; MI = myocardial infarction; ID-TVR = ischemia driven target vessel revascularization; AR = angiographic restenosis.

Table 4 Multivariate Cox Regression Analyses for target vessel revascularization endpoint

	Model 1		Model 2	
	HR (95% CI)	P Value	HR (95% CI)	P Value
Age	0.99 (0.96 – 1.02)	0.49	0.99 (0.96 – 1.02)	0.57
Creatinine	1.30 (1.10 – 1.53)	0.01	-	-
Diabetes	-	-	1.18 (0.60 – 2.31)	0.63
Syntax score	1.02 (0.99 – 1.05)	0.21	1.02 (0.99 – 1.05)	0.18
BOS	2.45 (1.11 – 5.40)	0.03	2.34 (1.07 – 5.12)	0.03

BOS = bail-out stenting



CORONARY: IMAGING

C14

MULTIMODALITY IMAGING APPROACH TO DEFINE LIPID-RICH VULNERABLE PLAQUES: ANGIO-DERIVED RADIAL WALL STRAIN AND μ FR COMBINED WITH ADVANCED CCTA ANALYSISEttore Ventura¹, Edoardo Genta¹, Saima Mushtaq, Andrea Baggiano, Stefano De Martini¹, Alice Bonomi¹, Gianluca Pontone, Piero Montorsi^{1,2}, Stefano Galli¹¹Centro Cardiologico Monzino, Milano, Italia; ²Department of Clinical Sciences and Community Health, University of Milan, Milan, Italia**Introduction**

Identifying vulnerable plaques (VP) is crucial for risk stratification in patients with coronary artery disease. This study aimed to evaluate the diagnostic accuracy in identifying VP of angiography-based parameters, namely Murray's quantitative flow ratio (μ FR) and maximal radial wall strain (RWSmax), compared to intravascular ultrasound with near-infrared spectroscopy (IVUS-NIRS) as the reference standard. Additionally, a subgroup analysis incorporating pre-procedural coronary computed tomography angiography (CCTA) was performed.

Methods

We enrolled 70 patients with a total of 89 coronary lesions who underwent invasive coronary angiography (ICA) with simultaneous IVUS-NIRS imaging. VP was defined as a maximum lipid core burden index (maxLCBI4mm) \geq 325. Angiography-derived μ FR and RWSmax were measured. The subgroup analysis included 43 patients (50 lesions) who also underwent CCTA prior to ICA, enabling advanced plaque characterization, including plaque burden (PBmax) and necrotic core area.

Results

Baseline clinical characteristics were comparable among groups. Overall, ROC analysis indicated good diagnostic accuracy for μ FR and RWSmax in identifying VP, with areas under the curve (AUC) of 0.71 and 0.80, respectively. In the CCTA subgroup, PBmax and necrotic core area demonstrated superior accuracy (AUC: 0.83 and 0.87, respectively). Furthermore, a combined multivariate model including PBmax and RWSmax enhanced diagnostic performance significantly, achieving an AUC of 0.95.

Conclusions

Angiography-based plaque parameters, particularly RWSmax, have shown solid diagnostic accuracy in detecting VP defined by IVUS-NIRS. Incorporating pre-procedural CCTA analysis substantially improved diagnostic precision. These findings support the integration of angiography-derived metrics and advanced CCTA-based plaque characterization into clinical practice to optimize the identification of vulnerable coronary plaques.

C15

PROCEDURAL AND IN-HOSPITAL OUTCOMES OF PERCUTANEOUS CORONARY INTERVENTION USING EXIMER LASER CORONARY ATHERECTOMY FOR COMPLEX DE NOVO CORONARY LESIONS: INSIGHT FROM THE ACCELERATE (EAST SICILY EXCIMER LASER ATHERECTOMY) REGISTRYSalvatore Davide Tomasello¹, Alessandro Mazzapicchi², Carla Rochira³, Salvatore Azzarelli¹, Francesco Scardaci¹, Alessandro Di Giorgio¹, Sergio Monaco¹, Vincenzo Argentino¹, Giorgio Sacchetta⁴, Giombattista Barrano⁴, Giovanni Ruscica⁴, Andrea Sole⁴, Silvia Crescenza Motta⁴, Paolo Mazzone⁴, Francesco Saia, Marco Contarini⁴, Francesco Amico¹¹Ospedale Cannizzaro, Catania, Italia; ²Policlinico San Marco, Zingonia, (BG), Italia; ³Presidio Ospedaliero "Gravina e San Pietro", Caltagirone, (CT), Italia; ⁴P.O. Umberto I, Siracusa, Italia**Introduction**

Excimer laser coronary atherectomy (ELCA) is an emerging therapeutic option for treating a broad spectrum of complex coronary lesions, including thrombotic lesions, severely calcified lesions, non-crossable or non-expandable lesions, chronic total occlusions, stent under-expansion, and stent restenosis.

Aims and Methods

This study aimed to evaluate differences between calcified de novo lesions (CDNL) and intrastent restenosis (ISR) in terms of procedural, in-hospital and long-term outcomes in a consecutive cohort of patients treated with ELCA within the multicenter ACCELERATE Registry in complex coronary lesions. This is a prospective, multicenter, observational study.

Results

From July 2018 to May 2024, 320 consecutive patients (mean age 71 \pm 9 years) with 429 lesions treated with ELCA were enrolled in the registry. Among them, 156 patients had 197 calcified de novo lesions (CDNL), while 164 patients had 232 "intrastent restenosis" (ISR), including 205 cases of ISR due to neointimal proliferation and 27 cases of stent under-expansion.

Notably, 58% of CDNL patients presented with acute coronary syndrome at the time of the index procedure (respectively, NSTEMI in 34.6% of cases, unstable angina in 17.3% of cases and STEMI in 6.1% of cases), on the other hand in ISR group 47% of patients presented with acute co-

ronary syndrome (NSTEMI in 28.2% of cases, unstable angina in 14.1% of cases and STEMI in 4.7% of cases). The mean left ventricular ejection fraction was 46.6 \pm 9.5% in CDNL group and 27.3 \pm 2.8 in ISR group. The cohort exhibited high anatomical complexity and high cardiovascular risk, with a Syntax score of 20.00 \pm 10.2 and an STS score of 2.8 \pm 2.3. On average, 1.93 \pm 1.2 stents were implanted per lesion, with a mean total stent length of 48.4 \pm 26.2 mm. Procedural and fluoroscopy times were 94.9 \pm 43.4 minutes and 28.3 \pm 14.5 minutes, respectively. Procedural success was achieved in 99% of cases, and complete revascularization was achieved in 74% of cases.

One patient died from acute stent thrombosis a few hours after the procedure, while three patients experienced Ellis type I coronary perforations that did not require covered stent implantation. No other major events occurred during hospitalization or within the 30-day clinical follow-up period. At a median follow-up of 2.3 \pm 1.4 years, there was a statistically significant difference in major adverse cardiovascular events (MACE) between the two groups (3 [1.5%] in CDNL vs. 12 [5%] in ISR, p = 0.006), driven primarily by target lesion revascularization (TLR) (3 [1.5%] in CDNL vs. 8 [3.4%] in ISR, p = 0.016). No statistically significant differences were observed for target lesion myocardial infarction (TLMI) (1 [0.5%] in CDNL vs. 4 [1.7%] in ISR, p = 0.17) or death (4 [2%] in CDNL vs. 3 [1.3%] in ISR, p = 0.7).

Conclusions

This study demonstrates that ELCA provides high rates of angiographic and clinical success in a real-world cohort of complex patients. Our data confirm the safety and effectiveness of treating both ISR and CDNL, though long-term outcomes of ISR remain inferior.

CORONARY: PCI, COMPLICATIONS

C16

CONTEMPORARY USE OF COILS DURING PERCUTANEOUS CORONARY INTERVENTION: INSIGHTS FROM THE MULTICENTER COILSEAL REGISTRYEnrico Cerrato¹, Giulio Piedimonte¹, Marco Franzino, Giorgio Marengo², Mario Bollati³, Simone Zecchino¹, David Rutigliano⁴, Francesco Soriano⁵, Massimo Leoncini⁶, Riccardo Mangione⁷, Emanuele Sagazio⁸, Francesco Maiellaro⁹, Francesco Jeva¹⁰, Gian Paolo Ussia¹¹, Fernando Scudiero¹², Alfonso Franzé¹, Umberto Barbero², Dario Calderone¹³, Annamaria Nicolino¹⁴, Fabrizio Ugo¹⁵, Alessio G. La Manna¹⁶, Pietro Mazzarotto³, Ignazio Amat Santos¹⁷, Ferdinando Varbella¹

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Introduction

The contemporary use of coils in coronary interventions—whether to manage coronary perforations, or to close fistulas or aneurysms—is largely guided by operator expertise and institutional experience. Although this technology can be life-saving, the use of coils in coronary applications remains off-label according to their instructions for use, due to a lack of supporting scientific data. Objective of our study was to evaluate in-hospital and long-term outcomes of patients undergoing PCI with coils implantation for treating coronary perforation or closing coronary artery aneurysms/fistulas.

Methods

Among 245.652 PCIs performed in 17 high-volume European centers, 143 patients (0.06%) undergoing coils implantation during PCI were finally included in the analysis. PCI strategy (coiling performed during coronary perforation vs closing aneurysm/fistulas) and procedural devices used were collected. The primary outcome was technical success, defined as the successful sealing coronary perforation or aneurysm/fistulas and procedural success defined as technical success without in-hospital Major Cardiovascular Events (MACE). Long-term MACE and mortality were also reported.

Results

The right coronary artery (RCA) was the most frequently affected artery, involved in 36.4% of cases in the perforation group and 26.7% in the fistula/aneurysm group. As expected, CTO were significantly common in the perforation group (46% vs. 5.6%, $p < 0.01$). Radial access was used in 54.3% of cases, with a slightly higher usage in the CAP group compared to CAA/CAF group (56.3% vs 46.2%, $p = 0.35$). The guide catheter size differed notably, with the 6 Fr size being more commonly used in CAA/CAF (66.7% vs. 46.8%, $p = 0.05$). WPs were mainly associated with workhorse guidewires (57.4%; $n = 62/113$) compared to CTO-dedicated guidewires (46.2%; $n = 46/113$). The latter were predominantly represented by polymer-jacketed wires ($n = 34$), stiff wires (≥ 3 Gr, $n = 16$), and tapered wires ($n = 15$). Most coils used were detachable (94%), with a similarly high proportion in both groups. Pushable coils were less frequently used (6%), and were exclusively found in the CAP group. On average, 2.18 ± 1.34 coils were used per patient, with a significantly higher number in the CAA/CAF group compared to the CAP group (3.27 ± 2.05 vs 1.89 ± 0.87 , $p < 0.01$). The total length of coils used also varied, with a mean length of 6.03 ± 4 cm with longer coils used in the CAA/CAF group (6.80 ± 6.32 cm vs. 5.95 ± 3.72 cm, $p = 0.01$). Additionally, the thickness of the coils was greater in the CAA/CAF group compared to CAP group (4.79 ± 2.11 mm vs. 2.51 ± 0.90 mm, $p < 0.01$). Technical success was achieved in 95.7% of cases, with no significant difference between the groups (94.5% vs 100%, $p=0.19$). Procedural success was achieved in 87.1% of cases and was significant lower in the CAP group compared to the CAA/CAF group (83.6 vs 96.6% $p = 0.01$). MACE occurred in 8.6% of patients, driven by 8.2% of mortality in patients experienced a coronary perforation during PCI. The need for emergency surgery was low, occurring in 1.4% of cases all in CAP group. At discharge, 92.2% of patients were prescribed aspirin, 54.3% were on clopidogrel, 29.1% on ticagrelor, and 16.4% were on oral anticoagulants. Dual antiplatelet therapy was administered to 80.5% of patients overall, but it was significantly less common in the CAA/CAF group (33.3% vs. 93.1%, $p < 0.01$). The use of oral anticoagulants was more common in the CAA/CAF group compared to CAP one (28.6% vs. 13%, $p = 0.04$). Target lesion failure occurred in 11.4% of cases without differences between groups at a median follow-up of two years.

Conclusions

The COILSEAL is the first and largest registry to confirm the safety and efficacy of coil implantation during contemporary PCI procedures, demonstrating high technical and procedural success rates. Coil delivery using coronary microcatheters was highly feasible and safe, both in cases of perforations occurring during chronic total occlusion (CTO) interventions and in non-CTO PCI procedures. Patients treated with coils for coronary perforations or for the closure of coronary artery aneurysms (CAA) and coronary artery fistulas (CAF) experienced favourable immediate and long-term outcomes, establishing coils as a viable option for managing these high-risk conditions. Coils implantation during PCI is safe and feasible among patients treated for coronary perforations or closing aneurysms/fistulas. These findings may help in supporting contemporary use of coils in interventional coronary procedures.

CORONARY: PHYSIOLOGY**C17****ANGIOGRAPHY-DERIVED INDEX OF MICROVASCULAR RESISTANCE TO PREDICT EVENTS IN PATIENTS WITH ANTERIOR ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION: THE AID-MICRO STUDY**

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Introduction

Microvascular dysfunction following primary percutaneous coronary intervention (pPCI) is a well-established determinant of adverse outcomes in ST-segment elevation myocardial infarction (STEMI) patients. Although the invasive Index of Microcirculatory Resistance (IMR) has demonstrated prognostic value, its reliance on thermodilution limits its routine applicability. Angiography-derived functional indices, already validated in the epicardial domain, may offer a simplified, non-invasive alternative for microvascular assessment. The AID-MICRO study was designed to evaluate the feasibility and prognostic performance of the angiography-derived Index of Microcirculatory Resistance (AngioIMR) computed using quantitative flow ratio (QFR).

Methods

We retrospectively analyzed consecutive patients who underwent primary percutaneous coronary intervention (pPCI) for anterior ST-segment elevation myocardial infarction (STEMI) at Fondazione Poliambulanza, Brescia, between January 1, 2016, and February 1, 2024. AngioIMR was

calculated using the formula: $\text{AngioIMR} = \text{MAP} \times \text{QFR} \times (\text{N}^\circ\text{Frames} / \text{FPS})$, where MAP represents mean aortic pressure and ($\text{N}^\circ\text{Frames} / \text{FPS}$) is the ratio between the number of frames required for contrast dye to travel from the coronary ostium to the distal reference point and the acquisition frame rate [Frames Per Second (FPS) = 15]. This latter parameter was automatically derived using the QFR software. Only patients with final TIMI 3 flow and a QFR value >0.80 were included, provided that technical requirements for QFR computation were met. Exclusion criteria were: coronary anatomies unsuitable for qFR analysis; cardiac arrest, cardiogenic shock and/or the need for mechanical circulatory support; prior anterior myocardial infarction. The primary endpoint was a composite of all-cause death, target vessel myocardial infarction, or hospitalization for heart failure. The secondary endpoint additionally included hospitalization for angina.

Results

After screening 440 potentially eligible patients, a total of 180 individuals with anterior STEMI treated with successful pPCI were included. Over a 5-year follow-up, primary and secondary endpoints occurred in 16 (8.9%) and 23 (13%) patients, respectively. The optimal AngioIMR cut-off was 43 (AUC 0.800; 95% CI: 0.714–0.887; $p < 0.001$), with sensitivity 87.5%, specificity 63.4%, positive predictive value 18.9%, and negative predictive value 98.1%. The incidence of both the primary and secondary endpoints was significantly higher among patients with AngioIMR ≥ 43 compared to those with AngioIMR < 43 : 18.9% vs. 1.9% ($p < 0.001$) and 28.4% vs. 1.9% ($p < 0.001$), respectively. Furthermore, AngioIMR ≥ 43 was associated with a markedly increased risk of adverse outcomes (HR: 9.5; 95% CI: 2.2–42.0; $p < 0.001$). When considered as a continuous variable, AngioIMR demonstrated a linear association with event risk, with a 6% increase in hazard for each unit increase in AngioIMR (HR: 1.060; 95% CI: 1.026–1.096; $p < 0.001$). Finally, AngioIMR remained an independent predictor of the primary endpoint in multivariable analysis.

Conclusions

AngioIMR is a feasible, non-invasive tool for risk stratification following pPCI in anterior STEMI, able to carry a prognostic value in this specific population.

C18**ISCHEMIA IN NON-OBSTRUCTIVE CAD IN ITALY: THE INOCA-IT MULTICENTER REGISTRY**

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Introduction

Despite increasing awareness, INOCA is underdiagnosed. Our study aims to assess the prevalence of INOCA in 3 centers in Northern, Central, and Southern Italy, stratifying patients based on coronary microvascular dysfunction (CMD), vasospastic angina (VSA), microvascular spasm (MSA), or non-cardiac origins (NCO), implementing tailored medical therapy and evaluating impact on angina severity, quality of life, and cardiac outcomes at 1 year.

Methods

The INOCA IT Multicenter Registry (RF-2019-12369486) is a prospective, multicenter, single-arm clinical study that included patients presenting with CCS symptoms and/or positive stress tests, and non-obstructive CAD on coronary angiography. Invasive coronary functional testing was performed, assessing Coronary Flow Reserve (CFR), Index of Microvascular Resistance (IMR). Acetylcholine (ACh) spasm provocation test was also conducted to identify abnormal vasoreactivity. Patients were consequently classified into different INOCA endotypes and received personalized medical therapy. Quality of life was assessed using the Seattle Angina Questionnaire (SAQ) and EQ-5D-5L at baseline and at 12-month follow-up.

Results

A total of 213 patients were enrolled, the median age of the study population was 61 years (range 36–82) and 60.1% were female. Overall, 63.8% of patients suffered from hypertension, 15.5% had diabetes, and the median BMI was 26.3 kg/m^2 (range 16.8–55.3) and 70.4% suffered from dyslipidemia. Most patients presented with typical chest pain (87.3%), and limitation of ordinary physical activity because of angina (CCS II or CCS III) at baseline. At invasive coronary functional testing, 22.5% of patients were diagnosed with CMD, 21.6% with VSA, 15% with MSA, 16.0% were affected by both CMD and VSA, 3.8% had both CMD and MVA, 21.1% patients had NCO symptoms. CMD was more prevalent in women, while men more frequently had VSA. Women also showed a trend towards greater prevalence of microvascular spasm (18.8% vs. 9.4%, $p = 0.062$). The geographic distribution of different INOCA endotypes was found to be uniform across northern, central, and southern Italy, with a notably higher percentage of NCO diagnoses in southern regions (32.1%, p for overall comparisons = 0.049). At follow-up, a statistically significant improvement in CCS angina class and NYHA functional class was observed ($p < 0.001$ for both). SAQ scores

showed substantial gains in physical limitation (from median 67.9 to 89.29), angina frequency, and quality of life (from 41.67 to 83.3; all $p < 0.001$). Similarly, EQ-5D-5L domains improved significantly, particularly mobility and pain/discomfort. Gender-based analysis at follow-up revealed that, despite receiving phenotype-guided therapy, women reported worse angina severity and quality of life than men (median SAQ Score: 79.88 vs. 82.91; $p = 0.043$; EQ-5D anxiety/depression: 58.7% women vs. 41.9% men with symptoms; $p = 0.036$). Adverse events were rare (8.9%) and generally mild. During the procedure, atrial fibrillation and transient bradyarrhythmias and were the most frequent complications. At 12 months, major adverse cardiac events (MACE) were infrequent, with one NSTEMI and one cardiovascular death. Overall, the procedure demonstrated an excellent safety profile.

Conclusions

Invasive coronary functional assessment combined with tailored therapy in INOCA patients is safe and leads to significant improvements in symptoms and quality of life at 1 year. Nevertheless, women remain a particularly vulnerable group with a less favorable response in terms of symptom relief and mental health status, highlighting the need for sex-specific approaches in the management of INOCA.

OTHER

C19

RADIAL ACCESS CROSSOVER FOR PERCUTANEOUS CORONARY PROCEDURES AND OUTCOME: THE REPEAT STUDY

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Introduction

Transradial approach (TRA), compared with transfemoral, reduces vascular and bleeding complications during percutaneous coronary procedures (PCP) at the expense of a higher conversion rate to another vascular access. Technical complexities related to the smaller caliber of the artery and anatomical vascular variants might be the reason for the higher crossover rate compared to transfemoral approach. Access site crossover can potentially increase procedure duration, radiation exposure and risk of vascular complications related to multiple vascular access site in patients on antithrombotic therapy. Aim of our study was to evaluate the crossover rate and direction (other arm access vs femoral access) after primary TRA failure and to assess the clinical impact of access-site crossover

Methods

From July 2022 to January 2025, at 10 experienced radial Centers, we prospectively enrolled all patients with attempted TRA and necessitating vascular crossover. Exclusion criteria were the lack of signed informed consent, age <18 years, and primary vascular access different from radial. Moreover, procedures initially attempted using distal transradial access were not included. A control group of effective TRA procedures (with a rate of 2:1 compared to crossover) was also included. The modality of radial puncture (needle vs cannula), the choice of radial sheath (long vs short; hydrophilic vs non hydrophilic), the type of catheters employed and the use of spasmolytic agents were left to the operator's discretion. In patients with access crossover, the selection of the alternative vascular access and of its side (left or right) were left to the interventional operator's choice.

All patients were checked during the procedure, immediately after and 24 hour after to evaluate possible vascular complications and bleeding. Primary endpoint was the rate of in-hospital vascular complications and major bleeding in crossover versus non-crossover groups. Univariate and multivariate analyses were performed to determine independent predictors of TRA crossover.

Results

Among 17462 undergoing TRA-PCP, a vascular crossover was needed in 462 patients (2.6%) and the second alternative vascular access was femoral in the majority of cases (53%) with 44% of procedures performed through the contralateral radial access and in only a minority of cases the ulnar or brachial access was utilized. Vascular access crossover was predominantly due to failure of radial puncture (36%) or tortuosity of the radial-brachial axis (31%). Other mechanisms included subclavian tortuosity (19%), radial spasm (11%) or radial perforation (3%). In 49 patients (11%) the second approach was not successful and a third arterial access site was needed to complete the procedure. Compared to controls (895 patients),

the rate of major bleeding and vascular complications was significantly higher in the crossover group (7% vs 1%, $p < 0.001$). Patients undergoing femoral access after TRA failure showed higher bleeding and vascular complications compared to patients with a "full arm" approach (9% vs 3%, $p < 0.001$). The multivariable analysis model showed that crossover to femoral approach, previous stroke and female sex were independent predictors of bleedings and vascular complications. At the same time, female sex was the most important predictor of radial crossover.

Conclusions

The present prospective study showed that in experienced Centers, TRA crossover rate is low but associated with increased vascular and bleeding complications. Even in high proficiency operators, more than 50% of crossover required femoral access and these patients are at elevated risk of complications. Operators should increase their effort to perform a "full wrist" procedure to reduce bleeding and vascular complications.

PERIPHERAL: LOWER LIMBS

C20

PAIN CONTROL AND PROCEDURAL EFFICIENCY IN PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY FOR THE TREATMENT OF PATIENTS WITH CHRONIC LIMB-THREATENING ISCHEMIA: A SINGLE-CENTER RETROSPECTIVE STUDY

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Introduction

Chronic limb-threatening ischemia (CLTI) is the most advanced stage of peripheral arterial disease and is associated with high rates of morbidity, limb loss, and healthcare utilization. Percutaneous transluminal angioplasty (PTA) is a cornerstone of revascularization in these patients. Effective pain control and patient cooperation are essential for procedural success and safety, especially in elderly individuals who often have multiple comorbidities. While local anesthesia (LA) is the standard approach, peripheral nerve block (PNB) may offer additional benefits by improving pain control and reducing the need for systemic sedatives. However, evidence comparing these two approaches in PTA is still limited.

This study aimed to compare LA alone with LA combined with PNB in patients undergoing PTA for CLTI, focusing on procedural efficiency, radiation and contrast exposure, analgesic effectiveness, use of adjunctive sedation, patient discomfort, and short-term clinical outcomes.

Methods

We retrospectively analyzed 75 patients who underwent PTA for CLTI at a single tertiary care center between January 2022 and June 2023. Patients were divided into two groups based on the anesthesia protocol: LA only ($n = 35$) and LA plus ultrasound-guided PNB ($n = 40$). The choice of anesthesia was made based on operator preference and patient clinical profile.

Baseline characteristics were similar between groups. Mean age was 75 ± 8.2 years (male:female ratio 45:30). Rates of diabetes mellitus (65.7% vs. 67.5%, $p = 0.82$), hypertension (82.9% vs. 85.0%, $p = 0.77$), chronic kidney disease (48.6% vs. 52.5%, $p = 0.71$), and smoking (37.1% vs. 42.5%, $p = 0.64$) were comparable. Rutherford stage 5–6 was found in 71.4% of LA and 75.0% of PNB patients ($p = 0.68$), with similar TASC C/D lesion prevalence (65.7% vs. 70.0%, $p = 0.64$).

Patient discomfort and pain were assessed using the Visual Analog Scale (VAS) and procedural tolerance scoring. The VAS (0 = no pain, 10 = worst pain imaginable) was recorded by nursing staff 30 minutes post-procedure. Additionally, operator-assessed patient tolerance was documented as "excellent," "good," "moderate," or "poor" based on patient cooperation and visible discomfort during the procedure.

Procedural metrics collected included total procedure duration (minutes), radiation exposure (dose area product, DAP in Gy·cm²), contrast media volume (mL), and use of adjunctive intravenous sedation. Sedation (midazolam 1–3 mg and/or fentanyl 25–100 µg) was administered as needed for anxiety or pain unrelieved by local measures.

Results

Technical success was similar across both groups: 91.4% for LA vs. 95.0% for PNB ($p = 0.48$). Procedural duration was significantly shorter in the PNB group (55.3 ± 12.1 minutes) than in the LA group (68.7 ± 14.5 minutes, $p = 0.002$), with 82.5% of PNB procedures completed in under 60 minutes compared to 48.6% in the LA group ($p = 0.01$). Radiation exposure was lower in the PNB group (DAP: 28.7 ± 6.2 Gy·cm²) vs. LA (36.4 ± 7.9 Gy·cm², $p = 0.004$), as was contrast volume used (PNB: 88.3 ± 15.9 mL vs. LA: 104.6 ± 18.7 mL, $p = 0.008$). Pain and discomfort assessment revealed significant benefit with PNB. VAS scores were substantially lower in the PNB group (2.1 ± 0.8) compared to the LA group (4.5 ± 1.2 , $p < 0.001$). Operator-reported procedural tolerance was "excellent" or "good" in 87.5% of PNB patients versus 57.1% of LA patients ($p = 0.003$), reflecting superior comfort and cooperation. Adjunctive intravenous sedation was required far less in the PNB group (12.5%) than the LA group (48.6%, $p < 0.001$). Among those requiring sedation, midazolam alone was used in

46° CONGRESSO NAZIONALE GISE

25.7% of LA patients and 7.5% of PNB patients, while midazolam + fentanyl was administered in 22.9% of LA patients and only 5.0% of PNB patients. ABI improvement post-PTA was comparable, with >0.4 achieved in 90.0% (PNB) vs. 85.9% (LA) ($p = 0.03$). 30-day amputation-free survival was similar between groups (PNB: 97.5% vs. LA: 96.8%, $p = 0.73$). No major anesthesia-related complications occurred. Two minor, self-limiting hematomas were reported at PNB sites (5%).

Conclusions

Combining peripheral nerve block with local anesthesia for PTA in CLTI patients offers significant clinical advantages over local anesthesia alone. PNB led to shorter procedure times, reduced radiation exposure, and lower contrast media use. Importantly, it provided superior pain control, with significantly lower VAS scores and higher operator-rated procedural tolerance.

The need for adjunctive intravenous sedation was also much lower in the PNB group, enhancing safety, especially in frail patients with comorbidities. Despite these advantages, technical success and short-term limb outcomes remained comparable between groups.

These findings support the adoption of PNB as a safe and effective adjunct in PTA, improving patient experience and procedural efficiency. Future prospective studies should assess long-term outcomes, including limb salvage and quality of life.

C21**EFFICACY AND SAFETY OF TRANSRADIAL TREATMENT OF COMPLEX AORTO-ILIAC LESIONS WITH A NEW 5F PLATFORM: A SINGLE CENTER, ALL-COMERS, REGISTRY**

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Introduction

Transradial arterial access (TRA) using 5 French (5F) devices is a new option to manage percutaneous aorto-iliac interventions, potentially reducing the rate of vascular complications and the length of hospital stay. However, evidence is limited on the efficacy and safety of this approach. The aim of our study was to assess the efficacy and safety of TRA 5F approach, using Micro device portfolio by Qualimed, for the treatment of aorto-iliac steno-occlusive disease up to 12 months-follow-up.

Methods

This is a single-center, all-comers, observational registry in which 60 consecutive patients undergoing transradial angioplasty due to aorto-iliac steno-occlusive disease, including complex lesions (TASC II C-D) were enrolled from April 2022 to September 2024. We assessed: procedural success of angioplasty using at least one TRA (primary efficacy outcome); primary patency, defined as a composite of freedom from target lesion restenosis (TLR) or thrombosis and persistent patency without any reintervention (angioplasty, surgical procedures, or amputation) at 12 months; length of hospital stay (secondary efficacy outcomes); freedom from major adverse events (MAEs) (primary safety outcome), a composite of death, major amputation, and repeated revascularization of the target vessel (by angioplasty or artery bypass graft operation) during the index hospital stay; and freedom from access-related vascular complications (secondary safety outcome).

Results

Procedural success of aorto-iliac angioplasty with 5F transradial approach was achieved in 58 of 60 patients (96.7%). Despite the complexity of the lesions (60% total occlusions; 71.7% TASC II \geq C), only two patients required conversion from radial to femoral access. Primary patency was 95.0%, since 3 patients underwent target vessel revascularization due to restenosis/thrombosis. Mean hospital stay was 2 days. As for safety, no MAEs were reported. Freedom from radial access-related vascular complications was 100% during index hospital stay and 88.3% after 12-month follow-up, since 7 radial occlusions occurred.

Conclusions

These 12-month findings suggest mid-term efficacy and safety of transradial aorto-iliac artery interventions using 5F Micro devices by Qualimed, even in the setting of complex lesions. Larger cohorts and randomized controlled trials will be needed to confirm these results.

C22**LONG-TERM EFFICACY AND SAFETY OF SIROLIMUS-COATED BALLOON IN FEMOROPLOPITEAL STENO-OCCLUSIVE DISEASE: 3-YEAR OUTCOMES**

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Introduction

Sirolimus-coated balloon (SCB) is a potential treatment option for peripheral arterial disease (PAD). However, evidence is limited on the durability of the treatment effect in the longer term. The aim of our study was to assess the long-term efficacy and safety of SELUTION SCB in the treatment of the femoropopliteal steno-occlusive disease.

Methods

This is a single-center, all-comers, observational registry in which 80 consecutive patients undergoing SELUTION SCB-angioplasty due to femoropopliteal steno-occlusive lesions were enrolled from February 2021 to March 2022. Assessments through 3 years included: primary patency (primary efficacy outcome), defined as freedom from restenosis determined by a duplex ultrasound peak systolic velocity ratio (PSVR) ≤ 2.4 ; freedom from clinically-driven target lesion revascularization (CD-TLR) and secondary patency, defined as freedom from new restenosis following the CD-TLR (secondary efficacy outcomes); freedom from major adverse limb events (MALEs, primary composite safety outcome); change in median ankle-brachial index (ABI) and Rutherford classification (functional outcomes).

Results

At 3 years, primary patency was 74.7% and freedom from CD-TLR was 85.3%. The rate of CD-TLR was 14.7% (11 patients). Among them, one patient experienced a new restenosis (failure of CD-TLR), therefore secondary patency was 90.9%. Freedom from MALEs was 94.7%.

Median ABI increased significantly from 0.4 ± 0.2 at baseline to 0.7 ± 0.3 at 36 months post procedure, as well as Rutherford classification data improved.

Conclusions

These three-year findings suggest long-term efficacy and safety of SELUTION SCB in the setting of femoropopliteal steno-occlusive endovascular treatment. Larger cohorts and randomized controlled trials will be needed to confirm these results.

PERIPHERAL: RENAL DENERVATION**C23****RENAL DENERVATION IN UNCONTROLLED HYPERTENSIVE PATIENTS WITH RENAL ARTERY STENOSIS ASSESSED BY INVASIVE PHYSIOLOGY**

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Introduction

Renal denervation (RDN) is traditionally contraindicated in patients with significant renal artery stenosis (RAS) due to the risk of exacerbating renal ischemia. However, the hemodynamic relevance of moderate stenoses (50–90%) remains often unclear. Renal artery stenosis represents approximately 15–20% of resistant hypertension cases in the general population. This study aimed to evaluate the safety and efficacy of RDN in such patients, provided that trans-lesional invasive physiological assessment ($Pd/Pa \geq 0.90$) excludes hemodynamically significant renovascular hypertension.

Methods

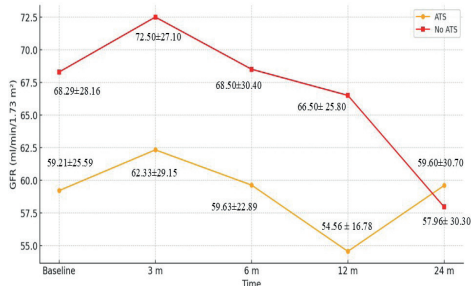
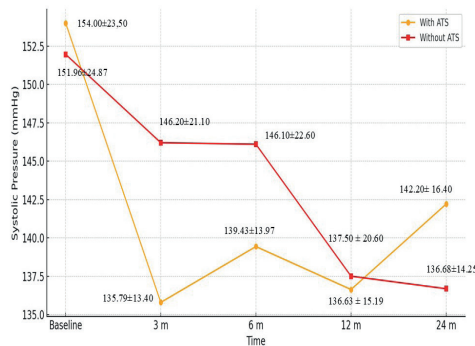
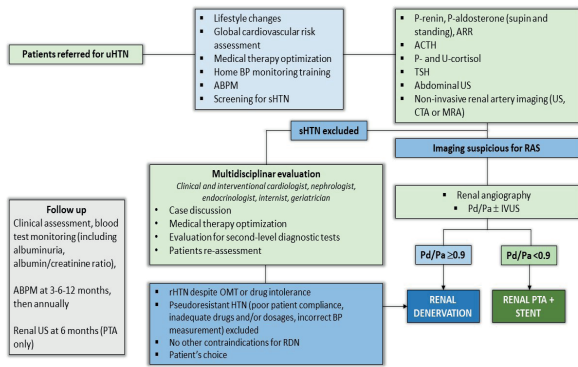
Since 2012, our center has implemented, within a multidisciplinary hypertension team, a structured treatment protocol for patients eligible for either RDN or renal angioplasty (see Figure 1). Patients with angiographic stenoses $<50\%$ were treated with RDN, while those with stenoses $>90\%$ underwent renal artery stenting. Cases with intermediate stenoses (50–90%) were further evaluated using hemodynamic assessment with pressure gradient measurements (Pd/Pa). Only patients with non-significant gradients ($Pd/Pa \geq 0.90$) proceeded to RDN using a radiofrequency system, while those with $Pd/Pa < 0.90$ received renal artery stenting. Intravascular ultrasound (IVUS) was selectively employed to characterize indeterminate lesions.

Results

Out of 139 patients eligible for RDN, 25 showed angiographic evidence of RAS. Among them, 16 patients (64%) had non-significant pressure gradients and safely underwent RDN. Systolic and diastolic blood pressure reductions at 3, 6, 12, and 24 months were comparable to those observed in patients with angiographically normal renal arteries. Renal function remained stable throughout follow-up. Patients with $Pd/Pa < 0.90$ ($n=9$) received renal artery stenting, resulting in significant reductions in office blood pressure (OBP) and preserved renal function at an average follow-up of 18 months (see Figures 2–3).

Conclusions

This study supports a paradigm shift in the selection criteria for RDN candidates. Functional—not merely anatomical—assessment of renal artery lesions allows safe extension of RDN indications to patients with moderate atherosclerotic disease previously considered ineligible. Multicenter randomized trials are needed to confirm these findings.



STRUCTURAL HEART DISEASE: PULMONARY INTERVENTIONS

C24

BALLOON PULMONARY ANGIOPLASTY IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: A SINGLE CENTRE 10-YEAR EXPERIENCE

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Introduction

Balloon pulmonary angioplasty (BPA) has emerged as an alternative, less invasive, therapeutic approach for chronic thromboembolic pulmonary hypertension (CTEPH). Nonetheless, the clinical effectiveness and procedural safety of this technique require thorough validation. This study aims to assess the impact of BPA in patients with inoperable CTEPH or persistent pulmonary hypertension after pulmonary endarterectomy (PEA).

Methods

From June 2015 to May 2025, patients with symptomatic inoperable CTEPH classified as WHO functional class II, as well as those with residual pulmonary hypertension (PH) after PEA, were enrolled. Clinical assessments, six-minute walking distance (6MWD), and right heart catheterization (RHC) were performed at baseline and between three to six months following the final BPA session. Data are expressed as median values with interquartile ranges. Comparative analyses of pre- and post-

BPA parameters were conducted using a two-tailed paired T-test, while statistical significance for non-normally distributed data was evaluated via the Wilcoxon Signed-Rank Test.

Results

Seventy-eight patients [male 44%, median age 72 (36-89) years, 67 inoperable and 11 with residual PH after PEA] were treated for a total of 209 sessions and 457 treated vessels [median number of sessions for each patient: 2 (1-4); median number of vessels treated for each patient: 5 (2-8)]. Sixty-nine patients were assuming pulmonary arterial hypertension specific drugs before BPA (18 were in combination therapy). All patients received life-long anticoagulation therapy (vitamin K-antagonist: 32 patients, direct oral anticoagulation: 44, fondaparinux: 2).

In 6 patients there was a small, non-flow limiting pulmonary artery dissection, and 20 patients experienced mild hemoptysis during the procedure, in only 1 case requiring oro-tracheal intubation; there were 3 major vascular complications (2 artero-venous fistulas, 1 pseudoaneurysm) and 5 minor vascular complications (groin hematoma < 5 cm).

Clinical and haemodynamic results are shown in the Table.

	RA (mmHg) n=71	mPAP (mmHg) n=71	CI (l/min/m²) n=71	PVR (WU) n=71	PAC (ml/mmHg) n=71	6MWD (m) n=61	NYHA FC n=70
Pre-BPA	6 (4-7)	40 (33-48)	2.7 (2.3-3)	6 (4.4-9.2)	1.34 (0.92-2.00)	450 (376-512)	3 (2-3)
Post-BPA	6 (4-7)	34 (28-39)	2.8 (2.5-3.3)	4.5 (2.9-6.2)	1.86 (1.23-2.84)	460 (390-567)	2 (2-2)
p-value	ns	<0.001	0.004	<0.001	<0.001	<0.001	<0.001

Legend: RAP, Right Atrial Pressure; mPAP, mean Pulmonary Arterial Pressure; CI, Cardiac Index; PVR, Pulmonary Vascular Resistance; PAC, Pulmonary arterial compliance; 6MWD, 6 Minute Walking Distance

Conclusions

BPA is a safe and effective treatment for symptom relief and hemodynamic improvement in inoperable CTEPH and residual PH after PEA.

STRUCTURAL HEART DISEASE: TAVI

C25

TAVR WITH JENA VALVE TRILOGY IN PATIENTS WITH SEVERE AORTIC REGURGITATION, EARLY CLINICAL AND ECHOCARDIOGRAPHIC OUTCOMES

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Introduction

Severe aortic regurgitation is frequently undertreated. The JenaValve Trilogy (JVT) system is a new transfemoral transcatheter option designed specifically for the treatment of this condition. This study investigates early clinical and echocardiographic outcomes in a single-center cohort of patients undergoing JVT implantation.

Methods

This prospective registry included 27 consecutive patients undergoing transcatheter aortic valve replacement (TAVR) for severe AR using the JVT system from November 2023 to May 2025. Pre-operative evaluations, procedural characteristics, and clinical follow-up data up to 1 month were collected. Echocardiographic parameters were assessed at baseline, discharge, and 30-day follow-up. Primary endpoint was device success at 30 days. Secondary endpoints included technical success and early safety.

Results

Mean age was 80 ± 5 years. Pre-operatively, 70% of patients were in New York Heart Association (NYHA) functional class III/IV. Mean left ventricular end-systolic volume (LVESV) and left ventricular end-diastolic volume (LVEDV) were 72 ± 29 mL and 143 ± 49 mL, respectively. 37.0% had moderate or greater mitral regurgitation (MR), and 22.0% had moderate or greater tricuspid regurgitation (TR). All procedures were performed via transfemoral access. One patient required conversion to open-heart surgery due to ascending aortic dissection. Minor vascular complications occurred in 3 patients. Four patients (14.8%) required a new permanent pacemaker. Device success and early safety at 30 days were 96.2% and 81.4%, respectively. At 30-day follow-up, all patients were in NYHA class I or II. Mean aortic valve gradient was 3.4 ± 1.4 mmHg. Notably, significant reverse left ventricular remodeling occurred, with reductions in LVESV (70 ± 40 mL, p < 0.05), LVEDV (112 ± 36 mL, p < 0.05), left ventricular mass, and left ventricular end-systolic diameter. Importantly, the incidence of moderate or greater MR and TR significantly decreased at 1-month follow-up.

Conclusions

This study highlights promising short-term clinical and echocardiographic results following treatment of severe AR with the JVT system. The reduction in valvular regurgitation and the observed reverse remodeling of the left ventricle raise the potential for enduring positive outcomes over time. Additional studies are needed to assess long-term clinical efficacy.

C26

SUPRA-ANNULAR VS. INTRA-ANNULAR DEVICES FOR TAVR-IN-TAVR: THE PANDORA INTERNATIONAL REGISTRY

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Introduction

The growing adoption of transcatheter aortic valve replacement (TAVR) to a younger/low risk population will inevitably lead to an increasing number of patients with a degenerated TAVR.

The TAVR-in-TAVR procedure appears to be a viable solution.

This study assessed TAVR-in-TAVR safety and efficacy, focusing on outcomes with different prosthetic combinations (supra-annular [SAV] and intra-annular [IAV]).

Methods

From an international multi-center registry (2011–2024), 172 cases of TAVR-in-TAVR were selected from ~30,000 TAVR procedures. Median time between first and second procedures was 1401 days.

Results

The most common initial prostheses were CoreValve/Evolut (49.4%) and the Edwards SAPIEN (35.5%). Structural valve deterioration (SVD) was the main failure mechanism (77.9%), while a non-SVD, combined or not with a SVD, occurred in 40.7% of the cases. Four groups were analyzed: SAV-IAV (n=32), SAV-SAV (n=29), IAV-SAV (n=74), and IAV-IAV (n=37). The most used second valve was Edwards SAPIEN (60.5%), followed by Evolut (35.5%), and Myval/Octacor (4.0%). Overall VARC-3 technical success was 91.3% (highest in SAV-IAV and IAV-SAV; p=0.090). Thirty-day device success accounted for 68%, numerically highest in SAV-IAV (75.9%, p=0.301). Thirty-day device failure was mainly due to a mean gradient ≥20 mmHg (12.7%), and to 30-day mortality (7.3%). Multivariate analysis identified male sex and chronic kidney disease as independent predictors of mortality. At one-year follow-up, IAV-IAV presented the numerically lowest freedom from all-cause mortality and heart failure hospitalization (76.1%; p=0.734).

Conclusions

The TAVR in TAVR procedure is safe and effective. Outcomes were generally favorable across SAV and IAV combinations, though IAV-IAV showed numerically lower one-year survival.

C27

COMPREHENSIVE RISK STRATIFICATION IN PATIENTS WITH MODERATE AORTIC STENOSIS

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Introduction

Patients with moderate aortic stenosis (AS) have an increased risk of adverse cardiovascular (CV) outcomes compared to the general population. The present study aimed to identify the predictors of adverse CV outcomes in patients with moderate AS and to combine them in a new scoring system suitable for clinical practice.

Methods

In this multicenter, retrospective study were enrolled consecutive patients diagnosed with moderate AS in three Italian centers between 2019 and 2023. The primary endpoint was defined as a composite of CV death or heart failure (HF) hospitalization. Patients who developed severe AS during follow-up were censored to restrict the analysis to moderate AS-related events.

Results

The study included 520 patients (mean age 78±9 years; 46% female). During a mean follow-up of 2.0±0.9 years, 59 patients (11.4%) experienced the primary endpoint. The independent predictors of primary endpoint were: (1) LVEF <50% (HR 3.39, 95% CI 1.98-5.81, p<0.001), (2) Lateral E/e' >14 (HR 4.35, 95% CI 2.63-7.7; p<0.001), (3) sPAP >40 mmHg (HR 1.99, 95% CI 1.17 - 3.39, p=0.011), (4) Hb <13 mg/dL (HR 1.94, 95% CI 1.01-3.79, p=0.049), and (5) eGFR <45 mL/min (HR 1.87, 95% CI 1.07-3.27, p=0.028). A new scoring system (the SPARK score) was developed and internally validated based on these variables (High- vs. Low-risk SPARK score: HR: 7.3; 95% CI 4.4-12.3; p<0.001).

Conclusions

The SPARK score, based on accessible clinical and echocardiographic parameters, offers a pragmatic approach for risk assessment in mo-

derate AS, guiding clinical management and potentially improving outcomes.

C28

TRANSCATHETER AORTIC VALVE IMPLANTATION WITH INTRA-ANNULAR SELF-EXPANDING OR BALLOON-EXPANDABLE VALVES IN SMALL ANNULI: FROM THE NAVULTRA REGISTRY

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Introduction

Comparative data between intra-annular self-expanding Navitor (NAV) and balloon-expandable SAPIEN 3 Ultra (ULTRA) transcatheter heart valves (THVs) in patients with small aortic annuli are limited. The aim of this study was to evaluate clinical and hemodynamic outcomes of transcatheter aortic valve implantation (TAVI) with intra-annular NAV and ULTRA in patients with severe aortic stenosis (AS) and small annuli.

Methods

Patients with severe AS and aortic annulus area ≤430 mm² undergoing TAVI with either NAV or ULTRA were enrolled from the NAVULTRA registry. Propensity score matching (PSM) was performed to balance baseline characteristics. The primary endpoints included 1-year all-cause mortality, a composite endpoint (all-cause mortality, disabling stroke, or heart failure hospitalization), and 30-day device-oriented outcomes (severe prosthesis-patient mismatch [PPM], moderate or greater paravalvular leak [PVL], or mean aortic valve gradient ≥20 mmHg).

Results

Among 1,617 patients, 524 PSM pairs were analyzed. At 1 year, all-cause mortality was 8.8% with NAV vs 9.0% with ULTRA (adjusted P = 0.585), and the composite clinical endpoint occurred in 11.3% vs 11.8%, respectively (adjusted P = 0.149). The 30-day device-oriented endpoint significantly favored NAV (6.0% vs 29.3%; adjusted P < 0.01). NAV demonstrated lower residual mean transvalvular gradients (7.3 mmHg vs 12.7 mmHg; adjusted P < 0.01) and reduced rates of any PPM (OR 0.27, 95% CI 0.18–0.43; adjusted P < 0.01), albeit at the expense of a higher rate of mild PVL (33.5% vs 23.2%; adjusted P < 0.05).

Conclusions

In patients with small aortic annuli, both NAV and ULTRA THVs provided comparable 1-year clinical outcomes. However, NAV was associated with superior hemodynamic performance at the cost of a higher rate of mild PVL.

C29

PERFORMANCE OF A NOVEL SELF-EXPANDING THV IN AORTIC VALVE-IN-VALVE: THE HYDRA VALVE-IN VALVE REGISTRY

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Introduction

Transcatheter aortic valve implantation to treat degenerated surgical bioprostheses (valve-in-valve -ViV) has emerged as a safe and effective

alternative to redo surgery in high-risk patients. While the ViV performance of the balloon-expandable Sapien family and the self-expanding Evolut family is known, very few data are available from other transcatheter heart valves (THV). The aim of this study is to assess the performance of a novel, self-expanding, supra-annular THV in the ViV setting.

Methods

All patients with severely degenerated surgical bioprosthesis treated with Hydra THV in different centers (Italy, India, Argentina, Bulgaria and UK) were included. Immediate and 30-day hemodynamic and clinical outcomes were evaluated. Clinical, procedural, and echocardiographic data were collected before and after the ViV intervention. The primary endpoint was VARC-3 defined technical success. Secondary endpoints included post-procedural hemodynamic performance and safety outcomes at 30-day and at the longest follow-up available.

Results

A total of 26 patients were included in the analysis. Vast majority of the degenerated surgical bioprosthesis were stented ($n=25$ vs. $n=1$ stentless). Surgical bioprosthetic mechanism of failure was predominantly stenosis ($n=19$), followed by pure regurgitation ($n=3$), and a combination of both ($n=4$). Small (<23 mm) degenerated surgical bioprosthesis were 18 (69.2 %). The interval between SAVR and the ViV procedure was 8.9 ± 4.1 years (range 1–16 years). Mean patient age was 10.3 years while mean left ventricle ejection fraction was 50.6 % and mean STS score of 6.1%. All the procedure were performed through the transfemoral route. VARC-3 defined technical success was achieved in 25 cases (96.1 %). Balloon valve fracture was performed in 13 cases due to high residual gradients after ViV in small degenerated bioprosthesis. Mean post-procedure transvalvular gradient was 7.2 ± 5.4 mmHg. Neither moderate-to-severe PVL was reported, nor permanent pace-maker was implanted. At 30-day follow-up, data were available for all patients (100%) with no reported death, stroke, moderate-to-severe paravalvular leak (PVL), or patient-prosthesis mismatch (PPM). Mild PVL was observed in one case. At a median of 12-months follow-up, no death, stroke, moderate-to-severe PVL, or PPM were reported.

Conclusions

In this initial experience the use of Hydra THV for the treatment of degenerated surgical bioprosthesis resulted effective yielding favorable hemodynamic outcomes and a good safety profile at 30-day follow-up.

C30

IN-HOSPITAL AND LONG-TERM OUTCOME OF TAVI IN YOUNG LOW-RISK PATIENTS WITH BICUSPID AORTIC VALVE: INSIGHT FROM THE AD-HOC INTERNATIONAL REGISTRY

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Introduction

Transcatheter aortic valve implantation (TAVI) has emerged as the treatment of choice for aortic stenosis across all surgical risk categories in patients older than 75 years in Europe. In younger low-risk patients, surgery may be favored in those with bicuspid aortic valve (BAV), which presents unique anatomical and technical challenges. However, data on the outcomes of TAVI in this specific patient population remain limited, especially with regard to long-term follow-up.

This study aimed to evaluate the outcomes of TAVI in low-risk, i.e., Society of Thoracic Surgeons (STS) score <4 , young (≤ 75 years) BAV patients, both during hospitalization and at 5-year follow up, and to compare these results with those of older (>75 years) BAV patients undergoing TAVI.

Methods

The retrospective, observational, international AD HOC registry (Characteristics, Sizing, and Outcomes of Stenotic Raphe-Type Bicuspid Aortic Valves Treated with Trans-catheter Device Implantation) includes 980 patients with Sievers type 1 BAV stenosis who underwent TAVI between 2016 and 2023. For the purpose of this analysis, patients were categorized

into three age-based groups: i) <69 years with STS <4 (Group I, $n = 113$), ii) 69–75 years with STS <4 (Group II, $n = 173$) and iii) >75 years (Group III, $n = 694$).

Baseline clinical, imaging and procedural data were retrospectively collected. In-hospital outcomes and post-TAVI echocardiographic assessments were documented at discharge. The most recent clinical follow-up was obtained through outpatient visits or structured telephone interviews, and included the last available echocardiographic evaluation and registration of major adverse events (MAEs), which were defined as a composite of all-cause mortality, stroke or transient ischemic attack (TIA), and hospitalization for heart failure. Group comparisons were performed using the chi-square or Fisher's exact test for categorical variables, and one-way analysis of variance or the Kruskal-Wallis test for continuous variables, as appropriate. The cumulative incidence of MAEs was estimated using Kaplan-Meier survival analysis, comparing the survival curves across groups using the log-rank test.

Results

Hypertension and coronary artery disease were significantly more prevalent in Group III ($P < 0.001$). Previous atrial fibrillation and history of stroke/TIA were more frequent in Groups II and III ($P < 0.001$ and $P = 0.03$, respectively).

On CT angiography, the ratio between the length of raphe and antiraphe space was significantly greater in Group I and II compared to Group III ($P=0.03$) while raphe localization showed no significant differences ($P = 0.68$) among the three groups.

Annular/LVOT calcification greater than mild was more frequently observed in Group I than Group II and III ($P=0.04$); however, the prevalence of severe calcification remained comparable ($P = 0.91$).

Procedural characteristics were largely consistent across the three age groups, with no significant differences observed in key technical aspects. Device success, as defined by VARC-3 criteria, was high and comparable among the groups: 86.6% in Group I, 91.2% in Group II and 89.8% in Group III ($P = 0.45$). Group III demonstrated a slightly lower mean post-procedural transvalvular gradient (ΔP), i.e., 9 mmHg vs. 11 mmHg in Group I ($P = 0.01$).

During follow up, in Group 1, there were negligible differences in mean ΔP s between pre-discharge and up to 5-year echocardiographic evaluation. In Group II, a modest but significant increase in median ΔP was noted: from 7 to 10 mmHg at 2-year follow-up ($P = 0.03$) and from 9 to 13 mmHg at 3-year follow-up ($P = 0.009$). In Group III, no significant changes in ΔP were observed throughout the 5-year follow-up period.

Immediately after the procedure, mild paravalvular leak (PVL) was more frequently observed in Group III compared to Groups I and II (44.1% vs. 33.9% vs. 31.0%, $P = 0.002$). However, the rate of PVL \geq moderate remained comparable across all groups (1.8%, 2.3% and 3.9%, respectively). During follow-up, PVL severity remained similar among the groups, except at 5 years, where Group III showed a higher incidence of mild PVL ($P = 0.006$). The prevalence of PVL \geq moderate PVL at 5 years did not differ significantly (6.2%, 12.5% and 12.5%, respectively).

Kaplan-Meier analysis of MAEs demonstrated superior event-free survival at 5 years ($P = 0.039$) in Group II (71.3%) compared to Group I (57.1%) and Group III (56.4%).

Conclusions

TAVI in young low-risk BAV patients demonstrated favorable in-hospital outcomes comparable to those observed in older patients (>75 years-old), with low mean aortic ΔP s and low incidence of PVL \geq moderate, with no significant progression over a 5-year follow-up period.

C31

TAVI TAKEAWAY. A HUB-AND-SPOKE PROTOCOL TO PERFORM TRANSFEMORAL TAVI

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Introduction

Transcatheter Aortic Valve Implantation (TAVI) is the first-line intervention for older patients that suffer from aortic stenosis (AS), or for those with increased surgical risk. In our Country, these patients can undergo TAVI only in Heart Valve Centres (HVC) with Cardiac Surgery Unit onsite, which produce long waiting lists because they cannot admit all the patients who need this intervention. Our Institution (Rovigo Hospital) is a Spoke-Centre for heart valve treatment, so we realized a Hub-and-Spoke protocol with our reference HVC (Verona University Hospital) to perform "TAVI takeaway".

Methods

This is a multicentric retrospective observational descriptive study performed to evaluate the technical and clinical outcomes of patients undergoing TAVI with Hub-and-Spoke protocol.

The protocol is as follows.

- Patient transfer by ambulance from Rovigo Hospital to Verona University Hospital.
- Transfemoral TAVI procedure in Verona Cath Lab.

46° CONGRESSO NAZIONALE GISE

- After a short post-procedural monitoring, patient transfer back to Rovigo; otherwise, if adverse events occur that do not allow transport to Rovigo, patient is hospitalized at the Cardiology Unit of Verona University Hospital.

Patients were consecutively enrolled between October 2023 and March 2025 by Interventional Cardiology Unit of Rovigo Hospital. The primary endpoint was the Technical Success (at exit from procedure room) composite endpoint defined by the Valve Academic Research Consortium-3 (VARC-3) classification. The secondary endpoints were the Device Success (at 30 days) and the Early Safety (at 30 days) composite endpoints defined by VARC-3 classification.

Results

Between October 2023 and March 2025, 71 patients underwent transfemoral TAVI with this Hub-and-Spoke protocol: 35 (49.3%) patients were female, mean age was 82 (79-84) years, with low STS Score 3.27 (2.09-5.60). The primary endpoint (VARC-3 Technical Success) was observed in 67 (94.4%) patients. Only 7 (9.9%) patients were subsequently hospitalized in Verona Hospital because of intraprocedural complications; among these, 4 (5.6%) patients experienced major vascular complications, 2 (2.8%) developed complete atrio-ventricular (AV) block that required urgent PPM implantation, and only 1 (1.4%) intraprocedural cardiogenic shock because of very low left ventricle ejection fraction (LVEF). 2 (2.8%) patients were transferred back to Rovigo with temporary PM despite the advanced AV block without complications.

At the univariable logistic regression analysis, hostile access site (OR 7.250 [1.302-40.358], $p=0.021$) resulted as significant predictor of procedural complications that require hospitalization in Verona University Hospital, while age, STS score, LVEF, NYHA class and QRS length at baseline EKG were not. After adjustment for clinical confounders, hostile access site resulted independently associated with procedural complications that require hospitalization in Verona University Hospital (aOR 11.651 [1.504-90.248], $p=0.019$), while age showed a trend to significantly (aOR 1.312 [0.965-1.783], $p=0.083$). About the secondary composite endpoints at 30 days, VARC-3 Device Success was observed in 63 (88.7%) patients, while VARC-3 Early Safety was observed in 55 (77.5%) patients. In particular, 7 (9.9%) patients suffered from in-hospital major bleedings, 4 (5.6%) patients suffered from in-hospital major vascular complication, and 1 (1.4%) suffered from ischemic stroke. Death within 30 days occurred in 1 (1.4%) patient. No one underwent vascular or cardiac surgery.

Conclusions

Our data suggest that this Hub-and-Spoke protocol to perform "TAVI takeaway" is simple, safe and effective. Since the patients are admitted to the Spoke Centre and, therefore, their hospitalizations (pre- and post-TAVI) does not burden the Hub Centre, dedicated TAVI sessions allow to lighten the waiting lists and, furthermore, to train the Interventional Cardiologists for this type of procedure. Moreover, recent Trials have shown that TAVI is a safe and effective procedure even for younger patients with low surgical risk, therefore the overbooking problem in Hub Centres will get worse, at least until Cardiac Surgery standby is necessary. For this reason, a protocol like this is essential to improve the health-care system and to ensure appropriate access to adequate care for all patients with AS who require TAVI.

C32**COMPUTED TOMOGRAPHY SCAN PREDICTORS AND PROGNOSTIC IMPACT OF COMBINED PULMONARY HYPERTENSION IN PATIENTS WITH AORTIC VALVE STENOSIS UNDERGOING TAVI**

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Introduction

Pre-capillary (PrPH) and combined pre- and post-capillary pulmonary hypertension (CoPH) increase all-cause and cardiovascular mortality risk in patients undergoing TAVI for severe symptomatic aortic stenosis. Since pulmonary artery (PA) diameter adapts to increased pulmonary artery pressure, this study evaluates the correlation between CT-derived main PA (MPA), right PA (RPA), left PA (LPA) diameters, and the MPA/ascending aorta (AA) ratio with PH subtypes defined by right heart catheterization (RHC), as well as their prognostic impact.

Methods

This retrospective study includes all consecutive patients undergoing TAVI between June 2007– December 2022 with pre-TAVI RHC and ECG-gated CT scans.

The primary endpoint was all-cause mortality. Mean follow-up time was 5 years.

Results

Among 638 consecutive patients, 329 (51%) had normal mPAP, while 309 (49%) had PH. Of these, 143 (46%) had isolated post-capillary PH (IpcPH), and 166 (54%) had CoPH. Patients with PrPH were excluded. CoPH patients had higher PAP than both IpcPH and no-PH groups.

In univariable and multivariable analysis, MPA, MPA index (MPAI), RPA,

RPA index (RPAi), MPA/AA, MPAi/AA, and RPA/LPA correlated with PH, while MPA, MPAi, RPA, RPAi, MPA/AA, and MPAi/AA were associated with CoPH. The best AUC for PH discrimination was MPAi (AUC=0.71, cutoff=16 mm/m², sensitivity=66%, specificity=72%), while MPA/AA best discriminated CoPH (AUC=0.73, cutoff=0.88, sensitivity=67%, specificity=72%).

Patients with PA/AA <0.88 had significantly lower five-year mortality after TAVI than those with PA/AA ≥0.88 (log-rank $p=0.046$, HR 1.39).

Conclusions

In conclusion, increase in MPA/AA CT-derived ratio is predictive of Combined PH, highlighting patients who could benefit from a RHC in term of CV stratification before TAVI.

C33**PORTICO VALVE-IN-VALVE FOR DEGENERATED SURGICAL AORTIC BIOPROSTHESES: A REAL-WORLD SINGLE-CENTER EXPERIENCE**

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Introduction

Transcatheter valve-in-valve (ViV) implantation is an established strategy to manage failed surgical aortic bioprostheses. The PORTICO transcatheter heart valve (THV) is an intrannular self-expanding valve and, although there is robust evidence showing a similar hemodynamic performance with respect to the Evolut platform (Portico IDE trial), it is not frequently used in this setting precisely because it is intrannular, and thus hypothetically associated with higher post procedural gradients compared to other self-expanding THVs. As a consequence, there is very limited data available.

This study sought to evaluate the procedural and mid-term outcomes of aortic ViV procedures using the Portico THV.

Methods

retrospective, single-center study including 117 consecutive patients undergoing transcatheter ViV implantation with the Portico THV between January 2016 and December 2024. All procedures were performed for failed surgical bioprostheses due to stenosis, regurgitation, or mixed etiology.

Results

The majority of the patients (59, 51%) had stented bioprostheses with externally mounted pericardial leaflets. The primary failure mode was stenosis (56, 50%), followed by regurgitation (29, 25%) and mixed etiology (28, 25%). In 82% of the cases, a small surgical valve (size ≤23 mm) was treated. Median time to surgical valve failure was 9 years (IQR 7-12). In 87 cases (74.4%) a 23-mm Portico THV was used. Post-dilation was performed in most (75%) cases. Coronary protection was used in 48 cases (41%): 1 case of BASILICA technique, and 47 cases of Chimney technique. Bioprosthetic valve fracture (BVF) was performed in 15% of cases.

Technical success was achieved in 94% of patients, with no procedural mortality; 6 patients (5.2%) required a second valve due to embolization. Device success was 63.2%, primarily limited by residual mean gradient ≥20 mmHg (33, 28.7%) and moderate-or-worse paravalvular leak (9, 7.8%). Prosthesis-patient mismatch (PPM) occurred in 32 patients (34.4%) and was severe in 10 (10.8%).

Surgical valve size ≤21 mm was an independent predictor of PPM at multivariable analysis.

At 1-year follow-up, valve gradients and aortic valve area remained stable. The composite endpoint of all-cause death or stroke occurred in 20.0% at 1 year and 28.9% at 2 years. Multivariable analysis identified chronic kidney disease (CKD) as an independent predictor of the primary endpoint.

Conclusions

Portico TAVI-ViV is a feasible option for treating failed surgical aortic bioprostheses. Procedural outcomes were favorable considering this complex scenario, though elevated residual gradients and PPM may occur, particularly in small surgical valves. Of note, mid-term outcomes were significantly influenced exclusively by baseline comorbidities.

C34**SMALL LEFT VENTRICLE AS ECHOCARDIOGRAPHIC PREDICTORS OF IN-HOSPITAL OUTCOMES IN PATIENTS WITH SEVERE AORTIC STENOSIS UNDERGOING TRANSCATHETER AORTIC VALVE IMPLANTATION**

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Introduction

Patients with severe aortic stenosis and a concomitant small left ventricle (LV) have shown significant variability in periprocedural outcomes after transcatheter aortic valve implantation (TAVI). Currently, the literature includes only one study on this topic, from a Japanese multicenter

registry, which highlighted a significant correlation between the presence of a small LV and worse post-procedural outcomes at two years after TAVI compared to patients with normal LV dimensions. Our study aims to explore the clinical, laboratory, echocardiographic characteristics and periprocedural complications in this specific population of patients with severe aortic stenosis and a small LV undergoing TAVI.

Methods

This retrospective analysis was conducted on data from patients undergoing TAVI at our center. From February 2018 to January 2025, 482 patients underwent TAVI at our institution. Data from 336 patients were collected and analyzed. A left ventricular end-diastolic diameter (LVEDD) less than 38 mm in female patients and 42 mm in male patients was defined as the criterion for identifying a small left ventricle. The population was divided into two groups based on LVEDD defined as non-small left ventricle (non-SLV) and small left ventricle (SLV). The following periprocedural outcomes were analyzed: in-hospital mortality, duration of coronary intensive care unit stay, total hospital stay, development of left bundle branch block (LBBB) on electrocardiogram, permanent pacemaker implantation, stroke/transient ischemic attack (TIA), acute kidney injury (AKI), shock, vascular complications, bleeding, and infections (e.g., pneumonia) developed during hospitalization.

Results

Two hundred forty-five patients belonged to the non-SLV group and 90 patients to the SLV group. Significant baseline differences were observed between the two groups. The SLV group showed a higher prevalence of female patients (78% vs. 45%, $p<0.0001$), lower body surface area (1.69 m^2 vs 1.8 m^2 ; $p<0.0001$) and body mass index (25 kg/m^2 vs 26.2 kg/m^2 ; $p=0.048$), higher left ventricular ejection fraction (LVEF) values (57% vs. 55%, $p<0.0001$), lower cardiac mass (178.4 g vs 240 g ; $p<0.0001$), and more severe echocardiographic indices of aortic stenosis severity characterized by smaller valve area (0.6 cm^2 vs 0.7 cm^2 ; $p=0.001$), higher peak gradient (69 mmHg vs 63 mmHg ; $p=0.040$) and mean gradient (44 mmHg vs 42 mmHg ; $p=0.019$). The analysis of periprocedural outcomes revealed a higher number of vascular complications (16.7% vs. 9%; $p=0.043$). There was a trend toward increased post-procedural bleeding (23.3% vs. 19.2%; $p=0.378$), new-onset atrial fibrillation/flutter (7.8% vs. 3.7%; $p=0.023$), LBBB (30% vs. 22.4%; $p=0.117$) and higher in-hospital mortality (6.7% vs. 3.7%; $p=0.251$) in the SLV group, although these were not statistically significant. The prevalence of AKI, hypotension, cardiac tamponade, cardiogenic shock, stroke/TIA, and permanent pacemaker implantation was similar between the two groups. The length of postoperative hospitalization, including coronary intensive care stay, was comparable between groups.

Conclusions

Our analysis showed that the presence of a small left ventricle correlates with patients with reduced body surface area and body mass, female sex, and more severe echocardiographic parameters of aortic stenosis. The postoperative course was characterized by a higher incidence of complications despite a similar length of hospitalization between the groups. Our results suggest that integrating the analysis of left ventricular dimensions in the screening of patients with severe aortic stenosis undergoing TAVI may help predict the risk of periprocedural complications and improve in-hospital patient management.

C35

PREDICTED VERSUS ACTUAL PROSTHESIS-PATIENT MISMATCH AFTER TAVR: A TWO CENTER REGISTRY

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Introduction

Prosthesis-patients mismatch (PPM) occurs when the effective orifice area (EOA) of the inserted prosthetic valve is too small in relation to the patient's body surface area. PPM can be measured with TTE (measured prosthesis-patient mismatch [PPMm]) or predicted (predicted prosthesis-patient mismatch [PPMp]) using published EOA reference values. This registry aims to evaluate the prevalence of PPMm and PPMp and assess the echocardiographic and clinical characteristics of patients with PPM following TAVR in a contemporary real-world cohort.

Methods

This two-center retrospective registry includes 902 patients who underwent TAVR between January 2021 and January 2023 using self-expanding valves (Evolut, Portico/Navitor, Acurate Neo 2) or balloon-expandable valves (Sapien, Myval) at two high-volume tertiary centers in Spain and Italy. Pre-operative evaluations, echocardiographic data, procedural characteristics, and post-procedural findings were collected. PPMm was defined per Valve Academic Research Consortium 3 (VARC-3) criteria based on indexed EOA (iEOA) measured before and after TAVR, while PPMp was assessed using core-lab adjudicated EOA reference standards. Moderate PPM was defined by iEOA >0.65 and $\leq 0.85\text{ cm}^2/\text{m}^2$ (>0.55 and $\leq 0.70\text{ cm}^2/\text{m}^2$ if BMI $>30\text{ kg/m}^2$), and severe PPM by iEOA $\leq 0.65\text{ cm}^2/\text{m}^2$ ($\leq 0.55\text{ cm}^2/\text{m}^2$ if BMI $>30\text{ kg/m}^2$).

Results

Of the 902 patients, 738 (81.8%) had no PPMm, while 164 (18.2%) exhibited PPMm, including 32 (3.5%) with severe, and 136 (15.1%) with moderate PPMm.

PPMp was less common, with 2.8% (25 patients) showing moderate and 0% severe PPMp. Mean age was 84.2 ± 6 years, and 51.3% were women. Predicted mortality risk was $5.1\% \pm 3.5\%$ by STS score. Increased weight was linked to higher rates of moderate PPMp ($p<0.001$) and any degree of PPMm ($p=0.004$), likewise female sex correlated with moderate PPMp ($p=0.036$) and with any degree of PPMm ($p=0.006$). Patients with any degree of PPMm or moderate PPMp had smaller aortic annulus diameter ($p<0.001$ and $p<0.001$), smaller annulus perimeter ($p=0.006$ and $p=0.002$), and smaller aortic valve area ($p=0.003$ and $p=0.001$). Lower aortic valve calcium score ($p=0.011$) was noted in PPMm patients, while moderate PPMp patients showed a higher annular eccentricity index ($p=0.009$). The incidence of any degree of PPMm was comparable between balloon-expandable and self-expanding valves ($p=0.408$) and despite the fact that was already significant for moderate PPMp ($p=0.015$), likely reflects the local preference of balloon-expandable valves (11.9%) mostly for patients with large annuli. Among self-expanding valves, PPM rates were similar across devices ($p=0.520$ for PPMm, $p=0.366$ for PPMp) regardless of the intrannular vs suprannular design. PPMm was more frequent with small versus large valves ($p=0.006$). Complications included pacemaker implantation (15.5%) and minor vascular complications (8.8%), with no significant differences in terms of technical and device success between patients with and without PPM.

Conclusions

This registry confirmed that a PPMm concerns almost 1 out of 5 patients, and this rate is much higher than that anticipated by considering the EOA given by the manufacturers. Specific phenotypes of patients (overweight, female) should be evaluated carefully as they are more prone to develop a significant PPM.

C36

GENDER DIFFERENCES IN PROSTHESIS-PATIENT MISMATCH AFTER TAVI: SUBGROUP ANALYSES FROM A SINGLE-CENTER REGISTRY

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Introduction

After aortic valve replacement (both surgical or transcatheter), there is the risk of developing prosthesis-patient mismatch (PPM) when the effective orifice area of the inserted prosthetic valve, functionally normal, is too small in relation to the patient's body surface area and this can lead to worse clinical outcomes. Related predisposing factors are small aortic annuli, obesity, redo procedures and female sex. The objective of this subgroup registry analysis is to evaluate sex-differences characteristics of patients who develop PPM following TAVR in a contemporary real-world cohort.

Methods

This subgroup analysis starts from a single center, prospective registry which includes 670 patients who underwent TAVR in a high-volume center. Pre-operative evaluations, echocardiographic data, procedural characteristics, and post-procedural clinical and echocardiographic findings were collected. PPM was evaluated according to the latest Valve Academic Research Consortium 3 (VARC-3) definition from the indexed EOA measured before and after the procedure.

Results

Of the 671 patients included in the whole registry, 54.3% were female. Of the overall registry patients, 548 (81.8%) had no PPM and 122 (18.2%) presented with PPM, including 22 (3.3%) with severe PPM and 100 (14.9%) with moderate PPM. Female patients, compared to male patients showed: lower body surface area (BSA), lower prevalence of prior coronary artery bypass grafting (CABG), smaller aortic dimensions (smaller aortic annulus perimeter, smaller aortic valve area, smaller mean sino-tubular-junction (STJ) diameter, smaller left ventricular outflow tract (LVOT) diameter), lower calcium scores and shorter distance between the aortic annulus and the ostia of the coronary arteries (all $p<0.001$). No significant difference in body mass index (BMI) between genders, female patients had significantly higher left ventricular ejection fraction (LVEF) but no significant difference in mean aortic gradient between genders. In procedural terms female patients received smaller predilatation and postdilatation balloon sizes compared to male patients ($p < 0.001$). The proportion of female patients was higher for smaller valve sizes, while larger valve sizes were more frequently used in male patients ($p < 0.001$). As post-procedural outcomes, left ventricular ejection fraction (LVEF) was significantly higher in female patients compared to male patients, however, no significant changes in LVEF were observed within each gender group between pre- and post-procedural assessments; no significant differences were observed in post-procedural aortic valve area (AVA), effective orifice area (EOA), and mean aortic gradient between male and female patients. From the whole registry of patients ($n=670$), we selected all the TAVI procedures in native aortic valves ($n=637$). Patients were divided according to the valve size (23, 25, 26, 27, 27.5, 29, 30.5, 32, 34). For bigger valve sizes (more than 30.5) incidence of PPM was very low (only 3 patients of the overall cohort). We thus created 5

46° CONGRESSO NAZIONALE GISE

different subgroups according to valve size (23, 25, 26, 27 + 27.5, 29). In every group no statistically difference of the incidence of PPM between the two sexes was found. Except for 23 size group (where men did not develop PPM), within all the other valve-size groups we found statistically significant gender differences in terms of annulus perimeter, annulus area, calcium score, LVOT dimension, STJ dimension and, in smaller sizes, mean diameter of the valvuloplasty balloon ($p < 0.001$). Table 1.

Size		Female	Male	P value
23	PPM	18 (21.7%)	0 (0.0%)	0.579
	CT-derived perimeter	66.2 ± 3.0	70.5 ± 3.7	0.006
25	PPM	25 (25.0%)	7 (25.0%)	1.000
	CT-derived perimeter	71.1 [66.8 – 75.4]	75.2 [69.8 – 80.6]	<0.001
26	PPM	12 (21.8%)	3 (21.4%)	1.000
	CT-derived perimeter	69.6 ± 3.6	73.8 ± 5.8	0.002
27 + 27.5	PPM	7 (14.6%)	10 (16.1%)	0.824
	CT-derived perimeter	75.1 ± 3.7	79.0 ± 3.8	<0.001
29	PPM	8 (16.3%)	15 (10.8%)	0.309
	CT-derived perimeter	77.1 ± 3.8	81.0 ± 7.2	<0.001

Table 1.

Conclusions

Female patients demonstrated a higher incidence of PPM compared to males. This association may be attributed to smaller aortic annulus dimensions, smaller aortic valve areas, smaller left ventricular outflow tract (LVOT) dimensions, and lower calcium scores in females. This is also reflected in procedural parameters, including predilatation and postdilatation balloon sizes, within the PPM population. Female patients, compared to males, exhibit a higher prevalence of paradoxical low-flow low-gradient (LFLG) aortic stenosis. Studies on mid-to-long-term outcomes after TAVI have shown that, despite higher in-hospital and 30-day mortality rates in females, primarily driven by vascular complications and high-risk bleeding events, female patients exhibit better long-term survival. Notably, in this context, PPM itself, which is a strong risk factor for adverse outcomes in women, does not appear to be associated with worse survival compared to male patients. High transvalvular gradients, which can occur in patients with PPM, may accelerate valve degeneration. However, there is no evidence to suggest that the durability of TAVI bioprostheses is lower in female patients compared to male patients. In small valve sizes PPM female patients, compared to males, have mean aortic perimeter dimension inside the reference interval but with values close to the upper reference limit. These findings highlight the importance of considering sex-specific differences in aortic stenosis anatomy and hemodynamics when selecting valve size and managing patients undergoing TAVI. The relationship between transprosthetic gradients, flows, and EOA can be simplified by the following equation: $GPT = Q^2 / [k \times EOA^2]$. According to our results, in female patients, when aortic annulus dimensions are close to the upper reference limit of the valve size chart, there's high risk of developing PPM as showed by lower iEOA.

This finding would theoretically imply a gender-based size chart, as those currently used may be inaccurate for the female genders. On the other hand, the evidence of higher PPM in women has never been correlated with an accelerated degeneration of the transcatheter bioprosthesis, thus, in the absence of any clinical effect, it may be conceivable that the definition itself of PPM may be inaccurate for women, perhaps related to a constant k that could be better defined on a gender basis.

STRUCTURAL HEART DISEASE: LAAO**C37****CLINICAL AND PROCEDURAL OUTCOMES OF THE PERCUTANEOUS LAO CLOSURE IN ATRIAL FIBRILLATION PATIENTS WITH HIGH CLINICAL AND BLEEDING RISK. INSIGHT FROM THE MULTI-CENTER LAIT (LAMBRE ITALIAN) REGISTRY**

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Introduction

Left atrial appendage (LAA) closure is a therapeutic option for atrial fibrillation (AF) patients at high bleeding risk who cannot undergo long-term oral anticoagulation. The LAMBRE™ Closure System offers a novel design potentially reducing perforation risks due to its proximal deployment strategy. However, real-world data in elderly, comorbid populations are limited.

Methods

This multicenter Italian registry (LAIT) enrolled 225 consecutive patients (mean age 76.2 years; 65.3% male) undergoing LAMBRE™ implantation across 11 centers. Most had AF (98.2%) and significant comorbidities (mean Charlson Index 6.0). Indications included major bleeding history (56.9%) or high bleeding risk. Transesophageal echocardiography was used in 97.8% of procedures. Procedural and follow-up outcomes (median 3.5 months) were assessed in 215 patients.

Results

Procedural success was 99.1%. Mean procedure and fluoroscopy times were 72.3 and 14.1 minutes, respectively. Device embolization occurred in 1.9%, cardiac tamponade in 1.4%, and TIA/stroke in 2.3%. Major bleeding occurred in 7.0% of patients during follow-up. No device-related deaths were reported, while non-device-related mortality was 11.2%.

Conclusions

In a real-world cohort of elderly, high-risk AF patients, LAMBRE™ LAA closure showed high procedural success and low complication rates. These findings support its feasibility in patients unsuitable for long-term anticoagulation and highlight the need for further prospective studies.

STRUCTURAL HEART DISEASE: PFO CLOSURE**C38****DURATION OF ANTIPLATELET THERAPY AFTER TRANSCATHETER PFO CLOSURE: INSIGHTS FROM THE PROLONG REGISTRY**

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Introduction

Following transcatheter patent foramen ovale (PFO) closure, dual antiplatelet therapy (DAPT) is commonly prescribed for 3–6 months and followed by single antiplatelet therapy (SAPT), but the optimal duration of SAPT remains undefined. To evaluate the long-term safety and efficacy of short-term (≤ 1 year) versus long-term (> 1 year) antithrombotic therapy following PFO closure in patients with cryptogenic embolism.

Methods

This retrospective analysis from the Italian PROLONG registry included 939 patients with complete data on antithrombotic therapy duration following PFO closure. Patients were categorized based on short- or long-term therapy. The primary endpoint was a composite of ischemic events (ischemic stroke, transient ischemic attack [TIA], or systemic embolism) or major bleeding (Bleeding Academic Research Consortium [BARC] type ≥ 3). Cox regression was used to identify independent predictors of the composite endpoint.

Results

During a median follow-up of 14.5 ± 2.4 years, a non-significant trend favoring short-term therapy emerged for the composite endpoint (0.27 vs. 0.42 events per 100 patient-years; HR: 0.64; 95% CI: 0.35–1.16;

p=0.138). This was mainly driven by a lower incidence of major bleeding (0.06 vs. 0.16 events per 100 patient-years; HR: 0.37; 95% CI: 0.12–1.15; p=0.086), while ischemic event rates were comparable (0.21 vs. 0.26 events per 100 patient-years; HR: 0.76; 95% CI: 0.37–1.55; p=0.444). RoPE score was the only independent predictor of the composite endpoint (HR: 0.83; 95% CI: 0.70–0.98; p=0.025). Stratified analysis by RoPE score showed that the benefit of short-term therapy was mainly driven by patients with RoPE ≥ 7 (HR: 0.41; 95% CI: 0.14–1.17; p=0.095), while no difference was observed in those with RoPE < 7 (HR: 0.86; 95% CI: 0.41–1.79; p=0.683).

Conclusions

Short-term antithrombotic therapy (≤ 1 year) after PFO closure may reduce bleeding without compromising ischemic protection, particularly in patients with a baseline RoPE score ≥ 7 . These findings support a personalized, risk-based approach to antithrombotic therapy duration.

STRUCTURAL HEART DISEASE: MITRAL INTERVENTIONS

C39

PREVALENCE AND PROGNOSTIC ROLE OF LEFT ATRIAL REVERSE REMODELING IN PATIENTS UNDERGOING MITRAL TRANSCATHETER EDGE-TO-EDGE REPAIR

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Introduction

Atrial enlargement is a complex maladaptive process related to pressure and volume overload. Left atrial reverse remodeling (LARR) has been described as a result of medical therapies (RAASI), cardiac resynchronization therapy (CRT), surgical mitral valve repair and atrial fibrillation (AF) ablation. LARR prevalence and its prognostic significance following mitral transcatheter edge-to-edge repair (M-TEER) are currently unknown and represent the objectives of this study.

Methods

Data regarding 425 patients who received successful M-TEER in 5 Italian centers, from 2012 to 2024, with available data regarding left atrial volume (LAV) at baseline and short-term follow-up have been analyzed. LARR has been defined as a reduction in LAV $\geq 15\%$. LARR prevalence and its impact on the composite outcome of heart failure (HF) hospitalization and all-cause mortality at 4 years follow-up have been evaluated in the overall population and according to mitral regurgitation (MR) etiology.

Results

At short term follow-up (98 days – IQR 63-148) LARR was observed in 124 patients (29,20%). LARR was significantly more prevalent among patients with primary MR (PMR) compared to those with ventricular secondary (vSMR) and atrial secondary MR (aSMR) (37,23% vs 27,19% vs 18,33% respectively; P = 0,017). Main LARR predictors included PMR etiology, largest LAVi, younger age and absence of AF history. Furthermore, patients with LARR showed more frequently left ventricular reverse remodeling (LVRR). At long-term follow-up (28,8 month – IQR 12,0-51,6) the composite outcome of all-cause mortality or HF hospitalization occurred in 153 patients. LAAR was independently associated with lower risk of events in the overall population (adjusted HR 0,59; 95%IC 0,43-0,85; p = 0,005). Among different MR aetiologies, LAAR was independently related to adverse outcome only in patients with vSMR (adjusted HR 0,43; 95% IC 0,26-0,71; p 0,001), but not in those with aSMR or PMR.

Conclusions

LARR was observed in less than one third of patients undergoing M-TEER (29,2%), occurring more frequently in those with PMR. LAAR was independently associated with lower risk of all-cause mortality and HF hospitalization in the overall population and particularly in patients with vSMR.

C40

LONG-TERM FOLLOW-UP AFTER MITRAL VALVE TRANSCATHETER EDGE-TO-EDGE REPAIR

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Introduction

The treatment of patients with severe mitral regurgitation (MR) has been entirely revolutionized by transcatheter mitral edge-to-edge repair (M-TEER). Even though survival data has been published by several studies, there is currently limited evidence regarding long-term consequences and survival trends as well as death causes in real-world registries.

Methods

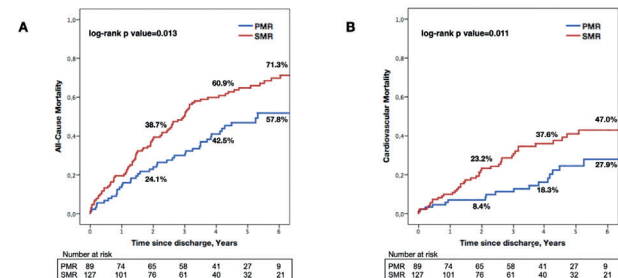
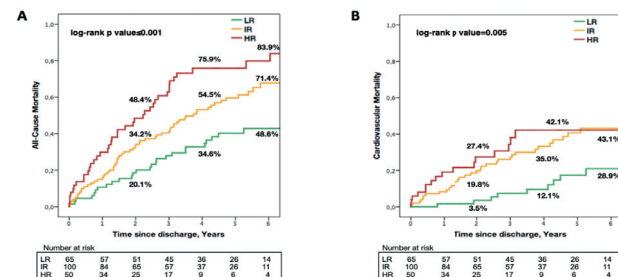
Consecutive patients undergoing M-TEER with the Mitraclip device for severe MR between February 2016 and June 2021 in 1 interventional center in Northern Italy were included. The main objective of this study was to investigate the long-term causes of death after M-TEER and to compare the baseline characteristics of patients who survived with those who did not, with the goal of identifying predictors of long-term mortality. Secondary aims involved analyzing differences in mortality rates and causes of death across calendar periods, as well as by etiology and risk categories defined by the MitraScore.

Results

During median follow-up time of 3.3 years (maximum 8.5), among 218 patients that underwent M-TEER, there were 130 deaths (59.6%), with 45% due to cardiovascular (CV) cause, and 88 survived patients. There were no differences in terms of cardiac and non-cardiac mortality between the first three years (2016-2019) and those after. After adjusting for possible confounders, ischemic secondary MR etiology, prior Heart Failure, TAPSE/SPAP ≤ 0.36 , MitraScore and at least moderate tricuspid regurgitation were independent predictors of overall mortality. Patients with low risk MitraScore had lower all-cause and cardiovascular mortality compared to those at high risk (48.6% vs 83.9%, p<0.001 and 28.9% vs 42.1%, p=0.005, respectively). After stratification for MR etiology, those with secondary MR had higher all-cause and CV mortality, than patients with primary MR (71.3% vs 57.8%, p=0.013, 47% vs 27.9%, p=0.011, respectively).

Conclusions

M-TEER using the MitraClip device has shown sustained effectiveness and safety, with consistent long-term survival rates and notable functional gains among survivors. Patients with long-term survival rates have residual mortality risk similar to the general population. Although mortality outcomes vary depending on the etiology of MR, the MitraScore continues to serve as a dependable tool for risk evaluation, supporting the effective management of MR patients and minimizing unnecessary interventions.



STRUCTURAL HEART DISEASE: TRICUSPID INTERVENTIONS

C41

REFINING RISK IN T-TEER: PROGNOSTIC VALUE OF INVASIVE HEMODYNAMICS BEYOND GUIDELINE THRESHOLDS – INSIGHTS FROM THE EUROTR REGISTRY

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Background

Right heart catheterization (RHC) plays a pivotal role in the preprocedural evaluation of patients considered for transcatheter tricuspid edge-to-edge repair (T-TEER). This study aimed to explore the potential impact of hemodynamic parameters obtained through RHC on patient-centered outcomes.

Methods

This study represents a pre-specified analysis from the retrospective, multicenter EuroTR registry (European Registry of Transcatheter Repair for Tricuspid Regurgitation; NCT06307262). For this analysis, patients who underwent isolated (T-TEER) for significant tricuspid regurgitation (TR) between 2016 and 2024 were included, provided they had complete invasive hemodynamic data. Hemodynamic variables of interest included mean pulmonary artery pressure (mPAP), pulmonary capillary wedge pressure (PCWP), pulmonary vascular resistance (PVR), right atrial mean pressure (RAP), and cardiac output (CO). Optimal cut-off values for continuous variables were determined using the maximally selected rank statistic to identify thresholds most strongly associated with clinical outcomes. The primary patient-centered outcome was a composite of 6-month all-cause mortality, hospitalization for heart failure (HFH), persistent New York Heart Association (NYHA) class IV symptoms, or worsening NYHA class compared to baseline. Secondary outcomes included a composite of 2-year all-cause death or HFH, as well as postprocedural NYHA class improvement.

Results

A total of 711 patients (mean age 79 years; 48% male) were analyzed, with a median follow-up of 377 days [IQR: 168–697]. The primary composite outcome of early death, HFH, or NYHA class IV/worsening occurred in 25% of cases. Two-year event-free survival was 63%. Optimal prognostic thresholds identified were: mPAP ≥ 32 mmHg, PCWP ≥ 20 mmHg, PVR ≥ 5 WU, RAP ≥ 9 mmHg, and CO ≤ 5 L/min. Based on these cut-offs, 35% of patients had relevant pulmonary hypertension and 32% exhibited postcapillary involvement; PVR ≥ 5 WU was present in 10%. In multivariate analysis (Table 1, Figure 1), PCWP ≥ 20 mmHg (HR 2.48; 95% CI 1.09-5.66; $p=0.03$) and PCWP (HR 2.69; 95% CI 1.06-6.85; $p=0.04$) were independently associated with early clinical deterioration. Increased PCWP remained independently associated with 2-year death/HFH (HR 1.81; 95% CI 1.15-2.94; $p=0.01$). Effective TR reduction independently predicted late but not early outcomes. NYHA class improved significantly throughout the follow up ($p<0.001$), although patients with elevated mPAP or PCWP experienced less symptomatic benefit ($p<0.05$ for both) (Figure 2).

Conclusion

In patients undergoing T-TEER, invasive hemodynamics—especially elevated PCWP—are independently associated with early patient-centered outcomes and late adverse clinical events. Despite overall improvement of the functional status, those with higher mPAP or PCWP benefit less. The prognostic thresholds identified for hemodynamic variables exceed current ESC guideline definitions, suggesting that diagnostic criteria may not adequately reflect procedural risk in this population. These findings support the role of comprehensive RHC in preprocedural risk stratification.

Table 1: Predictors of early death/HFH/NYHA class IV or worsening and 2 years death/HFH. AS: aortic stenosis; CO: cardiac output; eGFR: estimated glomerular filtration rate; HFH: heart failure hospitalization; LVEF: left ventricle ejection fraction; LVEDD: left ventricle end-diastolic diameter; MI: myocardial infarction; mPAP: mean pulmonary artery pressure; NYHA: New York Heart Association; PCWP: pulmonary capillary wedge pressure; PVR: pulmonary vascular resistance; RAP: right atrial

pressure; RV: right ventricle; TAPSE: tricuspid annular plane systolic excursion; TR: tricuspid regurgitation.

Predictors of early death/HFH/NYHA class IV or worsening	Univariate			Multivariate		
	HR	95% CI	p	HR	95% CI	p
Previous MI	2.21	1.19-4.08	0.012	2.20	0.90-5.41	0.085
Corony artery disease	1.58	1.04-2.40	0.031	1.13	0.57-2.23	0.723
HFH during last year	2.43	1.49-3.97	<.001	3.53	1.59-7.79	0.002
LVEF (%)	0.98	0.96-0.99	0.008	1.01	0.98-1.04	0.561
LVEDD (mm)	1.02	1.01-1.05	0.032	1.07	1.03-1.11	0.002
Baseline AS $\geq 2+$	3.58	1.34-9.54	0.011	5.29	1.24-22.66	0.025
TR Vena contracta (mm)	1.09	1.04-1.14	<.001	1.08	1.01-1.15	0.029
Rv mid-diameter (mm)	1.03	1.03-1.05	0.026	0.98	0.95-1.02	0.377
TAPSE (mm)	0.92	0.87-0.97	0.002	0.93	0.86-1.00	0.060
eGFR (ml/min)	0.98	0.97-0.99	0.014	1.00	0.99-1.02	0.771
Residual TR $\geq 3+$	2.20	1.34-3.60	0.002	1.99	0.89-4.46	0.095
PAP ≥ 32 mmHg	2.07	1.36-3.15	<.001	0.77	0.33-1.81	0.557
PCWP ≥ 20 mmHg	2.47	1.61-3.77	<.001	2.48	1.09-5.66	0.031
RAP ≥ 9 mmHg	1.91	1.07-3.40	0.028	1.39	0.57-3.42	0.469
PVR ≥ 5 WU	2.31	1.27-4.21	0.006	2.69	1.06-6.85	0.037

Predictors of 2 y death/HFH	Univariate			Multivariate		
	HR	95% CI	p	HR	95% CI	p
Sex (male)	1.63	1.23-2.16	0.001	1.29	0.83-2.00	0.251
HFH during last year	2.32	1.64-3.22	0.001	2.22	1.39-3.57	0.001
History of cardiac surgery	1.45	1.08-1.94	0.015	1.24	0.82-1.86	0.310
mPAP ≥ 32 mmHg	1.96	1.49-2.63	<.001	1.26	0.76-2.08	0.366
PCWP ≥ 20 mmHg	1.69	1.26-2.32	<.001	1.81	1.15-2.94	0.011
RAP ≥ 9 mmHg	1.69	1.26-2.32	<.001	0.98	0.57-1.66	0.939
CO ≥ 5 l/min	1.70	1.26-2.29	0.001	1.45	0.94-2.24	0.095
PVR ≥ 5 WU	1.73	1.18-2.53	0.005	1.48	0.83-2.64	0.188
Residual TR $\geq 3+$	1.61	1.16-2.23	0.005	1.85	1.18-2.90	0.007
eGFR (ml/min)	0.98	0.98-0.99	<.001	1.00	0.99-1.01	0.924
RV mid-diameter (mm)	1.02	1.01-1.04	0.001	0.99	0.97-1.02	0.583
TAPSE (mm)	0.94	0.91-0.97	<.001	0.95	0.91-0.99	0.022
LVEF (%)	0.98	0.97-1.00	0.006	1.00	0.98-1.02	0.873
LVEDD (mm)	1.02	1.01-1.03	0.001	1.04	1.01-1.07	0.011

Figure 1: Kaplan-Meier analysis for 2 years survival free from death and HFH according PCWP. HFH: heart failure hospitalization; PCWP: pulmonary capillary wedge pressure.

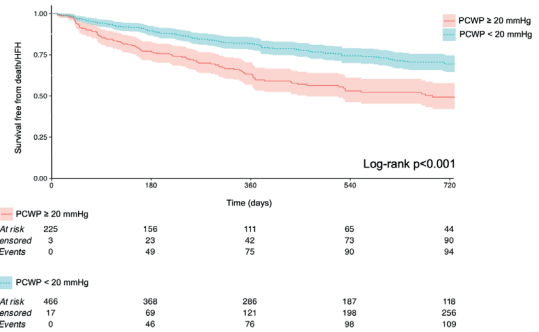
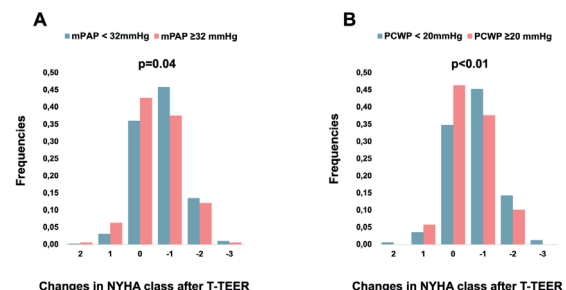


Figure 2: Changes in NYHA class after T-TEER according to mPAP (panel A) and PCWP (panel B). Negative values represent improvement after T-TEER, positive values vice versa. NYHA: New York Heart Association; T-TEER: transcatheter tricuspid edge-to-edge repair; mPAP: mean pulmonary artery pressure; PCWP: pulmonary capillary wedge pressure.



C42

CONCOMITANT VS. STAGED MITRAL AND TRICUSPID EDGE-TO-EDGE REPAIR: THE COMMITTEE STUDY

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Introduction Severe tricuspid regurgitation (TR) is a common finding in patients undergoing percutaneous mitral intervention. A significant proportion of patients may not experience significant TR improvement despite successful mitral procedure. Concomitant mitral and tricuspid transcatheter edge-to-edge repair (M-TEER and T-TEER, respectively) has been proposed as a therapeutic strategy for patients with simultaneous atrio-ventricular valve disease. This study aimed to assess the prognostic relevance of concomitant M-TEER and T-TEER compared to a staged approach.

Methods This retrospective, observational, international, multicentre registry was conducted across 7 sites in Europe and United States. Patients

ts were categorized according to procedural timing, namely a) concomitant group (simultaneous M-TEER and T-TEER) and b) staged group (M-TEER before or after T-TEER). Primary endpoint was a composite of 2-year all-cause mortality and re-hospitalization for heart failure according to procedural timing.

Results A total of 56 patients (mean age 80 ± 7 years; female 56%) were enrolled, with 23 (53%) individuals included in concomitant group. No significant differences were observed among study groups in terms of baseline clinical, echocardiographic and hemodynamic features, except for pulmonary vascular resistance which was relevantly higher in concomitant group (3.8 ± 2.0 vs. 1.9 ± 0.7 WU, $p = 0.007$). Patients included in staged group, underwent T-TEER 4 [2; 14] months after M-TEER. Similar rate of technical success for both procedures was observed among study groups. At 2-year follow, primary endpoint occurred more frequently in staged group (61% vs. 70%, log-rank $p = 0.045$). Univariate Cox regression analysis identified concomitant approach (HR 0.360, 95% C.I., 0.074 – 0.976, $p = 0.048$) and T-TEER technical success (HR 0.207, 95% C.I., 0.061 – 0.704, $p = 0.012$) as predictor of freedom from primary endpoint.

Conclusions In a contemporary, real-world cohort of patients with severe MR and TR undergoing M-TEER and T-TEER, concomitant procedure was associated with better mid-term clinical outcome compared to staged approach.