Abstracts of

INDIA LIVE 2026 ABSTRACTS

CORONARY INTERVENTIONS

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

MISCELLANEOUS

CORONARY INTERVENTIONS

Two-year outcome of sirolimus-coated versus paclitaxel-coated balloon angioplasty for the treatment of femoropopliteal artery disease: evidence from the randomized SIRONA trial

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Background: The SIRONA trial is the first randomized controlled trial (RCT) comparing the efficacy of sirolimus-coated balloon (SCB) angioplasty, a novel approach, to the standard of care, paclitaxel-coated balloon (PCB) angioplasty in patients with peripheral artery disease (PAD).

Aims: To assess the midterm efficacy and safety of SCB versus PCB angioplasty in the treatment of femoropopliteal lesions.

Methods: This prospective, multicentre, randomized, noninferiority trial enrolled 482 participants experiencing clinical symptoms classified as Rutherford category 2-4, with confirmed femoropopliteal lesions. Between April 2021 and September 2022, participants were randomly allocated to receive either SCB (n = 238) or PCB (n = 244) at 25 centres. The mean age was 68.0 years, with 64.5% of participants being male. The average lesion length was 8.4 cm, and 33.2% of the lesions were occluded; 28.3% of lesions were assessed as severely calcified. Key secondary endpoints evaluated at 24 months included primary patency, freedom from clinically driven target lesion revascularization (TLR), major amputation, and all-cause mortality.

Results: At the 24-month mark, primary patency rates were 64.6% for SCB and 67.2% for PCB (log-rank p = 0.34). Freedom from clinically driven TLR was reported at 91.2% for SCB and 88.6% for PCB (log-rank p = 0.32). Both groups maintained a 99.6% rate of freedom from major amputation.

Conclusions: Midterm results affirm comparable efficacy between SCB and PCB, showing a trend toward reduced TLRs with SCB, though statistical superiority has not yet been proven.

CORONARY INTERVENTIONS

The Role of Pharmacological Cocktails in Preventing Radial Artery Spasm and Complications During PCI: A Clinical Study

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Background: Radial artery access for PCI reduces bleeding risk and accelerates recovery, but radial artery spasm (RAS) can compromise procedural success. Pharmacological cocktails of vasodilators, antispasmodics and anticoagulants have been proposed to prevent RAS and improve outcomes.

Aims: To evaluate the efficacy of a pharmacological cocktail in reducing RAS, improving procedural success and minimising post-procedural complications.

Methods: This prospective, observational study included 900 patients undergoing elective PCI from January to December 2024, randomised into Cocktail (n=450) and Control (n=450) groups. The intra-arterial cocktail contained nitro-glycerine (100 µg), verapamil (2.5 mg) and heparin (5000 IU). Radial artery Doppler ultrasonography assessed patency, flow velocity and complications the day after PCI. Pain and spasm severity were evaluated using a visual analogue scale.

Results: RAS incidence was lower in the Cocktail group (5% vs 20%, p<0.001). Procedural success was higher (98% vs 90%, p<0.01) and radial artery patency improved (99% vs 92%, p<0.01). Post-procedural complications, including radial artery occlusion, were reduced (1% vs 5%, p<0.01). Doppler ultrasonography showed higher peak systolic (45 vs 30 cm/s) and end-diastolic velocities (10 vs 5 cm/s) and minimal flow resistance in 90% of cocktail patients versus 25% in controls.

Conclusions: A pharmacological cocktail of nitro-glycerine, verapamil and heparin significantly reduces RAS, enhances procedural success and decreases complications during PCI. These findings support routine use of this cocktail to improve patient safety and procedural efficiency. Longer-term studies are warranted to evaluate sustained benefits.

CORONARY INTERVENTIONS

Patient-Centric Barriers to Timely Reperfusion in ST-Elevation Myocardial Infarction: A Single-Centre Experience from a Tertiary Care Hospital in India

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Background: Timely primary percutaneous coronary intervention (PCI) is the cornerstone of ST-elevation myocardial infarction (STEMI) management. While tertiary care centres in India are equipped to deliver standard-of-care interventions, real-world delays persist, often unrelated to institutional capabilities. There are limited data on non-system, patient-related delays in STEMI care from low- and middle-income countries.

Aims: To evaluate the major contributors to delayed reperfusion in patients with STEMI at a high-volume Indian tertiary care hospital, with a focus on patient-centric and socio-economic barriers.

Methods: This retrospective observational study analysed patients with confirmed STEMI who presented to our tertiary care centre between January 2022 and June 2025. First medical contact-to-device time and total ischaemic time were recorded. Patients presenting beyond 6 hours from symptom onset were reviewed for contributing delay factors, categorised into (1) pre-hospital delays, (2) intra-hospital delays, and (3) socio-economic or decisional factors.

Results: Among 346 patients with STEMI, 61.4% (n=520) presented after 6 hours from symptom onset, and 18.3% (n=155) presented near or beyond the 12-hour window. The most common causes for delay were patient unawareness or misinterpretation of symptoms (72%), delay in reaching a medical facility (59%), initial presentation to a non-PCI-capable centre (41%), delayed decision-making by family due to financial concerns or lack of insurance (54%), and patient or family denial of illness or fear of angioplasty (36%). Only 42% of patients were eligible for any government-sponsored health scheme. Institutional workflow metrics, including door-to-balloon time, remained within guideline-recommended limits in 85% of patients once a decision for PCI was made.

Conclusions: Our single-centre experience underscores that delays in reperfusion in India are predominantly patient-centred, involving late presentation, symptom denial, socio-economic constraints, and decisional delays. Strengthening community education, enhancing emergency medical services, and expanding universal healthcare coverage are critical to improving timely STEMI care in the Indian context.

CORONARY INTERVENTIONS

Renal Safety of OCT- vs IVUS-Guided PCI in Moderate CKD

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Background: Patients with chronic kidney disease (CKD) undergoing percutaneous coronary intervention (PCI) are vulnerable to contrast-associated acute kidney injury. Optical coherence tomography (OCT) often requires more contrast than intravascular ultrasound (IVUS), raising concern in CKD; however, real-world renal safety data are limited.

Aims: To compare renal effects and 1-year clinical outcomes of OCT- versus IVUS-guided PCI in patients with moderate CKD.

Methods: We retrospectively analysed 65 consecutive patients with CKD (estimated glomerular filtration rate 45–60 mL/min/1.73 m²) who underwent intravascular imaging-guided PCI between January 2022 and January 2024. Final optimisation was performed using either OCT or IVUS according to operator preference, with a uniform peri-procedural hydration protocol. Recorded variables included demographics, risk factors, contrast volume, baseline and post-procedural creatinine, and need for in-hospital dialysis. Patients were followed for 1 year for major adverse cardiac events (MACE: all-cause death, myocardial infarction, or target-vessel revascularisation) and CKD progression.

Results: Contrast volume was higher with OCT than with IVUS (123±32.4 mL vs 104±23.4 mL). A post-procedural rise in creatinine occurred in 2.2% of OCT cases versus 1.8% of IVUS cases (p = NS); no patient required dialysis. At 1 year, MACE rates were low and comparable between OCT and IVUS (0.68% vs 0.76%, p = NS), with no significant difference in CKD progression or need for chronic renal replacement therapy.

Conclusion: In patients with moderate CKD undergoing PCI with standardised hydration, OCT-guided PCI did not increase creatinine rise, 1-year MACE, or CKD progression compared with IVUS despite higher contrast use, supporting the renal and clinical safety of both intravascular imaging strategies in this setting.

CORONARY INTERVENTIONS

Comparative Outcomes of Culprit-Only Versus Complete Revascularization Strategies in Acute Coronary Syndrome with Multivessel Disease: A Single-Center Experience

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Background: Coronary multivessel disease (MVD) is present in 50% of patients presenting with acute coronary syndrome (ACS), posing a complex revascularisation decision. Randomised trials have demonstrated the superiority of complete revascularisation—angiography- or physiology-guided—over culprit-only intervention in reducing major adverse cardiovascular events (MACE), but real-world Indian data remain limited.

Aims: To evaluate and compare clinical outcomes among patients with ACS and MVD undergoing culprit-only percutaneous coronary intervention (PCI), angiography-guided complete revascularisation, or physiology-guided complete revascularisation.

Methods: This retrospective study included 263 consecutive patients admitted with ACS and multivessel disease between January 2020 and December 2023. Patients were stratified into three groups based on revascularisation strategy following culprit-lesion PCI: culprit-only PCI (n=108), angiography-guided complete revascularisation (n=84), and physiology-guided complete revascularisation (n=71).

Results: The primary outcome was MACE at 12 months, defined as cardiovascular death, myocardial infarction, or unplanned revascularisation. MACE occurred in 25.9% of patients in the culprit-only group, 12.5% in the angiography-guided group, and 11.3% in the physiology-guided group (p=0.02). Cardiovascular mortality was lower in the physiology-guided group (4.2%) compared with the angiography-guided (6.0%) and culprit-only groups (9.3%). Unplanned revascularisation was significantly higher in the culprit-only group (17.6%) compared with the angiography-guided (7.1%) and physiology-guided (5.6%) groups (p=0.01).

Conclusion: Both angiography-guided and physiology-guided complete revascularisation were associated with significantly lower MACE rates compared with culprit-only PCI. While outcomes were comparable between complete revascularisation strategies, physiology-guided PCI showed a trend towards improved cardiovascular survival, supporting a complete revascularisation approach in selected patients with ACS and MVD.

CORONARY INTERVENTIONS

Prophylactic Jailed-Balloon Technique for Major Side-Branch Protection in Complex Bifurcation PCI: Prospective Comparative Single-Centre Data

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Background: Side-branch (SB) compromise during bifurcation percutaneous coronary intervention (PCI) can precipitate periprocedural ischaemia, particularly when the SB subtends a large myocardial territory. The jailed-balloon technique (JBT) offers prophylactic SB protection, but comparative data from Indian practice are limited.

Aims: To prospectively evaluate whether prophylactic jailed-balloon technique during complex coronary bifurcation PCI provides superior major side-branch preservation and reduces periprocedural ischaemic complications.

Methods: In this prospective, single-centre, open-label study, 57 consecutive patients undergoing bifurcation PCI with an important SB were enrolled. Twenty-five patients formed the JBT group, and 32 underwent conventional provisional main vessel stenting without prophylactic SB ballooning (non-JBT group). JBT was selected when the operator anticipated a high risk of SB occlusion. In the JBT group, 76% of lesions were non-left main (LM) bifurcations and 24% were LM bifurcations. Overall, 59% of patients had severe left ventricular dysfunction, 40% had diabetes, and many had calcified lesions, acute coronary syndrome, or single-surviving-vessel anatomy. All procedures followed a provisional single-stent strategy. SB drug-coated balloon (DCB) angioplasty was used in 15% of JBT cases. The primary endpoint was angiographic SB compromise, defined as TIMI flow <3 and/or ≥70% residual stenosis with clinical ischaemia.

Results: JBT was technically successful in all 25 cases. SB patency with final TIMI 3 flow and a good angiographic SB result was achieved in 25/25 (100%) JBT cases. In contrast, SB compromise occurred in 9/32 (28.1%) non-JBT cases (p=0.01). Bailout SB stenting was required in 0/25 (0%) versus 7/32 (21.9%) (p=0.02), and periprocedural myocardial infarction occurred in 0/25 (0%) versus 3/32 (9.4%) (p=0.09) in the JBT and non-JBT groups, respectively. Main-vessel results were satisfactory in both groups.

Conclusion: In complex, high-risk bifurcation PCI, prophylactic JBT provides more predictable major SB preservation and reduces bailout SB interventions compared with a conventional approach without SB protection, while maintaining a simple provisional single-stent strategy.

CORONARY INTERVENTIONS

Efficacy of Side-Branch Drug-Coated Balloons Versus Conventional Provisional or Two-Stent Strategies in Bifurcation Lesions: A Comprehensive Systematic Review and Meta-Analysis

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Background: Side-branch (SB) compromise continues to challenge optimal outcomes in coronary bifurcation percutaneous coronary intervention (PCI). Drug-coated balloons (DCBs) offer stent-less drug delivery while preserving SB architecture and may improve long-term results compared with plain balloon angioplasty (BA), provisional stenting, or two-stent strategies. Evidence synthesis from contemporary trials is needed.

Aims: To perform a systematic review and meta-analysis of PubMed-indexed studies evaluating SB DCB use versus non-DCB bifurcation PCI strategies, including BA with or without provisional stenting or planned two-stent approaches.

Methods: Following PRISMA guidelines, PubMed, Embase, and Cochrane databases were searched from inception to November 2025. Randomised trials and observational studies assessing *de novo* bifurcation lesions treated with SB DCB use were included. Comparators were BA or two-stent techniques. The primary endpoint was major adverse cardiovascular events (MACE) at ≥12-month follow-up. Secondary endpoints included target lesion revascularisation (TLR), target-vessel myocardial infarction (TVMI), and SB late lumen loss (LLL). Effect estimates were pooled using random-effects models.

Results: Seventeen studies (7 randomised controlled trials and 10 observational studies; 3,048 patients) were included. SB DCB use was associated with lower event rates compared with non-DCB strategies, with MACE of 7.8% versus 10.4% (risk ratio [RR] 0.81; 95% confidence interval [CI] 0.66–1.02), TLR of 4.2% versus 6.1% (RR 0.72; 95% CI 0.52–1.10), and TVMI of 2.5% versus 4.5% (RR 0.56; 95% CI 0.36–0.88). SB LLL was significantly reduced with SB DCB use, with a mean difference of –0.20 mm (95% CI –0.32 to –0.08). In left main bifurcation subsets, a lower composite MACE rate was observed with drug-eluting stent main-branch treatment plus SB DCB compared with two-stent strategies.

Conclusion: Across contemporary literature, SB DCB use during bifurcation PCI improves angiographic outcomes and reduces TVMI, with favourable trends in MACE and TLR. A DCB-based SB strategy represents a promising alternative to conventional provisional or complex two-stent techniques and merits evaluation in larger dedicated trials.

CORONARY INTERVENTIONS

Paclitaxel-Coated Balloon versus New-Generation Drug-Eluting Stents in Elderly Indian Patients With Complex Coronary Lesions: A Single-Center Retrospective Analysis

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Background: In elderly patients with coronary artery disease (CAD), particularly those with small vessels, side branches, calcification, chronic kidney disease (CKD), and in-stent restenosis (ISR), percutaneous coronary intervention (PCI) remains challenging. While drug-eluting stents (DES) are standard, drug-coated balloons (DCBs) may reduce the risks of long-term stent-related complications. Indian data comparing paclitaxel-coated balloons (PCB) with new-generation DES are limited.

Aims: To evaluate the safety and efficacy of PCB compared with latest-generation DES (Onyx Frontier, Xience Sierra) in elderly Indian patients with complex CAD.

Methods and **Results:** We retrospectively analysed 72 consecutive patients aged ≥65 years who underwent PCI between January 2024 and December 2024 at a tertiary care centre. Baseline characteristics included diabetes in 40%, ISR in 40%, CKD in 35%, and a high prevalence of calcified lesions. Patients were stratified into a PCB group (n=34) and a DES group (n=38). Follow-up was performed at 6 months. The primary endpoint was net adverse cardiac events (NACE), defined as death, myocardial infarction, target lesion revascularisation (TLR), or BARC 3–5 bleeding. Secondary outcomes included procedural success and restenosis. NACE occurred in 14.7% of patients in the PCB group versus 18.4% in the DES group (p=0.62). TLR rates were 8.8% versus 13.2%, respectively. Major bleeding (BARC 3–5) was lower in the PCB group (2.9% vs 10.5%, p=0.04). Procedural success was achieved in 94% of PCB cases and 96% of DES cases. In the ISR subgroup, outcomes were similar between the two strategies.

Conclusion: In this elderly Indian cohort with high-risk anatomical and clinical features, PCB demonstrated comparable efficacy to new-generation DES at 6 months, with a lower risk of major bleeding. These findings suggest PCB as a valuable alternative in small vessels, side branches, and ISR lesions, particularly in patients at increased bleeding risk.

CORONARY INTERVENTIONS

Early Aspirin Discontinuation and Ticagrelor Monotherapy After Onyx Frontier™ Drug-Eluting Stent Implantation in Very High Bleeding Risk Acute Coronary Syndrome: A Single-Centre Retrospective Proof-of-Concept Study

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Background: Early aspirin discontinuation with ticagrelor monotherapy after drug-eluting stent (DES) implantation may reduce bleeding; however, data in very high bleeding risk (HBR) patients treated with Onyx Frontier™ are limited.

Aim: To evaluate early discontinuation of dual antiplatelet therapy (DAPT) in a post-PCI cohort with HBR.

Methods: We performed a single-centre retrospective cohort study of 105 HBR patients with acute coronary syndrome (ACS) who underwent percutaneous coronary intervention (PCI) with at least one Onyx Frontier™ DES between January 2024 and January 2025. All patients received initial DAPT with aspirin plus ticagrelor. According to physician discretion, patients were treated either with early aspirin discontinuation and ticagrelor monotherapy within 1 month (early aspirin stop group) or with continued DAPT beyond 1 month (standard DAPT group). The primary endpoint was a 9-month composite of all-cause death, myocardial infarction, definite or probable stent thrombosis, stroke, and BARC ≥3 bleeding.

Results: The cohort was 75% male; 63% had diabetes, 50% had calcified lesions, 40% had bifurcation disease, and 12% had chronic total occlusions. Aspirin was discontinued at a median of 13 days in the early aspirin stop group. At 9 months, the primary endpoint occurred in 4 patients (7.7%) in the early aspirin stop group versus 8 patients (15.4%) in the standard DAPT group. Major bleeding (BARC ≥3) was lower with early aspirin discontinuation (1.9% vs 9.6%), while ischaemic events were similar between the groups.

Conclusions: In this HBR ACS cohort treated with Onyx Frontier™ DES, early aspirin discontinuation with ticagrelor monotherapy was feasible and associated with numerically lower major bleeding and a more favourable 9-month composite outcome compared with continued DAPT, without an apparent ischaemic penalty.

CORONARY INTERVENTIONS

Prognostic Factors and Clinical Outcomes in Acute Coronary Syndromes Due to Saphenous Vein Graft Occlusion After Coronary Bypass Surgery

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Background: Acute coronary syndrome (ACS) secondary to saphenous vein graft occlusion in patients with prior coronary artery bypass graft (CABG) surgery represents a unique, uncommon, and clinically challenging situation. Understanding outcome patterns and predictors may help optimise management strategies and improve prognosis.

Aim: To describe clinical presentation, procedural success, and in-hospital and short-term outcomes of patients with prior CABG presenting with ACS due to saphenous vein graft occlusion, and to assess the impact of PCI success on outcomes.

Methods: We retrospectively analysed 32 patients with prior CABG who presented with ACS (ST-elevation myocardial infarction, non-ST-elevation myocardial infarction, or unstable angina) secondary to saphenous vein graft occlusion. Baseline demographic, procedural, and in-hospital data were collected. The primary outcomes were in-hospital major adverse cardiac events (MACE), in-hospital mortality, and outcomes at 6-month follow-up.

Results: Among the 32 patients, non-ST-elevation myocardial infarction occurred in 46.9%, unstable angina in 43.8%, and ST-elevation myocardial infarction in 9.4%. The mean age was 66.7±8.8 years, and 84.4% of patients were male. Of the 32 patients who underwent coronary angiography, 29 underwent successful percutaneous coronary intervention (PCI) (90.6%), with an overall in-hospital mortality rate of 6.2%. Unsuccessful PCI was associated with a significantly higher in-hospital mortality rate compared with successful PCI (33.3% vs 3.4%, $p<0.05$). At 6-month follow-up, 6.7% of discharged patients experienced stent thrombosis.

Conclusion: Successful PCI was a key factor associated with improved in-hospital outcomes in post-CABG patients presenting with ACS. Larger-scale studies are required to validate these findings and to further elucidate factors that place this high-risk population at increased risk of adverse outcomes

CORONARY INTERVENTIONS

Assessment of incidence and angiographic characteristics of patients with no reflow after primary percutaneous coronary intervention

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Background: The no-reflow phenomenon is an important cause of suboptimal reperfusion in patients with ST-elevation myocardial infarction (STEMI) undergoing primary percutaneous coronary intervention (PCI) and is associated with adverse short-term outcomes.

Aims: To assess the incidence, angiographic and procedural predictors of no-reflow, and its impact on in-hospital outcomes following primary PCI.

Methods: This prospective observational study included 547 consecutive patients with STEMI treated with primary PCI at a tertiary care centre. Clinical, angiographic, and procedural variables were analysed. No-reflow was defined as a final TIMI flow ≤2. In-hospital outcomes were compared between patients with and without no-reflow.

Results: No-reflow was observed in 12% of patients. It was significantly associated with high thrombus burden (TIMI grade 4–5; p=0.003), poor baseline TIMI flow (grade 0–1; p=0.004), prolonged total ischaemic time ($p<0.0001$), multivessel coronary artery disease (p=0.012), proximal culprit lesions, and absence of post-dilatation ($p<0.0001$). Predilatation and thrombus aspiration did not significantly reduce the incidence of no-reflow. Diabetes mellitus showed a trend towards association, while other conventional risk factors were not predictive. Patients with no-reflow had higher rates of cardiogenic shock, malignant ventricular arrhythmias, and significantly increased in-hospital mortality compared with those without no-reflow (16.9% vs 8.8%; p=0.04).

Conclusions: No-reflow remains a frequent complication after primary PCI and is driven predominantly by ischaemic burden, thrombus load, and adverse angiographic characteristics rather than traditional risk factors. Its strong association with early mortality underscores the need for early risk stratification and targeted procedural and pharmacological strategies to improve myocardial perfusion and short-term outcomes in patients with STEMI.

CORONARY INTERVENTIONS

Clinical Outcomes of Hypertensive vs Non-Hypertensive Patients Undergoing PCI: A Single-Center Experience of 205 Cases with One-Year Follow-Up

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Background: Hypertension is a common comorbidity that may influence coronary complexity and outcomes after percutaneous coronary intervention (PCI).

Aims: To compare demographics, angiographic and procedural characteristics, and 1-year clinical outcomes between hypertensive (HTN) and non-hypertensive patients undergoing PCI.

Methods: This retrospective observational study included 205 consecutive patients who underwent PCI between January 2023 and December 2024 at a tertiary cardiac centre. Patients were categorised as hypertensive (n=92; 45%) or non-hypertensive (n=113; 55%). The primary outcome was major adverse cardiovascular events (MACE) at 1 year, defined as a composite of cardiac death, myocardial infarction, stent thrombosis, and target lesion revascularisation. Bleeding events were assessed using the Bleeding Academic Research Consortium (BARC) criteria (≥2).

Results: Overall, the cohort had a mean age of 62.8±10.4 years, and 76% were female. Hypertensive patients were older and more frequently had diabetes and dyslipidaemia. They also demonstrated greater lesion complexity, including higher rates of multivessel disease and calcification, with more frequent use of imaging-guided PCI. Non-hypertensive patients more commonly presented with acute coronary syndrome at admission. Procedural success was high and comparable between groups (HTN 96.7% vs non-HTN 97.3%). At 1 year, MACE was numerically higher in the HTN group (8.6% vs 6.2%), without a statistically significant difference. BARC ≥2 bleeding was infrequent and similar between the groups.

Conclusions: In this real-world single-centre cohort, hypertensive patients had a higher comorbidity burden and more complex coronary anatomy, yet procedural success and 1-year clinical outcomes were comparable to those of non-hypertensive patients, supporting the effectiveness of contemporary PCI strategies in higher-risk hypertensive populations.

CORONARY INTERVENTIONS

Comparative study on MACE in relation to timing of pharmaco invasive PCI in patients presenting with anterior wall ST Segment Elevation Myocardial Infarction

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Background: ST-segment elevation myocardial infarction (STEMI), particularly involving the anterior wall, carries a high risk of morbidity and mortality. Although primary PCI is the preferred reperfusion strategy, limited availability necessitates alternative approaches. A pharmacoinvasive strategy, early thrombolysis followed by planned PCI. However, the optimal timing of PCI after thrombolysis, especially in anterior wall STEMI where myocardial salvage is critical, remains uncertain and may significantly affect left ventricular recovery and clinical outcomes.

Aims: To compare major adverse cardiac events (MACE), left ventricular ejection fraction (LVEF) recovery, angiographic outcomes, and short-term mortality in anterior wall STEMI undergoing pharmacoinvasive PCI.

Methods: This prospective observational study included 480 patients with anterior wall STEMI who received thrombolysis followed by PCI. Patients were stratified into three groups based on PCI timing: 3–10 hours, 10–17 hours, and 17–24 hours post-thrombolysis. Clinical characteristics, procedural outcomes, LVEF, in-hospital complications, and 3-month outcomes were analysed.

Results: PCI performed within 3–10 hours was associated with the greatest improvement in LVEF (45.5% to 53.5%), higher rates of post-PCI TIMI grade III flow, and significantly lower rates of MACE and mortality (p<0.0001), without increased major bleeding.

Conclusion: Early pharmacoinvasive PCI within 10 hours is associated with superior functional recovery and outcomes.

CORONARY INTERVENTIONS

Guideline Adherence as a Determinant of 1-Year Target Lesion Failure in True Bifurcation PCI.

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Background: Outcomes in bifurcation PCI may depend more on technical execution and guideline adherence than on strategy choice alone.

Aims: Assess the impact of guideline adherence on 1-year target lesion failure (TLF) in true bifurcation lesions.

Methods: Retrospective registry of 180 true bifurcation PCI cases (Medina 1,1,1 / 1,0,1 / 0,1,1) treated 2023–2024. Guideline adherence is defined by prespecified criteria (appropriate proximal optimization, adequate SB protection, kissing balloon when indicated, and final optimization strategy consistent with lesion anatomy/technique). Primary endpoint: 1-year TLF (cardiac death, TVMI, clinically driven TLR).

Results: Guideline-adherent PCI occurred in 120/180 (66.7%). One-year TLF was 7.0% in adherent vs 15.0% in non-adherent cases (adjusted HR 0.44). The difference was mainly due to lower TLR (3.3% vs 8.3%). Two-stent techniques were used in 35% overall; when performed adherently, outcomes were comparable or superior to provisional in complex anatomy. Procedural complications (SB occlusion, dissection) were more frequent when adherence criteria were not met (10% vs 4%).

Conclusion: In true bifurcation PCI, guideline adherence is strongly associated with reduced 1-year TLF, emphasizing structured technique checklists and intraprocedural optimization.

CORONARY INTERVENTIONS

Factors Linked to Major Adverse Events in the Cath Lab During ACS PCI

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Background: Despite contemporary percutaneous coronary intervention (PCI), a small subset of patients with acute coronary syndrome (ACS) experience procedure-related catastrophic events.

Aims: To identify predictors of catheterisation laboratory major adverse events (CL-MAE) following PCI for ACS.

Methods: This single-centre retrospective case–control study included 180 patients with ACS undergoing PCI between January 2023 and December 2024. CL-MAE was defined as a composite of catheterisation laboratory or in-hospital death, cardiac arrest requiring cardiopulmonary resuscitation, emergency surgery, cardiac tamponade requiring pericardiocentesis, or definite or probable acute stent thrombosis within 24 hours. One-year follow-up was obtained for survival and major adverse cardiovascular events. Multivariable logistic regression was used to evaluate independent predictors.

Results: CL-MAE occurred in 14 of 180 patients (7.8%). Compared with patients undergoing uncomplicated PCI, those with CL-MAE more frequently presented with cardiogenic shock (43% vs 9%), required femoral access (57% vs 28%), had higher baseline creatinine levels (median 1.4 vs 1.0 mg/dL), and had longer fluoroscopy times (median 29 vs 18 minutes). Independent predictors of CL-MAE were cardiogenic shock (adjusted odds ratio [aOR] 5.6), femoral access (aOR 2.7), baseline creatinine per 0.5 mg/dL increase (aOR 1.8), and fluoroscopy time per 5-minute increase (aOR 1.2). One-year all-cause mortality was higher in patients with CL-MAE compared with those without CL-MAE (21% vs 6%).

Conclusion: In patients with ACS undergoing PCI, CL-MAE are uncommon but are strongly associated with cardiogenic shock, renal dysfunction, femoral access, and procedural complexity. These findings support the need for intensified haemodynamic planning and optimisation of vascular access in high-risk patients.

CORONARY INTERVENTIONS

Comparative Efficacy and Safety of High-Dose Statin Monotherapy Versus Low-to-Moderate Dose Statin Combined with Ezetimibe in High-Risk Patients with Atherosclerotic Cardiovascular Disease

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Background: One of the main modifiable risk factors for atherosclerotic cardiovascular disease (ASCVD) is elevated low-density lipoprotein cholesterol (LDL-C). In high-risk patients, high-intensity statin therapy is recommended; however, adherence is frequently limited by adverse effects. Ezetimibe provides an alternative strategy by enhancing LDL-C reduction with improved tolerability when combined with low- or moderate-intensity statins. In this 12-month study, high-dose statin monotherapy is compared with low- or moderate-dose statin plus ezetimibe for efficacy and safety in high-risk patients.

Aims: To assess the effectiveness of high-dose statin therapy versus low- to moderate-dose statins combined with ezetimibe in reducing LDL-C levels and cardiovascular risk in patients with high ASCVD risk over a one-year follow-up period.

Methodology: This prospective study included 100 patients with elevated LDL-C and high ASCVD risk, who were divided into two groups. Group A received high-dose statin therapy (n=50), and Group B received low- or moderate-dose statins plus ezetimibe (n=50). Patients were followed for 12 months to assess LDL-C reduction, achievement of target LDL-C levels (<70 mg/dL), and the occurrence of adverse effects.

Results: Baseline LDL-C levels were comparable between the two groups. At 12 months, Group A demonstrated a greater reduction in LDL-C (85.2±19.1 mg/dL) compared with Group B (76.5±17.8 mg/dL; p=0.03). Achievement of LDL-C <70 mg/dL was more frequent in Group B than in Group A (66% vs 60%, p=0.48). Adverse effects were more common in Group A (18% vs 10%).

Conclusion: Although high-dose statin therapy resulted in greater LDL-C reduction, combination therapy achieved comparable LDL-C target attainment with fewer adverse effects. This approach may represent a safer alternative for patients who are intolerant to high-dose statins.

CORONARY INTERVENTIONS

Ablation Versus Lithotripsy in Severely Calcified Coronary Lesions: Systematic Review and Meta-analysis

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Background: Severe coronary calcification remains a major obstacle during percutaneous coronary intervention (PCI), predisposing to stent underexpansion and adverse events. Rotational atherectomy (RA), orbital atherectomy (OA), and intravascular lithotripsy (IVL) are complementary calcium-modification strategies, but comparative long-term outcome data remain fragmented.

Aims: To systematically compare atherectomy (RA and/or OA) versus IVL in patients undergoing PCI for moderate-to-severe calcified coronary lesions, focusing on ≥12-month clinical outcomes, and to explore differences between RA and OA.

Methods: MEDLINE, EMBASE, Web of Science, Cochrane CENTRAL, Scopus, trial registries, and major cardiology conference proceedings will be searched from inception to December 2025 for randomised and comparative observational studies of PCI in angiographically or intravascular imaging-defined moderate-to-severe calcified lesions. Two reviewers will independently perform study selection, data extraction, and risk-of-bias assessment (RoB 2, ROBINS-I). The primary endpoint will be major adverse cardiovascular events (MACE) at ≥12 months. Secondary endpoints include all-cause and cardiac mortality, target lesion or vessel revascularisation, definite or probable stent thrombosis, and procedural outcomes. Random-effects meta-analyses will compare atherectomy (RA±OA) versus IVL and RA versus OA, with pre-specified subgroup analyses. Network meta-analysis will be performed if feasible.

Results: Prior meta-analyses report higher long-term MACE (RR 1.41) and mortality (RR 2.22) with RA versus non-RA PCI. OA has been associated with lower 1-year MACE (OR 0.66) and target vessel revascularisation compared with RA, but with higher rates of dissection and perforation. IVL consistently demonstrates higher procedural success (RR 1.04) and fewer perforations (RR 0.38) than RA, with similar mortality and revascularisation at follow-up.

Conclusion: IVL appears to offer a favourable balance of safety and efficacy compared with atherectomy, while RA may be associated with worse long-term outcomes. This systematic review will clarify comparative effectiveness to guide device selection in severely calcified coronary lesions.

CORONARY INTERVENTIONS

A study on the clinical profile, angiographic patterns and outcomes in NSTEMI patients with total coronary occlusion

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Background: Contrary to the long-held belief that patients with non-ST-elevation myocardial infarction (NSTEMI) present predominantly with subtotal coronary occlusion, approximately 15% of NSTEMI patients have total coronary occlusion. Early detection and revascularisation are therefore essential to prevent adverse cardiovascular events.

Aims: To study the clinical profile, angiographic patterns, and outcomes of patients with NSTEMI and total coronary occlusion.

Methods: This was a cross-sectional study conducted over a six-month period. Fifty patients with NSTEMI and angiographic evidence of TIMI flow grade 0 or 1 were included, and their clinical and angiographic profiles were recorded.

Results: Among the 50 patients, the majority were male (76%) and were aged between 50 and 60 years (62%). Diabetes mellitus was present in 82% of patients, 35% had uncontrolled hyperglycaemia at the time of presentation, and 74% were chronic smokers. The mean time to coronary intervention was 40 hours (range 24–48 hours). On coronary angiography, the right coronary artery was the most commonly involved vessel, followed by the left circumflex artery and the left anterior descending artery. Triple-vessel disease was present in 40% of patients. In the triple-vessel disease group, many patients had poor revascularisation targets with non-viable myocardium on cardiac magnetic resonance imaging and were managed medically. Percutaneous coronary intervention was performed in PCI-amenable cases, while others were referred for coronary artery bypass grafting. Three per cent of patients had severe left ventricular dysfunction and presented with acute pulmonary oedema and cardiogenic shock.

Conclusion: Patients with NSTEMI should undergo revascularisation at the earliest opportunity to prevent myocardial loss. Multimodality imaging should be considered in all patients with NSTEMI to assess myocardial viability and guide management strategy.

CORONARY INTERVENTIONS

Early echocardiographic evaluation of right ventricular function as a predictor of proximal right coronary artery stenosis in acute inferior wall myocardial infarction

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Background: Right ventricular (RV) involvement in acute inferior wall myocardial infarction (IWMI) is associated with increased morbidity and adverse outcomes. Early identification of proximal right coronary artery (RCA) involvement is clinically important; however, electrocardiographic findings may be transient or insensitive. Echocardiography provides a non-invasive method for early assessment of RV function.

Aims: To evaluate the role of echocardiographic parameters of RV systolic function in predicting proximal RCA involvement in patients with acute IWMI.

Methods: This prospective observational study included patients presenting within 24 hours of a first episode of acute IWMI. Comprehensive transthoracic echocardiography was performed to assess tricuspid annular plane systolic excursion (TAPSE), RV fractional area change (RVFAC), myocardial performance index (MPI), and RV systolic tissue Doppler velocity (S'). Coronary angiography was performed during the index hospitalisation or within one month, and patients were grouped according to the presence of proximal RCA involvement.

Results: Patients with proximal RCA stenosis (n=26) had significantly impaired RV systolic function compared with those without proximal involvement (n=41). TAPSE, RVFAC, and RV S' velocity were significantly lower, while MPI was higher ($p<0.05$ for all). RV wall motion abnormality and RV diastolic dysfunction were more frequent ($p<0.001$). A TAPSE value ≤16 mm demonstrated the highest diagnostic accuracy, with a sensitivity of 90.8% and a specificity of 98.5%.

Conclusions: Echocardiographic assessment of RV systolic function reliably predicts proximal RCA involvement in acute IWMI and may aid early risk stratification and clinical management.

CORONARY INTERVENTIONS

CTO PCI Success in Indian Patients: Hybrid Algorithm Outcomes from Single-Centre Experience

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Background: Percutaneous coronary intervention (PCI) for chronic total occlusion (CTO) remains challenging in India, with reported success rates of 68–87% compared with approximately 90% in expert Western centres. Hybrid algorithms have shown promise; however, real-world Indian data remain limited.

Aims: To evaluate CTO PCI success rates, predictors of success, and clinical outcomes using a hybrid approach in Indian patients.

Methods: This retrospective analysis included 50 CTO PCI cases performed between 2023 and 2025 at our centre. The J-CTO score was calculated for all lesions. A hybrid algorithm was employed, including antegrade wire escalation (AWE), retrograde techniques, and dissection–re-entry strategies. Procedural success was defined as <50% residual stenosis with TIMI grade 3 flow.

Results: The mean age was 62±9 years, and 85% of patients were male. Target vessels included the right coronary artery in 55%, the left anterior descending artery in 30%, and the left circumflex artery in 15%. The mean J-CTO score was 2.1±1.0. Overall procedural success was achieved in 80% of cases (40/50). Success rates by technique were 65% with AWE, 88% with retrograde approaches, and 75% with antegrade dissection–re-entry. In lesions with a J-CTO score ≥2, success was lower compared with those with a score <2 (70% vs 93%, p<0.05). Major adverse cardiovascular events occurred in 4% of patients. Left ventricular ejection fraction improved by 7% following successful CTO PCI.

Conclusion: Hybrid algorithm–guided CTO PCI achieved an 80% success rate in this Indian centre. The J-CTO score was predictive of procedural failure. Structured CTO programmes may improve outcomes of complex PCI in resource-limited settings.

CORONARY INTERVENTIONS

Contemporary Two-Stent Strategies for Coronary Bifurcation PCI: Procedural Optimization and 1-Year Target Lesion Failure in a Single-Centre Registry

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Background: Two-stent bifurcation percutaneous coronary intervention (PCI) is reserved for complex anatomy and remains technically demanding. With routine optimisation using the proximal optimisation technique (POT) and final kissing balloon (FKB) inflation, outcomes may improve compared with historical series.

Aims: To report mid-term clinical outcomes after two-stent bifurcation PCI and to identify predictors of target lesion failure (TLF).

Methods: We conducted a single-centre retrospective registry including consecutive patients treated with a planned two-stent strategy for coronary bifurcation lesions. PCI was performed electively in most cases. Procedural techniques and optimisation steps were recorded. The primary endpoint was TLF, defined as a composite of cardiac death, target-vessel myocardial infarction (TVMI), and target lesion revascularisation (TLR), at approximately 1 year. Definite or probable stent thrombosis was assessed as a safety endpoint. Clinical follow-up was performed to a median of 13.5 months.

Results: A total of 68 patients were included (mean age 61.4±11 years; male predominance). The predominant technique was T and protrusion (81.3%), followed by DK-crush (13.8%), culotte (6.3%), and mini-crush (6.3%). Optimisation was performed at high rates, with POT in 96.5% and FKB in 96.3% of cases. Procedural success was achieved in 100% of patients. At a median follow-up of 13.5 months, TLF occurred in 6.8% of patients, driven mainly by TLR (7.5%) and TVMI (3.8%); cardiac death occurred in 0.3%. Definite or probable stent thrombosis occurred in 0.8%. Independent predictors of TLF included a bifurcation angle >90°, side-branch reference diameter ≤2.5 mm, main-branch lesion length ≥25 mm, and main-branch calcification.

Conclusions: In this contemporary two-stent bifurcation PCI cohort with near-universal use of POT and FKB, procedural success was high and 1-year TLF rates were low. Anatomical complexity remained the principal determinant of adverse outcomes.

CORONARY INTERVENTIONS

MicroRNAs as a Novel Biomarker of Platelet Function and Activity in Patients Undergoing Percutaneous Coronary Intervention

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Background: Dual antiplatelet therapy (DAPT) is essential after percutaneous coronary intervention (PCI), but variable treatment response remains a major challenge. Platelet reactivity assays such as VerifyNow are limited by variability and incomplete reflection of molecular drug response. Platelet-derived microRNAs (miRs) are emerging biomarkers that may better reflect platelet activity at a molecular level.

Aims: To compare conventional platelet reactivity testing using P2Y12 reaction units (PRU) with platelet-derived miRs in patients with acute coronary syndrome (ACS) undergoing PCI and treated with clopidogrel, prasugrel, or ticagrelor.

Methods: This single-centre, prospective, randomised controlled, open-label trial included 100 patients with ACS undergoing PCI who received clopidogrel (n=33), ticagrelor (n=34), or prasugrel (n=33), along with 33 healthy controls. Platelet reactivity was assessed using VerifyNow, and platelet-derived miR-223, miR-126, miR-150, miR-191, and miR-107 were quantified by quantitative polymerase chain reaction using the 2^–ΔΔCt method on day 3 after PCI.

Results: Ticagrelor showed the most consistent suppression of P2Y12 receptor activity and miR expression (median PRU 135 [98–154]; decreased miR-107, miR-126, miR-150, miR-191, and miR-223; p<0.05), followed by prasugrel (median PRU 25 [10–55]; decreased miR-107; increased or unchanged miR-126, miR-150, miR-191, and miR-223) and clopidogrel (median PRU 201 [170–270]; decreased miR-107, miR-126, miR-150, and miR-223; increased miR-191). Clopidogrel resistance was observed in 36.3% (n=12) of patients, all showing miR-191 upregulation.

Conclusions: Platelet-derived miRs provide molecular insight beyond platelet reactivity assays and enable more reliable detection of clopidogrel resistance, potentially guiding early escalation to more potent P2Y12 inhibitors.

CORONARY INTERVENTIONS

Burden and Mechanisms of Coronary Reintervention After CABG: A Single-Centre Experience

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Background: Although coronary artery bypass grafting (CABG) reduces repeat revascularisation, a subset of patients re-presents with ischaemia and require coronary angiography followed by reintervention. Real-world data on the burden and mechanisms of post-CABG reintervention remain limited.

Aims: To quantify the burden of post-CABG coronary reintervention and characterise its principal angiographic mechanisms and clinical predictors in a contemporary single-centre cohort.

Methods: All coronary angiographies performed between January 2018, and December 2024 were retrospectively screened. Patients with prior CABG who underwent coronary reintervention, including percutaneous coronary intervention (PCI) to graft or native vessels or redo CABG, were identified. Aetiology was adjudicated by angiographic and clinical record review and categorised as graft failure, progression of native coronary artery disease (CAD), incomplete revascularisation, or combined mechanisms. All-cause mortality was assessed. Predictors of reintervention were evaluated using multivariable time-to-event analysis.

Results: Among 2,345 coronary angiographies, 154 post-CABG patients underwent coronary reintervention, accounting for 6.6% of the institutional angiography workload. Reintervention was attributed to graft failure in 100 patients (64.9%), progression of native CAD in 31 (20.1%), incomplete revascularisation in 16 (10.4%), and combined factors in 7 (4.5%). All-cause mortality did not differ significantly between patients with and without reintervention (9.7% vs 7.8%, p=0.18). Independent predictors of reintervention were diabetes mellitus (HR 1.58, 95% CI 1.14–2.20), graft age ≥5 years (HR 1.72, 95% CI 1.21–2.44), chronic kidney disease (eGFR <60 mL/min/1.73 m²; HR 1.49, 95% CI 1.03–2.16), and acute coronary syndrome presentation (HR 1.41, 95% CI 1.01–1.97).

Conclusions: Post-CABG coronary reintervention constituted 6.6% of angiography workload, with graft failure as the dominant mechanism. Mortality was comparable to non-reintervention patients. Risk profiling may guide surveillance and secondary prevention.

CORONARY INTERVENTIONS

OCT vs. IVUS: Plaque Morphology in Young Indian ACS (<40 Years)

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Background: Acute coronary syndrome (ACS) in young patients (<40 years) in India is associated with aggressive plaque morphology; however, intravascular imaging data remain limited. Optical coherence tomography (OCT) offers superior spatial resolution compared with intravascular ultrasound (IVUS) for detection of thin cap fibroatheroma (TCFA), which is crucial for risk stratification.

Aims: To compare plaque characterisation using OCT versus IVUS in young Indian patients presenting with ACS.

Methods: This prospective analysis included 25 young patients with ACS (<40 years) who underwent percutaneous coronary intervention with intravascular imaging between 2023 and 2025. Culprit lesions were imaged using both OCT (20 MHz) and IVUS (40–60 MHz). Plaque morphology was classified as lipid-rich, TCFA (fibrous cap thickness <65 µm), calcified, or fibrous.

Results: The mean age was 34±4 years, 80% of patients were male, and 64% presented with anterior wall myocardial infarction. Lipid-rich plaques were detected more frequently by OCT than by IVUS (68% [17/25] vs 52% [13/25]; p<0.05). TCFA detection was significantly higher with OCT compared with IVUS (44% [11/25] vs 28% [7/25]; p=0.04). Correlation for minimal lumen area measurement was stronger with OCT (r=0.88).

Conclusion: OCT detected lipid-rich plaques in 68% and TCFA in 44% of young Indian patients with ACS, compared with 52% and 28%, respectively, using IVUS. The superior resolution of OCT allows identification of vulnerable plaque features that may be missed by IVUS, supporting its use for enhanced risk stratification in young high-risk ACS patients.

CORONARY INTERVENTIONS

Imaging-Guided Inverted Provisional Strategy for Isolated LCx Ostial Disease: A Single-Centre Experience

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Background: Isolated left circumflex (LCx) ostial lesions remain among the most technically challenging subsets for percutaneous coronary intervention (PCI) because of steep vessel take-off, elastic recoil, and frequent calcification, and are associated with higher rates of repeat revascularisation than other coronary locations. An LCx-prioritised "inverted provisional" approach has been proposed for selected Medina 0,0,1 and 1,0,1 anatomy.

Aims: To evaluate procedural feasibility, lesion preparation strategies, and mid-term clinical outcomes of an inverted provisional technique for isolated LCx ostial disease.

Methods: This retrospective single-centre cohort study included 56 consecutive patients undergoing PCI using an inverted provisional strategy for Medina 0,0,1 or 1,0,1 lesion. Use of intravascular ultrasound (IVUS), calcium modification techniques (rotational atherectomy, scoring balloon, or intravascular lithotripsy), procedural success, need for bailout conversion to a two-stent strategy, and 3-year clinical outcomes were assessed. Lesion aetiology and anatomical characteristics were adjudicated by angiographic and clinical record review.

Results: Procedural success was achieved in 54 of 56 patients (96.4%), with 2 patients (3.6%) requiring bailout conversion to a two-stent technique. IVUS guidance was used in 43 patients (76.8%). Coronary dominance favoured an LCx-relevant perfusion territory, with 27 patients (48.2%) demonstrating left-dominant or balanced circulation, and 10 patients (17.9%) having a concomitant right coronary artery chronic total occlusion. Moderate-to-severe calcification was present in 48 patients (85.7%), and dedicated calcium modification was performed in 19 patients (33.9%). At 3-year follow-up, the composite clinical endpoint occurred in 12 patients (21.4%), and target lesion revascularisation in 8 patients (14.3%).

Conclusions: In a carefully selected LCx-dominant anatomical subset, an imaging-guided inverted provisional strategy is feasible and achieves high procedural success, with frequent need for calcium modification and non-trivial 3-year event rates, underscoring the distinct risk profile of isolated LCx ostial disease.

CORONARY INTERVENTIONS

An Independent Prognostic Value of Left Atrial Function by Two-Dimensional Speckle Tracking Imaging in Patients of Acute Coronary Syndrome

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Aim: To evaluate the prognostic value of left atrial (LA) strain parameters for major adverse cardiac events (MACE) and to compare LA strain with established risk scores (GRACE and TIMI) and the development of atrial fibrillation (AF).

Methods: This prospective observational study included 100 consecutive patients with acute coronary syndrome (ACS). Patients with AF, prior coronary artery bypass grafting, or moderate-to-severe valvular heart disease were excluded. Baseline demographic, clinical, echocardiographic (including LA strain and left ventricular global longitudinal strain assessed using Philips EPIQ 7), GRACE and TIMI risk scores, and angiographic data were collected. MACE was the primary outcome during 6-month follow-up. Multivariable logistic regression identified independent predictors.

Results: The mean age was 58.9 years; 75% were male, 58% had hypertension, and 52% had type 2 diabetes mellitus. Mean left ventricular ejection fraction was 44.1%. MACE occurred in 7% of patients (3% cardiovascular death, 4% heart failure), while AF developed in 4%. Independent predictors of MACE were smoking (OR 2.76, p<0.05), hypertension (OR 1.73, p<0.05), diabetes (OR 1.55, p<0.05), TIMI score (OR 1.41, p<0.05), and LA conduit strain (OR 1.19 per 1% less negative strain, p<0.05). The model showed excellent discrimination (AUC 0.919), high specificity (100%), and limited sensitivity (28.6%). Increasing coronary artery disease extent was associated with progressive deterioration in LV and LA function (p<0.001). LA reservoir strain was numerically lower in AF patients (26.1% vs 29.1%; p=0.556) and correlated with NT-proBNP and GRACE score.

Conclusion: LA conduit strain independently predicts adverse cardiac events in ACS, providing incremental prognostic value beyond conventional risk factors and scores. Comprehensive LA strain assessment may enhance risk stratification in ACS.

CORONARY INTERVENTIONS

Post-Pandemic Surge in Young ACS: Comparative Clinical and Angiographic Profiles in Indian Patients (<40 Years)

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Background: Acute coronary syndrome (ACS) in young Indians (<40 years) has shown a rising incidence following the COVID-19 pandemic, with evolving risk factors and angiographic patterns compared with the pre-pandemic era. However, Indian data describing these changes remain limited.

Aims: To compare clinical profiles, cardiovascular risk factors, and coronary angiographic findings in young patients with acute myocardial infarction (AMI) before and after the COVID-19 pandemic.

Methods: This retrospective cross-sectional study included 100 consecutive young patients with ACS (<40 years) treated at our centre between 2018 and 2024. Patients were grouped as pre-COVID (2018–2019; n=40) and post-COVID (2022–2024; n=60). All patients underwent coronary angiography. Traditional and emerging risk factors, including smoking, low high-density lipoprotein cholesterol (HDL-C), and hyperhomocysteinaemia, were assessed.

Results: The mean age was 33.2±4.1 years in the pre-COVID group and 34.1±3.8 years in the post-COVID group. Male predominance was observed in both groups (58% vs 62%). ST-elevation myocardial infarction was more frequent in the post-COVID group compared with the pre-COVID group (65% vs 55%). Left anterior descending artery involvement increased post-COVID (88% vs 82%). Smoking prevalence was higher in the post-COVID group (70% vs 60%), as were rates of low HDL-C (45% vs 40%) and hyperhomocysteinaemia (70% vs 65%).

Conclusion: Young patients with ACS in the post-COVID era demonstrated a higher prevalence of STEMI, greater left anterior descending artery involvement, and increased smoking rates. These findings underscore the need for aggressive cardiovascular risk factor screening and preventive strategies in this high-risk young Indian population.

CORONARY INTERVENTIONS

Speckle-Tracking Derived Global Longitudinal Strain: Superior Early Recovery Marker in STEMI Patients Following Primary PCI

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Background: Left ventricular ejection fraction (LVEF) assessment after ST-elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention (PCI) has limited sensitivity for early myocardial recovery because of load dependence and geometric assumptions. Global longitudinal strain (GLS) assessed by speckle-tracking echocardiography provides improved reproducibility and sensitivity for detecting subclinical myocardial dysfunction.

Aims: To evaluate the ability of GLS compared with LVEF to detect early left ventricular recovery within 72 hours after primary PCI in patients with STEMI.

Methods: This prospective case series included 25 patients with STEMI aged <80 years who underwent urgent PCI at a tertiary care centre between March and August 2025. Patients with prior cardiomyopathy, significant valvular disease, or inadequate echocardiographic windows were excluded. Transthoracic echocardiography was performed before PCI and within 72 hours after PCI. LVEF was measured using the biplane Simpson method, and GLS was assessed from apical views according to American Society of Echocardiography guidelines.

Results: Among the 25 patients, 20 (80%) were male, with a mean age of 58±12 years. Anterior wall STEMI was present in 15 patients (60%), with the left anterior descending artery as the culprit vessel in 60%. Mean GLS improved significantly after PCI (–16.65% vs –17.68%, p<0.01), whereas LVEF did not show a significant change (40.1% vs 40.6%, p=0.45). Patients with non–left anterior descending artery culprit lesions demonstrated greater improvement in GLS compared with those with left anterior descending artery involvement (–1.67% vs –1.21%, p=0.001).

Conclusion: GLS detects early myocardial recovery after primary PCI more effectively than LVEF in patients with STEMI. Greater functional improvement was observed in non–left anterior descending artery territories. Speckle-tracking echocardiography represents a practical bedside tool for early left ventricular assessment, including in resource-limited settings.

CORONARY INTERVENTIONS

From Guidelines to Real-World: Impact of Rosuvastatin–Ezetimibe Combination Therapy in Indian Dyslipidaemia Patients

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Background: Dyslipidaemia is a major risk factor for cardiovascular morbidity and mortality. In high-risk patients with low-density lipoprotein cholesterol (LDL-C) >50 mg/dL, as defined by lipid association of India (LAI) algorithms, aggressive LDL-C lowering is essential and often requires combination therapy with ezetimibe and high-intensity statins. This study evaluated the efficacy and safety of rosuvastatin–ezetimibe in patients with newly diagnosed dyslipidaemia.

Methods: This retrospective, multicentre observational study was conducted across 84 hospitals and included adult patients treated with rosuvastatin–ezetimibe. Demographic characteristics, cardiovascular risk factors, lipid parameters, glycated haemoglobin (HbA1c), blood pressure, and renal function were extracted from medical records.

Results: Data from 845 patients were analysed, of whom 58.1% were men. The majority of patients (62.1%) received rosuvastatin/ezetimibe 20 mg/10 mg. The mean duration of therapy was 3.4 months. The most common risk factors were obesity (36%), family history of cardiovascular disease (28%), smoking (22%), alcohol consumption (18%), and tobacco chewing (15%). Following treatment, significant improvements were observed in lipid parameters: total cholesterol decreased by 33% (228.1 to 153 mg/dL), LDL-C by 46% (142.2 to 76.5 mg/dL), and triglycerides by 28% (186.5 to 134 mg/dL), while high-density lipoprotein cholesterol increased by 11% (42.3 to 47 mg/dL). HbA1c remained stable, systolic and diastolic blood pressure showed a modest decline, and renal function was unchanged. Adverse events were mild, with gastrointestinal discomfort reported in 2% of patients, and no treatment discontinuations were required.

Conclusion: Rosuvastatin–ezetimibe therapy achieved substantial LDL-C and lipid reductions with good tolerability in real-world practice. In Indian patients with high residual cardiovascular risk and suboptimal LDL-C control, this combination represents an effective and safe management strategy.

CORONARY INTERVENTIONS

One-Year Real-World Safety and Performance of the Sirolimus-Eluting Cobalt Chromium Stent in Indian CAD Patients

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Background: Sirolimus-eluting cobalt-chromium drug-eluting stents are widely used in percutaneous coronary intervention (PCI) due to their strut design, deliverability, and antiproliferative efficacy. However, real-world evidence on their safety and performance across complex lesions in the Indian population remains limited.

Aims: To evaluate the 1-year safety and efficacy of sirolimus-eluting cobalt-chromium stents in PCI patients.

Methods: This prospective, single-arm, multicentre, post-marketing observational study was conducted across 14 Indian sites. Patients with coronary artery disease treated with Yukon Choice Flex, Ultima PC, or VIVO ISAR stents were enrolled. The primary endpoint was the device-oriented composite endpoint (DoCE) composed of cardiac death, target vessel myocardial infarction (TV-MI), and target lesion revascularization (TLR). Secondary endpoints included patient-oriented composite endpoints (PoCE), major adverse cardiac events (MACE), stent thrombosis (definite/probable), and device/procedural success. Clinical follow-up was performed at 1 year.

Results: A total of 576 patients were included, with 679 lesions treated using 827 sirolimus-eluting stents. Acute coronary syndrome was the presentation in 426 patients. Complex PCI accounted for a significant proportion, including chronic total occlusions (14.1%) and left main interventions (5.2%). At 1 year, DoCE occurred in 0.35% of patients, while PoCE and MACE were reported in 1.06%. No definite or probable stent thrombosis was observed. Device success was 100%, and procedural success 99.13%.

Conclusions: In this real-world multicentre study, sirolimus-eluting cobalt-chromium stents demonstrated excellent procedural success and favourable safety and efficacy at 1 year, supporting their role in contemporary PCI practice.

CORONARY INTERVENTIONS

Clinical Performance and Safety of Optima NC Non-Compliant and Optima SC Semi-Compliant Balloons: A Multicentre Real-World Study

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Background: Post-marketing evaluation of percutaneous transluminal coronary angioplasty (PTCA) catheters is essential to assess safety and performance during routine percutaneous coronary intervention (PCI).

Aims: To evaluate the procedural performance and short-term safety of Optima NC non-compliant and Optima SC semi-compliant PTCA balloon catheters in patients undergoing PCI for coronary artery disease (CAD).

Methods: This multicentre, retrospective, observational study included 379 CAD patients treated with Optima NC or SC catheters across four centres in India between January and June 2024. The primary endpoint was procedural success, defined as successful device delivery, inflation, deflation, retrieval, achievement of final TIMI flow grade 3, and absence of major complications. Angiographic lesion characteristics and operator-assessed device performance were recorded. Clinical outcomes were assessed up to 3 months.

Results: Device and procedural success were achieved in 98.15% of cases, with acute coronary syndrome accounting for 95% of presentations. Bifurcation lesions were present in ~14% of cases, while calcified plaques were observed in nearly half. Device performance attributes including, pushability, trackability, deliverability, and crossability were rated satisfactory or higher in >90–98% of procedures. No procedural complications, vessel perforations, or in-hospital major adverse cardiovascular events occurred. At 3 months, adverse events were rare: three in the NC group (MI, target lesion failure, cardiac death) and two in the SC group (angina, target lesion failure).

Conclusions: Optima NC and SC catheters demonstrated excellent procedural success, reliable performance, and favourable short-term safety, supporting their complementary role in PCI.

CORONARY INTERVENTIONS

Leave Nothing Behind: Real-World Use of Drug-Eluting Balloons in Diverse Coronary Lesions Including ACS and Large-Vessel Disease

Bhanu Duggal

Aiims Rishikesh

Background: Permanent metallic implants used in coronary intervention reduce restenosis but are associated with late thrombosis, neo atherosclerosis, and prolonged antiplatelet therapy. Drug eluting balloons provide local drug delivery without leaving a scaffold and are increasingly used in selected coronary lesions, though real world data from Indian centres remain limited.

Aims: To evaluate the feasibility and clinical outcomes of drug eluting balloon only angioplasty in diverse coronary artery disease settings.

Methods: This retrospective case series included 17 consecutive patients treated with drug eluting balloon only angioplasty between January 2024 and June 2025. Indications included acute coronary syndromes with deferred stenting, *de novo* lesions, and in stent restenosis. Clinical follow up assessed angina status, major adverse cardiovascular events, and need for repeat revascularization.

Results: The mean age was 54 years and 76 percent were male. Diabetes was present in 64 percent and multivessel disease in 59 percent. Acute coronary syndromes accounted for 66 percent of presentations, with thrombus in 41 percent. Mean treated vessel diameter was 2.75 millimetres. At a mean follow up of 18 months, one major adverse cardiovascular event was observed. Eighty two percent of patients were angina free or minimally symptomatic. No target lesion revascularization was required.

Conclusions: Drug eluting balloon angioplasty appears to be a safe and effective strategy in carefully selected real world patients, including those with acute coronary syndromes and *de novo* lesions. These findings support broader use of a stent free approach, particularly in resource constrained settings.

CORONARY INTERVENTIONS

IVL guided in stent restenosis treatment with drug eluting stent, DEB, IVL, ELCA, angiosculpt, Rota – Interstellar study

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Background: In stent restenosis (ISR) remains a significant clinical problem caused by multiple mechanisms and commonly seen in patients with cardiovascular risk factors. Intravascular imaging helps identify the underlying mechanism and guide optimal treatment strategy.

Aims: To study the mechanism, risk factors, treatment and outcome of patients with ISR.

Methods: Observational prospective study among 113 patients with ISR reported at a tertiary care hospital between Jan 2022 and Dec 2025.

Results: Mean age was 64.69 ± 10.0 years and 85.6% were males. Clinical presentation included NSTEMI (53.2%), unstable angina (32.4%), STEMI (10.8%) and stable angina (3.6%). Risk factors were hypertension (78.5%), diabetes (73.8%), chronic kidney disease (20.75%) and smoking (18.9%). Total ISR vessels were 122. ISR mechanism included edge restenosis (40.1%), neo-atherosclerosis-lipidic (33.6%), neo-atherosclerosis-calcific (22.5%), neo-intimal hyperplasia (21.3%), stent under expansion (21.3%), mixed pattern (19.6%) and >2 stent layers (0.9%).

All stent under expansion cases were corrected with non-compliant balloon dilatation. Neointimal hyperplasia cases were mainly treated with DEB. Edge restenosis was predominantly treated with DES. Neo-atherosclerosis cases were treated with DES or DEB. Mixed pattern lesions were mostly treated with DEB. Lesion preparation included scoring balloon (63.9%), cutting balloon (20.7%), non-compliant balloon (12.6%) and OPN-NC balloon (2.7%). Adjuvant calcium debulking included IVL (16 cases), rotational atherectomy (6 cases), ELCA and orbital atherectomy (1 case each).

Three patients had TLR and 8 deaths were reported, including 3 cardiac deaths. No stroke occurred during follow-up.

Conclusion: Intravascular imaging helped identify ISR mechanism and tailor treatment. DES were used more frequently than DEB. Clinical outcomes showed low rates of myocardial infarction, repeat revascularization, stroke and cardiac mortality.

CORONARY INTERVENTIONS

OCT mechanism–guided therapy for coronary in-stent restenosis: neo atherosclerosis versus fibrotic ISR

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Background: In-stent restenosis (ISR) is a heterogeneous entity. Treating all ISR with a single strategy (e.g., drug-coated balloon [DCB] alone) may be suboptimal because the underlying mechanism differs. Optical coherence tomography (OCT) can discriminate neo atherosclerosis from fibrotic neointimal hyperplasia and enable mechanism-tailored treatment.

Aims: To evaluate an OCT mechanism–guided ISR strategy in which neo atherosclerosis is treated with repeat drug-eluting stent (DES) implantation and fibrotic ISR is treated with DCB angioplasty, and to assess mid-term angiographic and clinical outcomes.

Methods: Consecutive patients with coronary ISR underwent OCT for mechanistic classification. Lesions with OCT-defined neo atherosclerosis were treated with repeat DES, while fibrotic ISR was treated with DCB. The primary endpoint was 6-month late lumen loss (LLL). Secondary endpoints included 12-month clinically driven target lesion revascularization (TLR), definite stent thrombosis, and procedure-related major complications.

Results: At 6 months, LLL was comparable between the DCB and DES strategies. At 12 months, clinically driven TLR occurred in 0.6% in the DCB group versus 0.5% in the DES group. There were no definite stent thrombosis and no procedure-related major complications. OCT mechanisms were evenly distributed. Mechanism-stratified analysis suggested comparable LLL in fibrotic ISR, whereas neo atherosclerosis showed a trend toward lower LLL with DES versus DCB; no definite stent thrombosis occurred.

Conclusions: OCT mechanism–guided ISR management is feasible and supports individualized therapy: neo atherosclerosis favouring repeat DES and fibrotic ISR favouring DCB. These findings emphasize that ISR should not be managed with a uniform “DCB-for-all” approach; mechanistic classification is critical for optimized therapy.

CORONARY INTERVENTIONS

A single centre experience of drug coated balloons in large (≥2.5 mm) native vessel CAD

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Background: Drug-coated balloons (DCBs) are increasingly being used in the treatment of native coronary artery disease (CAD). However, data regarding their effectiveness, safety, and procedural outcomes in large native coronary vessels (≥2.5 mm) remain limited. This study evaluates the effectiveness, safety, and procedural outcomes of DCB use in large vessel CAD at KIMSHEALTH Hospital, Trivandrum.

Aims: The primary objective was to evaluate the clinical efficacy of DCB treatment at 6 months, measured by target lesion revascularization (TLR) or clinically driven TLR. Secondary objectives included assessment of technical success, acute procedural outcomes, in-hospital adverse events, and documentation of major adverse cardiovascular or cerebrovascular events (MACE).

Methods: This was a retrospective, single-centre, observational cohort study. Patients undergoing percutaneous coronary intervention using DCB in large (≥2.5 mm) native vessel CAD were included.

Results: DCBs were increasingly used to treat native vessel CAD. The study evaluated the pattern of use, safety, and short- to medium-term clinical outcomes of DCB in large vessel CAD. There were no incidences of acute vessel closure, target vessel revascularization (TVR), or target vessel failure (TVF). Approximately 50% of cases were performed with intravascular imaging guidance. More than 50% of cases required lesion preparation using cutting or scoring balloons. One case required bailout stenting.

Conclusions: The findings demonstrate promising procedural safety and clinical outcomes for the use of DCBs in large native vessel CAD, supporting their feasibility as a treatment strategy in appropriately selected patients.

CORONARY INTERVENTIONS

Rotational Atherectomy (Rotablation) in Calcified Coronary Lesions: A 202Case SingleCentre Registry (2022–2025)

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Background: The presence of coronary calcification significantly increases the complexity of percutaneous coronary intervention (PCI), including difficulty in lesion crossing, inadequate lesion preparation, suboptimal stent expansion, and increased risk of procedural complications. Although rotational atherectomy (RA) is an established strategy for coronary calcium modification, contemporary real-world data from the Indian population are limited. We present a single-centre experience with RA for coronary calcium modification in routine and high-risk PCI.

Aim: To evaluate clinical profile, procedural characteristics, safety, and in-hospital outcomes of RA-assisted PCI in patients with calcified coronary lesions.

Methods: A retrospective analysis was performed on a prospectively maintained RA registry comprising procedures conducted between 30 March 2022 and 31 December 2025. Data on demographics, lesion and procedural characteristics, adjunctive device utilization, and in-hospital outcomes were analysed.

Results: Among 202 RA procedures, mean age was 67.3±8.8 years and 76.2% were men. Common risk factors included type 2 diabetes mellitus (69.3%) and hypertension (65.3%). Acute coronary syndrome was present in 29.7%, including STEMI in 14.5%. Target vessels included LAD (60.4%), RCA (36.6%), LCX (14.4%), and LMCA (14.9%). CTO lesions were observed in 11.4%, bifurcation stenting in 23.3%, and multivessel RA in 11.9%. A single burr was used in 98.5%, with maximal burr size 1.5 mm in 82.2%. Intravascular imaging was used in 32.7%. Adjunctive devices included cutting balloon (64.4%), IVL (6.9%), IABP (5.9%), and Impella CP (4%). Procedural success was achieved in 99%. Complications included coronary dissection (2.5%), perforation (2.0%), side-branch loss (3.5%), burr entrapment (0.5%), and transient arrhythmias or hypotension (9.4%). Periprocedural myocardial infarction occurred in 1%, with no in-hospital mortality.

Conclusion: RA-assisted PCI can be performed safely with high procedural success even in complex lesions and ACS patients. Intravascular imaging and additional calcium modification strategies may further improve outcomes.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Incidence and predictors of stent thrombosis following transcatheter sinus

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Background: While transcatheter closure (TCC) of sinus venosus defect (SVD) is rapidly emerging, concerns persist regarding thrombus formation on implanted stents.

Aims: To determine the incidence of stent-associated thrombus following TCC of SVD and to identify associated risk factors.

Methods: All patients who underwent TCC of SVD between May 2014 and August 2025 were evaluated. Transoesophageal echocardiography (TEE) was performed at 1 month and 1 year of follow-up. Thrombi were classified as major (>5 mm thickness) or minor (layered, <5 mm). Anatomical characteristics, procedural variables, and post-procedural thromboprophylaxis were compared between patients with and without thrombus detection.

Results: Among 153 patients who underwent SVD closure, follow-up imaging included TEE in 136 patients, computed tomography or magnetic resonance imaging in 7 patients, and transthoracic echocardiography alone in 10 young children. At a median follow-up of 1 month (range 0.5–16 months), thrombus was detected in 11 patients (7.2%), comprising major thrombus in 3 patients and minor layered thrombus in 8 patients. All thrombi were asymptomatic and non-obstructive, with no evidence of systemic or pulmonary thromboembolism. On univariable analysis, bilateral superior vena cava (SVC), use of multiple stents, and longer procedural duration were associated with thrombus formation. Multivariable analysis identified bilateral SVC (odds ratio [OR] 3.8; p=0.044) and multiple stents (OR 3.6 for two stents and OR 9.3 for three stents; p=0.048) as independent risk factors. Reduction in thrombus occurrence with post-procedural anticoagulation compared with dual antiplatelet therapy did not reach statistical significance (p=0.396).

Conclusions: Asymptomatic stent thrombosis was detected on surveillance TEE in 7.2% of patients after transcatheter SVD closure. Minor thrombi may be missed with alternative imaging modalities. Bilateral SVC anatomy and the use of multiple overlapping stents were significant risk factors. Optimal post-procedural thromboprophylaxis after SVD closure warrants prospective evaluation.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Impact of Presence of Bilateral Superior Vena Cava on Transcatheter Closure of Sinus Venosus Defects

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Background: Bilateral superior vena cava (SVC) is frequently associated with sinus venosus defects (SVD), for which transcatheter closure (TCC) is emerging as an alternative to surgery.

Aims: To evaluate the impact of bilateral SVC on the feasibility, procedural characteristics, and outcomes of transcatheter SVD closure.

Methods: Forty-one patients with bilateral SVC were retrospectively compared with 139 patients with a single SVC. Anatomical features, balloon interrogation feasibility, procedural characteristics, and post-procedural complications were analysed. In controls, paediatric patients were required to accommodate stents ≥16 mm, whereas smaller stents were permitted in bilateral SVC cases.

Results: Balloon interrogation was successful in 80.5% of patients with bilateral SVC and 87.8% of controls. Balloon upsizing was more frequent in bilateral SVC cases, whereas downsizing was common in controls. Procedural success was achieved in 100% of bilateral SVC cases and 96.7% of controls. Four control patients required surgery for stent embolisation, while none in the bilateral SVC group required surgical intervention. Stent migration prior to guidewire removal was more frequent in bilateral SVC but was successfully managed. During a median follow-up of 27 months (up to 9.5 years), asymptomatic stent thrombosis occurred more often in bilateral SVC than in controls (15.2% vs 4.3%) and was successfully treated. Rates of reintervention for residual shunt were similar.

Conclusions: Balloon interrogation is less frequently successful in bilateral SVC and often requires upsizing. Despite longer anchoring length, caudal stent migration is more common due to diameter mismatch, with a higher incidence of asymptomatic stent thrombosis.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Temporal trends in permanent pacemaker requirement after TAVI with Meril Octacor: a learning curve effect?

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Background: Transcatheter aortic valve implantation (TAVI) is a . randomized treatment for patients with symptomatic severe aortic stenosis (AS) worldwide, with expanding indications. While the Meril Myval balloon-expandable transcatheter heart valve (BETHV) series has shown non-inferiority to existing balloon-expandable THVs in a landmark randomized controlled trial (RCT), permanent pacemaker (PPM) implantation rates have been observed to be higher in both the RCT and multicentre observational studies.

Aims: To assess PPM rates following Meril Octacor BETHV implantation in a high-volume centre in the UK and to explore potential mechanistic causes.

Methods: Retrospective single-centre data uploaded to the National Institute for Cardiovascular Outcomes Research (NICOR) were used to analyse patients undergoing Meril Octacor BETHV implantation with respect to baseline characteristics, PPM implantation rates, and temporal trends.

Results: Over a 21-month period, a total of 169 Octacor valves were implanted, and a significant reduction in PPM implantation rates was observed (Q1 2024: 22.2% vs Q3 2025: 7.7%, $p < 0.001$). Plausible causes include a learning-curve effect, high-volume implantation experience, refinement of implantation techniques, and increased use of intermediate-sized valves. PPM rates were lower with intermediate-sized valves compared with conventional sizes (12% vs 18%, $p < 0.05$). Intermediate-sized valves were used more frequently than conventional sizes (56% vs 44%).

Conclusion: This study provides insight into potential mechanistic factors influencing PPM requirement and supports a plausible learning-curve effect, with observed temporal improvements. It also highlights the utility of intermediate valve sizes in the treatment of patients with severe AS. Further studies are required to assess long-term outcomes and CT correlation.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Elevated Lipoprotein(a) Is Associated With Mitral Annular Calcification and Early Progression: A 2023–2024 Echo Cohort

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Background: Lipoprotein(a) [Lp(a)] is linked to atherosclerosis and calcific valve disease, and its association with mitral annular calcification (MAC) is increasingly recognised.

Aims: To determine the association between elevated Lp(a) and prevalent MAC, as well as 1-year progression.

Methods: This single-centre cohort study included 190 adults who underwent Lp(a) testing and transthoracic echocardiography between 2023 and 2024. Elevated Lp(a) was defined as ≥50 mg/dL. The primary endpoint was prevalent MAC on baseline echocardiography. Secondary endpoints included MAC progression or new-onset MAC at 1 year (in a subset with repeat echocardiography) and a 1-year composite of heart failure hospitalisation or new-onset atrial fibrillation.

Results: Elevated Lp(a) was present in 70 of 190 patients (36.8%). Prevalent MAC occurred in 28% of patients with elevated Lp(a) compared with 15% of those with lower Lp(a) (adjusted odds ratio 2.05). Among 128 patients who underwent repeat echocardiography at 1 year, MAC progression or new-onset MAC occurred in 6% versus 2%. The 1-year clinical composite was numerically higher in patients with elevated Lp(a) (9% vs 6%), without statistical significance.

Conclusion: Elevated Lp(a) is associated with higher odds of MAC and signals early progression over 1 year, supporting routine assessment for MAC in patients with high Lp(a) and motivating prospective studies evaluating the impact of Lp(a)-lowering therapies on calcification progression.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Four-year multicentre experience with the Myval transcatheter heart valve in Mitral, Tricuspid, and Pulmonary positions: durability and hemodynamic outcomes

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Background: Transcatheter implantation of balloon-expandable valves (BEVs) in non-aortic positions is an emerging alternative for valve-in-valve and valve-in-ring procedures in high-risk patients. However, long-term clinical outcomes and haemodynamic durability data remain limited.

Aims: To evaluate four-year clinical outcomes and haemodynamic durability of the Myval transcatheter heart valve (THV) implanted in mitral, tricuspid, and pulmonary positions using Mitral Valve Academic Research Consortium (MVARC) criteria.

Methods: This retrospective multicentre analysis included 50 patients treated across 11 centres who completed four-year follow-up (mitral n=33, tricuspid n=13, pulmonary n=4). Technical success, survival, stroke, and valve-related outcomes were assessed. Serial echocardiography was used to evaluate transvalvular gradients and valve durability.

Results: Technical success was 96.9% in mitral procedures, with one procedural death, and 100% in tricuspid and pulmonary procedures. One-year survival was 93.9% in the mitral group and 100% in the tricuspid and pulmonary groups. At four years, survival and freedom from stroke were 87.9% in mitral, 84.6% in tricuspid, and 100% in pulmonary positions. Mean transvalvular gradients remained stable at four years (mitral 8.5±3.3 mmHg, tricuspid 3.8±1.6 mmHg, pulmonary 12.7±9.9 mmHg). No cases of severe regurgitation, valve thrombosis, or prosthesis dysfunction were observed during follow-up.

Conclusions: Transcatheter implantation of the Myval THV in non-aortic positions demonstrated favourable mid-term durability, stable haemodynamic performance, and excellent four-year clinical outcomes. These findings support the feasibility of this approach in high-risk patients and justify further prospective evaluation.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Restrictive Cardiomyopathy in a 67-Year-Old African Woman: An Unusual Association with Anomalous Right Coronary Artery from the Pulmonary Artery (ARCAPA)

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Background: Restrictive cardiomyopathy (RCM) is an uncommon myocardial disorder characterised by impaired diastolic filling with preserved systolic function. Anomalous right coronary artery from the pulmonary artery (ARCAPA) is a rare congenital coronary anomaly that is often diagnosed incidentally or during investigation for heart failure or ischaemia. The coexistence of RCM and ARCAPA is exceedingly rare and has not been widely reported.

Aims: We present the case of a 67-year-old African woman with progressive exertional dyspnoea and signs of right heart failure. Physical examination revealed elevated jugular venous pressure, hepatomegaly, and peripheral oedema. Echocardiography showed biatrial enlargement and Doppler evidence of restrictive physiology with preserved left ventricular systolic function. Cardiac catheterisation confirmed restrictive haemodynamic. Coronary angiography unexpectedly revealed ARCAPA with otherwise normal coronary arteries.

Methods: The patient underwent successful surgery with reimplantation of the right coronary artery into the aorta.

Results: The patient improved symptomatically.

Conclusion: The pathophysiological relationship between ARCAPA and restrictive cardiomyopathy remains unclear. Chronic subclinical myocardial ischaemia may cause fibrosis and restrictive physiology, or the findings may represent two coexisting but unrelated rare conditions. Regardless, detection of ARCAPA is clinically significant, as surgical correction can potentially improve prognosis. This case highlights the importance of considering congenital coronary anomalies such as ARCAPA in the differential diagnosis of unexplained restrictive cardiomyopathy, particularly in elderly patients without a clear ischaemic history. Advanced imaging plays a crucial role in identifying such rare but potentially treatable conditions.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Study of left ventricular function in patients with severe aortic stenosis pre and post transcatheter aortic valve implantation using global longitudinal strain by 2-dimensional speckle tracking echocardiography

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Background: Transcatheter aortic valve implantation (TAVI) has emerged as an effective, less invasive alternative to surgical aortic valve replacement in patients with severe aortic stenosis, leading to significant hemodynamic and symptomatic improvement. Left ventricular global longitudinal strain (LV GLS) on echocardiography is a sensitive marker of subclinical myocardial dysfunction.

Aim: This prospective observational study evaluates the impact of TAVI on myocardial longitudinal left ventricular strain in patients with severe aortic stenosis using echocardiography.

Methods: This study was conducted in the Department of Cardiology at Narayana Hrudayalaya, Bengaluru, on patients meeting inclusion criteria, excluding those with significant CAD, atrial fibrillation, severe coexisting valve lesions, recent ACS, valve-in-valve procedure, and poor echo window.

Results: The study included 36 patients with mean age 72.36 ± 7.42 years. Comorbidities included hypertension (80.6%), diabetes mellitus (58.3%), dyslipidaemia (52.8%), and chronic kidney disease (13.9%). Native aortic valve morphology was evenly distributed between tricuspid valves (50%) and bicuspid valves (50%). Post-TAVI evaluation showed significant improvement in mean GLS from –13.65 (SD 5.63) to –18.06 (SD 3.11), with mean increase of 4.41 (95% CI: 2.72–6.10; p<0.001). Overall clinical outcome following TAVI was favourable, with 100% reporting good outcome. Median hospital stay was 3 days. No adverse events were reported in 75% of patients.

Conclusion: TAVI provides significant early improvement in left ventricular function quantified by GLS in patients with severe aortic stenosis and preserved LV ejection fraction. GLS is sensitive in detecting subclinical myocardial dysfunction and may be useful for functional assessment and prognosis.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Safety of percutaneous apical access for complex cardiac structural interventions

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Background: Percutaneous apical access is used as an alternative route for selected complex structural cardiac interventions when conventional approaches are inadequate.

Aims: To evaluate the safety and procedural outcomes of percutaneous apical access in complex cardiac structural interventions.

Methods: Single-centre retrospective analysis of cases performed over 10 years. Procedural success, access-related complications, and early and late outcomes were assessed.

Results: Forty-three consecutive patients (median age 55 years; 72% male) who underwent percutaneous transapical access from 2015 to 2025 were included. The primary indications were mitral paravalvular leak closure (84%) and left ventricular pseudoaneurysm closure (14%). Transapical access was used alone in 58% and combined with transseptal access in 42%. Apical access closure was performed using occlusion devices in 98% of cases. Procedural success was achieved in 42 patients (97.7%). Significant access-related bleeding complications, including haemothorax or hemopericardium, occurred in 34.9%. Management included percutaneous aspiration (9.3%), intercostal drainage (13.9%), and surgical thoracotomy with exploration (11.6%). In-hospital mortality occurred in 2 patients (4.6%), both not directly related to access site complications. Among 41 patients with follow-up data, delayed pleural effusion occurred in 4.9%, and late mortality within 6 months was 7.3%.

Conclusions: Percutaneous transapical puncture provides high procedural success in complex structural cardiac interventions but carries a notable risk of access-related bleeding complications. Optimal patient selection and meticulous access and closure techniques are critical to improving safety outcomes and should be used with caution.

MISCELLANEOUS

Real World Effectiveness of Ultrasound Based Renal Denervation: A Cohort Study

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Background: Resistant hypertension (RH), defined as blood pressure (BP) remaining above target despite treatment with three or more antihypertensive drug classes, or controlled BP requiring four or more medications, represents a major therapeutic challenge. Ultrasound-based renal denervation (URDN) has emerged as a potential interventional option.

Aims: This study evaluates the early real-world impact of URDN on BP control and antihypertensive medication burden in patients with RH.

Methods: Nineteen patients referred to the UC Davis Resistant Hypertension Clinic underwent URDN. The mean age was 73 years, mean baseline BP was 165/83 mmHg, and the mean number of antihypertensive medications was 4.6. Procedural safety and BP-lowering efficacy were assessed in this cohort.

Results: Following URDN, systolic BP decreased by 29.4±24.3 mmHg ($p<0.05$) and diastolic BP by 10.4±13.5 mmHg ($p<0.05$). Eleven patients (57.9%) were classified as hyper-responders, defined as a systolic BP reduction >29 mmHg. Greater systolic BP reductions were observed in patients with higher baseline BP (median systolic BP 175 vs 146 mmHg, $p=0.004$; diastolic BP 94 vs 71.5 mmHg, $p=0.001$). The antihypertensive medication count was reduced by 1.1±0.88 ($p<0.05$). There was no significant change in estimated glomerular filtration rate (+4.8±11.0 mL/min/1.73 m², $p>0.05$).

Conclusion: In real-world clinical practice, URDN was associated with significant reductions in systolic and diastolic BP and antihypertensive medication burden in patients with resistant hypertension, without adverse effects on renal function. Carefully selected patients, particularly those with higher baseline BP,

may achieve substantial BP reductions that equal or exceed trial results.

MISCELLANEOUS

AI and the Cardiology of Tomorrow! : Use of CNN Image Segmentation for prediction of CRT response- A look into Precision-guided Cardiology

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Background: Cardiac resynchronisation therapy (CRT) is an established treatment for patients with heart failure, left bundle branch block (LBBB), and severe left ventricular (LV) dysfunction; however, up to 30% of patients do not respond. Conventional electrocardiographic (ECG) and echocardiographic markers have limited predictive accuracy. Advanced analysis using deep learning (DL) applied to ECG and echocardiographic data may improve patient selection.

Aims: To derive patient-specific ECG and echocardiographic predictors of CRT response using high-resolution imaging and deep learning algorithms.

Methods: A total of 182 patients undergoing CRT implantation were analysed using a split-sample design, comprising a derivation cohort (n=130) and a validation cohort (n=52). CRT response was defined as a ≥15% reduction in LV end-systolic volume at 12 months, with improvement in LV ejection fraction and functional status. Mechanical desynchrony was assessed by apical rocking and/or septal flash. Time to peak strain (TTP) was derived from LV global longitudinal strain curves. Baseline ECG features were extracted using convolutional neural network analysis and combined with echocardiographic parameters in a DL model. Fragmented QRS (f-QRS) was defined as >2 notches in the R wave or S-wave nadir.

Results: Mean LBBB duration was 148 ms, and 70% of patients in the derivation cohort were responders. Diabetes was associated with poorer response. In patients with LBBB ≥140 ms, four pre-implant ECG features (R–R' >50 ms, absence of f-QRS, PR <220 ms, V1–lead I LV activation time >100 ms) and one echocardiographic feature (TTP 60–100 ms) predicted response. PR >220 ms, LBBB >180 ms, and TTP >100 ms correlated with LV scar and reduced CRT benefit. The strongest post-implant predictor was V1 R-wave amplitude >5 mm. A composite 20-point score achieved an AUC of 0.87 and 87% accuracy in the validation cohort.

Conclusions: DL-derived ECG features combined with LV strain timing reliably predict CRT response and may improve patient selection beyond

MISCELLANEOUS

Assessment Of Right Ventricular Dysfunction By 2 D Echocardiography and Tissue Doppler Imaging and Global Longitudinal Strain in End-Stage Renal Disease Patients on Haemodialysis: A Cross-Sectional Study

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Background: Chronic kidney disease (CKD) is a global health burden, with cardiovascular disease accounting for more than 50% of deaths in affected patients. While left ventricular dysfunction is well documented, right ventricular (RV) dysfunction remains under-recognised despite its significant impact on outcomes in patients with end-stage renal disease (ESRD).

Aims: This study aimed to determine the proportion of patients with ESRD on haemodialysis who have RV dysfunction and to identify associated factors. A secondary objective was to assess the impact of arteriovenous fistula (AVF) location, brachial versus radial, on the development of RV dysfunction.

Methods: A hospital-based, descriptive cross-sectional study was conducted over 18 months (May 2024–November 2025) at Sapthagiri Institute of Medical Sciences, Bangalore. Eligible patients with ESRD on maintenance haemodialysis for ≥3 months were enrolled. RV function was assessed using conventional echocardiography and tissue Doppler imaging, including global longitudinal strain, with measurement of tricuspid annular plane systolic excursion (TAPSE), fractional area change (FAC), RV wall thickness, systolic pulmonary artery pressure (SPAP), and inferior vena cava dimensions. Data were analysed using SPSS version 27.

Results: The study cohort comprised 117 patients with ESRD (mean age 54.8 years; 66.7% male). Echocardiographic assessment revealed a high prevalence of RV dysfunction, with multiple associated factors including volume overload, pulmonary hypertension, and chronic inflammation.

Conclusion: This study highlights the substantial burden of RV dysfunction in patients with ESRD and underscores the importance of early echocardiographic screening for risk stratification and optimisation of clinical management.

MISCELLANEOUS

A Dual-Pathway Electrophysiometabolic Strategy for Long QT Syndrome: Integrating IKs/IKr Activation with SREBP2–FXR Modulation

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Background: Long QT syndrome (LQTS) remains a significant cause of syncope and sudden cardiac death due to delayed ventricular repolarisation. Current therapeutic options (β-blockers, mexiletine, left cardiac sympathetic denervation, and implantable cardioverter-defibrillators) incompletely address the diverse underlying electrophysiological substrates.

Objective: To propose a unified, dual-pathway therapeutic model that (i) directly augments repolarisation reserve via IKs and IKr activation (rottlerin, hexachlorophene, mallotoxin) and (ii) indirectly stabilises the cardiomyocyte membrane milieu through low-density lipoprotein cholesterol reduction (EP24→SREBP2→LDLR) and bile acid–driven cholesterol catabolism (e.g. guggulsterone→FXR antagonism→CYP7A1).

Methods: Theoretical pharmacology and biochemical pathway integration were developed from primary literature. A translational work plan is outlined, including in silico docking to KCNQ1 and KCNH2, *in vitro* patch-clamp studies (HEK293/CHO cells and human induced pluripotent stem cell–derived cardiomyocytes), *ex vivo* Langendorff-perfused heart experiments, and *in vivo* zebrafish and rodent LQTS models.

Results (conceptual): Combined IKs and IKr activation shortens action potential duration and corrects QT prolongation, while metabolic modulation lowers LDL cholesterol, restores lipid raft integrity, and improves Ca^{2+} handling, thereby amplifying ion channel efficacy. The model predicts reduced early and delayed afterdepolarisations and a lower torsadogenic risk.

Conclusion: This first-in-class electrophysiometabolic approach may outperform stand-alone antiarrhythmic strategies by simultaneously correcting the electrical and biochemical determinants of ventricular repolarisation.

MISCELLANEOUS

Echocardiographic and clinical outcome after percutaneous closure of atrial septal defect: Right ventricular remodelling and quality of life

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Background: Atrial septal defects are among the most frequently diagnosed congenital heart diseases in adults and may lead to chronic right ventricular volume overload, pulmonary hypertension, arrhythmias, and impaired quality of life. Percutaneous transcatheter closure is the preferred treatment for suitable secundum atrial septal defects and has demonstrated favourable clinical outcomes.

Aim: To evaluate short-term changes in right ventricular structure and function following percutaneous atrial septal defect closure and to assess its impact on patient-reported quality of life.

Methods: This prospective observational study included 60 adults undergoing transcatheter closure of secundum atrial septal defects with significant left-to-right shunt and suitable septal anatomy. Patients with severe pulmonary hypertension, Eisenmenger physiology, or complex congenital heart disease were excluded. Comprehensive transthoracic echocardiography and the 12-item Short Form Health Survey were performed at baseline, 24 hours, and 90 days after the procedure. Echocardiographic assessment included right ventricular basal diameter, right ventricular outflow tract dimension, right-to-left ventricular end-diastolic diameter ratio, tricuspid annular plane systolic excursion, right ventricular fractional area change, myocardial performance index, and right atrial dimensions.

Results: The mean defect size was 21.9 millimetres. Significant right ventricular remodelling was observed at 90 days, with reductions in right ventricular basal diameter, right ventricular outflow tract dimension, right-to-left ventricular diameter ratio, and right atrial size. Right ventricular systolic function improved, demonstrated by increases in tricuspid annular plane systolic excursion and fractional area change, along with reduction in myocardial performance index. Left ventricular systolic function remained stable. Quality of life scores improved in both physical and mental health domains.

Conclusions: Percutaneous closure of atrial septal defects results in early right ventricular reverse remodelling, accompanied by improvement in functional status and quality of life within three months.

MISCELLANEOUS

Ultrasound-guided femoral access with a standardized closure-device protocol reduces access-site complications and accelerates ambulation: a single-centre experience

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Background: Femoral access complications remain clinically relevant. Ultrasound guidance may improve puncture accuracy, and an optimized haemostasis strategy may reduce bleeding while enabling early mobilization.

Aims: To evaluate access-site outcomes and time to ambulation across four real-world femoral access/haemostasis categories: ultrasound-guided (USG) vs fluoroscopy-guided puncture, each with closure device versus manual compression.

Methods: We analysed 56 consecutive patients undergoing femoral access for cardiovascular procedures. Patients were stratified into: USG+device (n=23), USG+manual (n=11), fluoro+device (n=10), and fluoro+manual (n=12). Endpoints included pseudoaneurysm, hematoma (minor/large), transfusion requirement, and time to ambulation (ToA).

Results: USG+device had no access-site complications with ToA6±2 hours. USG+manual had ToA8±1.2 hours with only minor skin staining/minor hematoma in 2.6%. Fluoro+device showed ToA6.6±1.25 hours with 1 hematoma and 1 pseudoaneurysm. Fluoro+manual had the highest complication burden with ToA10±2 hours, including 3 large hematomas, 2 pseudoaneurysms, and 4 transfusions.

Conclusions: A workflow combining ultrasound-guided femoral access with closure devices was associated with the lowest complication rates and earliest ambulation. Manual compression—particularly after fluoroscopy-guided puncture—was associated with higher bleeding complications and delayed mobilization. This protocolized approach is scalable for routine femoral access.

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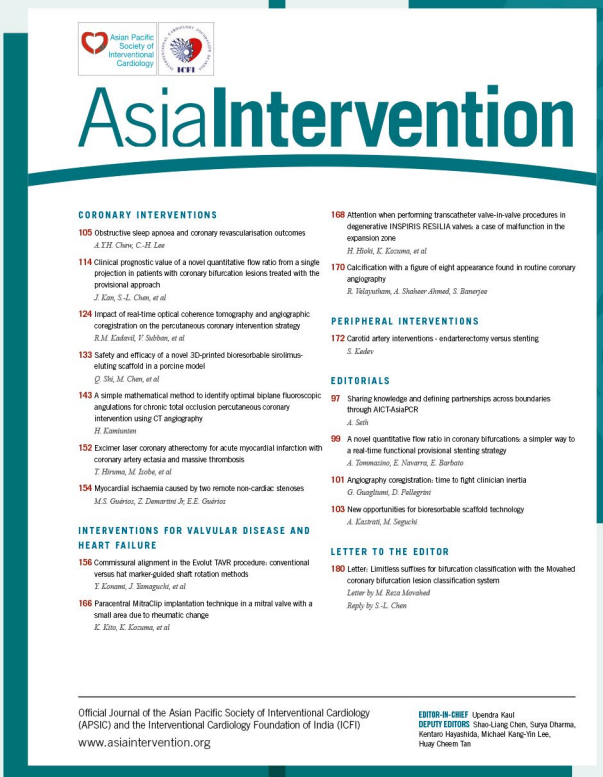

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