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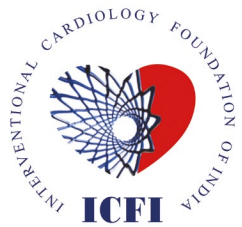
Abstracts of



CORONARY INTERVENTIONS

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

MISCELLANEOUS

CORONARY INTERVENTIONS

A prospective multicentre study on the impact of fractional flow reserve and optical coherence tomography on percutaneoUs coronary intervention outcomeS (iFOCUS) in patients with diabetes

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Background: Intracoronary imaging and physiology guidance of percutaneous coronary intervention (PCI) have shown significant improvements in clinical outcomes. Comparable data on the use of these modalities in PCI of diabetic patients is only sparsely available from South Asia.

Aims: This study investigates the benefits of systematic, combined use of FFR and OCT during PCI in diabetic patients.

Methods: The study enrolled 275 patients (≥18 years) from nine centres in India and one from Bangladesh between October 2021 and September 2022. Patients with stable ischemic heart disease, non-ST-elevation myocardial infarction, and unstable angina were included in the study. Angiographic intermediate lesions (40% to 80%) underwent FFR-guided PCI. Lesions with angiographic stenosis >80% underwent PCI without FFR evaluation. All PCI procedures were guided by OCT using MLD-MAX algorithm.

Results: At 12 months, target lesion failure, (TLF) was 3.2%, cardiac death [n=2, 0.7%], target lesion myocardial infarction [n=5, 1.8%], clinically driven-target lesion revascularization [n=2, 0.7%]. Among the intermediate lesions, PCI was deferred in 65% (n=53) after FFR evaluation. Pre and post-procedural OCT has led to strategy change in 49.5% and 33.6% of lesions respectively. The procedural success rate was 100%.

Conclusions: In diabetic patients, use of FFR and OCT in PCI resulted in substantial reduction of TLF rate at 12 months. The strategy of combined use of FFR and OCT in diabetic patients may contribute to clinical outcome benefits.

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CORONARY INTERVENTIONS

Analysis of gene expression in patients with acute coronary syndrome and correlation with oxidative stress

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Background: Coronary artery disease affects >7% of general population and is the leading cause of cardiovascular mortality worldwide. It is influenced by several factors including age, gender, family history, hypertension, diabetes, tobacco usage among others. SIRT1 plays an important role in regulating cellular physiological processes. SIRT1 is also thought to protect the cardiovascular system by means of its antioxidant, anti-inflammation, and anti-apoptosis activities. SIRT1 is assumed to be an atherosclerotic factor and might be associated with more reasonable mechanisms, such as inhibition of apoptosis by oxLDL, regulation of NOS3 expression and improving endothelial relaxation function.

Aims: 1. To measure mRNA levels of genes SIRT1, FOXO3, NOS3, and SOD2 in CAD patients. 2. To validate relation between Cad and oxidative stress. 3. To correlate mRNA levels of the genes involved in oxidative stress with the SOD enzyme activity levels. 4. To analyse the interrelation of pathway of genes

Methods and results: Patients admitted with ACS, who underwent guideline directed treatment for ACS including coronary angiogram and revascularisation were taken as controls along with age & sex matched controls. Superoxide dismutase activity, superoxide scavenging activity were measured. Total RNA Isolation and Quantitative RT-PCR Analysis. Gene expressions of SOD1, NOS3, SIRT1, FOXO3 were estimated in both cases and controls. Results were analysed using prismv.50 software. SIRT1 gene expression was significantly lower in cases ($p<0.001$). NOS3 mRNA expression was significantly higher in cases ($p<0.01$). FOXO3 expression was significantly lower than controls ($p<0.04$). SOD2 expression was significantly higher than controls ($p<0.001$)

Conclusions: In the present study, we report that SIRT1 gene expression is decreased in patients suffering from coronary artery disease. In line with this, expression of SIRT1-negatively regulated FOXO3. Oxidized low-density lipoprotein (oxLDL) has been shown to increase SIRT1 expression in human endothelial cells. SIRT1 and eNOS regulate each other synergistically.

In our study, there was downregulation of SIRT, FOXO3 and NOS3 in case of sample and upregulation of SOD2 in case of sample as compared to control. Therefore, it is hypothesized that the lower activity of SIRT1, FOXO3 and NOS3 and higher activity of SOD2 might be concurrent with the higher risk in coronary artery disease. Thus, the present study for the first time, investigated the correlation between SIRT1, FOXO3, NOS3 and SOD2 mRNA expression level in case of sample of coronary artery disease and control individuals.

CORONARY INTERVENTIONS

Unveiling the consequences: occluded culprit arteries and outcomes in NSTEMI patients

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Background: In ACS, timely diagnosis and management are crucial. A subset of patients with total occlusion (TO) of the culprit artery based on coronary angiogram, present as NSTEMI, a lack of classic electrocardiogram findings may lead to a delay in revascularization and worse outcomes.

Aims: To compare the clinical outcomes of NSTEMI patients with occluded and non-occluded culprit artery

Methods: All consecutive NSTEMI patients from August 2018 to December 2019, underwent PCI at Madras Medical Mission were included. Baseline, procedural characteristics, and outcomes were compared with total occlusion and without occlusion. Primary outcomes were 30-day,1-year MACE and LVEF.

Results: Among 283 patients, 203 non-occlusion, and 80 in TO group. TO patients were younger (56.3±11.2 Vs 60.5±16.3, p-0.001). In TO LVEF ≤ 49 was high (67.5% vs 53.2%, p-0.03), median admission to angiogram time was significantly longer (20 Vs 15, p-0.01) and predominant culprit artery was LCX (33.8% vs 18.8%, p-0.008) whereas LAD in the non-occluded group (37.5% Vs 45.2%, p-<0.001). Thrombus burden high in TO (10% vs 3.8%, p-0.08). No significant difference in 30-day and 1-year MACE but LVEF < 49 was high in TO (52.2% vs 32.4, p-0.009) at 1 year. TIMI flow and LCX involvement are significant predictors of LVEF at 1 year. The odds of LVEF <49 are three times higher in patients with LCX involvement.

Conclusions: NSTEMI Patients with TO tend to have more LCX involvement but the Traditional ST elevation criteria exclude a sizable fraction of patients which impacts their LV function at 1 year.

CORONARY INTERVENTIONS

Evaluation of cardiovascular events and bleeding complications in patients of Acute coronary syndrome on antiplatelet therapy in a tertiary care centre of Eastern India

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Background: This study is to determine the clinical profile of Acute Coronary Syndrome (ACS) patients, to observe cardiovascular events in patients with ACS undergoing Percutaneous Coronary Intervention (PCI) and to evaluate the bleeding complications with various antiplatelet agents.

Aims: To evaluate the effect of various anti-platelet drugs and their safety in patients of ACS undergoing PCI.

Methods and results: This hospital based observational study included patients of ACS presenting between February 2021 to January 2022 who received PCI and were on dual antiplatelet agents.

Results: Among 200 patients presenting with ACS mean age was 58.67, there was male predominance and 52.5% presented with STEMI. Cardiovascular death was seen in 2.5% patients and all-cause mortality was seen in 3.5% patients. The incidence of non-fatal myocardial infarction was more in Clopidogrel group (5%) as compared to Prasugrel (4%) and Ticagrelor (2%) group. Incidences of target vessel revascularization (TVR) and stent thrombosis were more in the Clopidogrel group as compared to Prasugrel and Ticagrelor. TIMI Major and Minor bleeding with Prasugrel was higher than Clopidogrel and Ticagrelor and TIMI minimal bleeding was seen in 2% patients and was similar in all three groups.

Conclusions: Patients receiving Clopidogrel has more numbers of CV death, all cause death, non-fatal MI, TVR and stent thrombosis in comparison to the groups receiving Prasugrel or Ticagrelor and on comparing Prasugrel and Ticagrelor, the two drugs are similar in efficacy but, Ticagrelor has better safety outcomes.

CORONARY INTERVENTIONS

TMeRes100 bioresorbable vascular scaffold: a real-world, retrospective single-centre Experience of one-year follow-up

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Background: The MeRes100 (Meril Life Sciences Pvt. Ltd., India) is an advanced bioresorbable vascular scaffold. With thinner struts, rapid resorption, and unique design using a 100µm thin-strut sirolimus-eluting system, it employs radiopaque markers for precise placement. Expected to dissolve within two years, it significantly improves safety and effectiveness in coronary artery disease treatment.

Aims: To assess the safety and efficacy of MeRes100 in coronary artery disease patients.

Methods and results: This single-centre, retrospective, observational study involved 86 consecutive coronary artery disease patients (*de novo* and in-stent restenosis) treated with MeRes100 between February 2021 and March 2023. It assessed safety and efficacy by analysing device success (successful scaffold delivery) and procedure success (achieving <30% residual diameter stenosis in treated lesions through visual inspection or quantitative coronary angiography).

Among 86 patients (mean age: 61.86 ± 11.25 years), 26.74% had diabetes, and 75.58% had hypertension. Most lesions were ACC/AHA type C (57.14%) or B2 (22.62%), with 11 in-stent restenosis cases and a mean lesion length of 17.51 ± 1.71 mm. 104 MeRes100 scaffolds were implanted. Procedural and device success was achieved in 86 (100%) patients with all attaining optimal blood flow. One cardiac death (1.16%) occurred during discharge due to myocardial infarction. There were no scaffold thrombosis incidents during the one-year follow-up, and no further adverse events were reported in the subsequent 6-month (72 patients) and 1-year (54 patients) follow-ups.

Conclusions: The study showed MeRes100 as a safe and effective treatment for coronary *de novo* and in-stent restenosis lesions, yielding positive clinical outcomes.

CORONARY INTERVENTIONS

Symptomatology & outcomes of ultra-low contrast PCI in chronic kidney disease patients with coronary artery disease

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Background: Cardiovascular disease is the leading cause of mortality in patients with chronic kidney disease (CKD). There is paucity of data regarding atypical presentations of cardiac ischemia in these patients and management of these cases with PCI is challenging.

Aims: To study symptomatology & outcomes among Stage 3 & 4 CKD patients with CAD undergoing ultra low-contrast percutaneous coronary intervention (PCI).

Method and results: We studied four patients with Stage 3 & 4 CKD with CAD.

First patient- 70 years old Diabetic male (stage 4 CKD with eGFR 28) with inferior wall MI and presented with vomiting epigastric pain and his angiogram showed single vessel critical 90% RCA disease. He successfully underwent IVUS guided PCI to RCA.

Second patient- 56 years old male (stage 3 CKD with eGFR 42) with Unstable angina and presented with dyspnoea and arm pain and his angiogram showed significant RCA proximal 90% disease. He successfully underwent IVUS imaging guided PCI to RCA.

Third patient-72 years old Diabetic male (stage 3 CKD with eGFR 45) with exertional angina and his angiogram showed significant osteo-proximal LAD 90% disease. He successfully underwent PCI to LMCA to LAD.

Fourth patient-75 years old Diabetic Hypertensive male (stage 4 CKD with eGFR 22) with fatigue and repeated hospitalization for diastolic heart failure and his angiogram showed significant calcific proximal LAD 90% disease. He successfully underwent PCI to LAD.

We found typical and atypical presentations of CAD in CKD patients. Post PCI patients showed significant symptomatic improvement and with use of Saline hydration, ultra low contrast, imaging we could successfully do PCI without need for dialysis nor contrast nephropathy suggesting its safety and necessity in symptomatic CKD patients.

Conclusions: In CKD stage 3 & 4 patients, atypical presentations are quite common and managing with ultra low-contrast PCI proves lifesaving in CKD patients.

CORONARY INTERVENTIONS

When "PINK" turns "RED!!"- The VENUS- CAD Risk Score for predicting occurrence of first ACS in Young Female Indian patients

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Background: CAD has alarmingly increased among female Indian patients < 50 years with demographics changing rapidly. We investigated patient characteristics and possible predictors in female patients < 50 years presenting with first ACS to a tertiary-care apex centre.

Methods and Subjects: We studied 1212 female patients who presented with recent (acute or up to < 30 days) first ACS. Demographics, risk factors, clinical profile and lab values were collated assuming them to be existing one day prior to ACS, for possible predictors. Specifically, no "novel" factors were estimated OR were substituted by easily available ones. Logistic Regression, and Machine learning techniques were used to construct a prediction model which we named the VENUS-CAD risk score, following which patients were evaluated in a "Forward-prediction" cohort for score accuracy.

Results: The TOP 10 strongest risk factors detected BY BOTH TECHNIQUES were, in the order of Weightage Scores(WS) , Newly detected or uncontrolled DM with admission sugars > 275mg% WS :4.5),High index LDL-C > 120 mg (WS: 3.5) Low index HDL(<35 mg%, WS: 2.5),Newly-detected or poorly treated HTN (WS:2.5),N/L at admission> 5.5 (WS: 2.5) Lack of physical exercise(WS: 2.0), Past Use of combination OC pills> 5 years(WS: 2.0) , Current Tobacco exposure(WS: 2.0 ,1.5 for second-hand exposure > 5 years),Kuppuswamy scale below Lower Middle (Class III)(WS:1.5), AND Poor dental hygiene (WS:1.5), with Youden J statistic cut-points of mean BP> 88 mmHg, LDL> 126 mg, HDL< 33 mg% and HbA1C at 6th month> 8.5% (6th month). A weighted-variable VENUS-CAD score of 15/ 25 (Se: 84%, Sp:80%, PPV: 84%, NPV: 80%) and above linearly and strongly predicted the risk of occurrence of first ACS with 87.5% probability above 21/ 25 in the Validation cohort.

Conclusion: VENUS CAD score is the FIRST INDIAN score for predicting ACS in Indian female < 50 years population with good accuracy and should be promoted in larger cohorts for study.

CORONARY INTERVENTIONS

Dilemma in percutaneous coronary interventions in retroviral positive patients with chronic total occlusion (CTO)

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Background: Coronary chronic total occlusions (CTOs) are commonly encountered in patients with coronary artery disease. Successful CTO percutaneous coronary intervention (PCI) can significantly improve angina and improve left ventricular function. HIV patients are exposed to a higher risk of adverse cardiovascular events, due to complex interactions between traditional risk factors and HIV infection itself in terms of ongoing endothelial dysfunctional immune activation/inflammation and increased risk of thrombosis.

Aims: The objective of our study was to analyse the procedural success and complication in doing PCI in Coronary chronic total occlusions (CTOs) in retro viral positive patients.

Methods and results: In this prospective and observational study, a total of 22 consecutive patients who were reported as having retroviral positive with CTO from August 2015. Detailed clinical presentation and coronary angiography of all patients were evaluated. Detailed clinical presentation and coronary angiography of all patients were evaluated. All patients underwent revascularization with percutaneous coronary intervention (PCI) and were followed up clinically for a period of 5 year. Procedural success rate was achieved in 100 % of cases and in-hospital course was uneventful. Mean age of the patients are 49 years, mean duration of HIV was 4.16 years. Mean duration of angina was 6.4 months. 14 patients had 100 % LAD occlusion, 4 patients were 100% RCA occlusion, 1 patient had 100% LMCA and LAD Occlusion, 3 patients had 100% LCX. Out of 22 patients, 14 patients had PCI to LAD, 3 Patients had PCI to LCX, 4 patients had PCI to RCA, 1 patient had PCI to LMCA to LAD Average size of the stent was 3x32mm. The average fluoroscopy time was two hours to three hours. 1st Death due to non-compliance of medication, 2nd death due to AWMI and cardiogenic shock and 3rd death due to opportunistic infection. During follow up period of 5 year there were no reported major adverse cardiovascular events, and the patients were found to have definite symptom benefit from this procedure.

Conclusions: Risk of coronary CTO lesions is high in HIV infected patients and is seen to occur at much younger age compared to general population and seems to occur during the initial phase of the natural course of HIV infection. PCI is an adequate and safe treatment strategy of coronary revascularization in HIV POSITIVE patients with coronary chronic total occlusion. Post PCI, there is definite symptomatic and prognostic benefit of PCI in HIV positive patients with coronary CTO. HIV status and HAART therapy didn't interfere with revascularization approach or clinical outcome.

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CORONARY INTERVENTIONS

"Simplicity is the ultimate sophistication"- A novel risk prediction model predicting In-hospital mortality in patients undergoing primary PCI using bedside parameters for everyday use

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Background and aims: Mortality risk prediction models following primary PCI suffer from skewed and imbalanced data sets as also involve expensive lab parameters like BNP etc and specialised ECHO techniques and have not been tested in Indians. Our study aimed to establish a simple nomogram predicting in-hospital mortality (up to 14 days) in patients undergoing primary PCI that could be used at the bedside using basic ECG, ECHO and lab parameters that are easily available.

Materials and methods: We studied 425 patients undergoing primary PCI at two apex centres from Jan 21 2015, Jan 1 2020 undergoing primary PCI. The risk model was generated by logistic regression with the stepwise backward method, while calculating Odds ratios (OR) and 95% CI for in-hospital mortality.

Results: Nine patient features were selected to build the nomogram and weightage was given as per attributable hazard to each variate including(weighted using SHAP analysis): Post PCI TIMI flow grade< 3 (WF: 3), along with AW- STEMI or LBBB(WF: 3.5), admission Vasotrope-Inotrope Index > 40(WF: 3.5), admission Shock Index > 1.3(WF: 3.5),Uncontrolled insulin-requiring DM(WF: 3.0) anytime in hospital course, LVEF < 25%(WF: 3), ICU Serum Lactate > 120 anytime in hospital course (WF: 3), MAPSE < 7mm by ECHO (WF: 2.5) anytime in hospital course and Admission N/L ratio > 7(WF: 2.0). AUROC was 0.881 (95% CI: 0.63–0.956). On generating tertiles of the score of T1< 16, T2 between 17- 22.5 and T3 > 22.5 of the total 27 points, Low, Intermediate and Highest risk cohorts were identified. In a forward Validation cohort the score had an excellent predictive accuracy of 85% agreement and outperformed both the PAMI risk score and CADILLAC scores using different variables without losing out on accuracy.

Conclusions: Our Novel 9- parameter risk score in Indians for bedside prediction of in-hospital mortality after Primary PCI uses simple and easy –to- evaluate parameters and will simplify risk stratification in real-world practice.

CORONARY INTERVENTIONS

Genetic determinants of the no-reflow phenomenon development during percutaneous coronary interventions in myocardial infarction patients

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Background: the role of genetic factors in the no-reflow phenomenon development has not been studied sufficiently.

Aims: determine the genetic determinants of the no-reflow phenomenon development during percutaneous coronary interventions in myocardial infarction patients.

Methods: 80 patients with ST-segment elevation myocardial infarction and percutaneous coronary intervention were included in the case-control study (1 to 1 ratio). 40 (50%) patients with no-reflow and 40 (50%) without no-reflow. No-reflow criteria: TIMI flow grade <3 points or Myocardial blush grade < 2 points or ST segment resolution <70%. The median age 65 [60; 72] years, 58 (73%) men, 22 (27%) women. Using real-time polymerase chain reaction, single nucleotide polymorphisms were detected in the following genes: ADD1 (identifier rs4961), AGT (rs699, rs4762), AGTR1 (rs5186), AGTR2 (rs1403543), CYP11B2 (rs1799998), GNB3 (rs5443), eNOS (rs2070744, rs1799983), EDN1 (rs5370), F2 (rs1799963), F5 (rs6025), F7 (rs6046), F13 (rs5985), FGB (rs1800790), ITGA2-α2 (rs1126643), ITGB3-β3 (rs5918), PAI-1 (rs1799762), MTHFR (rs1801133, rs1801131), MTR (rs1805087), MTRR (rs1801394).

Results: the allele frequency distribution followed the Hardy-Weinberg law (p>0.05). The groups differed statistically significantly in the frequency of genotypes of the polymorphisms: rs4961 (ADD1 gene), rs1799998 (CYP11B2 gene) and rs1801133 (MTHFR gene). The odds ratio and 95% confidence interval of the no-reflow development for the mentioned genotypes were as follows: rs4961 (GT or TT) – 2.83 (1.12–7.19), p=0.03; rs1799998 (CC) – 5.33 (1.55–18.30), p=0.008; rs1801133 (CC) – 4.00 (1.13–14.17), p=0.03.

Conclusions: the following variants of single nucleotide polymorphisms are associated with the no-reflow development: rs4961 (ADD1 gene) GT or TT genotypes, rs1799998 (CYP11B2 gene) CC genotype, rs1801133 (MTHFR gene) CC genotype.

CORONARY INTERVENTIONS

Study on landmarks in IVUS guided zero contrast PCI

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Background: Contrast induced nephropathy is the third most common cause of renal insufficiency following angioplasty. Patients with pre-existing renal dysfunction are even at higher risk for poor outcomes. With the advent of intravascular imaging the safety and efficacy of angioplasty can be improved significantly in these patients.

Aims: To assess the usefulness of fluoroscopic landmarks in addition to intravascular ultrasonography for precise landing of balloon and stent in patients undergoing zero contrast angioplasty.

Methods and results: 72 patients with eGFR < 40ml/min/m2 who had undergone angiography and were subsequently planned for PCI were included in our study. All procedure were performed by a single operator under dry fluoroscopy and IVUS guidance. age of the patient was 62.46±10.15 yrs. with male predominance (83.33%). Mean Ejection fraction was (43.95±8.8 %). Mean serum creatinine and eGFR of patients were 2.27±1.03 mg/dl and 31.76±8.20ml/min/1.73m^2 respectively. 11 patients underwent left main stenting. Technical and procedural success was achieved in 100% and 97% of patients respectively. Post procedure serum creatinine was 1.84±0.78 mg/dl and 40.75±14.06 mg/min/1.73m2 respectively. 1 patient died in hospital due to non-cardiac cause and 1 patient required haemodialysis on follow up. On 3 month follow up there was no significant MACE.

Conclusions: In addition to intravascular imaging, other fluoroscopic landmarks such as calcification, side branch wires, vertebra, ribs, sternal wires, surgical clips, pacing wires, resistance encountered while crossing the wire or delivering balloon, presence of waist in the balloon during inflation can significantly improve procedural outcomes by assisting in precise landing of stent.

CORONARY INTERVENTIONS

Correlation of coronary artery calcium (CAC) score with invasive coronary angiography findings and metabolic syndrome in symptomatic patients of CAD

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Background: Coronary artery calcium (CAC) score adds the most value to atherosclerotic cardiovascular disease (ASCVD) risk assessment, apart from traditional risk factors. It has been validated as a risk assessment tool in asymptomatic patients for primary prevention of ASCVD based on long term follow up studies. However, the relationship between CAC score and invasive coronary angiography findings has not shown a similar association, with significant racial variations. There is a need for ascertaining its role in symptomatic patients of coronary artery disease (CAD) and the correlation with metabolic syndrome (MeTS), especially in Indian patients.

Aims: To evaluate the correlation between CAC score and invasive coronary angiography findings in symptomatic patients of CAD, and to assess its relation with risk factors of CAD including MeTS.

Methods and results: A prospective observational study was done on 100 patients of CAD undergoing invasive coronary angiography. CAC score was measured using a multidetector CT scan system, and its relation was assessed with demographic variables, metabolic parameters, and invasive coronary angiography findings.

Results: There is a strong association of increasing age, presence of diabetes and hypertension with incident CAC score. The average CAC score was higher for patients presenting with stable ischemic heart disease (278.48 ± 438.3) than acute coronary syndrome (178.34 ± 320.9). No independent correlation was found between presence of MetS and CAC score (p=0.38). CAC score does not correlate well with the degree of coronary stenosis detected angiographically, and its utility in predicting significant coronary stenosis is limited in symptomatic patients. However, it is noted that a CAC score > 100 has 100% positive predictive value (PPV) for angiographically significant CAD (> 50% luminal diameter stenosis).

Conclusions: Increasing age, diabetes and hypertension have a positive correlation with incident CAC score of an individual. It is not affected by presence of MetS. In symptomatic patients, the relationship of CAC score with invasive angiography findings is nonlinear, but CAC score > 100 has high PPV for significant CAD.

CORONARY INTERVENTIONS

Coronary intravascular lithotripsy for calcium nodule modification during percutaneous coronary intervention

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Background: Among calcified lesions, calcified nodules (CNs) are the most challenging subset to deal with during percutaneous coronary intervention.

Aims: This study was done to assess the safety, efficacy, and optical coherence tomography (OCT) insight of coronary intravascular lithotripsy (IVL) on CN.

Methods: A total of 21 patients with 54 CNs undergoing PCI using coronary IVL were prospectively enrolled in the study. The primary safety endpoint was freedom from major adverse cardiovascular events (death, MI, and target vessel revascularization) during hospitalization and at 30 days and primary efficacy end point was OCT stent expansion of more than 80%.

Results: Pre-IVL mean MLA at CN was 3.9 ± 2.1 mm^2, Ca score was 3.7 ± 0.5, Ca arc 216.2 ± 81.4°, Ca depth 1.03 ± 0.3 mm, Ca length 24.93 ± 10.55 mm, and CN height 1.1 ± 0.3 mm. Mean IVL balloon size was 3.21 ± 0.33 mm. 40 out of the 54 CN treated (74.1%) developed Ca fracture with a mean number of 2.71 ± 0.84; post IVL MLA at CN was 4.9 ± 2.3 mm^2 and luminal gain at CN was 1.02 ± 1.2 mm^2. 32 (80%) CNs developed fractures at base and rest developed fractures at apex. None of the patient developed flow limiting dissection, perforation, slow flow, or abrupt vessel closure. All patients were free of MACE during hospitalization and at 30 days. 85.7% patients achieved stent expansion >80% at CN. Mean stent expansion and MSA at CN was 100.6 ± 18.2% and 7.9 ± 2.5 mm^2 respectively.

Conclusions: Coronary IVL is safe and effective for modification of coronary CNs during PCI.

CORONARY INTERVENTIONS

Trans-radial angioplasty of anomalous origin of right coronary artery from left sinus of valsalva - a single-centre experience

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Background: PCI of anomalous origin of right coronary artery from left sinus of Valsalva (RCA-LSV) through radial route remain a challenge.

Aims: Explore the challenges and techniques for success in PCI of RCA-LSV.

Methods: This study consisted of 13 patients who underwent PCI for an angiographically significant stenosis in RCA-LSV between November 2017 to March 2020. The procedural details including numbers of catheters used, access, hardware, techniques, duration of procedure, volume of contrast and complications were recorded and statistically analysed.

Results: The most frequent site for RCA-LSV is at the level of left main stem (LMS) (53.8%), with 30.8% being just above and 5.4% being just below the LMS level. PCI was done successfully in 100% cases. Our default route was radial for coronary angiography. Angioplasty was performed through trans-radial route in 92.3% and transfemoral in 7.7%. The average number of guide catheters used was (2±1.0), (range:1-4). The guide catheter hooked the coronary ostium selectively and off ostium in 46.2% cases each, while in 7.6% cases it was deeply engaged. Anchoring wire was used in 7.7% of cases. The mean duration of the procedure was 33.8 minutes (range: 15-65 minutes), the mean volume of contrast used was 61.5 (range:30-150) ml. Judkin's left (JL) and Judkin's Right (JR) successfully cannulated the RCA-LSV in 76.9% & 23.1% respectively.

Conclusions: PCI of RCA-LSV through radial route is technically challenging but feasible with reasonable amount of contrast and radiation, localization of ostium and selection of suitable guide catheter.

CORONARY INTERVENTIONS

IVUS derived plaque characteristics and outcomes in patients with acute coronary syndrome undergoing percutaneous intervention

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Background: No / slow flow after percutaneous intervention (PCI) for acute coronary syndromes (ACS) is common. Whether a comprehensive intravascular ultrasound (IVUS) analysis of plaque characteristics can predict final flow in culprit vessel is largely unknown

Objectives: To identify IVUS predictors of suboptimal flow in patients with ACS undergoing PCI

Materials & methods: We performed a prospective multicentre, investigator-initiated study. Patients with ACS, who underwent IVUS guided PCI were enrolled. Clinical, angiographic, and imaging characteristics of lesions which developed suboptimal flow after PCI were analysed and compared with patients with normal flow.

Results: Between October 2021 and August 2022, we enrolled 187 patients (195 lesions) with ACS who underwent IVUS guided PCI. Mean age of patients was 58 + 10.4 years; Incidence of slow /no reflow in our study was 14/195 (7.2%). Presentation as ST elevation myocardial infarction, presence of angiographically complex lesion type (type B2/C) and pre procedural TIMI flow 0 were significantly more in patients who developed no reflow after PCI. Pre PCI IVUS derived plaque attenuation length (9.51mm Vs 4.35mm p=0.037), lesion site positive remodelling (Odds ratio 6.4 : 95% CI ; 1.1 – 38.4 p=0.042) were significant predictors of slow flow. Post PCI length of plaque prolapse (9.73mm Vs 6.58mm p=0.029), significantly correlated with slow flow.

Conclusions: Plaque characteristics on IVUS in patients with ACS helps to predict suboptimal flow following PCI.

CORONARY INTERVENTIONS

Percutaneous transluminal coronary angioplasty (PTCA) in post coronary artery bypass (CABG) patients presenting with ACS: experience from a tertiary care centre

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Background: Due to an expanding population of patients with surgically treated coronary artery disease and the natural progression, of atherosclerosis, an increasing number of patients with previous CABG require repeat revascularization procedures.

Aims: To know the presentation, angiographic findings, and feasibility of PTCA in Post CABG patients who presented with ACS.

Methods and results: The present study was a retrospective analysis of data available in the department of cardiology, Kalinga institute of medical sciences, a tertiary care centre. During 2017 - 2022, 113 patients who previously underwent CABG and now presented with ACS were enrolled. Mean time of presentation after CABG was 6.7 years. Mean age was 58.63 years. Presentation was STEMI, NSTEMI, USA in 23 (20.35%), 55 (48.68%), 35 (30.97%) respectively. After CAG, PTCA, medical management and re CABG were advised for 89 (78.76%), 20 (17.70%) 4 (3.54%) patients respectively. In 89 patients who were advised for PTCA, at CAG, 128 lesions were identified, 112 (87.5%) in native vessels with total and subtotal occlusion present in 29 (22.65%) and 21(16.40%) patients in LAD, 22(17.19%) and 16 (12.5%) in RCA, 13(10.15%) and 11(8.59 %) in LCX respectively. 13 (10.10%) had lesion in SVG graft. 3 (2.35%) had lesion in LIMA graft. PTCA was attempted in all the 128 lesions, with DES. 98 lesions (76.5%) were successfully revascularized with PTCA. Procedural failure in native vessels may be attributed to inability to cross the CTOs, heavily calcified vessels. Lesions in graft vessels where revascularized with ease when compared to native vessels.

Conclusions: PTCA in patients with post CABG status who presented with ACS, was successful with minimal procedural complications. PTCA may be considered in this special population where redo surgery was associated with significant mortality.

CORONARY INTERVENTIONS

Role of PCSK9 in patients with coronary artery disease: a case-control study

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Background: PCSK9 (Proprotein convertase subtilisin/kexin type 9) plays a key role in cholesterol homeostasis and coronary artery disease (CAD). Many studies have extrapolated the association of PCSK9 gene with LDL-C levels and CAD but with contradicting results. Mutations in the PCSK9 gene resulted in reduced blood cholesterol levels (hypocholesterolaemia) by reducing the activity of the PCSK9 protein or decrease the amount of this protein that is produced in cells. Loss of function mutations in the PCSK9 were expected to have a better response to statins suggesting that lipid-lowering by PCSK9 inhibitors may be synergistic to that achieved by statins treatment. There is no such study available stating the intergenotypic variations in the levels of expressions of LDL cholesterol and their correlations with CAD risk factors in patients with CAD.

Aims: We aim to explore the association of PCSK9 A/G (rs505151) polymorphism with CAD and their intergenotypic variation in the levels of LDL cholesterol in patients with CAD.

Methods: Angiographically confirmed CAD patients [N=250] and controls [N=250] were genotyped by PCR followed by RFLP techniques. The differential expression of PCSK9 were studied by REAL TIME PCR and Western Blot techniques.

Conclusions: To conclude, our study has shown a significant association of PCSK9 gene polymorphism with coronary artery disease. Odds ratio being the index of association revealed a statistically significant association of PCSK9 A/G (rs505151), A Vs G= 4.94 [1.37-7.79] polymorphism with CAD. We also observed an increased expression of PCSK9 gene in patients with G allele of PCSK9 A/G (rs505151) gene polymorphism in patients with CAD. We report for the first time a higher expression of PCSK9 gene correlated with circulating levels of LDL-cholesterol in patients with CAD in GG genotype. In our study, PCSK9 gene and LDL-cholesterol have emerged as independent risk factors. Further, follow up studies are also needed to explore whether up-regulated PCSK9 gene expression is an independent risk factor and can it serve as prognostic marker for CAD. We envisage that studies in this direction may lead to better insight into the role of higher expression of PCSK9 in the GG genotype in patients with CAD. Till date, no such study has been conducted in the north Indian population with respect to PCSK9 and CAD.

CORONARY INTERVENTIONS

Phenotypes of no-reflow phenomenon by percutaneous coronary interventions in myocardial infarction

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Background: several pathogenetic mechanisms can lead to the no-reflow phenomenon development.

Aims: use the clustering method to determine the phenotypes of the no-reflow phenomenon by percutaneous coronary interventions in myocardial infarction patients.

Methods: 190 patients with no-reflow phenomenon (TIMI flow grade <3 points or Myocardial blush grade < 2 points or ST segment resolution <70%). The median age 64 [56; 70] years, 137 (72%) men, 53 (28%) women. ST-segment elevation myocardial infarction in 170 patients (89%). Primary percutaneous coronary interventions in 127 (67%) cases. Nine patients (4.7%) died.

Results: three phenotypes in a ratio of 56% (n=106) / 27% (n=52) / 17% (n=32) were identified. The parameters values were respectively the following: age 62 [54; 67] / 73 [67; 79] / 59 [50; 65] years; women 8 (8%) / 39 (77%) / 6 (19%); STEMI 102 (96%) / 43 (83%) / 25 (78%); acute heart failure Class 1 [1; 2] / 2 [1; 4] / 2 [2; 2]; platelet to lymphocyte ratio 110 [78; 153] / 106 [85; 132] / 132 [100; 182]; glucose on admission 8,0 [6,9; 9,6] / 11,1 [8,8; 15,2] / 7,5 [6,1; 8,1] mmol/l; total cholesterol 4,7 [4,2; 5,4] / 5,3 [3,7; 6,2] / 5,1 [4,5; 6,2] mmol/l; glomerular filtration rate 77 [64; 88] / 58 [46; 74] / 81 [64; 88] ml/min/1.73m2; Syntax Score 15 [10; 21] / 20 [14; 26] / 8 [5; 10] points; collaterals according to Rentrop 0 [0; 1] / 0 [0; 1] / 0 [0; 0] degree; TIMI thrombus grade 5 [5; 5] / 5 [3; 5] / 1 [0; 2]; TIMI flow grade 0 [0; 0] / 0 [0; 1] / 2 [2; 3]. 2 (1.9%), 7 (13.5%) and 0 (0%) patients died (p=0.002, χ2-Pearson).

Conclusions: three phenotypes have been identified. The first phenotype (microthromboembolic): severe thrombus burden, mostly men, moderate atherosclerosis. The second phenotype (age-associated): mostly elderly women, high hyperglycaemia, severe atherosclerosis, severe acute heart failure, impaired renal function, infarct-related artery thrombosis. The third phenotype (atheroembolic): mostly men, mild atherosclerosis, slight thrombus burden, preserved coronary blood flow before intervention, elevated levels of inflammatory markers and total cholesterol.

CORONARY INTERVENTIONS

Feasibility of distal left main stenting with sirolimus-eluting tapered stent system a single-centre experience India

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Background: Coronary artery bypass grafting has been the traditional approach for left main coronary artery disease. With advances in drug-eluting stents and percutaneous coronary intervention, the left main coronary artery stenting at the distal left main trunk has become feasible.

Aims: This study sought to assesses the feasibility of use and clinical outcomes of a novel tapered coronary stent system, BioMime™ Morph, for left main to distal branch vessel percutaneous coronary intervention.

Methods and results: In this prospective, observational, single-centre study, 30 patients with distal left main coronary artery disease extending into side branch vessels underwent percutaneous coronary intervention. A tapered coronary stent BioMime™ Morph sirolimus-eluting coronary stent system, (Meril Life Sciences Pvt. Ltd, India) was implanted.

Of the 30 patients, 3 patients (10%) underwent left main coronary artery to left circumflex stenting, whereas 27 patients (90%) required left main coronary artery to left anterior descending stent. In 90% of cases, stents with proximal and distal diameters of 3.5 mm and 3 mm, respectively, and 30 mm length were used. The procedural success rate was 100%. Patients were followed-up at 30 days, 3 months, and every 6 months till 2 years follow-up. Five patients had angina or angina-like symptoms during follow-up. There were no cases of in-stent restenosis.

Conclusions: Distal left main to distant branch percutaneous intervention poses challenges due to tapering vessel diameters. Expertise and patient selection are crucial to achieve success of left main stenting. Tapered stents can prevent stent overlap, maintain blood flow, and reduce size mismatch.

CORONARY INTERVENTIONS

Evaluation of vascular response, downstream effect, and pharmacokinetics after sirolimus- and paclitaxel-coated balloons treatment in swine heart model

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Background: This study investigated the vascular and downstream effects and drug pharmacokinetics in a porcine coronary model treated with different types of drug-coated balloons (DCBs), two sirolimus-coated balloons (SCB) [Magic Touch (MT-SCB) and Selution SRL (SEL-SCB)], Agent paclitaxel-coated balloon (PCB), and plain old balloon angioplasty (POBA).

Methods: The hearts of 10 domestic pigs were treated with one of three DCBs or POBA in the coronary artery with 28 days follow-up. In 6 pigs, histological assessment was performed for the arterial response with semi-quantified scoring and downstream effects on the myocardium for distal emboli and tissue injury. In 4 pigs, sirolimus and paclitaxel concentrations were measured in the coronary artery and downstream myocardium.

Results: In 17 coronary arteries, neointimal formation was minimum in all DCBs. Tow SCBs showed lower scores on medial SMC loss compared to the PCB. In the histology section-based analysis of downstream myocardium, the PBC showed evidence of myocyte necrosis/scarring in 22.2% of sections, but no evidence in the other groups (P=0.002). The MT-SCB had the lowest downstream emboli (3.7%), followed by POBA (5%), SEL-SCB (9.1%), and PCB (39.1%) (P=0.002). In the pharmacokinetic analysis, paclitaxel showed higher concentrations after treatment with PCB compared to sirolimus after treatment with both two SCBs in both coronary and myocardium. There was no statistical difference in drug levels between two SCBs.

Conclusions: MT-SCB and SEL-SCB demonstrated lower arterial injury, downstream effect, and drug concentration compared to PCB at subacute phase, suggesting favourable profile for SCBs in the safety during percutaneous coronary intervention.

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CORONARY INTERVENTIONS

Transcatheter closure of ruptured sinus of valsalva aneurysm: expanding horizons to larger defects

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Background: Ruptured Sinus of Valsalva Aneurysm (SOVA) conventionally requires surgical intervention. Transcatheter Closure (TCC) has become the preferred treatment in recent times, especially for smaller defects.

Aims: The clinical features, feasibility, and procedural nuances of TCC for larger defects are presented here.

Methods and results: The clinical and procedural details of patients undergoing TCC of ruptured SOVA between January 2018 and July 2023 were reviewed. A previous large case series published in the journal from the same institute established the feasibility of this procedure. The largest device used in this series was the 16 mm x 14 mm Amplatzer Duct Occluder. For the purpose of the present study, the authors defined large defects as those needing devices measuring more than 16 mm in diameter at the aortic end for effective occlusion. Out of 18 patients who underwent TCC in the study period, a total of eight patients fit the above definition of large defects. The outcome of patients undergoing TCC for ruptured SOVA with large defects has been exceptional. There has been no mortality and the patients have maintained asymptomatic status at the follow up of 12 months. However, 75% patients developed afterload mismatch which recovered on follow-up without any intervention.

Conclusions: TCC of ruptured SOVA with large defects is feasible and safe. Availability of larger duct occluders has enabled successful closure in more patients otherwise heading towards complex surgical repair.

CORONARY INTERVENTIONS

Three years clinical and imaging outcomes of MeRes100 bioresorbable vascular scaffold- MeRes-1 Extend study

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Background: Bioresorbable Vascular Scaffolds are transforming interventional cardiology by offering a resorbable alternative to traditional stents, potentially reducing the risk of long-term complications.

Aims: This study assessed the long-term safety and efficacy of thin-strut MeRes100 sirolimus-eluting Bioresorbable Vascular Scaffold in patients with *de novo* coronary artery lesions.

Methods and results: MeRes-1 Extend, a multicentric, prospective, single-arm, open-label study that enrolled 64 patients across multiple countries. The primary safety endpoint was major adverse cardiac events (including cardiac death, myocardial infarction, and ischemia-driven target lesion revascularization) and scaffold thrombosis. Additionally, mean in-scaffold late lumen loss was evaluated through quantitative coronary angiography and optical coherence tomography at baseline and 6-month follow-up.

At 3-year follow-up, one out of 62 patients developed a major adverse cardiac events (1.61%) in the form of ischemia-driven target lesion revascularization. There was no case of myocardial infarction, cardiac death, and scaffold thrombosis during the 3-year follow-up. In 32 patients, paired quantitative coronary angiography showed mean in-scaffold late lumen loss of 0.18 ± 0.31 mm at 6 months. In 21 patients, at 6-month follow-up, optical coherence tomography revealed 97.95 ± 3.69% strut coverage with a mean scaffold area of 7.56 ± 1.79 mm^2 and no evidence of strut malapposition.

Conclusions: The 3-year clinical and 6-month imaging outcomes of the MeRes-1 Extend study indicated favourable safety and efficacy of the MeRes100 sirolimus-eluting Bioresorbable Vascular Scaffold in patients with *de novo* coronary artery lesions.

CORONARY INTERVENTIONS

Safety and effectiveness of BioMime sirolimus eluting stent in real-world all-comers coronary artery disease patients – two-year outcomes of MILES UK registry

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Background: There are concerns about the real-world effectiveness and safety of drug-eluting coronary stents in terms of restenosis and in-stent thrombosis.

Aims: MILES UK registry was designed to evaluate the safety and efficacy of the novel BioMime™ sirolimus-eluting coronary stent in a real-world all-comers coronary artery disease patients which includes long lesions, bifurcation lesions and chronic total occlusions.

Methods and results: This was a prospective, observational, multicentre, post-marketing surveillance study. The primary endpoint was target vessel failure rate at 9-month follow-up, as per Academic Research Consortium. Secondary endpoints included target lesion revascularization, cumulative target vessel failure, major cardiac events, and stent thrombosis during hospitalization and at 1-, 9-, 12-, and 24 months follow-up.

Out of 758 enrolled patients, 677 patients completed the 2-year follow-up. The target vessel failure was reported to be 4.43%, target lesion revascularization 2.36%, stent thrombosis (definite and probable) 1.03%, and 2.95% of all-cause mortality cases including 1.48% cardiac deaths at 2-year follow-up. Target vessel failure rates in subsets of long lesions, bifurcation lesions, and chronic total occlusions were 6.25%, 4.05%, and 13.95% respectively.

Conclusions: Despite the population pool of complex lesion types including coronary chronic total occlusion and bifurcation lesions and implantation of long as well as short stents, BioMime™ sirolimus-eluting stent showed satisfactory results in the real-world all-comers patients suffering from coronary artery disease at two-year follow-up.

CORONARY INTERVENTIONS

MeRes100 Bioresorbable vascular scaffold: a real-world, retrospective single-centre experience of one-year follow-up

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Background: The MeRes100 (Meril Life Sciences Pvt. Ltd., India) is an advanced bioresorbable vascular scaffold. With thinner struts, rapid resorption, and unique design using a 100µm thin-strut sirolimus-eluting system, it employs radiopaque markers for precise placement. Expected to dissolve within two years, it significantly improves safety and effectiveness in coronary artery disease treatment.

Aims: To assess the safety and efficacy of MeRes100 in coronary artery disease patients.

Methods and results: This single-centre, retrospective, observational study involved 86 consecutive coronary artery disease patients (*de novo* and in-stent restenosis) treated with MeRes100 between February 2021 and March 2023. It assessed safety and efficacy by analysing device success (successful scaffold delivery) and procedure success (achieving <30% residual diameter stenosis in treated lesions through visual inspection or quantitative coronary angiography).

Among 86 patients (mean age: 61.86 ± 11.25 years), 26.74% had diabetes, and 75.58% had hypertension. Most lesions were ACC/AHA type C (57.14%) or B2 (22.62%), with 11 in-stent restenosis cases and a mean lesion length of 17.51 ± 1.71 mm. 104 MeRes100 scaffolds were implanted. Procedural and device success was achieved in 86 (100%) patients with all attaining optimal blood flow. One cardiac death (1.16%) occurred during discharge due to myocardial infarction. There were no scaffold thrombosis incidents during the one-year follow-up, and no further adverse events were reported in the subsequent 6-month (72 patients) and 1-year (54 patients) follow-ups.

Conclusions: The study showed MeRes100 as a safe and effective treatment for coronary *de novo* and in-stent restenosis lesions, yielding positive clinical outcomes.

CORONARY INTERVENTIONS

ANti-Thrombotic strAtegy for nonocclusive thRombus with ST-segment elevation myocardial InfarCtion in young pAtients—ANTARTICA study.

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Background: Following percutaneous coronary intervention (PCI), patients with atrial fibrillation (AF) are commonly offered direct oral anticoagulants (DOACs), dual or single antiplatelet therapy (DAPT/SAPT), and antithrombotic therapy (ATS) to reduce the risk of stroke and manage pulmonary embolism and venous thromboembolism. Several limited observational studies have demonstrated that a combination of antithrombotic therapy can effectively eliminate tiny blood clots in left ventricular failure.

Aims: Therefore, we suggest an efficient, affordable, and demonstrative ATS for non-obstructive significant blood clots in clinically stable, young STEMI patients.

Methods and results: We conducted a retrospective analysis of 45 patients who had stable ST-elevation myocardial infarction (STEMI) with nonocclusive thrombus and thrombolysis in myocardial infarction flow 2/3. These patients were treated with dabigatran and clopidogrel in the ATS arm. They were compared to 47 similar patients who underwent standard-of-care PCI in the control group. NYHA functional class and left ventricular ejection fraction (LVEF) were assessed in all participants during the initial presentation and again at the 6-month mark following the administration of ATS. Every patient in the ATS group had CT-CAG after 6 months. We analysed notable safety events such as haemorrhage, reinfarction, and cardiac death.

All cases in the ATS arm showed full clearance of the thrombus, as confirmed by the primary angiographic result. The clinical secondary outcomes showed a significant improvement in NYHA class, with a greater drop from 3.53±0.52 to 1.07±0.25 in the ATS arm compared to a reduction from 3.6±0.51 to 1.49±0.51 in the control group ($p<0.001$). The secondary echocardiographic outcome showed a notable enhancement in LVEF, with the mean value increasing from 45.05±2.84% to 49.24±3.96% in the ATS group, compared to a change from 44.13±2.05% to 45.03±1.98% in the control group ($p< 0.001$). The clinical safety shown decreases in TIMI haemorrhage and reinfarction. There were no deaths in either group.

Conclusions: By postponing PCI and administering antithrombotic medications to patients with STEMI, the occurrence of no-reflow, distal embolization, and intraprocedural thrombotic events was significantly reduced. The medicinal intervention solely enhanced myocardial preservation.

CORONARY INTERVENTIONS

Unveiling the consequences: occluded culprit arteries and outcomes in NSTEMI patients

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Background: In ACS, timely diagnosis and management are crucial. A subset of patients with total occlusion (TO) of the culprit artery based on coronary angiogram, present as NSTEMI, a lack of classic electrocardiogram findings may lead to a delay in revascularization and worse outcomes.

Aims: To compare the clinical outcomes of NSTEMI patients with occluded and non-occluded culprit artery

Methods: All consecutive NSTEMI patients from August 2018 to December 2019, underwent PCI at Madras Medical Mission were included. Baseline, procedural characteristics, and outcomes were compared with total occlusion and without occlusion. Primary outcomes were 30-day,1-year MACE and LVEF.

Results: Among 283 patients, 203 non-occlusion, and 80 in TO group. TO patients were younger (56.3±11.2 Vs 60.5±16.3, p-0.001). In TO LVEF ≤ 49 was high (67.5% vs 53.2%, p-0.03), median admission to angiogram time was significantly longer (20 Vs 15, p-0.01) and predominant culprit artery was LCX (33.8% vs 18.8%, p-0.008) whereas LAD in the non-occluded group (37.5% Vs 45.2%, p-<0.001). Thrombus burden high in TO (10% vs 3.8%, p-0.08). No significant difference in 30-day and 1-year MACE but LVEF < 49 was high in TO (52.2% vs 32.4, p-0.009) at 1 year. TIMI flow and LCX involvement are significant predictors of LVEF at 1 year. The odds of LVEF <49 are three times higher in patients with LCX involvement.

Conclusions: NSTEMI Patients with TO tend to have more LCX involvement but the Traditional ST elevation criteria exclude a sizable fraction of patients which impacts their LV function at 1 year.

CORONARY INTERVENTIONS

The impact of the pre-procedural pathophysiological pattern of coronary disease on immediate hemodynamic and predicted clinical outcomes: insights from the multivessel TALENT trial

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Background: Diffuse coronary artery disease (CAD) impacts the immediate hemodynamic and clinical outcomes of percutaneous coronary intervention (PCI).

Objectives: We evaluated whether the diffuse pattern of CAD derived from angiographic Quantitative flow ratio (QFR) impacts the immediate hemodynamic outcome post-PCI and the medium term predicted vessel-oriented composite outcome (VOCE).

Methods and results: Paired pre-procedure QFRs were assessed in 503 patients and 1022 vessels in the Multivessel TALENT (MVT) trial. The pathophysiological pattern of CAD was defined as "predominantly diffuse" or "focal" according to a virtual QFR pullback pressure gradient (PPG) index <0.78 and ≥0.78, respectively. Physiological "focal severity" was assessed using the QFR gradient per mm (dQFR/ds), with a value ≥0.025/mm the threshold for a "major gradient". A post-PCI QFR ≥0.91 was considered optimal. Median pre-PCI PPG index was 0.70 (IQR 0.59-0.80). The prevalence of "predominantly diffuse" CAD and "major gradient" were 68.6% and 85.8%, respectively. A "Predominantly diffuse" pattern with a major gradient had a higher risk of a post-PCI QFR <0.91 (OR 1.52,95%CI 1.47-1.58). In multivariable analysis, low QFR PPG index (diffuse disease) was an independent determinant of a post-PCI QFR<0.91 (per 0.1 decrease of QFR PPG index, OR:9.8, 95% CI 3.0-32.2, p<0.001). Based on post-PCI QFR the predicted 2-year VOCE, a powered endpoint in the MVT trial, was 6.1% and 4.2% in diffuse and focal lesions, respectively.

Conclusions: A pre-procedure physiological pattern of diffuse CAD is an independent determinant of an unfavourable immediate hemodynamic outcome post-PCI, and detrimentally affects the predicted 2-year VOCE.

CORONARY INTERVENTIONS

Optical Coherence Tomography predictors of side branch restenosis after unprotected left main bifurcation angioplasty using double kissing crush technique (OP-SIBRE LM Study)

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Background: Among the two stent strategies, contemporary evidence favours double kissing crush technique (DKC) for complex unprotected distal left main bifurcation (UdLMB) lesions. However, one of the major challenges to these lesions is side branch (SB) restenosis.

Aims: To identify optical coherence tomographic (OCT) characteristics that may predict SB restenosis after UdLMB angioplasty using DKC technique.

Methods: This was a single-centre, retrospective study that included 60 patients with complex UdLMB disease, who underwent OCT-guided angioplasty using DKC technique. Angiographic follow-up was performed in all patients at one year to identify patients with SB restenosis. Patients with SB restenosis (SBR group) were compared with patients without SB restenosis (NSBR group) for OCT parameters during index procedure.

Results: 12(20%) patients developed side branch restenosis at 1-year follow-up. The SBR group had longer SB lesion (18.8 ±3.2 vs 15.3 ±3.7 mm, p = 0.004) and neo-metallic carinal length (2.1mm vs 0.1mm, p < 0.001) when compared to the NSBR group. Longer neo-metallic carinal length was associated with the absence of the dumbbell sign, presence of hanging stent struts across the SB ostium on OCT of final MB pullback.

On multivariate regression analysis, SB distal reference diameter (DRD) and SB stent expansion were identified as independent predictors of SB restenosis with SB-DRD of ≤2.8 mm (area under curve-0.73, sensitivity-83.3%, specificity-62.5%) and SB stent expansion of ≤89% (area under curve-0.88, sensitivity-83.3% & specificity- 81.2%) as the best cut off values to predict SBR.

Conclusions: SB DRD, SB stent expansion and length of neo-metallic carina are the OCT predictors of future SB restenosis after UdLMB angioplasty using DKC technique.

CORONARY INTERVENTIONS

Vascular response in patients with diabetes mellitus: an optical coherence tomography study of biodegradable polymer-coated sirolimus-eluting stent – the OCID study

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Background: The percutaneous coronary intervention in patients with diabetes mellitus (DM) is challenging in multiple aspects. They often have multivessel and complex morphology. Diabetics also have various other co-morbidities causing high-bleeding risk possibility. Vascular response after implantation of thin strut (60 µm) stent has not been specifically established in diabetic subset.

Aims: To evaluate the extent of strut coverage and vessel wall healing at early period of 90 days after implantation of the biodegradable polymer-coated Cruz (Sahajanand Medical Technologies Ltd., Surat, India) sirolimus-eluting stent (SES) in patients with DM using Optical Coherence Tomography (OCT) analysis.

Methods and results: In OCID study, 44 patients with DM were prospectively enrolled into this study between June-2019 and March-2020. All patients underwent OCT at 3 months follow-up. The OCT images were analysed by the core laboratory at Stanford (CA, USA). The core laboratory was blinded to the angiographic outcomes. All other risk factors and demographic characteristics were recorded. All patients successfully underwent OCT analysis at 3 months. There were no clinical events before the OCT analysis in any patient. Analysed stent length was 31.61 ± 13.04 mm and mean stent diameter was 2.73 ± 0.37 mm. The average number of struts analysed per patient was 358.84 ± 156.06. The strut coverage was 99.99 ± 0.05%. Mean incomplete stent apposition of struts was 0.20 ± 0.56%. Stent eccentricity index was 0.10 ± 0.04. Area and volume of neointimal hyperplasia (NIH) on the struts at 3 months was 0.76 ± 0.36 mm^2 and 24.17 ± 15.15 mm^3, respectively.

Conclusions: This study demonstrated excellent endothelization and extensive strut coverage of 99.99 ± 0.05% with low NIH accumulation in patients with DM at 3 months after implantation of Supraflex Cruz SES. This may have implications for abbreviated dual-antiplatelet therapy (DAPT) in high-bleeding risk patients.

CORONARY INTERVENTIONS

Myocardial Infarction Delhi Angioplasty Study (MIDAS) : 5 year experience of a Level I Comprehensive Heart Attack Centre

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Background: Timely Primary Percutaneous Coronary Angioplasty is the preferred treatment for patients with ST Elevation Myocardial Infarction. In India, the implementation of established therapies into practice is suboptimal. PPCI is performed in 24 – 40% patients with STEMI despite an exponential increase in PPCI capable hospitals. Focus on hospital processes is more likely to accelerate care and improve outcomes.

Aims: To study the impact of standardised care protocol on providing timely PPCI 24x7x365 to consecutive patients presenting with STEMI at a Level I Comprehensive Heart Attack Centre. To study the clinical profile, treatment given, in hospital mortality, adequacy of discharge treatment and mode of payment of this group.

Methods: Standardised protocol, were developed and implemented, to provide 24 x 7 x 365 PPCI and achieve D2B less than 90 min. A single reperfusion strategy of PPCI was used and a single call, CODE STEMI, was implemented to activate the team. After approval of ethics committee, retrospective study on Clinical profile, risk factors, disease extent, procedure details, in hospital mortality and adequacy of discharge treatment and mode of payment was done.

Results: During the period Jan 1, 2015, to December 31, 2019, there were 900 CODE STEMI, 557 patients presented during daytime (8 am to 7:59 pm) and 343 patients who presented during night hours (8 pm to 7:59 am). 79.8 % patients were male, the mean age was 59 + 12.9 years. The median Door to Cath lab time was 26 min during daytime and 30 min during night-time (p = NS). There was no difference for men, women, elderly, and economically weaker section (EWS) patients 61.6 % patients presented within 6 hours of chest pain, 43.2% had history of hypertension, 34% were diabetic, 7% were smokers, 2% had family history of CAD. 41% patients had SVD and 26% had TVD. After CAG, 36 patients were advised medical therapy, 843 patients underwent PPCI, for whom the median Door to Balloon time was 50 min. D2B of less than 90 minutes was achieved in 86% of patients. 41 patients underwent CABG after initial stabilisation. The overall mortality was 5.2%, 9.8% for CABG group and 8.2% for women. The median duration of stay was 3 days. 6% of patients were EWS, 28.3% were self-paying and 64.6% had insurance cover. 70% patients lived within 10 kilometres of the hospital. All patients received dual antiplatelet therapy and statin at discharge, 70% were on beta blockers and 40% on ACE/ ARB.

Conclusions: Implementation of standardised protocols enabled the delivery of timely, co-ordinated, consistent care. Establishing leadership teams, with systematic collection of data can identify gaps in care and create accountability, improve processes and patient outcomes. A rigorous approach enables translation of guidelines to clinical practice.

CORONARY INTERVENTIONS

Prolonged Tpeak-end and Tpeak-end/QT ratio as predictor of malignant ventricular arrhythmias in acute STEMI: case-control prospective clinical study

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Background: Ventricular tachyarrhythmias (VAs) in patients presenting with an acute MI has increased risk of mortality. Following STEMI, electrocardiographic (ECG) indices such as T-wave alternans, heart rate (HR) turbulence, decreased HR variability, prolonged corrected QT (QTc) interval and increased QT dispersion provide the prognostic measure usually 6–8 weeks after MI. In the earlier exploratory work, authors studied malignant ventricular arrhythmias in patients presenting with STEMI by evaluating the prolonged Tpeak-end and Tpeak-end/QT ratio and its relation to malignant ventricular arrhythmias in the acute phase of STEMI. This ratio was prolonged in patients with acute STEMI helping predict development of ventricular arrythmias within 24 hours of MI and can enable decision for emergency PCI.

Aims: To evaluate the precision and applicability of Tpeak-end and Tpeak-end/QT ratio is predicting

ventricular arrythmias in patients with acute STEMI at admission.

Methods and results: This prospective case control study comprises 125 STEMI patients and 125 healthy controls. Their Tpeak-end and Tpeak-end/QT ratio and its implications in development of malignant ventricular arrhythmias within 24 hours of MI were studied. The average Tpeak-end/QT ratio observed was 0.28 at admission among these STEMI patients with 7 cases of ventricular arrythmias with the average Tpeak-end/QT ratio of 0.42. The regression analysis of our study dataset demonstrates the cut-off Tpeak- end /QT ratio as 0.30.

Conclusions: Any STEMI patient with Tpeak- end /QT ratio above 0.30 should be considered for revascularization immediately to prevent progression to VF and related risks.

CORONARY INTERVENTIONS

Trans-radial angioplasty of anomalous origin of right coronary artery: a single-centre experience

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Background: Percutaneous coronary intervention (PCI) to anomalous coronary arteries is technically challenging.

Aims: Explore the technical and procedural challenges in PCI of anomalous origin of right coronary artery (AORCA) through trans-radial route.

Methods: This prospective study consisted of 25 consecutive patients underwent PCI for an AORCA between November 2017 to May 2019. Procedural data including numbers of catheters used, access, techniques, duration of procedure, volume of contrast and complications were recorded and statistically analysed.

Results: Origin of AORCA was 48% each from right and left coronary sinus, with 4% arising from the ascending aorta. Superior & inferior take off was 83.3% and 8.3% respectively, 8.3% originating from the left main, with a common origin with the left anterior descending artery, from right coronary sinus. Angioplasty was performed trans-radially in 92.0% and trans-femoral in 8.0%. The average number of guide catheters used was (2±1.0), (range:1-4). The guide catheter hooked the coronary ostium selectively in 32.0%, off ostium in 56.0% and deep intubation was done in 12.0% cases. Anchoring wire was used in 12.0%. Guide extension catheter was used in 8.0% cases. The average duration of the procedure & contrast used were 39.4 (range;15-90) minutes & 67.0 (range: 30-150) ml. For PCI, JL (36%), JR (28%) & MPA (12.0%) guide catheters were used. Thrombo-suction was done in one case with coronary artery dissection in another case.

Conclusions: PCI of AORCA through radial route is feasible with a reasonable amount of contrast, radiation, and appropriate techniques. Proper localization of ostium and selection of guide, aided by additional armamentarium like guide extension catheter and anchoring wires.

CORONARY INTERVENTIONS

Drug coated balloon - only strategy for treatment of coronary artery lesions – a prospective observational study

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Background: Percutaneous coronary interventions (PCI) with drug-coated balloon (DCB) was found as a promising way of delivering antiproliferative drugs directly to the vessel wall. While DCB is now a preferred choice for use in in-stent restenosis lesions and small vessel lesions, but the use of DCB in treating *de-novo* lesions in large vessels remains limited.

Aims: The aim of this study is to evaluate the safety and efficacy of the DCB-only strategy percutaneous coronary intervention in in-stent restenosis as well as in *de-novo* small and large coronary vessels lesions.

Methods and results: Single centre prospective, observational study conducted from 1/1/2023-1/6/2023 and enrolled 37 patients (45 lesions). The primary end point was clinically driven target lesion revascularisation rate (TLR) at 6-month. Of the 37 patients, 10 patients with 15 lesions had ISR, while 27 patients with 30 lesions had *de-novo* coronary lesions (*de-novo* small and *de-novo* large vessels were 22 and 8 respectively). The average age was 63.14 ± 12.72 years and 83.9% were male. Procedural success rate was observed in 100% of *de-novo* large vessel and ISR groups while 95.5% in *de-novo* small vessel lesions (P value= 1). Analysis at 6-month revealed a TLR rate of 4.8% in *de-novo* small vessel lesion, while TLR for *de-novo* large vessel and ISR arm was zero. Cardiac death was observed in 7.7% of ISR arm versus none for *de-novo* lesions.

Conclusions: Our data showed that DCB-only PCI is as safe and effective procedure for ISR, *de-novo* small vessel as well as *de-novo* large vessel lesions.

CORONARY INTERVENTIONS

IV antiplatelet therapy with $P2Y_{12}$ inhibitor cangrelor versus Gp2b3a inhibitor tirofiban in patients presenting with ST-elevation STEMI, undergoing primary PCI

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Background: Inhibition of COX-1 by aspirin and the $P2Y_{12}$ receptor by a $P2Y_{12}$ inhibitor with oral loading doses is a first line treatment strategy in patients with ACS and in patients undergoing PCI. Recently, treatment with short-course GPIIb/IIIa inhibitors and intravenous $P2Y_{12}$ receptor blocker cangrelor has gained interest. Cangrelor selectively and specifically blocks $P2Y_{12}$ receptor-mediated platelet activation. It is the only intravenous $P2Y_{12}$ inhibitor available for clinical use. Blockade is direct, reversible, and competitive. Cangrelor has a linear dose-dependent pharmacokinetic profile that leads to stable antiplatelet effects. Platelet inhibition is rapid and potent, occurring within minutes, has a 3-6-minute plasma half-life with rapid platelet function recovery within 30-60 minutes after discontinuation of infusion. It does not require dose adjustment in patients presenting renal failure and was approved for clinical use by the US FDA as an adjunct to PCI to reduce the risk of MI, repeat coronary revascularisation, and stent thrombosis. There is a need to generate more clinical evidence to evaluate the efficacy and safety of cangrelor compared to GPIIb/IIIa inhibitors like tirofiban in this category of patients.

Aims: In this study we have compared the safety and efficacy of cangrelor with tirofiban in patients presenting with acute coronary syndrome STEMI and undergoing percutaneous coronary intervention.

Methods and results: This was a prospective, single centre, observational study including consecutive STEMI patients who received either cangrelor or tirofiban during PCI at MAX Super Specialty Hospital, New Delhi from October 2023 to December 2023. On arrival to ER all STEMI patient were loaded with loading dose. Study population selected in randomized way and were divided in two groups based on antiplatelet treatment received, either with cangrelor or tirofiban. The primary outcome was impaired myocardial revascularisation assessed by post-procedural thrombolysis in MI (TIMI) flow grade < 3. The secondary outcome measures were incidence of major bleeding and all-cause mortality during hospitalization. A total of 40 STEMI patients received IV antiplatelet therapy during primary PCI. The mean age 62 +/- 10 years out of which 76% were males. The use of cangrelor was associated with a lower probability of post-procedural TIMI flow < 3 than tirofiban. Major bleeding was seen in 1 (0.5%) and 3 (1.5%) patients. There was no incidence of death in either groups.

Conclusions: In this observational study of STEMI patients undergoing primary PCI, post procedural use of cangrelor was associated with comparatively less bleeding risk and improved myocardial reperfusion compared to tirofiban, but no differences in terms of death during hospitalisation.

CORONARY INTERVENTIONS

Comparison of OCT evaluated healing pattern in small versus large coronary arteries after ultra-thin strut sirolimus-eluting stent implantation

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Background: Although the strut coverage and neointimal healing patterns after 90 days of implantation of ultra-thin strut sirolimus-eluting stent (SES) have been documented, concerns have been raised about the healing in large vessels with ultra-thin strut stents.

Aims: To evaluate strut coverage and healing response after implantation of the biodegradable polymer-coated Supraflex Cruz (Sahajanand Medical Technologies Ltd., Surat, India) SES of diameter <3.00 mm and ≥3.00 mm using optical coherence tomography (OCT) analysis.

Methods and results: We used the combined data from OCID and OCIMI studies in which OCT analysis was performed at 90 days after implantation of Supraflex Cruz SES (strut thickness 60 µm). The patients were divided into two groups based on stent diameter, i.e., small diameter (<3 mm, n=27) and large diameter (≥3 mm, n=40). All patients underwent OCT examination at 3 months follow-up. The OCT images were analysed by the core laboratory at Stanford (CA, USA). The core laboratory was blinded to the angiographic outcomes. All other risk factors and demographic characteristics were recorded and were statistically non-significant. There were no clinical events before the OCT analysis in any patient. The analysed stent length was 30.03±13.31 mm and 30.81±12.73 mm (p=0.812) for the small and large diameter group, respectively. The mean stent diameter was 2.59 ± 0.17 mm and 3.18 ± 0.27 mm (p<0.001), respectively. The strut coverage was 99.99±0.04% and 99.97±0.13% (p=0.314), respectively. Mean incomplete stent apposition of struts per lesion was 0.15±0.35% and 0.19±0.59% (p=0.756), respectively. The stent eccentricity index was 0.09±0.03 and 0.1±0.04 (p=0.566), respectively. Thickness of neointimal hyperplasia (NIH) on the struts at 3 months was 0.1±0.03 mm and 0.11±0.05 mm (p=0.306), respectively. Mean neointimal unevenness score was 1.71±0.17 and 1.78±0.22 (p=0.209), respectively.

Conclusions: The comparative data showed that there was no significant difference in coverage of stents, eccentricity index and NIH thickness over the struts of <3 mm diameter compared to ≥3.00 mm diameter Supraflex Cruz SES, at 3 months OCT follow-up.

CORONARY INTERVENTIONS

Clinical and functional outcomes of fractional flow reserve guided management of triple vessel coronary artery disease

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Background: Invasive coronary angiography is the gold standard in managing obstructive coronary artery disease (CAD). Careful selection of ischemia-inducing stenosis is essential, thus the role of Fractional flow reserve (FFR).

Aims: To assess the clinical and functional outcomes of FFR guided management of triple vessel CAD in real life settings.

Methods: 66 Patients diagnosed with TVD were included. Intermediate lesion was defined as 30-90% diameter stenosis based on QCA. All three vessels were subjected to FFR and the consistency of initial decision (PCI, CABG, Medical management) or deviation after FFR was recorded. Follow-up was done at 1 month and 3 months for residual angina and MACE.

Results: Mean age was 61.1 years (Male: Female = 3.17). No lesions in group 1 (30-49% stenosis) were FFR positive in any of the vessels. FFR in group 2 (50-70% stenosis) was positive in 20.6% lesions. 27.27% lesions were found to be functionally non-significant despite >70% stenosis on QCA. FFR created treatment variation of 19% in medical management (MM) group, 17.9% in PCI group and 0% in CABG group. All-cause mortality was 3.03%. Stroke (1.5%) and ACS (1.5%). 71.2% were in CCS class 1 at 3 months.

Conclusions: TVD was more common in males, diabetics, and hypertensives. Compared to LAD, FFR positivity in group 2 LCx and RCA lesions was significantly less. Hence majority ended up with PCI instead of CABG. FFR changed treatment plan in 16.6% patients. MACE was most common in PCI group and least in CABG group.

CORONARY INTERVENTIONS

Long-term clinical outcomes from 2 European centres following the use of sirolimus-coated balloon in small vessel and long-lesions in de-novo segments

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Background: Incidence of in-stent restenosis is directly related to diameter and length of the stents. In this study, we have reported long-term clinical outcomes following the use of MagicTouch Sirolimus DCB in small vessels (<3.0) and long-lesions (>20 mm) from 2 European centres.

Aims: To assess the long-term outcomes following the use of Sirolimus Coated Balloon in Coronary Intervention in real world complex patients

Methods and results: We included all patients treated with MagicTouch DCB in small vessels and long-lesions between April 2018 and August 2020. During the study period, 151-patients with vessel size <3.0 mm and lesion length of > 20 mm were treated with MagicTouch DCB. The mean age of patients was 64 ± 11 years, 125 (83%) were male and 42% (n=64) had diabetes, of which 21 (14%) of them were on insulin. 25 (17%) of them had chronic kidney disease. Pre-dilatation was performed in 98% (148-lesions) of cases. Bailout stenting (with DES) was required in 6% lesions (n=9). The mean diameter and length of DCBs were 2.3 mm and 32 mm respectively. During a median follow-up of 635 days (17-months); cardiac death was reported in 3 cases (2%). Target vessel MI was in 2%; n=3, TLR and TVR were 6% (n=10) and 8.6% (n=13) respectively. The MACE rate was 8.6% (n=13). There were no documented cases of acute vessel closure.

Conclusions: The long-term outcome from the first ever study on sirolimus DCB in small vessel and long *de novo* lesions appears promising with low rates of hard endpoints with no documented case of acute vessel closure. The revascularisation and MACE rates are acceptable despite the complex group of patients and lesion subsets. We should probably be using less metal especially in small vessels and diffuse disease where restenosis rates are high and are often difficult to treat with high rates of recurrence.

CORONARY INTERVENTIONS

Efficacy of nicorandil and ranolazine in preventing contrast induced nephropathy (CIN) in patients with mild to moderate renal dysfunction undergoing elective percutaneous coronary intervention

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Background: Limited data available with regard to efficacy of Nicorandil in preventing CIN in mild to moderate renal dysfunction. There is physiological possibility as well as data in animal study that Ranolazine may be protective against CIN. However no human study has been done till date.

Aims: To evaluate efficacy of Nicorandil plus hydration and Ranolazine plus hydration vis-à-vis hydration alone in preventing CIN with mild to moderate renal dysfunction patients undergoing elective PCI.

Methods: CIN defined as an elevation of S Creatinine >25% or ≥0.5mg/dl from baseline within 48-72hrs. We enrolled 315 CAD patients with mild to moderate renal dysfunction (eGFR 30 to 89) undergoing elective PCI and assigned either into control(n=105), Nicorandil(n=105) or Ranolazine(n=105) group in 1:1:1 by block randomization. All enrolled patients given IV NS 1ml/kg/hr (0.5ml/kg/hr if LVEF<45%) 6hrs before and 12hrs after the procedure. Non- ionic contrast agent Iodixanol (Visipaque) was used. In addition to hydration, patients in Nicorandil and Ranolazine group received oral Nicorandil (10mg,3times/day) and oral Ranolazine(1000mg,2times/day) 1 day before and for 2days after PCI respectively. Blood samples collected for Blood urea and S Cr 24hrs before and 24,48,72hrs after the procedure and for CRP at 72hrs. Patients followed for 6 months for adverse events.

Results: Number of CIN in control group was 19, Nicorandil 8 and Ranolazine 7. Significant association between CIN reduction and groups (P = 0.012). After Bonferroni correction, pair wise comparison showed a risk reduction of 58% in CIN using Nicorandil VS control [RR =0.42(95%CI:0.19-0.92:P=0.023)] and 63 % in Ranolazine VS control [RR=0.37(95%CI:0.16-0.839) P value= 0.012]. As per Bonferroni correction, CIN reduction with both Nicorandil and Ranolazine was statistically significant in comparison to control. Increase in S Cr at the end of 72 hrs was least in Nicorandil as compared to other two groups. Median CRP value at 72 hrs was also less in Nicorandil as compared to other two groups (P=0.641).

Conclusions: Nicorandil and Ranolazine have protective effect against CIN. Efficacy of Ranolazine in protecting against CIN has been established in world literature for the first time.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Single-Centre experience of transcatheter aortic valve replacement- Myval vs. contemporary valves

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Background: Transcatheter aortic valve replacement was initially used for high-risk patients with aortic stenosis. Now, it's being considered for wide range of patients with different risk levels. There are two types of transcatheter aortic valves, balloon-expandable and self-expandable, and they've yielded conflicting results. Hence, it is important to thoroughly study and evaluate them.

Aims: The aim of this single-centre study was to compare the early clinical outcomes of the balloon-expandable Myval transcatheter heart valve versus contemporary balloon-expandable Sapien-3 and self-expandable valves in a real-world population of consecutive patients with severe aortic stenosis.

Methods and results: This study included 225 patients who underwent transcatheter aortic valve implantation with Myval or Sapien or Evolute transcatheter heart valves for severe aortic stenosis. The study endpoints included all-cause mortality, cardiovascular death, stroke, paravalvular leakage, new permanent pacemaker implantation, and late mortality at 30-day as per Valve Academic Research Consortium-3 guidelines.

In-hospital and 30-day mortality rates were lower in Myval group (0% and 1.4%) compared to Sapien-3 (1.3% and 2.7%) and other self-expandable valves (2.7% and 4.2%). The cumulative rates of new permanent pacemaker implantation and stroke were lower in Myval group (1.4% and 0%) when compared to Sapien-3 (5.2% and 0%) and self-expandable contemporary valves (10.7% and 2.7%). Mortality, new permanent pacemaker, and stroke rates were higher in self-expandable valves group.

Conclusions: Early clinical outcomes of Myval transcatheter heart valve showed favourable outcomes compared to contemporary devices in a real-world population of patients with severe aortic stenosis.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Early clinical outcomes of transcatheter aortic valve implantation with Myval in patients with native bicuspid aortic valve stenosis

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Background: Bicuspid aortic stenosis, characterized by narrowing of the aortic valve, comprises a considerable proportion of cases that require aortic valve replacement. However, the exclusion of this specific anatomical variation from previous clinical trials have limited the emergence of transcatheter aortic valve replacement as a viable option in this patient population.

Aims: This study aimed to assess the safety and effectiveness of Myval transcatheter heart valve in individuals with native bicuspid aortic stenosis. Post-procedure, patients were followed up for 30 days to record clinical events.

Methods and results: This was a retrospective analysis of 152 patients who underwent transcatheter aortic valve replacement with Myval for bicuspid aortic valve stenosis across four centres in India.

The study subjects had a mean age of 68.81 ± 8.71 years, and 75% were male. Before the intervention, the mean Society of Thoracic Surgeons Score was 4.05 ± 4.31. The commonest valve sizes implanted were 23 mm (30.26%) and 26 mm (25.66%). Following the intervention, three (1.97%) patients required implantation of a new permanent pacemaker, and no other significant complications or adverse events were observed. Of the 152 patients, 94 completed the 30-day follow-up, during which one (1.06%) patient experienced conduction disturbances and arrhythmias. No additional patients required a new permanent pacemaker at 30-day follow-up.

Conclusions: The early findings demonstrated the safety and effectiveness of Myval transcatheter heart valve for treating individuals with native bicuspid aortic stenosis.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Transcatheter pulmonary valve replacement with Myval in patients with pre-stented right ventricular outflow tract

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Background: Surgical repair for congenital heart diseases often involves modifying the right ventricular outflow tract using conduits or patches. Over time, these conduits deteriorate, causing pulmonary stenosis or regurgitation. This can affect the right ventricular function and necessitate multiple surgical interventions. Transcatheter pulmonary valve replacement has emerged as a valuable non-surgical option to restore the right ventricular function, thus reducing the risks associated with multiple surgeries.

Aims: To evaluate the safety and feasibility of Myval transcatheter heart valve for transcatheter pulmonary valve replacement in patients with pre-stented right ventricular outflow tract.

Methods and results: Data of nine patients with pre-stented right ventricular outflow tract subsequently implanted with Myval was collected from various centres across India. The endpoints analysed were all-cause death, all stroke, moderate or severe prosthetic valve regurgitation, conduction disturbances and arrhythmias, vascular and access-related complications, bleeding complications, pulmonary embolism, surgical replacement of right ventricular outflow tract conduit, procedure or valve-related hospitalization, and device-related reintervention.

The mean age of patients was 32.44 ± 16.76 years and 77.78% were male. Out of nine patients, 9.09% had coronary artery disease and hypertension. Valve sizes implanted were 20, 23, 24.5, 26, 27.5 and 32mm in one, two, one, two, two and one patients respectively. No post-procedural complications were observed. Seven patients completed the 30-day follow-up, and no adverse events were reported.

Conclusions: Myval demonstrated feasibility and early safety with no adverse clinical outcomes for transcatheter pulmonary valve replacement in patients with pre-stented right ventricular outflow tract.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Safety and effectiveness of Myval in treating patients with surgical bioprosthetic mitral valve failure

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Background: The use of transcatheter devices is a promising alternative to surgical interventions for replacing degenerated mitral bioprostheses and unsuccessful repairs of the mitral valve. Expertise in mitral valve-in-valve and valve-in-ring procedures, though currently limited, is increasingly growing and expanding.

Aims: To evaluate the safety and effectiveness of Myval transcatheter heart valve in patients with surgical bioprosthetic mitral valve failure.

Methods and results: Data of patients with failed surgical bioprosthetic mitral valves, including stenosis, mitral valve insufficiency, or a combination of both, and subsequently implanted with Myval was retrospectively collected from various centres across India.

Among 57 patients 66.67% patients were female and the mean age was 62.61 ± 13.10 years. The mean Society of Thoracic Surgeons score was 4.88 ± 2.74. No significant post-procedural events were seen after Myval implantation. Twenty-six patients completed the 30-day follow-up. Among these (26 patients), all-cause mortality was 7.69% (two patients). No other adverse events, such as new conduction disturbances, new permanent pacemaker implantation, all stroke, bleeding, acute kidney injury, vascular and access related complications were recorded.

Conclusions: The early clinical outcomes showed that implantation of Myval was feasible and safe in patients with failure (stenosis, insufficiency, or both) of a surgical bioprosthetic mitral valve. Further studies with long-term follow-up are necessary to further validate our results.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

TAVI for symptomatic degenerating bioprosthetic aortic valve replacement: a single centre study

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Background: Transcatheter Aortic valve Implantation (TAVI) is emerging as a practical solution for patients who have had a bioprosthetic aortic valve replacement (AVR) in the past but are symptomatic with a degenerative prosthesis (either stenotic &/or regurgitation). Long term data is not yet available for these patients who have undergone TAVI within an AVR.

Methods: We undertook a detailed retrospective analysis of patients who underwent TAVI at our centre between Jan 2020 to December 2021, in particular, assessing patients undergoing TAVI within an AVR, looking at patient characteristics & Echo parameters pre-TAVI, post TAVI and at follow up.

Results: Overall, 350 patients underwent TAVI at our centre between Jan 2020 & Dec 2021. Patients undergoing TAVI for a failed AVR were much younger (Age 75 Vs 81 years) compared to those without previous AVR but had a similar Katz index of independence in activities of daily life. Baseline characteristics are depicted in Table 1.

A 3rd of patients in the Valve in valve group had regurgitation as the predominant mode of AVR failure. Over an average follow up of 208 days with echocardiography, the peak gradient & mean gradients were noted to be much less than at baseline (Figs 1 & 2)

Conclusions: TAVI for SAVR degeneration is increasingly a viable option with patients much younger to the current TAVI cohort. We have demonstrated a high degree of success and safety with self-expanding TAVI with good short-term echo follow up. In our single centre experience, no coronary occlusion was noted. Further studies are needed to evaluate long term efficacy and the effective valve choice failing for this cohort.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Panacea for inoperable: a case series on Transcatheter Aortic Valve implantation in descending thoracic aorta for severe aortic regurgitation with high surgical risk

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Background: Transcatheter aortic valve implantation (TAVI) has emerged as a less invasive alternatives for treating aortic valve stenosis. TAVI in native pure aortic regurgitation (AR) is currently an off-label indication with sparse global experience. However, the use of TAVI in the descending thoracic aorta for surgical inoperable aortic regurgitation as palliative care is a relatively novel approach.

Aims: To assess the feasibility, safety, and clinical outcomes of TAVI in the descending aorta for inoperable high-risk patients with severe AR.

Methods and results: This study included consecutive patients undergoing TAVI in descending thoracic aorta as bail out strategy. Symptomatic patients with severe AR and NHYA class (III-IV) diagnosed clinically and on echocardiography were included in the study. Decision regarding implantation of TAVI in descending thoracic aorta was taken after discussion with Heart Care team. Patients were assessed post procedure and on follow-up for improvement in clinical symptoms. Total of seven cases underwent TAVI in descending thoracic aorta position, mean age of 51 ± 5.3 years. There were no in-hospital deaths or 30-day mortality. On follow-up of three months, patients experienced a mean 65.4 ± 4.2% improvement in NYHA class signifying improvement in symptoms and exercise tolerance. There was also improvement in echocardiographic parameters, including mean 20.8 ± 9.9% improvement in left ventricular ejection fraction.

Conclusions: Our study confirms that TAVI in the descending thoracic aorta for severe AR can be a viable palliative treatment option for patients deemed surgically inoperable and unsuitable for an anatomical site transcatheter valve implantation.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Transcatheter closure of atrial septal defects in children weighing ≤ 10kg – a single centre experience over 10 years

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Background: When young patients with secundum atrial septal defect present very early with significant growth failure, heart failure and pulmonary hypertension, they are traditionally referred for surgery as transcatheter closure is not recommended in patients <15kg.

Aims: To analyse the clinical characteristics and procedural outcomes of children weighing ≤10kg who underwent device closure of ASD in the last 10 years and compare them with a standard cohort.

Methods and results: Transthoracic echocardiography guided the procedure without balloon sizing. Symptoms, anthropometry, defect size, shunt ratio and pulmonary pressures were recorded. Device size, device/body weight ratio, percentage oversizing, complications, post procedural growth spurt on follow-up were compared.

96 patients weighing ≤10kg during device closure were compared with 160 patients aged below 4 years but weighing >10kg. The median defect size indexed for body surface area was 35.2 and 27.4 in the two groups. The device/body weight ratio was 1.93 and the device oversizing was 8.7%. Device embolization related to deficient inferior margin was the only complication in study group compared to none in controls. Both groups showed significant growth spurts and proportion of severe malnutrition reduced to 42% and 11% in the two groups.

Conclusions: Device closure was feasible and safe in patients ≤10kg. Transthoracic echocardiogram alone provided adequate images in all patients. Symptoms and growth significantly improved after intervention. Outcomes were comparable in patients from both groups. In symptomatic children under 10kg needing early closure, transcatheter device closure should not be deferred.

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

Valve-in-valve transcatheter aortic valve implantation in degenerated Freedom Solo stentless surgical bioprothesis – a case series

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Background: Valve-in-valve implantation of transcatheter aortic valves in degenerated surgical bioprosthesis has become a treatment of choice for elderly patient with high operative risk. Sorin Freedom Solo (LivaNova PLC/Sorin Group, Saluggia, Italy) is a bovine, supra-annular, stentless surgical bioprosthesis that has been known to be prone do early degeneration and potential coronary ostia occlusion.

Aims: The objective of the study was to evaluate the baseline population, procedural characteristics, and clinical outcomes in patients with degenerated Freedom Solo valve treated with TAVI.

Methods and results: We retrospectively analysed 30 consecutive patients in the last 10 years admitted at our centre between 2013 and 2023. The mean age was 81 (SD 6) years with the majority being female (63%). Patients had a high surgical risk with a median STS score of 5% (IQ 3-9%) and Euroscore II of 11% (IQ 7-31%). Indications for intervention were as following: severe degenerative stenosis in 83%, severe regurgitation in 13 % and combined moderate stenosis and insufficiency in 4% of cases. Average years to prosthesis failure was 8 (SD 2) years. Half patients were treated with a self-expandable (1 Corevalve, 11 Evolute R and 3 Portico) and half with a balloon expandable valve (1 Sapien XT, 12 Sapien 3 and 2 Myval). Pre-dilatation was used in 30% and post-dilatation in 17% of cases. Concomitant PCI was performed in 10% (3 cases). Coronary protection was used in 7 cases (23%). All implantations were deemed successful with 6 (20%) reported procedural serious adverse events (4 acute LMCA or RCA occlusions, 1 valve embolization and 1 severe access site bleeding). 6 (20%) of patients needed a pace-maker implantation, 5 (17%) had an access site complication and 9 (30%) an acute kidney failure. There we no reported neurological adverse events. We observed a significant reduction of maximal aortic velocity from 4.3 (SD 0.9) m/s to 2.4 m/s (SD 0.8) m/s ($p < 0.001$) and mean transaortic gradient from 48.2 (SD 17.6) mmHg to 15.4 (SD 6.9) mmHg ($p < 0.001$) in all patients with severe aortic stenosis. Moderate to severe patient-prosthesis-mismatch was present in 57% of patients. 30-day and 1-year mortality were 13% an 18% respectively.

Conclusion: Valve-in-valve implantation of transcatheter aortic valves in Freedom Solo stentless valves is a feasible procedure carrying a high percentage of complications. Randomised studies are still lacking to identify the best treatment option.

MISCELLANEOUS

Management of Acute Aortic syndrome with percutaneous endovascular stent graft placement

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Background: Thoracoabdominal acute aortic syndromes can be rapidly fatal and associated with high morbidity and mortality. Endovascular stent grafts are a good alternative to surgical repair and are an evolving strategy to treat thoracoabdominal aortic syndromes.

Aims: To study the outcomes of patients presenting with acute aortic syndrome managed with endovascular stent graft.

Methods and results: This is a single centre observational study done at our tertiary cardiology centre from 2007 to 2023. We included the patients in our study who presented with symptomatic thoracoabdominal aortic pathology, and who underwent 58 transcatheter endovascular aortic interventions over a period of 16 years. Our study aimed to analyse the safety, outcome and complications and mortality of endovascular stent grafts.

We studied 58 cases of thoracoabdominal acute aortic syndrome, out of which there were 50 males and 8 females. Out of 58 individuals, 3 patients had traumatic aortic transection (TAT), 2 presented with acute aortic intramural hematoma (IMH), 1 had aortic penetrating ulcer (PAU), 7 patients presented with symptomatic aortic dissection (AD). 19 patients with abdominal aortic aneurysm (AAA) of which 13 patients have infra renal aortic aneurysm. 15 patients had thoracic aortic aneurysm (TAA). The patients who presented with traumatic aortic transections underwent emergency endovascular aortic intervention. All patients with acute aortic pathology initially received optimal medical therapy followed by endovascular aortic repair. Chimney grafts were done in 8 patients to protect subclavian, renal arteries etc. Additional stent was deployed in common iliac artery and superior mesenteric artery in few patients. One patient developed endo leak and four patients developed paraparesis who recovered gradually. Three patients died due to acute renal failure.

Conclusions: Endovascular stent graft is an effective and less invasive modality for management of acute aortic syndromes and can be done in high-risk patients too. Chimney grafts can be made to prevent occlusion of important branches and help in adequately closing the intended area. Complications like renal failure result in an increased mortality rate. Access site complications are also seen and can be managed with multidisciplinary care.

MISCELLANEOUS

"INDI"-A Live 2024: Creating and Validating a first "Indi"-genous model for predicting Ventricular Arrhythmias for "Indi-an" HOCM patients – "INDI"-cations for early intervention with AICD?

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Background: We explored if we could determine easily available parameters to develop an easy-to-use real world prediction model for Ventricular arrhythmia (VA) risk estimation in HCM population by avoiding less-available tests such as genetic analysis.

Subjects, methods and statistics: We included 172 HCM/HOCM patients and compared demographic, clinical, electrical and echocardiographic and CMRI-derived fibrosis in 76 patients who had undergone ICD implantation for "secondary" or "primary" prevention versus age – and gender- matched 95 HCM patients with no history of VA to determine predictors of the latter. We used Logistic regression and Machine Learning using SMOTE, and k- NN (where k=√n) to create a composite prediction model and then performed goodness-of-fit of the score in a Forward Validation cohort.

Results: One CLINICAL , 1 ECG – based, 6 ECHO-derived parameters, and 1 CMRI-based parameter were determined to be predictive of occurrence of VA and specific CUT-POINTS were drawn for each by Youden J-Statistic: > 2 episodes of confirmed Exertional syncope, Maximum LV wall thickness > 27mm ,Resting or inducible LVOT gradient > 60 mm Hg ,Reverse Septal curvature curve morphology, Septal tissue Doppler velocity Sa< 5 cm/sec, Septal MAPSE < 8 mm , LV GLS< -12%, CMRI-% LGE > 10% and Spatial QRS angle>108 degrees on ECG (all p< 0.001). We modelled a 30 –point HCM- VAs risk prediction score by weighing each parameter. In prospective Validation, the predictability of VA with score of >18/30 yielded a c- statistic of 0.84 with good PPV of 90% at LINEARLY increasing scores </= 12 ,12- 18 and > 18/30.

Conclusions: Our novel risk score is a first-in-literature OBJECTIVE, CUT-POINT based, FORWARD-VALIDATED, ACCURATE and EASY-TO -USE scoring system for risk prediction of VAs in HCM/HOCM and comprises of parameters easily acquired in most referral centres, and is being evaluated for prophylactic life-saving AICD implant in our centres in this vulnerable cohort

MISCELLANEOUS

Role of artificial intelligence in intervention cardiology & endovascular interventions

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Background: The advancements in use of big data along with enhanced computing and storage capabilities have resulted in meteoric rise in involvement of artificial intelligence and deep learning in healthcare.

Aims: We report the impact and adoption of artificial intelligence in intervention cardiology.

Methods and results: We conducted literature review to study the integration of artificial intelligence | deep learning in the field of intervention cardiology | endovascular intervention.

Our findings suggest the impact for-

- Clinicians-new tools which enable rapid & accurate image interpretation, diagnostics tools and access to patient data.
- Healthcare Systems-Improvement in overall workflow, efficiencies, reduction of medical errors
- Patients- Use of own data to improve and control health in general with wearable devices.

Machine-driven electronic health records and genetic data mining have been used to predict adverse outcomes including mortality, cardio-vascular diseases (CVDs), and their primary prevention. The big data of image analysis and dedicated imaging software have granted more anatomic design in image interpretation, thus simplifying the workflow.

Some clinical studies have evaluated clinical decision support systems with autonomous computing using self-learning ML algorithms, deep learning, and pattern recognition. These include physiology measurements, imaging (IVUS| OCT) and CT scans.

Conclusions: AI will have a phenomenal impact on intervention cardiology. The advent of artificial intelligence in significant in vascular intervention in improving patient care. AI has resulted in a paradigm shift in healthcare, clinical practice, and cardiologist-machine interactions. However, ML is prone to some bias and ethical issues, and these challenges need to be overcome.

MISCELLANEOUS

Venous access alone for transcatheter closure of ventricular septal defects in paediatric population

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Background: Transcatheter closure of relatively large ventricular septal defects (VSDs) is traditionally done by retrograde crossing, formation of arteriovenous (AV) loop and antegrade deployment of device. This necessitates a need for arterial access and related complications, more hardware and longer procedural time.

Aims: To evaluate the feasibility and safety of antegrade crossing of VSD and deployment of device from venous access for device closure of perimembranous and outlet VSDs.

Methods and results: This is a prospective, single arm study including children less than 13 years in the last 6 years. The VSDs were crossed antegrade under pressure guidance and exchanged for a sheath or guiding catheter for device delivery. Antegrade crossing was attempted in 78 children, with a median age of 41 months (range 2-144). The commonest VSD type was perimembranous (84.6%). Antegrade crossing was successful in 84.6% and in the remaining cases arterial access was taken and procedure was completed with 100% overall success. In those with retrograde crossing AV loop was required in 66.7% of cases. The median procedural time was 45min and fluoroscopy time was 12.8min. None of the factors including type of VSD, presence of aneurysm, size determined failure to cross the VSD antegrade. One patient had deep vein thrombosis, 2 had device embolization that was successfully retrieved.

Conclusions: Device closure of VSDs can be done safely using only venous access by antegrade crossing and antegrade device deployment. It decreases the complexity of the procedure with less access site related complications.

MISCELLANEOUS

Atrial septal defect closure with fenestrated septal occluder devices – a single centre experience

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Background: Transcatheter ASD closure with fenestrated devices is indicated in patients with significant pulmonary hypertension and in those with left heart pathologies. Though hand-made fenestrated devices have been used in many studies, long term patency is questionable.

Aims: To evaluate the efficacy of custom made fenestrated atrial septal occluders and the short and intermediate term patency and efficacy of this fenestration.

Methods and results: This is a single centre, retrospective review of all cases of ASDs closed using custom made fenestrated devices. The decision to perform a fenestrated device closure was based on clinical scenario and hemodynamic assessment.

A total of 23 patients required a fenestrated ASD device closure –14 in the PAH group and 9 in the LV pathology group. In the PAH group all procedures were successful. In the LV pathology group one patient with CKD and CAD required retrieval of device due to pulmonary oedema on table. All were treated with dual antiplatelet therapy for 6 months followed by aspirin monotherapy lifelong. Pulmonary vasodilators were continued for those in PAH group. On follow up there was significant reduction in NYHA class (pvalue-0.042) and PA pressures in PAH group (pvalue-0.03).

Conclusions: In an appropriate patient, partial closure of ASD with a fenestrated device is safe and effective. There was improvement in functional status in both the groups. In those with PAH, there was reduction in PA pressures with ongoing pulmonary vasodilator therapy. The fenestration was patent in all. Long term follow up is essential.

MISCELLANEOUS

Trans-catheter management of congenital porto systemic shunt with myriad presentation

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Background: Congenital portosystemic shunt (PSS) are abnormalities of vascular system where portal blood is shunted into the systemic circulation. Clinical manifestations range from cyanosis to hepatic encephalopathy. Transcatheter management of PSS depends upon the presence and adequacy of portal venous system. We present our experience of 10 cases of PSS and its evaluation for transcatheter management.

Methods: All patients diagnosed to have PSS between January 2016 to October 2023 underwent catheterisation and test balloon occlusion to assess native portal vein radical and portal system pressure. Only patients with native portal vein undergo closure of the shunt. All were followed serially to assess growth of portal radicals and persistence of symptoms.

Results: Total 10 cases were diagnosed to have PSS. Mean age was 60 months (15 days -13 years). Presentation varied from cyanosis/pulmonary AVM (n:4), severe PAH (n:4) haemorrhoids (n:1) and cardiac failure (n:2). 2 diagnosed to have intrahepatic while 8 diagnosed to have extrahepatic PSS (4 connected to IVC, one to iliac vein, one to innominate vein and two connected to azygous/hemiazygos system in presence of interrupted IVC). One intrahepatic PSS had connection between right hepatic vein and right portal vein while another had persistent ductus venosus. One patient with severe PAH and RV dysfunction died while waiting for intervention and in one procedure was not performed due to absence of native portal vein radicals. Other 8 patients underwent successful closure of PSS using occluder/coils. Portal venous pressure measured was mean of 12 mm Hg (range 8 -20mm Hg). On follow up (mean 38 months, range 3 months-72 months) one patient with haemorrhoids had one episode of bleeding per rectum. Another patient had persistence of PAH. One underwent mitral valve repair for the associated organic mitral valve disease. One patient improved of cyanosis, on follow found to have mild IVC obstruction. All patient showed normal LFT and good flow across portal vein.

Conclusions: Congenital PSS can present in a myriad way ranging from cyanosis, portal hypertension, severe PAH, cardiac failure to hepatic failure. High index of suspicion is needed to diagnose such shunts using multi diagnostic modalities. Integrity of portal venous system is the key for preforming trans catheter closure for congenital PSS. Long term follow-up for liver function, portal system growth and persistence/recurrence of symptoms are needed.

MISCELLANEOUS

Alcohol septal ablation in hypertrophic obstructive cardiomyopathy: long-term follow-up. A single centre, single-operator experience of the first 100 consecutive patients

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Background: In symptomatic hypertrophic obstructive cardiomyopathy (HOCM), alcohol septal ablation (ASA) can lead to gradient reduction and symptom improvement.

Aims: To assess the efficacy, safety, and long-term outcome of ASA.

Methods: We studied 100 consecutive patients who underwent ASA over a twenty-three-year period (2001 to 2023). Symptomatic patients in New York Heart Association (NYHA) class ≥III and with recurrent exertional syncope, refractory to medical management and associated with an outflow gradient ≥50 mmHg were treated with ASA after prior risk assessment for arrhythmias. The target septal artery was identified by contrast echocardiography during ASA. A successful procedure was defined as a decrease in the outflow gradient to <20 mmHg at rest or a provocable gradient being decreased by >50% without any serious complication. The mean follow-up was 12.2 years.

Results: The mean age was 46±12 years; 65% were male, and 95% had NYHA III symptoms. One patient had a permanent pacemaker, and three patients had an implantable cardioverter-defibrillator at baseline. Baseline resting and provocable outflow gradients were 82±24 mmHg and 124±42 mmHg, respectively. The primary success rate was 97%, while 3% with initial suboptimal gradient reduction had a successful repeat procedure at 3-6 months. After ASA, the resting and provocable outflow gradients were reduced to 14±6 and 36±12 mm Hg, respectively. New RBBB was developed in 76%, LBBB in 3%, and high-grade atrioventricular block needing a permanent pacemaker in 3%. There was no procedure-related mortality. On long-term follow-up, 3% died due to arrhythmia, and 80% of patients remained in NYHA class <II till the last follow-up.

Conclusions: ASA is a safe procedure with a high success rate on short- and long-term follow-ups.

MISCELLANEOUS

Protecting the solitary sentinel: Early PDA closure in setting of LPA agenesis

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Background: The coexistence of Patent Ductus Arteriosus (PDA) with left pulmonary artery agenesis (LPA) is an exceedingly rare condition characterized by a rapid downhill course. The presence of a left-to-right shunt directed to a single lung leads to compromised hemodynamic and pulmonary reserves. Early percutaneous intervention may offer a chance to salvage the single functional lung and avoid an otherwise poor outcome.

Objective: We aim to share our experience with percutaneous device therapy in two cases of PDA with LPA agenesis, both treated before the age of 2 months.

Case summaries: The first patient, presenting at 40 days of age with congestive heart failure symptoms and dependence on positive pressure ventilation, exhibited a large tubular PDA with LPA agenesis. Percutaneous closure was achieved with an Amplatzer Duct Occlude Type I device (6-8mm). The second case, presenting at 45 days of age with a similar clinical picture, featured a larger diameter PDA with small length, and was closed with a Multifunction Occluder (8-10mm).

Notably, the risk of iatrogenic pulmonary stenosis was low, as the PDA insertion was distant from the origin of the right pulmonary artery. Both cases were successfully weaned off oxygen support within 12 hours. Adequate weight gain was observed during the 6-month follow-up period and no further hospital admissions were required for the cardiopulmonary illness.

Conclusions: PDA with LPA agenesis demands early intervention due to the compromised pulmonary and hemodynamic reserves in affected patients. Thoughtful planning and careful device selection contribute to the safe and successful percutaneous management of this condition.

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MISCELLANEOUS

Comparing Obtura vascular closure device to manual compression for achieving haemostasis-randomised study

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Background: Vascular closure devices or manual compression are used to close the access site interventions to prevent bleeding and complications after transfemoral or transradial percutaneous coronary interventions.

Aims: This study compared the safety and efficacy of the Obtura™ Vascular Closure Device to manual compression in patients undergoing transfemoral catheterisation.

Methods and results: In this prospective, randomized-controlled, multicentre trial, 268 patients were randomized in a 1:1 ratio (134 in each group) and followed up to 3 months. Primary endpoints included time to haemostasis and deployment success. The secondary endpoints were technical success, device-related adverse events, and time to ambulation. In Obtura group, 95.52%, 2.99% and 1.49% of the patients used right femoral, left femoral and bilateral approach, respectively while in the manual compression group, it was 96.27%, 2.99% and 0.75% of the patients. Both groups achieved 100% technical success. The Obtura group had a significantly shorter time to haemostasis (3.26±3.39 min vs. 23.95±8.24 min; $p<0.001$) and time to ambulation (155.44±125.32 min vs. 723.84±197.98 min; $p<0.001$). No access site complications were seen in either of the groups during follow-up. Hematomas occurred in 3% of patients in the Obtura group and in 4.5% in the manual compression group. Each group had one case of post-procedural arterial pseudoaneurysm. All patients were successfully managed without adverse events during subsequent follow-up.

Conclusions: This study demonstrated the favourable safety and efficacy of the Obtura™ Vascular Closure Device, with significantly lesser time to haemostasis and time to ambulation compared to manual compression.