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CORONARY INTERVENTIONS

INTERVENTIONS FOR STRUCTURAL HEART DISEASE AND HEART FAILURE

MISCELLANEOUS

INDIALIVE 2018 Coronary interventions

PCI of unprotected left main: real-world experience of a solo cardiologist in a peripheral centre without IABP or IVUS

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Aims: To describe our experience in a peripheral centre with multiple constraints.

Methods and results: A total of 49 patients underwent PCI of unprotected LMCA from Nov 2008 till Nov 2017. Neither IABP nor IVUS was available. Initially PCI was carried out only as a lifesaving procedure (11 patients) but later it was also carried out in patients with comorbid conditions (38 patients). There were 36 males and 13 females (age 40-91, mean 65.49 years). Comorbidities included diabetes in 26 (53.06%), hypertension in 35 (71.42%), COPD in 4 (8.16%), renal failure in 5 (10.20%) and CVA in 2 (4.08%) patients. EF ranged from 25 to 73% (mean 45%). In 35 patients the lesion was ostial, in 3 in the shaft and in 11 patients it was in the terminal LMCA. SYNTAX score ranged from 11 to 41 (mean 15.34) and EuroSCORE ranged from 1.11 to 39.81 (mean 11.55). A total of 74 stents (mean 1.4 per patient) (2 BMS and 72 DES) were used. Follow-up physically or telephonically was available in all. Follow-up ranged from 1 month to 118 months with a mean of 23.34 months. Follow-up angiography was carried out in 6 patients (12.24%), one of whom had ACS due to in-stent stenosis and underwent CABG surgery. In total there were 9 deaths (18.36%), one in hospital and 8 at follow-up. In-hospital death was in a patient with cardiogenic shock due to STEMI who had LMCA and RCA lesions. Two patients died due to senility, 2 of progressive heart failure, one of renal failure and 3 had sudden cardiac death, possibly ischaemic.

Conclusions: LMCA PCI is feasible even in a peripheral centre with multiple constraints and is a choice of treatment in the emergency setting and a good option in a select group of patients with high surgical risk.

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CIN in elective PCI

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Aims: To decide whether the presence of metabolic syndrome increases the risk of CIN among non-diabetics undergoing elective PCI.

Methods and results: This was a prospective cohort study in which 500 non-diabetic patients undergoing elective PCI were enrolled. Two hundred and fifty (250) patients met the criteria for metabolic syndrome and 250 patients were in the control group. All the patients were evaluated for development of CIN. Contrast-induced nephropathy was defined as a post-PCI rise in creatinine ≥25% from baseline or an absolute increase ≥0.5 mg/dL. CIN developed in 42 patients out of 500 patients (8.4%), 29 (11.6%) of whom had metabolic syndrome and 13 (5.2%) of whom were in the control group. The development of CIN was significantly higher in patients with metabolic syndrome (p=0.01). Post PCI, rise in creatinine was significantly high from 0.92±0.19 mg/dL to 0.96±0.25 mg/dL (p=0.001) in the metabolic syndrome group while there was no significant change in the control group (p=0.127).

Conclusions: Metabolic syndrome is a risk factor for the development of CIN in non-diabetic patients undergoing elective PCI. Hence, patients should be screened for the presence of metabolic syndrome before elective PCI and appropriate preventive measures should be taken.

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Impact of stent overlap on clinical outcome in patients undergoing sirolimus-eluting coronary stent implantation: insights from en-ABL e-registry

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Aims: We analysed the impact of overlapping of a sirolimus-eluting stent, Abluminus DES+ (Envision Scientific), in patients with coronary artery disease.

Methods and results: The en-ABL e-registry is a prospective and multicentre post-marketing registry. We pooled the data of patients with overlapping of stents from this registry. A total of 162 patients were enrolled in this substudy. The primary endpoints of the study were incidence of major adverse cardiac events (MACE) and stent thrombosis (ST) at 1 year. MACE was defined as the composite of cardiac death, target vessel myocardial infarction, and target lesion/vessel revascularisation. A total of 338 Abluminus DES+ were employed to treat 164 lesions in a total of 162 patients. The study population was dominated by male patients (82.10%). Diabetes mellitus was present in 41.36% of patients while 40.12% of patients had hypertension. The mean stent diameter and mean stent length were 2.88±0.41 mm and 28.97±9.79 mm, respectively. One-year follow-up was available for 74.69% of the patients. The incidence of MACE was reported as 9.09% at 1 year. The MACE comprised TLR (4.13%), TV-MI (2.48%) and cardiac death (2.48%). ST was reported as 3.31% at 1 year. There was no late or very late stent thrombosis reported at 1 year.

Conclusions: The present study results indicate that, even in this highly complex cohort of patients, treatment with the Abluminus DES+ ensures good clinical outcomes at 1 year of follow-up.

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Safety and efficacy of sirolimus-coated balloon in in-stent restenosis in small coronary arteries

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Aims: To evaluate the performance of the MagicTouch sirolimus-coated balloon (Concept Medical) in high-risk patients with in-stent restenosis lesions in small vessels.

Methods and results: The study comprised 199 patients with in-stent restenosis (ISR). Amongst them, we sub-analysed 96 (48.24%) patients with ISR lesions in small calibre vessels (RVD ≤2.75 mm). The main study endpoint assessed was major adverse cardiac events (MACE) at 1 year. The MACE component comprised target lesion revascularisation (TLR), target vessel myocardial infarction (TV-MI) and cardiac death. A total of 105 ISR lesions were treated in 96 patients. Male patients accounted for the majority of the study population (79.17%). Half of the patients presented with diabetes mellitus (51.04%). Among 105 treated lesions, most lesions were focal (60.95%), followed by diffuse intra-stent (16.19%), diffuse proliferative (9.52%) and diffuse total occlusion (9.52%). DES-ISR (83.81%) was the most prevalent in the study group. Ninety-one (94.79%) patients completed 1-year follow-up. Follow-up for the rest of the patients is yet to come as this is an ongoing study. The occurrence of MACE was reported as 6.59%. The rate was mainly propelled by TLR (5.49%) and TV-MI (1.10%). There was no cardiac death reported at 1 year for this group.

Conclusions: The present study supports the use of the MagicTouch SCB for the treatment of a high-risk population such as patients with ISR in small calibre vessels and is associated with an optimal long-term clinical follow-up.

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SYNTAX plus score for outcomes in multivessel and left main angioplasty

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Aims: To develop an accurate risk system combining the SYNTAX angiographic score and clinical variables to predict the clinical outcomes for patients undergoing complex PCI.

Methods and results: The development set included 900 patients who underwent PCI from April 2011 to April 2015 and was retrospective. Their baseline, clinical, procedural characteristics and SYNTAX scores were assessed using univariate and forward stepwise logistic regression without intercept. Age >70 years, severe LV dysfunction, high and intermediate SYNTAX scores, branch vessel disease and GFR <60 ml/min/1.73 m^2 were the 6 most significant variables to predict the primary endpoint (MACE), which was the composite of cardiac death, MI, ischaemia-driven target lesion revascularisation and definite/probable stent thrombosis at 1 year. A formula was then developed with the 6 variables using a regression equation. The resultant score was employed in the prospective arm of 300 patients. Median age was 57.8 (SD=9.6) years. Males were 86%. Diabetes and hypertension were prevalent at 59.4% and 55%. Most patients presented with either acute coronary syndromes or recent myocardial infarction (62.9%). The median value of the SYNTAX score in the study group was 18 (15-40). Total MACE rate was 10.2%; it was 9.3% in the low (<23), 17.9% in the intermediate (23-32), and 13.3% in the highest (>33) SYNTAX score groups. The final SYNTAX plus score system calculated the risk of MACE from a possible 2% to 75%. The total risk of MACE was 11.3% in the validation group. The scoring model correlated well in the validation group (sensitivity 92.3%, specificity 82.1%, c statistic 0.85).

Conclusions: A simple risk scoring equation can be employed to predict the probability of major adverse cardiovascular events in patients undergoing complex PCI, developed by combining the SYNTAX score and clinical variables. Patients can be treated with an optimal and safe revascularisation procedure using this risk score.

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Long-term results of a novel sirolimus-eluting stent with biodegradable polymer for treatment of coronary stenoses

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Aims: To investigate the long-term results of the novel sirolimus-eluting stent, Abluminus DES+ (Envision Scientific), in patients with atherosclerotic lesions in coronary arteries.

Methods and results: The en-ABL e-registry is a multicentre, non-randomised, post-market registry. Patients presenting with either stable or unstable disease (including ST- and non-ST-elevation myocardial infarction) were enrolled. The main study endpoint was the rate of major adverse cardiac events (MACE) at two-year follow-up; MACE is a composite of cardiac death, target vessel myocardial infarction (TV-MI) and target lesion revascularisation (TLR). The rates of probable or definite stent thrombosis were also recorded. Enrolled in the study were 2,377 patients, with 2,821 lesions in total. The mean age of the study population was 57 years, with a high prevalence of diabetes mellitus (34.46%). Most of the patients (45.46%) presented with ST- or non-ST-elevation acute coronary syndrome. One-year follow-up was completed by 1,982 (83.38%) patients, while 5 (0.21%) patients were lost to follow-up. The follow-up for the rest of the patients is yet to come. MACE occurred in 2.67% of the patients. MACE components were reported as cardiac death (0.71%), TV-MI (0.40%) and TLR (1.56%). At 2 years, 1,498 (63.02%) patients had completed follow-up and the incidence of MACE was 3.60%. The probable and definite ST were reported as 9 (0.6%) and 4 (0.27%), respectively, at 2 years.

Conclusions: The present data support the use of the Abluminus DES+ stent in patients with coronary atherosclerosis with reduced revascularisation rates at long-term follow-up of 2 years.

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Sirolimus-eluting coronary stent in elderly patients with stenosis in coronary arteries: a subgroup analysis from the en-ABL e-registry

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Aims: To evaluate the performance of the Abluminus DES+ - a newer-generation biodegradable polymer sirolimus-eluting stent (Envision Scientific) - in this scenario.

Methods and results: A total of 658 patients aged ≥65 years having atherosclerosis in the coronary arteries were recruited into the en-ABL e-registry – a multicentre, prospective and real-world registry. The primary endpoint is major adverse cardiac events (MACE), a composite of cardiac death, target vessel myocardial infarction (TV-MI), or target lesion revascularisation (TLR) at one-year follow-up. Also, stent thrombosis (ST) was observed at one-year follow-up. A total of 799 lesions were treated with 893 Abluminus DES+ in 658 patients. The study population was predominantly male (70%). The mean age of the patients in this group was 70.05±9.42 years; 37.99% of patients had diabetes mellitus whereas almost half of the patients had hypertension (53.04%); 65.96% patients clinically presented acute coronary syndrome. At 1 year, follow-up was available for 528 (80.24%) patients. One (0.15%) patient was lost to follow-up and follow-up of the rest of the patients is yet to come. The cumulative incidence of MACE at 1 year was recorded as 3.78%. MACE components are reported as TLR (1.33%), cardiac death (1.70%) and TV-MI (0.76%). The rate of stent thrombosis was reported as 0.95% at 1 year.

Conclusions: The analysis suggests that the Abluminus DES+ is safe and efficacious in treating coronary artery disease in elderly patients with lower revascularisation rates at 1-year follow-up.

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Clinical outcomes of real-world diabetic patients treated with Abluminus DES: a multicentre en-ABL e-registry

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Aims: We sought to assess the performance of the Abluminus DES+ - a newer-generation biodegradable polymer sirolimus-eluting stent (Envision Scientific) - in diabetic patients with coronary stenosis.

Methods and results: This multicentre, prospective registry was conducted in 30 centres in India. The en-ABL e-registry enrolled 2,377 patients; 819 patients had documented history of diabetes mellitus (DM). The study endpoints were major adverse cardiac events (MACE), a composite of cardiac death, target vessel myocardial infarction (TV-MI), or target lesion/vessel revascularisation (TLR/TVR) and stent thrombosis (ST) at 1 year. We analysed two cohorts in this prospective study: DM (819) and non-DM (1,558). Patients with diabetes were more frequently treated for hypertension (60.32% vs. 33.70%, p<0.001). At 1 year, 84.86% and 82.61% of patients were available for follow-up for the DM cohort and non-DM cohort, respectively. The reported MACE rates at 1 year were 3.30% in the DM group and 2.33% in the non-DM group; (p=0.198). The MACE rate was mainly driven by TLR (2.01% vs. 1.32%, p=0.235), followed by TV-MI (0.43% vs. 0.39%, p=1.000) and cardiac death (0.86% vs. 0.62%, p=0.579). The rate of ST was recorded as 0.86% vs. 0.54% (p=0.397) at 1 year for the two groups.

Conclusions: At 1 year, diabetic patients had a low rate of MACE, actually similar to non-diabetic patients, supporting the safety and efficacy of the Abluminus DES+ - a newer-generation biodegradable polymer sirolimus-eluting stent that incorporates a unique coating technology.

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Impact of diabetes mellitus on the performance of a sirolimus-coated balloon in patients with coronary in-stent restenosis: insights from the Nanolute study

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Aims: We aimed to assess the impact of diabetes mellitus on the safety and efficacy of the MagicTouch sirolimus-coated balloon (Concept Medical) in patients with coronary in-stent restenosis.

Methods and results: A total of 199 patients with coronary in-stent restenosis (ISR) were included in the multicentre and prospective Nanolute study. Among these, we assessed two subgroups: ISR-DM (103) and ISR-non-DM (96). All patients were treated with a sirolimus-coated balloon. The clinical study endpoint was major adverse cardiac events (MACE) - a composite of cardiac death, target vessel myocardial infarction (TV-MI) and target lesion revascularisation (TLR) at 1 year. Among 199 patients with ISR, 103 (51.76%) patients had a diagnosis of diabetes mellitus, whereas 96 (48.24%) had no documented history of the disease. One-year follow-up was available for 94 patients and 84 patients in the DM and non-DM cohorts, respectively. The follow-up for the rest of the patients is yet to come as it is ongoing study. The incidence of MACE was reported as 4.25% and 8.33% for the DM cohort and non-DM cohort, respectively, with a p-value of 0.26. The MACE rate was broken down into TLR (4.25% vs. 7.14%, p=0.520) and TV-MI (0.0% vs. 1.19%, p=0.472). The clinical outcomes were not statistically different for both the DM and non-DM cohorts. There was no cardiac death reported at 1 year for both cohorts.

Conclusions: The present analysis suggested that diabetes mellitus does not appear to have a negative impact on the efficacy of SCB in patients with ISR lesions and is associated with good clinical outcome in this complex cohort.

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Revascularisation with a sirolimus-coated balloon in atherosclerosis in small coronary arteries: real-world experience from the Nanolute study

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Aims: We sought to investigate the clinical outcomes after treatment using the MagicTouch sirolimus-coated balloon (SCB) (Concept Medical) in patients with *de novo* lesions located in small coronary arteries.

Methods and results: The all-comers, multicentre, Nanolute registry enrolled patients with *de novo* lesions located in coronary vessels with a reference vessel diameter (RVD) ≤2.75 mm. We conducted the analysis at 1 year with the pre-specified primary study endpoint of major adverse cardiac events (MACE) which is composed of target lesion revascularisation (TLR), target vessel myocardial infarction (TV-MI) and cardiac death. We also assessed the procedural success, defined as technical and angiographic success in the absence of MACE at hospital discharge. A total of 196 patients with 204 lesions were treated with 217 SCB; 38.78% of patients presented with diabetes mellitus and 44.39% of patients with hypertension. Additional stenting was performed only in 6.12% of the patients. The mean diameter of the SCB was 2.33±0.26 mm. Procedural success was achieved in 99.49% of patients while only 1 patient had vessel dissection. One-year follow-up is available for 175 (89.29%) of the patients; MACE occurred in 3.43% of the patients. MACE was mainly propelled by TLR (2.86%) followed by cardiac death (0.57%). There was no TV-MI reported at 1 year in the study.

Conclusions: 1-year clinical results after treatment using the SCB demonstrated low rates of MACE in a small vessel cohort of the Nanolute registry, hence showing an adequate efficacy and safety in this setting. Adequately powered studies in a western population are ongoing.

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Two-year clinical follow-up of a multicentre Nanolute study assessing the safety and efficacy of a sirolimus-coated balloon in coronary artery stenosis

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Aims: We sought to evaluate the efficacy and safety of the MagicTouch sirolimus-coated balloon (Concept Medical) in patients with atherosclerotic lesions in coronary arteries.

Methods and results: Nanolute is a multicentre, prospective, real-world study of patients undergoing percutaneous coronary intervention (PCI) with the MagicTouch sirolimus-coated balloon (SCB) for in-stent restenotic (ISR) and/or *de novo* lesions in coronary vessels. The measured clinical endpoint was the occurrence of major adverse cardiac events (MACE), defined as a combination of cardiac death, target vessel myocardial infarction (TV-MI) and target lesion revascularisation (TLR) at 1 year. We also assessed the MACE rate at an extended follow-up of 2 years. Included in this ongoing study were 438 patients, with a total of 516 PCI procedures on 465 lesions, all treated with SCB. Diabetes mellitus accounted for 44.29% of the total study population; 48.40% of patients clinically presented with acute coronary syndrome. Of 465 lesions, 45.81% were ISR lesions whereas 54.19% were *de novo* lesions. One-year follow-up was available for 393 (89.73%) patients. The follow-up of the rest of the patients is yet to come. The occurrence of MACE was recorded as 4.33% at 1 year with TLR (3.82%), TV-MI (0.25%) and cardiac death (0.25%). We recorded MACE at an extended follow-up of 2 years. Two years of follow-up was completed by 333 (76.02%) patients, and the incidence of MACE was 5.10%. There was no increment in events at 2 years.

Conclusions: In this cohort of patients, SCB angioplasty delivered good clinical outcomes at 1 year. The results are very promising at 2 years of extended follow-up.

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HBA1c levels in patients with ST-elevation myocardial infarction and its correlation with severity of coronary artery disease (assessed by SYNTAX score) and short-term mortality

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Aims: To evaluate the correlation between HBA1c on admission and severity of coronary artery disease using the SYNTAX score and mortality in patients with ST-elevation myocardial infarction (diabetic and non-diabetic).

Methods and results: Three hundred and sixty-two (362) patients presenting with STEMI (within 48 hrs) were included in our study (96 diabetic and 266 non-diabetic). Data regarding patient characteristics were collected over 7 months. SYNTAX score was calculated by the online SYNTAX score calculator. All-cause mortality data were collected prospectively up to 6 months. Diabetics were older, predominantly male, and more hypertensive than non-diabetics. Mean HBA1c was greater in diabetics (8.01±1.50) than in non-diabetics (5.69±0.65) ($p<0.001$). SYNTAX score showed significant linear correlation with HBA1c values in all cases, diabetic and non-diabetic subgroups ($p<0.001$). HBA1c quartiles (<5, 5.1-5.5, 5.6-6, 6.1-6.4) showed increased mean SYNTAX scores (2.65, 5.53, 7.15, 13.42, respectively, $p<0.001$) and increased 6-month mortality (3%, 4.8%, 1.7%, 15.1%, respectively, $p=0.004$) with increased values in the non-diabetic group. In the diabetic group, increased HBA1c quartile (<7.5, 7.6-8.5, 8.6-9.5, >9.5) values correlated with increased mean SYNTAX scores (12.7, 16.5, 18.25, 22.5, respectively) ($p<0.001$) but not with mortality ($p=0.525$). Multivariate regression analysis showed HBA1c >6 as an independent predictor of 6-month mortality.

Conclusions: A significant correlation exists between HBA1c and angiographic SYNTAX score in STEMI patients (both diabetic and non-diabetic). It also significantly correlates with 6-month mortality.

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2D speckle tracking echocardiography as a predictor of significant coronary artery stenosis in female patients with effort angina who are treadmill test positive - an angiographic correlation

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Aims: 1. To determine the diagnostic accuracy (sensitivity and specificity) of 2D speckle tracking echocardiography (GLS score) in predicting the angiographic severity of coronary artery disease in female patients with effort angina who are TMT positive. 2. To risk stratify TMT positive female patients with effort angina based on longitudinal myocardial strain assessed by 2D speckle tracking echocardiography, in order to decide on the need for invasive management.

Methods and results: Female patients with effort angina who are TMT positive and are recommended for coronary angiogram based on standard treatment guidelines are subjected to 2D speckle tracking echocardiography and a global longitudinal strain (GLS) score is obtained. Following CAG, a correlation was sought between lesion severity and GLS score. Sensitivity and specificity of the GLS score in predicting the angiographic severity of coronary artery disease was also calculated. One hundred (100) patients were evaluated. The average age of patients included in the study was 55 years. All were TMT positive female patients, with the average Duke score being –2. Effort angina was the predominant symptom; 70% of patients were in NYHA Class II. The most common associated risk factor was HTN, with 66 patients being hypertensive; 63 patients were diabetic. Dyslipidaemia was observed in 46 patients. There was no RWMA or LV dysfunction in any of the patients. Sixty-three percent (63%) of patients had a GLS score greater than or equal to –17, with the average being –15; 56% of patients had a significant lesion of greater than 70% in at least one of the coronary arteries. Sensitivity of GLS in predicting significant CAD in TMT positive female patients was 94% and specificity 76%. The positive predictive value was 84% and the negative predictive value was 90%. The optimum cut-off value of the GLS score to predict a coronary lesion is –17.5. Patients with a GLS more than –20 had no significant coronary lesion and those with a GLS less than –12 had multivessel disease. Compared to the Duke TMT score, GLS showed better correlation with a significant coronary lesion and this was more evident in the age group 45 to 55 years.

Conclusions: GLS by 2D speckle tracking echocardiography correlates well with the angiographic severity of coronary artery disease and can predict a significant coronary lesion with a sensitivity of 94% and a specificity of 76% in female patients with effort angina.

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CT angiography: a distinguishing marker of coronary artery disease in comparison with conventional coronary angiography

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Aims: The present study was carried out to evaluate the diagnostic performance of CTA as compared with CIA in an Indian set-up.

Methods and results: A cross-sectional analytic study was carried out for a period of two years in 50 patients after obtaining written informed consent. Sixty-four (64) slice CT coronary angiography was performed prior to CIA. The angiograms were evaluated by an experienced observer. The total number of significant lesions (>50%) was 44 by CTA. The most commonly involved vessels were proximal, mid or distal segments of the LAD and RCA. The sensitivity and specificity of CTA for detecting significant stenosis on a per patient basis with CIA as reference standard was 95.7% and 90.5%, respectively, while the PPV and NPV value was 91.7% and 95%, respectively.

Conclusions: MDCT has reasonably high accuracy for detecting significant obstructive CAD when assessed at artery level. CTA using scanners with at least 64 slices should be recommended as a test to rule out obstructive coronary stenosis in order to avoid inappropriate invasive coronary angiography in patients with an intermediate pre-test probability of CAD.

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Comparison of new-generation everolimus-eluting stents and new-generation sirolimus-eluting stents in chronic renal failure patients with 3-year outcome

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Aims: To compare the safety and efficacy outcome between new-generation everolimus-eluting stents and sirolimus-eluting stents in patients undergoing PCI.

Methods and results: We retrospectively analysed 150 patients who underwent PCI in our centres between August 2014 and August 2017. Patients were divided into two groups: new EES (n=105) and new SES (n=45). Primary endpoints were, at 1 year, 2 years and 3 years, the composite of all-cause death, MI, CVA, and TVR; MACE and stent thrombosis were also evaluated. Femoral access was used in 30% and radial access was used in 70% of patients. The rate of dual antiplatelet therapy use at 1 year was 96% in EES and 90% in SES. The primary endpoints occurred in 7% of EES patients and in 25% of SES patients. Significant differences were found with respect to the rate of 3-year all-cause mortality (3% vs. 18%), MI (1% vs. 15%), CVA (0.5% vs. 5%), ST (1.5% vs. 15%), TVR (2% vs. 18%), and MACE (1% vs. 14%), and 2 cases of major bleeding were observed in SES patients but not in EES.

Conclusions: New EES stents showed very positive and encouraging results in CKD patients compared with new SES stents. This 3-year study may be extended to evaluate very late events.

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Global longitudinal strain and angiographic correlation in NSTEMI

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Aims: To investigate the role of 2D speckle tracking echocardiography as a non-invasive predictor of significant coronary artery occlusion in patients with non-ST-segment elevation myocardial infarction.

Methods and results: Sixty patients with a first attack of non-ST-segment elevation myocardial infarction were included in the study. The patients were divided into two groups: group 1 with significant (>70%) CAD, and group 2 with non-significant CAD (<70%) based on coronary angiogram results. Images were obtained in the apical long-axis, four-chamber, and two-chamber views. Regional longitudinal systolic strain was measured in 17 myocardial segments and averaged to provide global longitudinal strain (LVGLS). There was a significant decrease in LVGLS in group 1 compared to group 2 ($p<0.05$). The optimal cut-off value of LVGLS for prediction of significant CAD was –15.57 (AUC 0.797, p-value 0.009). The sensitivity, specificity and PPV of LVGLS for detecting significant CAD were 91%, 90%, and 93.3%, respectively. An area of 4 or more adjacent dysfunctional segments had the best ability to identify patients with significant coronary occlusion (AUC 0.945, p-value <0.001, sensitivity 90%, specificity 80% and PPV 90%).

Conclusions: Both global and regional longitudinal systolic strain can offer accurate, feasible, and non-invasive prediction of acute coronary artery occlusion in patients with non-ST-elevation myocardial infarction who may benefit from urgent revascularisation.

INDIALIVE 2018 Coronary interventions

Dilemma in percutaneous coronary interventions in retroviral positive patients with chronic total occlusion (CTO): to treat or not to treat?

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Aims: The objective of our study was to analyse the procedural success and complication rates in performing PCI in CTO in retroviral positive patients.

Methods and results: This was a prospective and observational study. A total of 7 consecutive patients who were reported as being retroviral positive with CTO between August 2012 and June 2017 were evaluated. Detailed clinical presentation and coronary angiography of all patients were evaluated. A procedural success rate of 100% was achieved and the in-hospital course was uneventful. The mean age of patients was 42.66 years, mean duration of HIV was 3.43 years. The mean duration of angina was 7.83 months, 4 patients had 100% LAD occlusion, and 3 patients had 100% RCA occlusion. Out of 7 patients, 2 patients had PCI to the LAD, 3 patients had PCI to the RCA, and one patient each had PCI to LMCA to the LAD, LCX and LMCA to the LAD. The average size of the stent was 3×32 mm. The average fluoroscopy time was three hours.

Conclusions: PCI is an adequate and safe treatment strategy for coronary revascularisation in HIV positive patients with coronary chronic total occlusion.

INDIALIVE 2018 Coronary interventions

Retroviral positive (HIV) patients presenting with STEMI – dilemma for coronary interventions: to do or not to do?

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Aims: To study the clinical profile of HIV infected patients presenting with acute coronary syndrome and their in-hospital outcome and therapeutic challenges with respect to revascularisation.

Methods and results: We studied 109 consecutive patients infected with HIV and presenting with acute coronary syndrome to our acute coronary care unit between 2013 and September 2017. The baseline clinical characteristics, response to fibrinolytic therapy, angiographic findings, and results of PCI and in-hospital outcome were studied. The mean age of patients was 46 years, which is lower than HIV uninfected patients. Most patients presented with acute anterior wall ST-elevation myocardial infarction (n=98, 89%). Most patients presented with lower Killip class (Class I: 84.4%, Class II: 11.9%, Class III: 3.7%). Ninety-six (96) patients (88.1%) received thrombolytic therapy with streptokinase. Thombolysis was successful in 96 (78.33%) and failed in 13 (21.67%) patients. Four patients underwent rescue angioplasty and primary PCI was performed in 3 patients. Coronary angiography was carried out in all the patients and revealed significant residual stenosis in 51 patients. Three-vessel coronary artery disease was seen in only 4 patients (3.7%). Two-vessel coronary artery disease was seen in 16 patients (14.7%). Sixty-nine (69) patients (81.6%) had a significant single-vessel lesion. All patients with significant residual lesions (n=51) underwent PCI with drug-eluting stents. Only 1 patient died due to cardiogenic shock. All 108 patients were followed up for 3 years and they are receiving adjuvant HAART.

Conclusions: HIV infected patients hospitalised for an ACS are relatively young. The presentation and outcomes of ACS in this population are similar to those of uninfected patients. Anterior wall MI is the most common presentation, hence the LAD is the most common culprit vessel. HIV status and HAART therapy did not interfere with the revascularisation approach or clinical outcome.

INDIALIVE 2018 Coronary interventions

Left main treatment with the latest generation sirolimus-eluting stent: preliminary data after one follow-up of an average of 6 months

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Aims: To evaluate the clinical performance of the Abluminus DES+ in LM critical lesions. The peculiarity lies in the coating technology which takes place after the stent is crimped.

Methods and results: Patients undergoing LM angioplasty with the Abluminus DES+ were clinically evaluated at regular intervals in order to evaluate any new symptoms. The target lesion was the LM, either in the LM ostium or the LAD-CFX bifurcation. Primary endpoints were MACE and definite or probable stent thrombosis. The study population was 70.8% male, average age 65.5 years, 8% STEMI for LM occlusion. In relation to DAPT, 58.4% were treated with clopidogrel 75 mg, 41.6% with ticagrelor 90 mg bid, none with prasugrel. There was 83.3% RCA dominance, 65% with RCA critical stenosis and 23% with RCA total occlusion. In LM lesions, average length was 13 mm, TIMI flow 3 was 100% at baseline. Predilatation: 83%, SC balloon 2.67 mm mean calibre (median 2.75), mean length 14.24 mm (median 15). Abluminus DES+: mean diameter of 3.77 mm (median 4.00), mean length of 16.5 mm (median 16). Post-dilatation: 95.8% with mean and median balloon size of 4.00, mean length 9.9, median length 11. IVUS: 50%, confirmed the already well-defined angiographic result. Procedural success: 100% of patients, no signs and/or symptoms in the 24 hours post procedure that could be attributed to myocardial infarction. Six-month follow-up: no symptoms 100% patients. One-year follow-up: 54.6% achieved 12-month follow-up without adverse events.

Conclusions: Due to its peculiarities in coating technology, the Abluminus DES+ is a good treatment strategy even for the most complex coronary lesions, including LM treatment.

INDIALIVE 2018 Coronary interventions

Techniques and outcomes of bioresorbable vascular scaffolds in the treatment of coronary bifurcation lesions: one-scaffold strategy vs. two-scaffold strategy

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Aims: Our objectives were to study the technical aspects and outcomes of treating coronary bifurcation lesions with A-BRS by comparing a "one-scaffold strategy" (OSS) with a "two-scaffold strategy" (TSS).

Methods and results: Patients who underwent coronary bifurcation stenting, either OSS or TSS, with A-BRS over a period of 3 years were prospectively included. The lesion bed was predilated with a non-compliant balloon and a scaffold was deployed gradually at nominal pressure. The side branch was recrossed with a wire and then the scaffold was post-dilated at high pressure. Finally, snuggle balloon dilatation was performed. Patients were followed up periodically with stress testing and CT coronary angiography. Out of 122 bifurcation lesions in 117 patients, 87 lesions were treated with OSS while 35 lesions were treated with TSS. The mean number of A-BRS implanted per lesion was 1.3±0.6 (OSS group: 1.3±0.6, and TSS group: 1.2±0.5). In the TSS group, bail-out stenting of the side branch was performed in 5 (14.3%) lesions with elective stenting in 30 (85.7%) lesions; "T", "TAP" and "V" stenting techniques were performed in 14 (40%), 16 (45.7%) and 5 (14.3%) lesions, respectively; hybrid stenting with A-BRS and metallic stent was performed in 5 (14.3%) lesions. In the OSS group, the side branch was protected, predilated and recrossed in 87 (63.9%), 21 (57.7%) and 24 (49.5%) lesions, respectively. Final snuggle balloon dilatation was performed in 23 (26.4%) and 35 (100%) lesions in the OSS and TSS groups, respectively ($p<0.0001$). The mean duration of follow-up was 26.4±7.9 months with 98.3% follow-up. There was no scaffold thrombosis (0%). One patient in both the OSS group and the TSS group developed restenosis and underwent bypass surgery subsequently (TLR rate: 1.2% vs. 2.9%, $p=0.49$; overall 1.6%). The rest were doing fine without any major adverse clinical events.

Conclusions: Coronary bifurcation stenting with the A-BRS, both the one-scaffold strategy and the two-scaffold strategy, is technically feasible producing excellent results at short-term and long-term follow-up.

INDIALIVE 2018 Coronary interventions

Everolimus-eluting bioresorbable vascular scaffolds for the treatment of diffuse coronary artery disease: technical challenges and long-term outcomes

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Aims: To study the technical challenges and long-term outcomes of using Absorb bioresorbable vascular scaffolds (A-BRS) for the treatment of diffuse coronary artery disease (CAD) requiring a continuous segment of A-BRS measuring more than 40 mm.

Methods and results: Patients who underwent PCI with the A-BRS in diffuse CAD were included in this study from January 2013 to July 2016. After adequate preparation of the lesion, A-BRS was deployed gradually at nominal pressure and post-dilated at high pressure. Minimal overlap of scaffolds was performed in these diffuse lesions. All patients were followed up regularly after the procedure. Sixty-one (61) patients with one diffuse lesion each were included in this study (in total 61 diffuse CAD lesions). The number of A-BRS used per diffuse CAD lesion was 2.3±0.6. All lesions were routinely predilated and post-dilated. The diameter and total length of A-BRS used were 3.01±0.3 mm and 57.5±17.7 mm, respectively. The strategy for deployment of A-BRS was either proximal-to-distal vessel deployment (16 lesions) or distal-to-proximal vessel deployment (45 lesions). Two techniques of overlapping scaffolds were utilised - marker-to-marker overlap and edge-to-edge placement of markers. All patients received dual antiplatelet therapy for at least 12 months. Ticagrelor or prasugrel was preferably used for the initial 3 months and then switched to clopidogrel. A GP IIb/IIIa inhibitor was used as and when required. The median duration of follow-up was 1,026 days (interquartile range: 713-1,305 days). On follow-up, 4 cases underwent target lesion revascularisation but no (0%) definite scaffold thrombosis was reported in any of the study patients.

Conclusions: Treatment of diffuse CAD with a continuous segment of minimally overlapping multiple A-BRS is technically possible with a trend towards favourable outcomes on long-term follow-up, provided optimal implantation techniques and a meticulous antiplatelet regimen are followed.

INDIALIVE 2018 Coronary interventions

Comparison of clinical outcomes in patients treated with indigenous (Indian) versus foreign drug-eluting stents (DES)

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Aims: To compare clinical outcomes in patients treated with indigenous (Indian) versus FDA approved/CE-marked drug-eluting stents (DES).

Methods and results: This study was a single-centre, prospective, observational study in which clinical follow-up data were collected at 9 months in patients undergoing DES implantation in *de novo* native vessel coronary artery disease. Patients were divided into 4 groups: group 1 (n=132) received biodegradable polymer indigenous SES (Metafor), group 2 (n=69) received the biodegradable polymer CE-marked SES (Orsiro), group 3 (n=75) received durable polymer FDA/CE-marked ZES (Resolute Integrity), and group 4 (n=132) received durable polymer FDA/CE-marked EES (XIENCE Xpedition). At 9-month follow-up, stent thrombosis occurred in 1 (0.8%), 0 (0%), 1 (1.3%), and 1 (0.8%) (p-value-0.830) in groups 1, 2, 3 and 4, respectively. TLR occurred in 6 (4.5%), 2 (2.9%), 2 (2.7%) and 2 (1.5%) (p-value-0.542) in groups 1, 2, 3 and 4, respectively, and MACE occurred in 10 (7.6%), 2 (2.9%), 4 (5.3%) and 5 (3.8%) (p-value-0.421) in groups 1, 2, 3 and 4, respectively.

Conclusions: In the present study, we demonstrated that a biodegradable polymer indigenous SES is non-inferior to biodegradable polymer CE-marked SES and two leading permanent polymer-based second-generation DES for hard clinical endpoints. The lower cost of the indigenous stent makes it an attractive option for treating patients with coronary artery disease in developing countries (such as India) without compromising on efficacy.

INDIALIVE 2018 Coronary interventions

Coronary angioplasty in spontaneous coronary artery dissection: strategy and outcomes

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Aims: PCI in spontaneous coronary artery dissection (SCAD) is associated with high rates of technical failure. Studies examining the procedural characteristics and hardware used during PCI in SCAD are limited to anecdotal case reports.

Methods and results: This was a retrospective single-centre study which analysed the clinical, angiographic and procedural characteristics of patients with angiographically confirmed type 1 SCAD undergoing PCI over a period of 4 years (2013-2017). There was a total of 42 patients with type 1 SCAD during the study period, of whom 16 (38.1%) underwent PCI; 14 out of the 16 patients (87.5%) who underwent PCI had technical success. In all patients, the lesion was attempted to be crossed initially with a floppy wire and, if this was unsuccessful, it was escalated to a hydrophilic wire and finally to a stiff wire. The SCAD lesion was crossed with a floppy wire in 71.4% of patients, with a hydrophilic wire in 14.2% and with a stiff wire in 7.1% of patients. Wire escalation was required in 5 patients (31.3%) and in 60% of cases there was technical success after wire escalation. Presence of diabetes mellitus, hypertension, smoking, coexisting atherosclerosis, diffuse nature of the lesion, and baseline TIMI flow ≤2 did not predict procedural failure during PCI.

Conclusions: PCI in SCAD was associated with a fair rate of technical success in our population. Choosing a floppy wire initially and then escalating to a hydrophilic wire followed by a stiff wire is an optimal revascularisation strategy.

INDIALIVE 2018 Coronary interventions

Percutaneous coronary intervention of an anomalous left circumflex coronary artery

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Aims: We report our experience of percutaneous coronary intervention in patients with an anomalous origin of the left circumflex artery.

Methods and results: We report a case series of 14 cases (12 male, 2 female) of mean age 54.14±14.75 years, who have undergone successful coronary angioplasty and stenting of an anomalous left circumflex artery. Eight (57%) cases had a transfemoral approach, while the rest (6; 43%) had a transradial approach. The target lesion was type B in 50% and type C in 50% of cases. The site of the lesion was: proximal retro-aortic portion in 5, ostial in 3, distal portion in 5, and major obtuse marginal in 1 case. A Judkins right coronary guide catheter was used in 11 (79%) cases, while an Amplatz Right-1 catheter was used in the remaining 3 (21%) cases. A two-wire strategy was adopted in 64% of cases. In total, 16 stents of mean diameter 2.95±0.33 mm and mean length of 26.93±7.92 mm were deployed. The long-term follow-up was uneventful in all the cases.

Conclusions: Percutaneous intervention of an anomalous left circumflex coronary artery is technically challenging but feasible with a good success rate. An appropriate selection of hardware and technical expertise results in a favourable outcome.

INDIALIVE 2018 Coronary interventions

Comparison of neointimal coverage between ultrathin biodegradable polymer-coated sirolimus-eluting stents and durable polymer-coated everolimus-eluting stents: 6-month optical coherence tomography follow-up from the TAXCO study

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Aims: The TAXCO study was designed to compare the degree of neointimal coverage and the prevalence of malapposition at 6 months subsequent to implantation of ultrathin biodegradable polymer-coated sirolimus-eluting stents (SES) and durable polymer-coated everolimus-eluting stents (EES) using optical coherence tomography (OCT).

Methods and results: The TAXCO study included a total of 37 patients who consented to and underwent OCT examination between August 2017 and September 2017. Among them, 21 patients had been treated with Tetriflex SES (Sahajanand Medical Technologies Pvt. Ltd., Surat, India) and 16 with XIENCE V EES (Abbott Vascular, Santa Clara, CA, USA), 6 (±1) months earlier at our institution. The OCT was performed using a C7 Dragonfly™ imaging catheter (St. Jude Medical, St. Paul, MN, USA). All OCT images were analysed at an independent core laboratory (Cardiovascular Research Center, São Paulo, Brazil) by analysts who were blinded to patient and procedural information. A total of 763 cross-sections (6,908 struts) were analysed in the XIENCE V EES group, and 1,134 cross-sections (9,992 struts) in the Tetriflex SES group. At 6 months, on a per-lesion basis, no significant differences were observed between the XIENCE V EES group and the Tetriflex SES group in mean percentage of uncovered struts (1.87±3.86 vs. 2.42±3.45, p=0.137) and malapposed struts (0.05±0.20 vs. 0.21±0.69, p=0.302). Strut-level neointimal thickness also did not differ between the XIENCE V EES group and the Tetriflex SES group (0.18±0.12 vs. 0.14±0.07, p=0.370).

Conclusions: This OCT study found no significant difference in strut coverage and neointimal thickness at 6 months after implantation of the biodegradable polymer-coated Tetriflex SES, when compared with the durable polymer-coated XIENCE V EES.

INDIALIVE 2018 Coronary interventions

Seven-year clinical outcomes in patients undergoing percutaneous coronary intervention with biodegradable polymer-coated sirolimus-eluting stent: results from a single-centre real-world experience

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Aims: Sirolimus-eluting stents have been used in clinical practice due to their demonstrated ability to reduce restenosis. However, reports of late and very late stent thrombosis have raised questions about long-term outcome in patients treated with these stents. The aim of the present study was to assess the seven-year clinical outcomes of a biodegradable polymer-coated sirolimus-eluting stent (Supralimus; Sahajanand Medical Technologies Pvt. Ltd., Surat, India) in real-world patients with coronary artery disease.

Methods and results: This observational, retrospective study was carried out in all 346 consecutive enrolled patients who underwent percutaneous coronary intervention (PCI) with the Supralimus sirolimus-eluting stent (SES), between April 2008 and December 2009, at a single centre. We analysed major adverse cardiac events (MACE), a composite of cardiac death, myocardial infarction (MI), target lesion revascularisation (TLR) and target vessel revascularisation (TVR) as the primary outcomes at seven-year follow-up. Out of 346 patients, seven-year follow-up was obtained in 327 (94.5%) patients and hence results were analysed for 327 patients. At seven-year follow-up, MACE occurred in 41 (12.5%) patients, consisting of 23 (7.0%) cardiac deaths, 14 (4.3%) TLR, and 4 (1.2%) TVR. Late stent thrombosis was observed in 3 (0.9%) patients. At follow-up of seven years the cumulative event-free survival was found to be 84.7% using the Kaplan-Meier method.

Conclusions: The present study demonstrated satisfactory and sustained seven-year clinical outcomes, as evidenced by the low rates of MACE and ST for the biodegradable polymer-coated Supralimus SES.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Transcatheter device closure of paravalvular leaks

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Aims: To study our experience with transcatheter PVL (TPVL) closure as a less invasive alternative to surgical reintervention to improve clinical outcomes.

Methods and results: Thirty-one (31) patients underwent PVL closure in our institute between May 2015 and November 2017. Inclusion criteria were patients with significant PVL with heart failure, PAH, haemolytic anaemia. Exclusion criteria were presence of active local or systemic infection, prosthetic valve dysfunction, patients with a life expectancy of less than 6 months. All patients underwent preprocedural 3D TEE evaluation. Thirty-one (31) PVL closure procedures were carried out in 27 patients. Age varied from 12 to 67 years; sex ratio 25:6. The target valve was mitral (22), aortic (5) and both (3). Approaches included femoral arterial (7), femoral venous-transseptal (12) and LV apical (12). Devices used were: AVP1 - 1, AVP2 - 18, AVP3 - 4, AVP4 - 4, Muscular VSD devices - 5, ADO1 - 3, Occlutech PLD - 12. Three patients underwent reinterventions for significant residual leaks. One patient had a device embolisation and was taken up for surgery. There was one in-hospital mortality due to a haemothorax-related complication leading to multiorgan failure and two late deaths. There was no residual PVL in 26 patients and mild to moderate in 4 patients at late follow-up.

Conclusions: Percutaneous device closure of PVL is an effective technique with good clinical outcomes and low morbidity.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Atrial septostomy with a novel atrial flow regulator enables reliable and sustained decompression of the left atrium in diastolic heart failure: early results

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Aims: To study the effects of implantation of a novel atrial flow regulator (AFR) (Occlutech, Istanbul, Turkey) in creating a reliable atrial septal fenestration of requisite size to facilitate left atrial decompression in patients with diastolic heart failure.

Methods and results: In patients aged >12 years and satisfying the inclusion criteria for HFpEF, a) Clinical: symptomatic HF in NYHA Class III or above, needing at least one hospitalisation in the preceding year, despite optimal ongoing medical management of at least 6 months duration and optimal medical rate control (<90/min) of arrhythmias, if present; b) Echocardiographic (2DE): left ventricular ejection fraction (LV-EF) ≥40%; c) Cardiac catheterisation (CC): pulmonary capillary wedge pressure (PCWP) ≥15 (rest); ≥25 (exercise) mmHg and greater than the central venous pressure (CVP), AFR was implanted after septal puncture. Four patients (3 male, 1 female) of age range 12-65 years underwent AFR implantation for HFpEF. In 2 patients the mechanical primary efficacy endpoint of a patent device *in situ* and shunting left-right was confirmed by 2DE and CC at the end of 6 months. Secondary efficacy variables included functional class, 6-minute walk distance (6MWD), N-terminal pro brain natriuretic peptide (NT-pro-BNP) levels.

Conclusions: Based on initial results, LA decompression appears to be a suitable strategy to address LV diastolic dysfunction, and AFR implantation seems to provide a reliable, sustained interatrial communication.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Comparision of outcomes of transcatheter alcohol septal ablation with surgical myomectomy

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Aims: Retrospective analysis of subjective and objective outcomes of those patients who underwent septal reduction therapies – surgical as well as transcatheter.

Methods and results: Forty-one patients (15 males; age 68±10 years) with symptomatic drug-refractory obstructive HCM were studied. Twenty-four patients underwent surgical myomectomy and 15 alcohol septal ablation. All patients underwent clinical evaluation, echocardiography, Holter, cardiac MRI before and after intervention. Fall in peak gradient by both modalities was almost comparable (myectomy: 115±39 to 22±13 mmHg [p<0.000001]; ablation: 100±35 to 22±8.4 mmHg [p<0.000002]; p=0.24 for myomectomy vs. ablation) and led to similar improvements in NYHA class (myomectomy: 2.54±0.6 to 1.5±0.7 [p<0.00001]; ablation: 2.66±0.48 to 2.2±0.56 [p=0.02]; p=0.3 for myomectomy vs. ablation).

Conclusions: Surgical myomectomy and alcohol septal ablation are equally effective in reducing obstruction and subjective exercise limitation in appropriately selected patients. Periprocedural AV conduction abnormalities were higher in transcatheter therapy; however, these were transient.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Transcatheter closure of sinus venosus atrial septal defect: how to select patients - institutional experience from 14 patients

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Aims: We present here a total of 14 patients with SVASD and anomalous drainage of RUPV in RSVC in whom we closed the defect along with rerouting of RUPV to the left atrium (LA) using a covered stent in 5 patients; 7 patients were referred for surgery after failed balloon occlusion testing of the defect, and 2 patients in whom our attempts resulted in stent embolisation were referred for surgery.

Methods and results: Among 14 patients, females were predominant, with a 9:5 ratio (F:M). Mean age was 29.14±8.55 (7-41) years. All patients presented with complaints of shortness of breath on exertion (functional class 1). On cardiac examination, there was ESM murmur and wide fixed split S2 sound in all. Chest X-ray showed mild cardiomegaly and electrocardiography (ECG) showed sinus rhythm and incomplete right bundle branch block pattern. Predominantly patients underwent 2-D TTE as well as TEE to diagnose SVASD with left to right shunt and anomalous drainage of RUPV in RSVC. Right-sided cardiac chambers were dilated and pulmonary artery pressure was normal. All patients underwent balloon occlusion testing to delineate the defect and the anatomy of the anomalous pulmonary vein. Procedure: the procedure was carried out under controlled sedation without GA and transoesophageal echocardiography (TEE) guidance. Two femoral venous access routes were used. Anomalous drainage of RUPV into RSVC and the lower end of the sinus venosus ASD was demonstrated with a hand angiogram in AP and steep LAO view. Based upon the size of SVC and drainage site of RUPV into SVC, the desired balloon was selected with a suitable diameter and length, and balloon occlusion of SVC with hand injection in RUPV was carried out to study the relationship and flow pattern of RUPV. Hand injection was carried out in RUPV while blocking the SVC with a balloon to demonstrate free flow of contrast into the LA in 7 patients. Simultaneous TEE was performed during inflation of the balloon in RSVC to check for unobstructed blood flow from RUPV to LA. Among the 7 patients whom we referred for surgery, 2 patients had elevation of pulmonary venous pressure post balloon occlusion, 3 patients had unsuitable anatomy with RUPV becoming occluded on balloon occlusion, 1 patient had drainage of RUPV in the high end of SVC and 1 patient had accessory RUPV with inability to occlude with a balloon.

Conclusions: An attempt can be made to close this type of ASD and reroute the partial anomalous pulmonary vein to LA by transcatheter technique in selected patients. Long-term follow-up data from many more cases are required before comparing the feasibility and safety of this procedure as an alternative to surgery.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Plasma NT-proBNP: a prognostic and diagnostic marker of diastolic heart failure in hypertensive patients

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Aims: In this study we tried to evaluate the value of plasma NT-proBNP in the diagnosis of diastolic heart failure in hypertensive patients.

Methods and results: The study was carried out for a period of one year where 100 hypertensive patients with diastolic dysfunction on 2D echocardiography and NYHA functional class were selected and classified as: group I - patients with impaired relaxation, group II - patients with pseudonormal, and group III - patients with a restrictive filling pattern within 24 hours after admission or OPD visit and plasma NT-proBNP levels measured simultaneously. The plasma level of NT-proBNP was compared within the study groups. It was observed that mean plasma NT-proBNP was significantly lower for NYHA functional Class I and diastolic function grade I as compared to NYHA Class II and Class III and diastolic function grade II and grade III, respectively. There was significant association of plasma NT-proBNP and NHYA functional Class ($p<0.05$) and diastolic function ($p<0.05$) as per the Student's t-test.

Conclusions: NT-proBNP appears as a strong prognostic index in hypertensive patients with cardiovascular risk profiles, can reliably detect the presence of isolated diastolic dysfunction in symptomatic patients, and is a useful tool to rule out patients with reduced exercise tolerance of non-cardiac origin.

INDIALIVE 2018 Interventions for structural heart disease and heart failure

Intravascular stenting for coarctation of aorta/acquired interruption: Indian experience with early and intermediate follow-up

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Aims: We share our experience of treating coarctation of the aorta and functional acquired interruption with its technical challenges and the effect of stenting on aortic regurgitation associated with the bicuspid valve.

Methods and results: Since 2008, coarctation stenting was attempted in 27 patients with a median age of 21 years (range 9-58 years). The procedure was abandoned in one patient due to profound femoral artery injury. In three patients an interrupted aortic segment was crossed antegradely using a CTO wire. Eleven (11) patients underwent predilatation using a peripheral balloon or serially with a PTCA balloon (in acquired interruption cases). Palmaz/Genesis stents were used in 8 cases, while in the rest CP stents (covered in 6 and uncovered in 12) were used. The median pre-procedure gradient was 70 mmHg (range 30-200 mmHg) which dropped to 10 mmHg (range nil-30 mmHg). Six patients had loss of lower limb pulsations with preserved lower limb circulation. Two patients developed severe radial artery spasm during the procedure and recovered later. On a mean follow-up period of 48 months, four out of 5 patients with significant residual gradient underwent successful balloon coarctoplasty. One of the interesting findings is decrease in severe AR in 5 cases (moderate in 4 and mild in one) after stent placement.

Conclusions: Coarctation of the aorta, including functional interruption cases, is amenable to stenting considering its technical challenges. Interestingly, severe AR associated with the bicuspid valve tends to decrease after successful coarctation stenting.

INDIALIVE 2018 **Interventions for structural heart disease and heart failure**

Combination of ivabradine and eplerenone significantly reduces repeat hospitalisation and mortality in heart failure with reduced ejection fraction (HFrEF)

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Aims: To evaluate the efficiency of an ivabradine and eplerenone combination with current treatment regimes such as ACEI, ARBs, BBs, diuretics, statins, digitalis, etc.

Methods and results: The study was conducted between 2011 and 2017 and included a total of 1,590 heart failure patients: 780 patients were selected for prospective study and 810 with placebo. All patients were selected with history taking, clinical examination, ECG, echo, basic biochemistry and hormone study. Ivabradine 5 mg bid for all patients and eplerenone 25 mg od for 80% of patients, with 20% being titrated to 50 mg od. The patients were followed in terms of complaints, 6MWT, echo and mortality. Significant improvements were found in the ivabradine and eplerenone study compared to placebo. Ejection fraction increased in 80% of patients, 6MWT improved in 92% of patients, repeat hospitalisation reduced in 90% of patients, one wall motion was improved in 90% of patients and two wall motions were improved in 60% of the patients. No hospitalisation was found in the study group.

Conclusions: A combination of I(f) current inhibitor and mineralocorticoid receptor blockers has shown significant positive results with a reduced mortality rate and re-hospitalisation compared to placebo.

INDIALIVE 2018 **Miscellaneous**

Evaluation of the effectiveness and safety of balloon pulmonary angioplasty for inoperable chronic thromboembolic pulmonary hypertension

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Aims: The current established gold standard curative therapy for chronic thromboembolic pulmonary hypertension (CTEPH) is surgical pulmonary thromboendarterectomy (PTE). However, 40% of patients are judged to be inoperable due to associated comorbidities, high-risk status and, predominantly, due to involvement of distal pulmonary arteries. In selected patients who are deemed inoperable, percutaneous balloon pulmonary angioplasty (BPA) is considered as an alternative treatment modality.

Methods and results: CTEPH patients who had 1) distal surgically inaccessible disease, 2) complete occlusion, 3) intravascular webs and filling defects, 4) residual distal pulmonary thrombus following surgical PTE were selected for BPA. Advance Low-Profile PTA Balloon Dilatation Catheters (Cook Medical) of sizes 2×20, 3×20, 4×20 and 5×20 mm were used for dilatation. Thirty-five procedures in 11 consecutive patients (mean age 32.3 years) underwent BPA in Narayana Hrudayalaya Heart Hospital, Bangalore between Jan 2017 and August 2017. Each patient had an average of 3.2 procedures (range 2 to 5) and 12 dilations per procedure (range 10 to 24). After a mean follow-up of seven months, we observed a significant improvement in NYHA Class (from Class IV to II), 6-minute walking distance (from 133 to 390 metres) and mean pulmonary artery pressure (from 70.5 to 43 mmHg). Four patients developed reperfusion pulmonary oedema two of whom required mechanical ventilation. Minimal haemoptysis was observed in two patients which subsided spontaneously. One patient who underwent bail-out BPA after surgical PTE died on the 24th postoperative day.

Conclusions: BPA significantly improves the haemodynamic status and exercise capacity of patients with CTEPH with acceptable complication rates. BPA is a promising and rewarding interventional technique for patients who have inoperable CTEPH.

INDIALIVE 2018 Miscellaneous

Association of vitamin D3 with non-specific chest pain

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Aims: To establish the association of vitamin D3 with non-specific chest pain.

Methods and results: A total of 115 patients were included in this study. Of the study population, 75% were female and they were in the age group 31-40 years. According to the study most of the patients were higher middle class. The majority of the patients had non-specific chest pain (86%) and palpitation (79%). Most of the patients (89.6%) had vitamin D deficiency - serum 25 (OH)D concentration less than 30 nmol/l. Ninety-one patients (79.1%) with vitamin D deficiency responded to the proposed treatment and their VAS scores diminished.

Conclusions: This study showed that vitamin D3 deficiency is associated with non-specific chest pain and vitamin D3 supplementation reduces the chest pain significantly.

INDIALIVE 2018 Miscellaneous

A study of genetic variation in the metabolism of clopidogrel in patients with stent thrombosis

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Aims: We intended to study the CYP2C19 genetic polymorphism for clopidogrel metabolism in patients with stent thrombosis.

Methods and results: Fifty-one patients were included, 26 cases (angiographically proven stent thrombosis) and 25 controls (post-PCI patients). CYP2C19 genotyping for clopidogrel response was assessed. Allele specific PCR stratified individuals into one of these six categories: CYP2C19*1/*1, CYP2C19*1/*2, CYP2C19*1/*3, CYP2C19*2/*2, CYP2C19*2/*3, CYP2C19*3/*3. Patients were classified as poor metaboliser (2/2, 2/3, 3/3), intermediate metaboliser (1/2, 1/3) and normal metaboliser (1/1) of clopidogrel and correlated between cases and controls. Among stent thrombosis cases, poor metabolisers accounted for 11 cases (42.30%), intermediate metabolisers 13 cases (50%) and normal metabolisers 2 cases (7.69%). In the control group, poor metabolisers accounted for 1 case (4%), intermediate metabolisers 14 cases (56%) and normal metabolisers 10 (40%) cases. Our study showed an increased prevalence of poor metaboliser (CYP2C19 2*2*) genotype in patients with stent thrombosis as compared to controls (p=0.004). Also, there was an increased prevalence of normal metaboliser (CYP2C19 1*1*) genotype in the control group as compared to cases.

Conclusions: Clopidogrel should be avoided in post-PCI patients, who carry the poor metaboliser variants of CYP2C19 gene, to reduce the chances of stent thrombosis.