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Coronary artery disease in HIV-infected patients – a study of clinical profile, presentation, angiographic characteristics and outcome

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Aims: as an increasing proportion of HIV-infected patients have access to antiretroviral therapy and achieve virologic suppression, the focus of clinical care is shifting from treating the infectious complications of advanced immunodeficiency to managing and preventing chronic diseases and non-infectious complication.

Methods and results: the present study is a single-center, retrospective study. All HIV positive patients who underwent coronary angiography and percutaneous coronary intervention between 1 Jan 2015- 31 Dec 2017. Patients were followed for a period of 11 months to 46 months (36 males and 4 female patients). 21 were first time diagnosed with HIV during admission. CD4+ count ranged from 192-1002 per cmm (mean- 421). Risk factor profile-chronic smoker-17 (including current and past), hypertensive – 8, chronic alcoholic – 8, diabetes – 5, dyslipidaemia- 19 patients. 24 patients presented with STEMI (14- AWMI and 10 IWMI), 10 patients with UA/NSTEMI, 6 with stable angina. 20 patients had Single vessel disease, 14 had double vessel disease and six had triple vessel disease. SYNTAX score: 33 patients had SS< 22, 7 had SS >22 (mean - 8 ±4). In all except 3 patients, standard PCI hardware which included workhorse PCI wire/balloon/Drug-eluting stent were required. In 98.4% of PCI procedures, TIMI III flow was achieved. No patient required re-intervention in a previously treated artery during the same hospital stay. No deaths and readmissions in any of the 40 patients during follow up.

Conclusions: HIV+ patients had, overall, a less amount of multi-vessel disease with mild CAD burden, and their lesions were, for the most part, non/mild calcified, of moderate length and mildly obstructive. HIV+ lesions were characterized by a lower degree of diameter stenosis, localized in more proximal coronary segments. Proximal LAD is the most common lesion site. Despite their observed low-risk angiographic lesion profile, HIV+ patients were more likely to present with STEMI.

ATHEROSCLEROSIS

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

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Aims: the current spectrum of HIV infections has dramatically shifted after the advent of effective antiretroviral therapy. Cardiovascular disease is an increasing cause of morbidity and mortality in HIV patients in the post-antiretroviral therapy era. The aim of our study was to study the clinical profile, angiographic profile of HIV infected patients presenting with ACS.

Methods and results: prospective observational study conducted from January 2013 to September 2018 with 109 consecutive patients infected with HIV and presenting with ACS. The baseline clinical characteristics, response to fibrinolytic therapy, angiographic findings, and results of PCI and in hospital outcome were studied. Mean age of patients was 46 years which is lower than HIV uninfected patients. Most patients presented with AWMI (n=98, 89%). Thrombolysis was successful in 96 (78.33%) and failed in 13 (21.67%) patients. Four patients underwent rescue angioplasty and primary PCI was done in 3 patients. CAG was done in all the patients revealing significant residual stenosis in 51 patients. Three-vessel coronary artery diseases were seen in 4 patients (3.7%), Two vessels coronary artery disease was seen in 16 patients (14.7%). 69 patients (81.6%) had significant single vessel lesion. All patients with significant residual lesions (n=51) underwent PCI with DES.

Conclusions: HIV-associated atherosclerosis and its complications are a significant human health burden for which the pathogenesis remains elusive. HIV infected patients hospitalized for an ACS is relatively younger. Anterior wall STEMI is the most common presentation hence LAD is the most common culprit vessel.

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ATHEROSCLEROSIS

Major adverse cardiovascular events comparison between accepted versus denied invasive coronary evaluation in NSTEMI patients

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Aims: review of importance of early coronary angiography with revascularization of significant coronary artery disease to reduce major cardiovascular adverse events (MACE).

Methods and results: N=4772 divided in groups. The early group received angiography within 3 hours (Group-A) 28%, a delayed group received angiography 12 to 48 hours (Group-B) 36% and third group was denied for angiography (Group-C) 34% due to different reasons after NSTEMI. Primary endpoint at 30 days and at 6 months. All groups had similar baseline characteristics, such as history of MI, Hypertension, Diabetes, and aspirin and P2Y12-ADP use. Angiography was done within 1.5 hour in the early group and at 19.5 hours in the delayed group. PCI was performed on 57% of the study population, 10 % underwent CABG and 33 % received medical therapy. The MACE rate was 3.6% in the early group, 12.8% in the delayed and 29.3% in the denied group. Rates of recurrent ischemic events were 3.2% for the early group, 11.5% for the delayed group and 19.4 % for the denied group during hospitalization, and 5.0%, 17.4% & 28,6% at 30 days and 5.0%, 17.4% & 28,6% at 6 months. Rates of cardiovascular death were 0.8% for the early group, 1.5% for the delayed group and 7.2 % for the denied group during hospitalization, and 1.5%, 3.4% & 13.6% at 30 days and 3.0%, 7.1% & 21.4% at 6 months.

Conclusions: study revealed fourfold lower rate of MACE in the early group compared to delayed group and tenfold lower rate of MACE compared to denied group. The positive effect of early revascularisation in early diagnosed patients was beneficial to reduce rate of recurrent ischemia and death.

ATHEROSCLEROSIS

Awareness on Risk Factors of Cardiovascular Disease among Patients with Diabetes Mellitus Attending Diabetic Clinic of BP Koirala Institute of Health Sciences

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Aims: to assess the awareness on risk factors of CVD among patients with diabetes mellitus attending diabetic clinic of BPKIHS and to find the association between awareness with their selected socio demographic variables.

Methods and results: a descriptive cross sectional study was conducted among 112 patients with diabetes in diabetic clinic of BPKIHS. Convenient sampling technique was used for data collection over duration of one month using interview schedule by HDFQ II tool. Data were analysed by using descriptive and inferential statistics. The mean age of respondents was 55.4±12.13 years. That mean HDFQ score was 14.31± 5.08. Only 33% of the respondents had adequate level of awareness whereas majority of the respondents (67%) had inadequate level of awareness. Majority of respondent (83.9%) were aware about smoking, (78.6%) physical activity, (75%) increasing age, (75.9%) high blood pressure, (71.4%) overweight respectively. Whereas most of the respondents were not aware about high cholesterol, fatty diet, preventive strategies and association of diabetes with CVD. Awareness was statistically significant with (p=0.043) educational status, (p=0.025) monthly income, (p=0.05) residence, (p=0.006) CVD information received and (p=0.022) co morbid condition as a heart disease.

Conclusions: most of the respondents had inadequate level of awareness on risk factors of CVD. So effective education and appropriate preventive strategies of CVD are indeed important to reduce CVD burden in diabetes patients.

ATHEROSCLEROSIS

Clinical outcome of women with Coronary Artery Disease (CAD) requiring revascularisation at Tertiary Care Hospital in South India

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Aims: CAD remains the leading cause of death in women. There is no consensus or guidelines specific to management of CAD in women. Real world data regarding clinical outcomes in women among different treatment strategies is lacking.

Methods and results: retrospective and prospective observational study. A total of 202 female patients requiring revascularisation (>70% stenosis on CAG) underwent PCI or CABG or opted for medical management were included. All patients were evaluated in terms of MI, death, TVR, Stroke and MACE for a min. period of 2 years extending up to 5 years. The mean age of study population is 63.73±9.31 years with mean follow up of 32.25 months. In High SYNTAX score, the mean event free survival is 9.5 months in medical management, 11.6 months in PCI group and 11.742 months in CABG group at end of 1 year. There is lower event free survival in medical management group compared to PCI and CABG in High Syntax score at 1 year and it is statistically significant (p-value −0.002). In High SYNTAX score, the mean event free survival is 14.803 months in medical management, 21.20 months in PCI group and 20.294 months in CABG group at end of 2 year. There is lower event free survival in medical management group compared to PCI and CABG group in High Syntax score at 2 year and it is statistically significant (p-value −0.001). There is significantly higher MACE in medical management group compared to PCI and CABG in high syntax score at 1 and 2 years.

Conclusions: the mean event free survival is less in medical treatment arm compared to PCI vs CABG group in High Syntax score at 1 and 2 years. In low syntax score the mean event free survival was lower in CABG group but the number of patients in CABG group was small. Patients with high syntax score on medical management have higher mortality and MACE. We also conclude patients with ACS managed medically had higher mortality compared to revascularisation group.

CALCIFIED CORONARIES

A Single-centre study evaluating the real-life usage of Excimer laser-facilitated angioplasty in complex coronary lesions: procedural success and medium-term outcome

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Aims: ELCA has been recently used for the treatment of complex coronary lesions. The aim of this study was to evaluate the indications and outcome of this approach on patients with complex coronary lesions at a single centre.

Methods and results: we evaluated the indications and clinical outcome of patients who were treated with ELCA at University Hospital of Wales, Cardiff, between May 2011 and August 2018. A total of 62 patients were treated with ELCA catheter 0.9 – 2.0 mm in diameter, with a maximum fluence of 80 mJ/mm^2 and a maximum repetition rate of 80 Hz. The mean age was 68.8±11.1 years. Fifty-four (87%) were male. Of the 62 patients, 27 (43.5%) were treated for compliance modification, 13 (20.9%) for ISR, 14 (22.5%) for thrombus vaporization, 5 (8.0%) for plaque debulking, 1 (1.6%) for under-deployed stent and 2 (3.2%) for treating stent recoil. A 0.9 and 1.7 mm-diameter ELCA catheters were used most frequently (33.8%), followed by 1.4 mm-diameter catheter (24.1%). RCA (37.0%) and LAD (35.4%) were the most frequently treated vessels, followed by SVG (17.7%), LCx (8.0%) and intermediate (1.6%). The technical success was achieved in 87.0%, procedural success in 82.2%. Mean follow-up was 543.6±720.3 and median 195 days.

Conclusions: this study suggests that laser-facilitated coronary angioplasty is a safe and effective device for the management of complex coronary lesions associated with good technical and procedural success.

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CAROTID INTERVENTION

Carotid Artery Stenting – Single-centre experience, results and long-term follow-up

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Aims: be it symptomatic or asymptomatic patients the role of CAS for carotid artery disease is well established. Indian data on the outcomes of these procedures is limited.

Methods and results: 116 patients underwent CAS from 2000 to 2017. Stenosis quantification was done using North American Symptomatic Carotid Endarterectomy Trial (NASCET) method. The mean follow-up period for the patients is 4.5 years. Out of 116 patients, 36 were asymptomatic, 50 had motor weakness, 8 had LOC, 9 had Amaurosis, 6 giddiness, 5 dysarthria and 2 had headache. Embolic protection device (EPD) were used in 41 (35.3%) patients and no significant difference was found when compared to those without EPD (p=0.535). In 1st 30 days patient had 1 death (0.86%) and 2 major strokes. Long term follow-up (with 55% follow-up) revealed 14 deaths with 4 major strokes.

Conclusions: CAS is an effective treatment modality of symptomatic/asymptomatic carotid artery disease, but should be done carefully in high risk groups with cardiovascular disease (those planned for elective CABG).

CONGENITAL HEART DISEASE

Use of Atrial Septal Defect Occluders – Nine years follow-up

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Aims: this study presents the results of endovascular treatment of patients with ASD or PFO, in a cardiovascular unit of Paraná, Brazil.

Methods and results: 50 patients were analysed, in a prospective study, between May 2009 and December 2018. Patients with no atrial rim or from the National Health Service, were excluded. Mean age was 42.12±18.23 years, 27 (54%) were female, 31 had PFO (62%) and 19 ASD (38%). Occlusion (PFO group), was indicated on those who had transient ischemic attacks, unknown cause migraines and positive transoperative bobble test. Procedures were performed under general anaesthesia or sedation, with transoesophageal echocardiographic monitoring. Immediate results showed no intercurrences, no signs of embolism or neurological deficits. No deaths occurred and all maintained NYHA class I. Mean times were: hospitalization 2.00±1.44 (2-10), preoperative 0.56±0.62 days and postoperative was 2.00±1.15 days. Patients had double antiplatelet therapy with clopidogrel 75mg/day, for six months, and aspirin 100mg/day indefinitely. Patients continue to be monitored annually with a control echocardiogram, with a mean of 2.87±2.49 years of total follow-up, the longest follow-up being nine and a half years and the shortest of four and a half months.

Conclusions: in selected patients, the use of the percutaneous technique for occlusion of ASD and PFO presents low rate of complications, less trauma and shorter post-procedure recovery time, with results similar to surgical results, with a good cost-benefit ratio.

CONGENITAL HEART DISEASE

Clinical profile of patients of atrial septal defect device closure with special reference to short & intermediate term complications

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Aims: to study the clinical profile of patients with ostium secundum ASD undergoing trans-catheter device closure and complications related to ASD device closure procedure with special reference to short and intermediate term outcomes.

Methods and results: prospective observational study of 184 patients with ostium secundum ASD undergoing device closure and followed up till end of study or death whichever occurred first. All the patients were discharge and had follow up at 15-30 days (short) and 3 to 12 months (intermediate). Amplatzer (ASO) was used in majority of patient (90.7%) followed by Life Tech cera (9.3%). The most common device (waist) size was 22mm in Amplatzer and 28mm in Life tech cera. Out of 184 patients who underwent procedure, there were four procedure failures (2.17%) and 180 procedure success (97.83%). Out of 184 patients, 167 (90.76%) underwent uncomplicated procedures, 11 (5.97%) had major complications, one patient had post-procedure death (0.54%) whereas 5 (2.7%) patients had minor complications (including vascular access site complications). On regular short and intermediate-term follow-up, symptoms of 69 patients (38.12%) resolved at short term, while that of 92 (50.82%) patients resolved at intermediate term. However, symptoms persisted in 20 patients (10.9%) at the end of 1-year follow-up. At end of 1 year, all patients having pre-procedure abnormal ECG and CXR findings in subsets with moderate and multiple defects showed normal ECG and CXR. Also, 21% of patients with large defects had persistent ECG abnormalities and 16% of patients with large defects had persistent CXR abnormalities at 1 year. In present study residual shunt was noted in 34% patients, which resolved in 100% at the end of 6 months. Post procedure persistent PAH was noted in 21 (11.48%) patients while PAH regressed in nearly 15 (8%) patients.

Conclusions: transcatheter ASD closure is highly successful not only in small children but in patients of all age groups despite associated morbidities as patients of all ages experience reduction in PA pressure and an improvement in functional capacity after transcatheter device closure of ASD and these improvements appear to be greater if the defect is closed earlier. Given the low rate of complications and virtual lack of mortality, isolated secundum ASDs which are larger than 5 mm should be considered for percutaneous device closure regardless of symptoms or patient age. Amplatzer device appears to be best available option at the present time.

CONGENITAL HEART DISEASE

Successful percutaneous balloon dilatation of supravalvular aortic membrane in a 10-year-old male

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Aims: supravalvular aortic stenosis is the least common type of left ventricular outflow tract obstruction. Three anatomical types have been described – hourglass, hypoplastic, and membranous obstruction. Of these, the hourglass is the most common and membranous the rarest.

Methods and results: 10-year-old male admitted with effort intolerance since 3 years. A harsh, loud V/VI grade systolic murmur was heard in right first and second intercostal space radiating to right carotid more than left carotid artery. Transthoracic echocardiography showed left ventricular hypertrophy, a membrane was noted at the sinotubular junction. Peak gradient was 106 mmHg. Cardiac catheterization showed systolic left ventricular pressure of 236 mmHg. The aortic systolic pressure was 106 mmHg. Gradient across the membrane was 130 mmHg. The position of the membrane was confirmed on Left ventriculogram. TYSHAK 16 mm×40 mm balloon was used based on the measurement of aortic annulus. After inflation, LV systolic pressure reduced to 130 mmHg and systolic aortic pressure was 116 mmHg with gradient reduced to 14 mmHg from 130 mmHg. The procedure was uneventful. The patient was discharged after 2 days. Patient is asymptomatic on subsequent follow-ups.

Conclusions: balloon dilatation may be an alternative to surgery in selected patients with supravalvular stenosis. Excellent results are obtained in the membranous type of supravalvular stenosis, possibly related to the tearing of the membrane by the balloon. It provides good immediate results. Follow-up of successfully dilated patients shows sustained relief of stenosis.

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CONGENITAL HEART DISEASE

Transcatheter device closure of patients with Outlet Ventricular Septal Defects – Defining the anatomy and feasibility of closure based on intermediate follow-up

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Aims: to report midterm follow up of transcatheter device closure in outlet VSDs in a tertiary cardiac centre from September 2011 to February 2018, thus defining the anatomy and methodology of closure of these difficult VSDs

Methods and results: a retrospective observational cohort study was conducted which included all children with outlet VSDs who underwent device closure between September 2011 to February 2018. Outlet VSDs were categorized into three subgroups: subarterial, outlet muscular [intracristal] and subpulmonary. Patients underwent device closure using ADO/ADO II based on the size of defect and type of outlet VSDs. All patients underwent follow up at predefined time intervals. 29 patients were enrolled into the study cohort. This included 14 subarterial, 12 outlet muscular VSDs [intracristal] and 3 subpulmonary. Median age was 8 years (7m-30years) and median weight was 19.5 kg (6.5kg -81kg). ADO II device was used in 26 (90%) of these patients and ADO I was used for 3 (10%) of them. One child developed device embolization (3%) which required surgical intervention whereas two patients developed mild AR (6%) which got resolved for one patient on follow-up and one patient had ventricular bigeminy which was controlled medically. Procedure success rate was 27/29 (93%) as per prior defined criteria for success and follow up was obtained for all except one patient. Four patients (14%) had trivial shunt on follow up. 9 patients (31%) had trivial AR pre-procedure which did not worsen on follow up. New onset trivial AR was seen in one child with subarterial VSD (3%).

Conclusions: transcatheter device closure of outlet VSDs is difficult but possible procedure with reasonably good success rate. The ADO I/ADO II device can be used as per size and location of the VSD with few peri and post procedural complications. Further studies with larger populations are needed to establish device closure option for outlet VSDs as a reliable one.

CHRONIC TOTAL OCCLUSION

Percutaneous Coronary Intervention Provided Better Results Than Optimal Medical Therapy in Patients with Chronic Total Occlusion: Meta-analysis of Published Data

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Aims: this study aims to conduct a meta-analysis of published data of observational as well as randomized studies comparing long term outcomes of PCI+OMT versus OMT alone.

Methods and results: the present protocol is registered in PROSPERO. PubMed, Embase and Cochrane databases were systematically reviewed. Fourteen studies meeting criteria were included in the meta-analysis. The Cochrane Risk of Bias scale was used to appraise the overall quality of the studies. Revman 5.3 software was used to analyse the data and random-effects model with inverse variance method was undertaken. Baseline parameters of both the groups were comparable. Major adverse cardiovascular events (MACE) which comprises of cardiac death, myocardial infarction, stroke, unplanned revascularization and heart failure [Figure 1] were significantly lower in the PCI+OMT group. (OR:0.74; 95% CI:0.55 to 0.98; p=0.03; I^2=84%). All-cause mortality and cardiac death [Figure 2, 3 respectively] were significantly lower in the PCI+OMT group (p<0.00001 in both). Myocardial infarction (p=0.25) and stroke rates (p=0.15) were lower in the PCI+OMT group, however they did not reach statistical significance. Unplanned revascularization (of any vessel) showed a higher trend in the PCI+OMT group, without reaching statistical significance (p=0.46, I^2=88%).

Conclusions: PCI of CTO is rewarded with better long term outcome, in terms of MACE and all-cause mortality but limited to greater unplanned revascularisation.

CHRONIC TOTAL OCCLUSION

Complex CTO interventions in retroviral positive patients: challenges and dilemmas

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Aims: to assess clinical profile and risk factors associated with coronary chronic total occlusions in retro viral positive patients.

Methods and results: prospective and observational study of total of 6 consecutive patients who were reported as having retroviral positive with CTO between august 2014 and June 2018 were evaluated. Detailed clinical profile and coronary angiography of all patients were evaluated. All 6 patients underwent revascularisation with percutaneous coronary intervention. Mean age of the patients are 42.667 years, mean duration of HIV was 3.433 years. Mean duration of angina was 7.833 months, 4 patients had 100% LAD occlusion, and 2 patients were 100% RCA occlusion. Out of 6 patients, 2 had PCI to LAD, 2 had PCI to RCA, and 1 patient each had PCI to LMCA to LAD, LCX and LMCA to LAD. Average size of the stent was 3x32mm. Procedural success rate was achieved in 100% of cases.

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 revascularisation in HIV patients with CTO.

CHRONIC TOTAL OCCLUSION

Balloon-assisted guidewire crossing technique in Coronary total occlusion – Safe and cost-effective technique

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Aims: crossing guidewire in patients with coronary total occlusion is confronted with number of challenges. We describe an innovative yet cost-effective method for crossing the totally occluded artery.

Methods and results: twenty symptomatic patients (chronic stable angina and ACS) having total occlusion of >1 month duration (majority) were included in the study. Initially the totally occluded lesion was chased with multiple CTO guidewires but when failed to cross, uninflated, semi-compliant, low profile balloon were used as a support to cross the totally occluded segment. Mean age of the patients were 51.1 years. Two third of patients were males, 5 patients had diabetes, 8 were hypertensive. Majority(n=14) of patients had SVD and 3 patients had TVD. Ten patients had LAD lesion, RCA in 7 patients, LCx in 2 patients. One patient had occlusion of both LCx and RCA. Balloon assisted guidewire crossing technique was successful in majority (14 out of 20 patients). 13 out of 20 patients had totally occluded segment for more than one month and one patient had duration more than seven month. Mean fluoroscopy time required to cross the lesion was < five minutes. There were no periprocedural dissections/perforations.

Conclusions: balloon assisted technique is safe and cost-effective method for crossing the totally occluded coronary lesions with significantly less fluoroscopic time and peri-procedural events.

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CHRONIC TOTAL OCCLUSION

Percutaneous intervention for chronic total occlusion in resource limited settings

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Aims: we report here overall procedural results and clinical outcome of 199 consecutive CTO intervention performed since June 2014 till December 2017.

Methods and results: we performed retrospective analysis of the data collected for all 199 CTO interventions performed at our centre. The interventions were performed with significant financial limitations. Mean age of 199 patients undergoing CTO intervention was 59±10 years. CTO was present in left anterior descending (LAD) artery in 89 (44%), left circumflex (Lcx) in 27 (14%) and right coronary artery (RCA) in 83 (42%). Overall the J-CTO score of the lesion was 0 in 43 (20.4%), 1 in 81 (38.4%), 2 in 56 (26.5%) and 3 in 19 (9%). Overall success in antegrade crossing, balloon dilation and stenting the CTO segment was achieved in 157 (78.9%) of lesions. Success rate differed significantly (p= 0.00) between the different J-CTO scores of lesion (95.2% with score 0, 91.3% with score 1, 58.2% with score 2, and 44.4% with score 3). The success rate did not differ significantly (p=0.58) between CTO intervention of the three arteries. Significant rise in ejection fraction by 4% (p=0.01) after successful CTO intervention, limited to patients having successful outcome in LAD artery. The average number of guide wire and balloon used were 2.26±0.63 and 2.27±0.86 respectively. With an average length of CTO segment to be 21.4±8.6 mm, average length of stent used was 46±20 mm. Average number of stents used per lesion were 1.3±0.7. To determine the clinical outcome, these patients were followed up over a mean duration of 16±11 months. TLR and TVR rate at 1 year was 8% and 11% respectively. Overall survival at 1 year was 78%. Major procedural adverse events (pericardial effusion, cardiac tamponade, femoral hematoma, ventricular tachycardia, precipitation of angina) occurred in 12 (6%) of patients and one patient died during the procedure because of cardiac tamponade.

Conclusions: we describe here a fair success rate and good clinical outcome in patients undergoing intervention for CTO even in significant resource constraints.

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DRUG-ELUTING BALLOON

Safety and Efficacy of Sirolimus Coated Balloon in Treatment of Small Vessel Disease

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Aims: stenting of small coronary vessels with reference diameter of ≤ 2.75 mm is always complex. Drug coated balloon is one of the alternative to treat the small vessels. We evaluated the safety and efficacy of MagicTouch (Concept Medical) – Sirolimus coated balloon in *de novo* small vessels sub population.

Methods and results: NANOLUTE is a prospective, all comers, real world population registry which enrolled 450 patients. Out of 450 patients, 197 patients had small vessel disease. The main endpoint of this registry was MACE rate which includes Cardiac death, TV- MI, and TLR/TVR at 1 year. 2 year clinical outcome was assessed to evaluate the performance of MagicTouch for the longer duration. 205 lesions were treated in 197 patients and more than 80% patients among them were male. 30.2% lesions were present in left anterior descending followed by 21.0% in diagonal. 93.4% patients were treated with DCB only while 6.6% patients required additional therapy. At 1 year, 100% clinical follow-up was achieved and MACE rate was recorded as 3.5% with 2.5% TLR/TVR and 0.5% cardiac death. No TV-MI was reported at 1 year. 89.3% patients completed the clinical follow-up at 2 years and clinical follow-up is still ongoing for the remaining patients. MACE rate was found to be 3.9% with 2.8% TLR/TVR and 1.1% cardiac death.

Conclusions: long term clinical follow-up shows low MACE rates hence reflecting the safety and efficacy of MagicTouch SCB in complex small vessel disease.

DRUG-ELUTING BALLOON

Safety and Efficacy of Sirolimus-Eluting Stent in Diabetic Patients compared to Non-Diabetic Patients: Data from en-ABL e-registry

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Aims: the aim of this registry is to assess the long term outcome of ABLUMINUS Sirolimus eluting stent (Envision Scientific) in patient with diabetes. ABLUMINUS DES has unique fusion coating which addresses the complexity of the lesion in diabetic patients.

Methods and results: en-ABL e-registry was all comers, real world population study. Total 2,500 patients. Primary endpoint was MACE rate which comprises of Cardiac Death, TV-MI and TLR at 1 year. Secondary endpoint was total ST and MACE rate up to 2 years. Out of 2,500 patients, 859 patients were diabetics. Demographic characteristics were almost same for both diabetic and non-diabetic cohorts. At 1 year, 96.5% and 96.6% patients in diabetic and non-diabetic cohorts completed the follow-up respectively and incidence of MACE was 2.9% in DM group versus 2.0% in non-DM group (p=0.152). Total ST was 0.8% vs 0.4% (p=0.260) at 1 year respectively. At 2 years, MACE rate for DM and non-DM cohorts was 3.5% vs. 2.3% (p=0.119) respectively and ST was 1.0% vs 0.5% (p=0.263) respectively. There was no significant difference observed between DM and non-DM cohorts and follow-up of remaining patients is still on-going.

Conclusions: in diabetic real world population, ABLUMINUS DES was associated with lower MACE rate and low ST hence proves similar safety and effectiveness in diabetic patients compared to non-diabetics.

DRUG-ELUTING BALLOON

Long-Term Performance of Novel Sirolimus Drug-Eluting Stent in Real-World Population

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Aims: the objective of this study is to capture the long term clinical outcome of ABLUMINUS DES which has unique fusion coating which coats stent as well as exposed part of the balloon to assess its safety and efficacy in complex real world population.

Methods and results: en-ABL e-registry was multicentre, all comers, real world registry. Total, 2,500 patients. Primary endpoint was major adverse cardiac events at 1 year [MACE: cardiac death, TV-MI, and TLR/TVR]. Secondary end-point were the Stent Thrombosis (ST) & MACE rate up to 2 years. Mean age of the population was 57.0 ± 12.6 years and 78.9% were men. 78.6% patients had cardiovascular risk factors (34.3% diabetes mellitus, 42.2% hypertension and 2.0% renal failure). 2,969 lesions were treated with 3,287 number of devices. 14.8% patients had 2-vessel disease while 1.9% and 0.4% patients had 3-vessel and 4-vessel disease respectively. Clinical follow-up of 96.6% and 81.3% patients at 1 year and 2 years was achieved respectively. Follow-up for the remaining patients is still on-going. Analysis have revealed a MACE rate of 2.3% and 2.8% at 1 year and 2 years respectively while ST rates were 0.6% and 0.7% respectively.

Conclusions: this result suggest a well maintained safety and efficacy profile of ABLUMINUS DES when used in routine clinical practice.

DRUG-ELUTING BALLOON

Long-Term Safety and Efficacy of Sirolimus Coated Balloon in Real-World Population from NANOLUTE Registry

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Aims: Magictouch – Sirolimus coated balloon (Concept Medical) is a novel approach to treat atherosclerotic plaques. We evaluated the safety and effectiveness of this device in real world complex population.

Methods and results: NANOLUTE is a prospective, multicentre registry with a total of 450 patients. The main endpoint was MACE rate which includes Cardiac death, TV-MI, TLR/TVR at 1 year. MACE rate at 2 and 3 years was also calculated to assess the performance of the device in longer duration. Mean age of the population was (60.08 ± 10.08 years) with more than 80% were men. 211 patients had in-stent restenosis out of which, 169 patients had drug eluting stent restenosis. 197 patients had *de novo* small vessel disease with vessel diameter ≤ 2.75 mm. 448 (99.6%) patients had completed the clinical follow-up at 1 year. The observed MACE rate was 3.8% constituting 0.4% Cardiac Death, 0.2% TV-MI, and 3.1% TLR/TVR. At 2 and 3 years, clinical follow-up of 396 (88.0%) patients and 337 (74.9%) patients were achieved respectively and the incidences of MACE were 4.5% and 5.3% respectively. MACE rate in ISR subgroup at 1 year was recorded as 4.8% while MACE rate in *de novo* small vessel disease was 3.6%. Clinical follow-up of remaining patients is still on going.

Conclusions: lower MACE rate in overall population as well as in subgroups shows that MagicTouch SCB is promising alternative to treat the coronary disease.

ELECTROPHYSIOLOGY

Early experience in use of point of care basic ultrasound for emergency temporary pacemaker insertion

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Aims: in haemodynamically unstable patients with bradycardia it is proven that a prompt insertion of TPM is lifesaving until the definitive treatment is available. We propose a modified technique of insertion which is ultrasound guided and avoids the inherent complexities of the blind techniques.

Methods and results: 10 consecutive patients with haemodynamically unstable bradyarrhythmia recruited. Right femoral vein access ensured with 6FR sheath. Length of TPM lead from inguinal canal to umbilicus and then to angle of Louis marked. TPM inserted with curve facing upwards. Flat ultrasound probe of portable ECHO utilised to follow the TPM lead in inferior vena cava up to right atrium. Clockwise turn and a push used to place it at right ventricle. Confirmation can be achieved with an ECHO probe. RV ectopics will be an indirect clue. All 10 cases were successfully completed utilising the above technique. Subsequent fluoroscopy confirmed 8 leads to be in right ventricle and 5/8 to be exactly in RV apex. 2 cases were paced at right atrium. Procedure time on average was 7minutes and no perforation/complications noted.

Conclusions: as the skills set of using abdominal quick scan is prevalent in most of medical centres due to frequent assessment in dengue patients we believe IVC scan guided TPM insertion can be achieved in most of the critical care centres. It would be a more scientific and trustworthy way of TPM insertion.

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ELECTROPHYSIOLOGY

Incidence of venous thrombosis in post pacemaker implantation

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Aims: to evaluate incidence of venous thrombosis in patients with post pacemaker implantation

Methods and results: all consecutive adult patient's scheduled for an implantation of their first pacemaker PM or ICD and without contraindication for venography were eligible for study. Total 50 patients were enrolled Intravenous contrast venography was performed at baseline (i.e. at the time of discharge, then 1 month & at the end of 1 year) on all 50 patients in order to access patency after PM implantation. Mean age was 66.8 (+/- 12.3) years, males (60.7 %). Mean procedure duration was 1 hour and 13 minutes. Longer procedures in patients implanted with a biventricular PM compared to other device types (mean 183 vs. 66 minutes, p<0.001), and longer in patients receiving multiple as opposed to a single lead (mean 81 vs. 59 minutes, p=0.003). Majority (42, 84 %) of the devices were implanted on the left side. Intravenous contrast venography was abnormal in 5 patients among them 2 patients have total venous occlusion. During the first 4 weeks, significant acute complications of PM implantation developed in a total of 8 (3.7 %) of the 50 patients. These included 1 case (0.5%) of atrial lead dislodgement, 1 case (0.5 %) of pericardial effusion, 1 case (0.5 %) of pneumothorax, 3 (1.2 %) wound infection, and 2 (1%) hematoma treated conservatively.

Conclusions: this study shows that venous thrombosis is relatively common after maintenance as asymptomatic PM insertion, although chronically benign. Early detection of subclinical venous thrombosis in asymptomatic patient leads to early treatment and improve outcome in future. Totally occluded veins may hamper future upgrading or replacement of pacing system. Venous complication seems difficult to prognosticate as firm predictors were not identified from wide range of parameter analysed. Decrease number of leads and decrease in size of leads will reduce chances of removal thrombosis.

ELECTROPHYSIOLOGY

Innovative techniques to stabilise LV lead in difficult coronary sinus anatomy – a single-centre experience

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Aims: to depict the various techniques deviced by the implanters to stabilize the LV lead while implanting in a difficult CS and its tributaries anatomy.

Methods and results: retrospective analysis of 132 CRT-P/CRT-D implanted at a single centre. A total of 17 procedure required innovative techniques. In 11 patients LV lead was stabilized by retaining the guidewire over which the LV lead was placed at the desired location. 2 patients require balloon dilation of the veins for placement of LV lead because of stenosis in the posterolateral or lateral vein. 2 patients required placement of stent into the posterolateral vein, through which the LV lead was negotiated. For 2 patients we had to place the stent besides the LV lead to stabilize the lead between the stent and the wall of vein. The measured LV threshold at the time of implantation was 1.1±0.7 V. The average impedance at the time of implantation was 840±240Ω. At an average follow-up of 24±11 months the average threshold have remained 1.6±1.0 V and the impedance to be 980±360Ω. 1 patient had macro dislodgement of LV lead 6 months after the initial procedure, completed with permanent stylet technique. He required re-implantation of LV lead by the right side as the left subclavian vein developed stenosis after the initial procedure. Another patient started developing alarm of high impedance after 1 year of implantation. He was found to have fracture of LV lead confirmed on fluoroscopy. He has been managed on medical management as the patient remained class I despite stopping of biventricular pacing.

Conclusions: in patients with difficult CS anatomy and unstable LV lead position we may have to use different innovative techniques to stabilize the LV lead. However, in some of these patients despite using these technique micro or macro dislodgement or lead fracture may be seen.

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ELECTROPHYSIOLOGY

Knowledge regarding Care of Patient with Pacemaker among Nurses Working at Selected Wards of BP Koirala Institute of Health Sciences

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Aims: the objectives of this study were to assess the knowledge regarding care of patient with pacemaker among the nurses working at selected wards of BPKIHS.

Methods and results: descriptive cross-sectional study design was used to conduct the study among the Nurses working at selected wards of BPKIHS. Total 69 subjects meeting the eligibility criteria were included in the study using total enumerative sampling technique. Data were collected using the questionnaire. The knowledge score of majority of the nurses were about natural pacemaker of heart (97%), function of pacemaker is to regulate heart rhythm (91%), pacemaker works as fast emergency treatment (82%), care of patient with pacemaker (77.53%), indication of pacemaker is complete heart block (69%) & dual chamber pacemaker (61.20%), evidence of infection and failure of pacemaker implantation (50.72%), discharge teaching of patient (70.53%). The mean score for the overall knowledge of the nurses was 67.6%. The knowledge with age & area of service of the nurses was associated significantly at 5% significance ($p<0.05$) i.e. nurses of >25 years of age & working in critical care unit had adequate knowledge ($p=0.001$) respectively.

Conclusions: the study concluded that nearly one fourth of the nurses had satisfactory knowledge regarding care of patients with pacemaker among nurses working at selected wards of BPKIHS. The socio demographic characteristics: age and working ward was only associated with the knowledge regarding care of patients with pacemaker among nurses working at selected wards of BPKIHS.

IMAGING PHYSIOLOGY

Utility of fractional flow reserve in moderate in-stent restenosis and jailed side branches and comparison of fractional flow reserve with SPECT-MPI in native coronary artery stenosis

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Aims: FFR demonstrated discrepancy between angiographic and functional significance of jailed side branches (JSB) as well as moderate In-stent restenosis, with only minority of such lesions having functional significance. An attempt was made to study utility of FFR in such scenarios and comparison of FFR with SPECT-MPI in native coronary artery stenosis.

Methods and results: total 101 lesions from 79 patients with stable ischemic coronary artery disease were subjected to FFR and SPCT-MPI including Native, ISR and Jailed side branches. Clinical follow up was performed for CCS class of angina and MACE events. Data was analysed using SSPS for significance. 101 lesions were studied [LAD 54/101(53.5%), LCx 22/101(21.8%), and RCA 25/101(24.7%)]. Native 78/101(77.2%), 11/101 (10.9%) ISR and 12/101(11.9%) were JSB. There was statistically significant negative correlation between summed difference score (SPECT- MPI) with FFR values. There was no statistically significant difference between FFR groups and MACE.

Conclusions: QCA/Operator visual interpretation is an inappropriate tool for assessing functional significance in native coronary stenosis as well as In-stent restenosis and Jailed side branches. FFR value of <0.75 or less can safely be considered for revascularization in such scenario. Although summed difference score in SPECT-MPI, which denotes myocardial reversibility extent correlates well with FFR, SPECT- MPI often tends to underestimates severity and extent of ischemia especially in multivessel CAD.

IMAGING PHYSIOLOGY

Impact of plaque burden and composition on coronary slow flow in ST-segment elevation myocardial infarction patients undergoing percutaneous coronary intervention: Intravascular ultrasound and virtual histology analysis

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Aims: coronary slow flow is an important complication of PCI with poor prognosis. The aim was to assess gray-scale IVUS and VH-IVUS features of culprit lesion in STEMI.

Methods and results: a total of 252 consecutive patients with STEMI underwent coronary angiogram and IVUS. Following PCI, divided into 2 groups; slow flow (TIMI flow ≤ 2, n = 61) and normal flow (TIMI flow > 2, n = 191). Coronary plaque and composition in relation to slow flow evaluated. On IVUS, plaque area (14.30 ± 9.80 mm^2 vs. 12.92±9.11 mm^2, p=0.047), plaque volume (121.38±41.28 mm^3 vs. 102.94±30.70 mm^3, p=0.001), lesion external elastic membrane cross-sectional area (15.77±4.70 mm^2 vs. 14.28±3.25 mm^2, p=0.038) and remodelling index (1.38±0.36 vs. 1.27±0.32 mm^2, p=0.035) were significantly higher in slow flow group. On VH- IVUS, absolute fibrous volume (52.48±21.55 mm^3 vs. 43.48±15.74 mm^3, p=0.002), necrotic core volume (12.42±6.50 mm^3 vs. 6.75±4.79 mm^3, p<0.001), dense calcium volume (1.94±2.46 mm^3 vs. 1.26±1.71 mm^3, p=0.016) and thin cap fibroatheroma single (31.10% vs. 16.80%, p=0.015) or multiple (4.90% vs. 0.5%, p=0.045) were higher in slow flow arm. In multivariable analysis absolute necrotic core volume (odds ratio=1.184; 95% CI 1.087 -1.288, p<0.001) was the only independent predictor of slow flow.

Conclusions: VH-IVUS derived absolute NC volume is closely associated with the coronary slow flow phenomenon in patients with STEMI after PCI.

IMAGING PHYSIOLOGY

Clinical Outcomes of patients with coronary artery disease who underwent FFR evaluation of intermediate coronary lesions – COFFRS study – 5-year follow-up

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Aims: we undertook this study to validate the impact of FFR guided coronary interventions among Indian patients on long term.

Methods and results: 282 patients with intermediate stenosis in their coronary arteries, who underwent FFR to assess the functional severity of the lesion. Divided into 3 groups: Group 1-FFR > 0.8- kept on medical follow up; Group 2–FFR ≤ 0.8 - underwent revascularisation and Group 3–FFR ≤ 0.8- refused for revascularisation. 277 (98.22%) patients had regular follow-up. Primary end point was MACE defined as composite of cardiovascular death, ACS and target vessel revascularisation.

Mean follow-up was 5.68 years, 230 were males. Mean age was 57 years (28–78). 84 patients were in Group 1, 176 in group 2 (PCI in 144 & CABG in 32) and 17 in group 3. 16 patients (19.04%) in Group 1; 19 patients (10.79%) in Group 2 and 5 patients (29.41%) in Group 3 had MACE. There was no difference in MACE in patients with FFR > 0.8 kept under medical therapy when compared with FFR ≤ 0.8 who underwent revascularisation (p=0.17). There was much higher rate of MACE in patients with FFR ≤ 0.8 and did not undergo revascularisation compared to those who underwent revascularisation (p<0.001).

Conclusions: FFR based revascularisation decision appears to be a safe strategy in Indian patients. However, it warrants revascularisation if FFR ≤ 0.8. This is the first Indian study to assess the impact of FFR based revascularisation on long term.

IMAGING PHYSIOLOGY

Comparison of Intravascular Ultrasound Virtual Histology parameters in Diabetes versus non-Diabetes with Acute Coronary Syndrome

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Aims: the progression and the pattern of coronary atherosclerosis in Diabetes Mellitus is different from non-DM, leading to higher rate of vascular complications in DM. This study aims to assess and compare the plaque characteristics in the culprit artery of DM and non-DM patients with ACS using VH-IVUS.

Methods and results: this was a prospective single-centre study carried out in a tertiary care institute in North India. A total of 158 patients of ACS were included, out of which 63 were known to have DM on the basis of ADA guidelines. IVUS analysis was done in the culprit vessel, for which percutaneous intervention was planned. The mean age of the study population was 52.4±11.6 years. No significant difference was observed in quantitative IVUS parameters like lesion length, luminal and vessel volume and plaque area. However, there was significant difference in VH-IVUS parameters like higher necrotic core and dense calcium in DM as compared to non-DM patients ($p<0.01$). Thin-cap fibroatheroma in the culprit vessel was significantly higher in DM group as compared to the non-DM group (63.5% vs. 5.2%; $p<0.01$). Positive remodelling was noted in both groups ($p=0.74$).

Conclusions: the DM patients had plaque composition features like higher necrotic core and calcium which are the markers of plaque vulnerability. Thus, aggressive medical therapy targeting vascular inflammation using high dose statins and angiotensin converting enzyme (ACE) inhibitors would help in stabilisation of unstable plaque morphology and decrease in major cardiovascular events.

IN-STENT RESTENOSIS

Safety and Efficacy of Sirolimus Coated Balloon in Coronary In-Stent Restenosis: Insights from NANOLUTE Registry

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Aims: in-stent restenosis (ISR) is one of the major risk associated with DES as well as in BMS. We investigated the safety and efficacy of MagicTouch (Concept Medicals) – Sirolimus coated balloon in patients with in-stent restenosis in coronary arteries.

Methods and results: NANOLUTE is a prospective, all comers, real world population registry. Total 450 patients were enrolled in the registry out of which, 211 patients had ISR. The main endpoint of this registry was MACE rate which includes Cardiac death, TV-MI, and TLR/TVR at 1 year. We also assessed MACE rate at 2 years and 3 years to investigate the device in longer duration. Average age of the population was 60.60 ± 9.58 years with 80.1% were male. 54.0% patients had diabetes and 51.7% patients had hypertension. 53.8% had focal ISR followed by 21.8% diffuse intra-stent ISR out of 225 lesions. Most of the patients had Drug eluting stent associated in-stent restenosis (80.1%). At 1 year, 99.1% (209/211) clinical follow-up was available and MACE rate was 4.8% with 4.3% TLR/TVR and 0.5% TV-MI. No cardiac death was reported at 1 year. MACE rate at 2 years was 6.1% with 5.0% TLR/TVR and 0.6% TV-MI in 85.8% patients. Only one cardiac death was reported at 2-years. At 3 years, 74.4% clinical follow-up was completed and MACE rate was 7.0% with 5.7% TLR/TVR.

Conclusions: lower MACE rates in longer duration proves the long term promising performance of Magictouch device in patients with coronary ISR.

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IN-STENT RESTENOSIS

Determinants of DES-ISR and generation of a predictive model for in-stent restenosis following DES implantation. First model from Indian subcontinent

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Aims: despite major advances in coronary hardware, particularly the newer generation DES, in-stent restenosis (ISR) following stent implantation is considered the Achilles' heel in PCI treatment of CAD. We sought to study demographics and clinical outcomes of stent restenosis following PCI from our Institute.

Methods and results: patients who underwent PCI with DES between January 1 2009 and December 31, 2017 and returned with symptoms suggesting ISR were evaluated as per demographic parameters, functional status, comorbidities, and echocardiographic parameters, including LVEF, angiographic, and angioplasty details including type of stent and instituted medical therapy were collected at baseline, and at 9th month follow-up, and till last available. When patient returned for a second suspected ISR, they were similarly reevaluated. Using a split-sample validation technique (100 for Derivation cohort and 111 as Validation cohort), predictors of TLR due to ISR development were identified from approximately one-half of the subjects (derivation cohort) using multiple logistic regression. Integer point values were created for each predictor based on the OR of each variable, and the summed risk score (range, 0 to 20) was applied to the remaining sample (validation cohort). At 18 months, TLR occurred in 3.2% of patients, and after excluding stent thrombosis and early mechanical complications, the incidence of late TLR (most likely representing restenosis-related TLR) was taken into account.

Conclusions: a simple risk model incorporating readily available clinical and angiographic variables helps identify individuals at extremely low (< 1.5%) to markedly increased (> 9%) risk of TLR after DES implantation up to 1.5 years in a linear interestingly, controlling for the above factors, the type of DES (G1 DES V/S G2 DES) did not make a significant impact on future ISR probability. DES ISR presented as a new ACS in almost 3 5% of patients. Also, no relation of second ISR was seen with the use of same or hetero-DES after the first ISR episode.

IN-STENT RESTENOSIS

Long-Term Clinical Follow-up of Sirolimus Coated Balloon in Treatment of In-Stent Restenosis in Drug-Eluting Stent

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Aims: ISR remains a major problem in drug eluting stents. The aim of this registry is to evaluate the safety and efficacy of MagicTouch (Concept Medical) – Sirolimus coated balloon in patients with DES associated ISR.

Methods and results: NANOLUTE is a prospective, all comers and real world population registry - 450 patients. Out of 450 patients,169 patients with DES-ISR were analysed. The endpoint was MACE rate which comprised of CD, TV-MI and TLR/TVR at 1 year. MACE rate for 2 years was also compiled to assess the long term efficacy and safety of the device. Average age of the population was 59.8 ± 9.2 years with 77.5% were male. 53.8% were diabetics while 52.5% had hypertension. 46.2% lesions were present in left anterior descending followed by 28.0% in right coronary artery and 23.6% in left circumflex. 61.5% ISR were focal while 37.9% were of diffused pattern lesions. At 1 year, 98.8% patients completed the clinical follow-up and MACE rate was recorded as 4.8% with 4.2% TLR/TVR and 0.6% TV-MI. No cardiac death was reported at 1 year. 83.4% patients completed the clinical follow-up at 2 years with MACE rate of 6.4% [Cardiac death: 0.7%, TV-MI: 0.7% and TLR/TVR: 5.0%]. Clinical follow-up of the patients is still ongoing.

Conclusions: the clinical outcomes in the present study were very promising. Overall, the present data shows the beneficial effect and safety of Magictouch Sirolimus coated balloon in patients with DES-ISR.

LEFT MAIN

Safety of unprotected Left main PCI: An observational analysis from large single-centre experience

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Aims: in patients with coronary artery disease, approximately 3-5 % have LM disease. Although trials have shown efficacy of unprotected left main percutaneous coronary intervention (uLMPCI), data from Indian subcontinent are lacking. Hence, we planned this observational analysis of single-centre uLMPCI data of last 3 years in tertiary care institute.

Methods and results: Retrospective observational study of clinical, risk factor, angiographic profile and long-term outcome after uLMPCI. 52 consecutive patients of uLMPCI between May 2015 and May 2018 were retrieved from a computerised database wherein detailed records were maintained. Clinical history, Risk factors, examinations findings and angiographic images were analysed. Data of patient of LM disease was categorized into LM alone (ostial, mid part, distal) and LM with single/multivessel disease. Patient counselling done and treatment options were explained in details as CABG, a standard treatment of choice. Written informed consent was taken. IVUS study was performed in 30 (58%) patients to confirm the lesion of LM before stenting. DES was used of revascularisation. Post stent IVUS study was done to check for residual lesion, dissection, flap and LCX ostium pinch. Mean age of the patients was 58 years. Men comprised 35 (67%) and females constituted 17 (33%) of the total. A total of 25 (48%) patients were diabetics. HTN was present in 23 (44%) and 18 (34.6%) were current smokers. The most common clinical presentation was stable angina in27 (52%), followed by unstable angina (USA) in 16 (30.7%). Non-ST elevation myocardial infarction (NSTEMI) was diagnosed in 7 (13.4%) at admission and 3 (5.7%) presented with ST elevation myocardial infarction (STEMI). mean hospital stay was 4.1 days. Out of 52 patient 1 (1.9%) patient died with cardiogenic shock post LM PTCA.

Conclusions: Unprotected left main percutaneous coronary intervention (uLMPCI) is safe and effective alternative to CABG for LM alone and LM plus single/multivessel disease.

MISCELLANEOUS

Spontaneous Coronary Artery Dissection In Women With Different Clinical Presentation, Risk Scenario And Coronary Angiographic Evaluation: Multicentric Analysis

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Aims: Analysed all myocardial infarction patients in Asia and collected data of SCAD through multi centric randomised observational study (From 2012 to 2017) with assessment of risk scenario and clinical presentation. We accessed invasive coronary evaluation with support of Intravascular ultrasound or OCT.

Methods and results: 181 cases of SCAD (1.8% of 9863 patients) were registered for SCAD Registry, mostly women n=146 (80.6%). 146 female patients of SCAD from different cardiac centres Age- 33 to 54 years, mean weight was 61+/-17.5 kg. We found STEMI patients 61% and NSTEMI (39%) with different symptoms like; chest pain 65%, palpitation 26%, shortness of breath 24%, sweating 19%, tiredness 16%, nausea 14%, dizziness 11%, syncope 6%. We categorized risk scenario of SCAD like; pregnancy (n=9) 6.1%, during delivery (n=8) 5.5%, post-delivery (n=7) 4.8%, menstrual periods 4.8%, fibromuscular dysplasia (n=14) 9.6%, accelerated hypertension (n=5) 3.4%, heavy exercise 6.1%, severe emotional stress 5.5%, tobacco (n=3) 2.05%, %, cocaine abuse 2.05%, cannabis (n=2) 1.36% , systemic lupus erythematosus 2.05%, Marfan syndrome 2.05%, Ehlers denlos syndrome 1.36%, polyarteritis nodosa 1.36%, ulcerative colitis 1.36%,Crohn's disease 1.36%, poly cystic kidney (n=1) 0.68%, endometriosis 0.68%, uterine fibroid 0.68% and hormonal therapy /contraceptives / Treatment for infertility (n=10)6.8 %. CAG revealed single vessel were often like: Left Main (n=16), LAD (n=77)-simple (n=59) & bifurcation (n=18), LCX (n=34)-simple (n=28) & bifurcation (n=6), RCA (n=19)-simple (n=17)-& bifurcation (n=2).

Conclusions: High rates of recurrent SCAD; its association with female sex, pregnancy, stress triggers; and concurrent systemic arteriopathies, particularly fibromuscular dysplasia. Research has increased awareness improved diagnostic capabilities and findings led to changes in approaches to initial and long-term management.

MISCELLANEOUS

Risk scoring system to predict contrast-induced nephropathy after PCI in Indian population – Validation

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Aims: we aimed to externally validate the new Risk scoring system to predict contrast induced nephropathy after PCI.

Methods and results: prospective, multi-centre study that consists of 1850 consecutive patients who underwent PCI from 2016 to 2018. CIN was defined as an increase of 25% and/or 0.5 mg/dl in serum creatinine at 48 hours after PCI when compared to baseline value. Patients with renal failure on regular dialysis, acute renal failure before PCI, cardiogenic shock, patients who were exposed to contrast media within 14 days, patients requiring IABP support and patients who developed PCI related complications were excluded from the study. The risk scoring system was then assessed in the study group. Patient's outcomes and need for renal replacement therapy were noted meticulously. Data were collected and analysed using SAS, 9.2 version. Discriminatory power was analysed by calculating the value of the area under the ROC curve. Calibration of the model was evaluated using the Hosmer-Lemeshow goodness of fit test. The mean (±SD) age was 55.3 (±10.2) years. 84% were males. Diabetes and hypertension were prevalent at 56% & 58%. The total incidence of CIN was 9.8% (n=181). The total risk of renal replacement therapy in the study group is 1.1% (n=21). Mortality is 0.5% (n=9). The risk score system had sensitivity of 92.3%, specificity was 82.1% and demonstrated excellent discriminative power (c – statistic = 0.91) in the study group. The Hosmer-Lemeshow 'p' value for the calibration of the score was significant at 0.001.

Conclusions: a simple risk scoring equation can be employed to predict the probability of CIN following PCI, applying it to each individual. More vigilant preventive measures can be applied to the high risk candidates.

STENTS

Short- and intermediate-term outcome of percutaneous coronary intervention in octogenarians

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Aims: the aim of the present study was to assess clinical characteristics, procedural details, and intermediate term outcomes in the patients older than 80 under-going PCI.

Methods and results: Single centre, randomised prospective study. Patients equal to or above the age of 80 years (Octogenarians) both male and female presented with symptoms and signs of ACS or chronic stable angina, and planned for PCI were included in the study. Parameters were assessed at baseline, pre-discharge and at 6 months post-procedure. MACE (Cardiac death, non-fatal MI, CVA, stent thrombosis, bleeding and target vessel revascularization) was taken as primary composite end point. Patients (n= 50) were divided into 2 groups: Group I (80–85 years, n=35, 70%) and Group II (≥85 years, n= 15, 30%). At baseline, overall presentation with STEMI, cardiogenic shock and heart failure were significantly more in Group II compared to Group I {53.33% GpII vs 31.42% GpI ($p<0.001$), 26.67% GpII vs 8.57% GpI ($p<0.001$), 80% GpII vs 45.71% GpI ($p<0.001$), respectively}. Incidence of double and triple vessel disease were more in Group II than in Group I {93.33% GpII vs 82.85% GpI ($p<0.001$)}. Procedural success was significantly decreased in Group II {94.28% GpI vs 86.67% in GpII ($p<0.001$)}. Bleeding complications significantly increased in Group II {46.67% GpII vs 20% GpI ($p<0.001$)}. On 6 monthly follow-up, the overall (n= 50) all-cause mortality was 24%, MI incidence 8% and TVR 6%. MACE were significantly increased in Group II {46.67% GpII vs 17.14% GpI ($p<0.001$)}.

Conclusions: PCI and stenting can be done in elderly patients (>80 years) with reasonably high success and acceptable complication rates. Within the group, the more elderly (>85 years) have higher risk profile, lesser success and higher complications and MACE.

STENTS

One-year clinical outcomes of ultrathin strut everolimus-eluting coronary stent system (50 µm) for treatment of patient with de novo coronary artery lesions

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Aims: Previous generation of DES had thicker struts and were associated with increase rate of stent thrombosis. Hence newer generation biodegradable DES with thinner strut are developed. The Evermine 50 EES-KLES study was designed to evaluate clinical safety and performance of Evermine 50 EES in "real-world" patients with *de novo* coronary artery lesions.

Methods and results: Retrospective, single-arm and observational study – 171 patients. The safety endpoint was the occurrence of MACE, a composite of cardiac death, any MI and ID-TLR 12 month follow-up. The performance endpoint was ID-TVR at 12 months follow-up. Among 171 patients (average age 57.85 ± 10.05 years), hypertension and diabetes mellitus were found in 69 (40.35%) and 70 (40.94%) patients, respectively. A total of 246 Evermine 50 EES were implanted to treat 258 *de novo* coronary lesions. DVD and TVD reported in 55(32.16%) and 16 (9.36%) patients. According to ACC/AHA lesion classification majority lesions were B1 (41.87%) and B2 (47.97%) followed by 14 (5.69%) C type. The cumulative MACE rate was observed 0.58% at 6-month and 1.81% at 12-month follow-up. Occurrence of ID-TLR was reported in one case. No MI and ST were identified at 6 and 12 months. No ID-TVR reported at 12-month follow-up.

Conclusions: The study revealed favourable clinical safety and performance of Evermine 50 as for treatment of *de novo* coronary artery lesions evident by lower MACE rate at 12-month follow-up.

STRUCTURAL

The Initial Experience of Transcutaneous Aortic Valve Implantation (TAVI) in a Brazilian Centre

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Aims: the present study presents the immediate and medium results of the initial experience in the treatment of high-risk patients with severe aortic valve stenosis.

Methods and results: prospective study, from December 2014/18, of 22 patients, with severe aortic stenosis referred for endovascular treatment, 16 submitted to PCI, 4 died before the procedure, and are in the waiting list. Mean age was 79±9.27 years, being 10 patients female (62.5%). One patient was in New York Heart Association (NYHA) functional class II (6.25%), 3 in III (18.75%) and 12 in IV (75.00%). Mean preoperative gradient was 71.16±17.72 mmHg and the mean logistic EuroScore was 17.98±12.15. 13 patients had a normal postoperative evolution (81.25%), in 2 cases a definitive pacemaker was implanted (12.5%), due to AVblock, and in one cardiac tamponade occurred (6.25%), that was drained. Mean postoperative hospitalization was 10 ± 15.97 days. 2 hospital deaths occurred (12.5%), on the 4th day due to metabolic disorder, and on the 64th day to pneumopathy. Mean postoperative gradient was 22,35±9,93. All patients were, NYHA class I, after 70 days. After 180 days, 9 were class I (81.82%) and 3 class II (18.18%).

Conclusions: patients with high surgical risk and/or with important comorbidities, TAVI is a viable option with an acceptable risk. The procedure should be performed before symptoms increase in an elective way.

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STRUCTURAL

Balloon pulmonary angioplasty in chronic distal pulmonary thromboembolic disease and pulmonary hypertension

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Aims: this is the first study conducted in Indian patients, for evaluating the impact of BPA in patients with distal CTEPH.

Methods and results: total 11 CTEPH patients who underwent BPA and met our inclusion and exclusion criteria. Detail case record from containing information on demographics, clinical features and necessary blood and imaging investigations, V/Q scan, CT pulmonary angiogram, right heart catheterization study, pulmonary angiogram, BPA procedure details obtained for all our participants before BPA. Patients than assessed after, 8 weeks of last BPA session and evaluated for improvement in 6 minutes' walk distance (6mwd), RV function (TAPSE), PASP. Mean age of presentation: 39.81±12 years. Pulmonary angiography in all our patients revealed segmental and sub-segmental disease. 30 BPA sessions performed. Minimum BPA session underwent was 1 and maximum BPA sessions underwent by 1 patient was 5. 45% of patients underwent 2 BPA sessions. Total number of segmental arteries dilated was 104.segmental vessels dilated per each session was 3.46. 2 patients had developed mild breathing difficulty associated with blood streaky sputum during procedure but stabilised by non-invasive ventilation. There was statistically significant improvement in 6mwd after BPA. 6mwd increased from 299m to 421m (p value <0.001). This improvement in functional capacity is strongly associated with the improvement in RV function (TAPSE from 15.3mm to 18.9 mm) and with the reduction in PASP (from 92 mmHg to 60 mmHg).

Conclusions: in patients with CTEPH who undergo BPA there was statistically significant improvement in 6mwd. These changes correspond to a treatment induced reduction in pulmonary artery pressure and lend support to use of BPA in Indian patients with distal CTEPH 6mwd can be used for evaluating BPA efficacy and monitoring of disease progression.

STRUCTURAL

Immediate results, safety and efficacy of percutaneous transmitral commissurotomy (PTMC) in juvenile mitral stenosis

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Aims: although PTMC has become an established method of treatment for mitral stenosis (MS) in adults, reports of this technique in the younger age group are scarce. The study presents the tertiary care experience regarding PTMC in juvenile MS (JMS).

Methods and results: single centre retrospective observational study (January 2008 to January 2018). Pre and post procedure clinical, echocardiographic and intra procedural data was systematically analysed. Procedure was considered successful when post procedural mitral valve area increased by more than 50% and mean TMG fell by more than 50%. Total number of patients: 305. 79% patients were in NYHA class II and 20% patients were in class III and 1% was in class IV. All patients were in sinus rhythm except 7 of which 2 spontaneously reverted to SR after procedure. Mean pre PTMC mitral valve area by planimetry was 0.7 cm^2 and post PTMC area was 1.39 cm^2. Mean pre PTMC TMG was 25.13 and mean post PTMC was 5.26. Procedure was successful in most of the patients with procedural success rate of 99.39%. The most common complication was commissural MR. Total 7 patient developed post PTMC severe MR, of which 4 required immediate MVR and rest were managed medically. One patient developed severe pericardial effusion amounting to cardiac tamponade which was relieved with tapping & PTMC was performed successfully as staged procedure.

Conclusions: PTMC in JMS is efficacious and safe and should be considered as first line of treatment.

STRUCTURAL

Immediate maternal and foetal outcome of percutaneous balloon mitral valvuloplasty during pregnancy

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Aims: we studied immediate maternal and foetal outcomes of women undergoing balloon mitral valvuloplasty (BMV) during pregnancy.

Methods and results: retrospective single centre observational study of ten years duration. 163 pregnant patients with severe rheumatic mitral stenosis or restenosis underwent BMV using Inoue technique at tertiary care hospital in western India. Mean age of patients was 26.7 years + 5 years (range 19-45 years) with mean gestational age by USG scan was 26 weeks (range is 6 weeks to 38 weeks). Gestational age during intervention was: less than 20 weeks- 27 patients (16.8%), between 20-28 weeks -96 patients (59.6%) and >28 weeks- 38 patients (23.6%). NYHA status of the patient: class IV - 16 patients, Class III – 49 patients and class II-96 patients. Mean Wilkins score was 8.5 (range from 7 to 11). Inoue balloon size used during procedure was: 24 number in 27 patients, 26 number in 130 patient, 28 number in 6 patients. A detailed echocardiographic evaluation was performed before and after the procedure. Special shield was used during the procedure to limit radiation to the foetus. Obstetric Ultrasonography (USG) for foetal viability was done in all case before and after procedure. Immediate clinical, hemodynamic and echocardiography improvement was seen in 97.5% patients after valvuloplasty. The BMV procedure was successful in 151 patients (93.78%), partly successful in 6 patients (3.8%) and unsuccessful in 4 patients (2.4%). Mitral valve area increased from 0.8 cm^2 ±0.19 cm^2 to 1.4 cm^2 ± 0.23 cm^2 and transmitral peak gradient decreased from 27.33 mmHg + 9.9 to 14.13 + 5 and mean gradient decreased from 17.8 mmHg ± 7.8 to 7.9 mmHg + 3.5. Four patients (2.5%) developed significant commissural MR and managed conservatively, two patients (1.2%) complicated with rupture of anterior mitral leaflet and was sent for emergency mitral valve replacement. There was no immediate adverse foetal outcomes in the form of foetal distress, foetal hematoma or foetal death documented on obstetric USG.

Conclusions: BMV by the Inoue technique is feasible, safe, and effective during pregnancy. BMV provides good immediate results without significant maternal risk or foetal morbidity or mortality.

STRUCTURAL

Diagnostic accuracy of a novel “winking coronary angiographic sign” in patients presenting with ventricular septal rupture complicating acute myocardial infarction

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Aims: ventricular septal rupture (VSR) is an uncommon but potentially lethal complication of acute myocardial infarction (MI). Its prompt recognition is essential to permit timely institution of corrective measures. The present study was undertaken to assess the diagnostic accuracy of a novel and unique angiographic sign, the “winking coronary sign (WCS)”, for recognizing post-MI VSR. The WCS is defined as partial transient occlusion of the infarct-related culprit artery overlying the site of VSR during ventricular systole with near normal filling in the diastole.

Methods and results: a total of 56 patients with post-MI VSR (mean age 60.9 ± 9.9 years, 75% male) were compared with 73 age- and sex-matched acute MI patients without VSR. The extent of coronary artery disease was not different between the two groups, but higher number of patients in the VSR group had thrombolysis in MI grade 3 flow (57.1% vs 34.5%, p 0.01). The WCS was observed in 67.9% of the patients with VSR but in none of the patients without VSR ($p<0.0001$), yielding a sensitivity of 67.9% and specificity of 100% for this sign for diagnosing underlying VSR.

Conclusions: this demonstrates the potential utility of the WCS for diagnosing VSR in patients in whom the VSR has developed in the time frame between the echocardiography and angiography or has been missed during the initial clinical and/or echocardiographic evaluation.

STRUCTURAL

TAVR using the Hydra self-expanding bioprosthesis – A single-centre experience

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Aims: TAVR using Hydra self-expanding bioprosthesis.

Methods and results: 8 cases of TAVI with Hydra self-expandable valve from April 2017 to August 2018. 4 Females. Mean age: 77.1 years. Age range: 72-84 years. NYHA II (6), NYHA III (2). Pre TAVI PCI: 2. Previous BAV: 1. Mild CKD: 2 Dialysis dependent: Nil. COPD: 7, Neb dependent: 4, O2. Dependent: 0. Atrial fibrillation: 1. LV Dysfunction: 1 (30% > 45%). All cases were transfemoral, right side. GA with online TEE: 6. Conscious sedation with Preclose Proglide technique: 3. Temporary pacemaker: All patients RCFA (valve), LFA & LFV access. Standard heparinization after sheath insertion. 18 F Long (Cook) sheath. Predilated in 7 cases. Direct valve implantation in 2 cases. At 30 days: all were transfemoral, in calcific tricuspid aortic valves. Valve deployment was successful in all patients in first attempt (Hydra valve: 9). All were post dilated. CHB: 1; Transient for 3 hours; Recovered and doing well till date. PPI: Nil. New onset LBBB: 3, Maximum QRSD was 150 msec. Static on Holter follow up. Doing fine so far. Significant PVL: Nil. LV function normalized: 1. Mortality: 1.

Conclusions: TAVR is a unique procedure. Despite it is minimally invasive, it has high risk patient subset and hence, minimal reserve for errors.

STRUCTURAL

Thrombolysis is an Effective and Safe therapy In Stuck Mitral Valves with Delayed Presentation As Well As Haemodynamically Unstable patients – single-centre study in India

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Aims: study conducted in tertiary care cardiology unit to evaluate the effectiveness and safety of thrombolytic therapy in stuck mitral bi leaflet heart valves.

Methods and results: prospective observational study, fluoroscopy was the mainstay in diagnosis of stuck mitral valve. Gradient across the valve is used to monitor the therapy every 6 hourly. Fall of mean gradient more than 50% considered as successful thrombolysis. And final results were again checked by fluoroscopy with documentation of improved leaflet movement. Patients (34 total) receiving thrombolytic therapy with streptokinase achieved an overall 82.7% freedom from a repeat operation or major complications, a large subcutaneous hematoma occurred in one (2.9%), reoperation required in two (5.9%), allergic reaction in one (2.9%), one patient developed transient neurologic dysfunction (2.9%) and one patient died during therapy (2.9%). All patients including those with delayed presentation (>14 days) and hemodynamically unstable patients had good results similar to those who presented within 14 days and hemodynamically stable patients. Mortality is higher in unstable patients and reoperation higher with delayed presentation.

Conclusions: by comparing data from the main reports on thrombolytic therapy in stuck bileaflet mitral valves, it is evident that the outcome in this study ranks among the best reported in the current literature. In patients with stuck bileaflet mitral valves without large clots, thrombolysis offers a valid alternative to surgery with a high success rate and minimal complications. This therapy may be implemented in a wide variety of patients, regardless of symptom duration or severity, especially in centres where round the clock cardiothoracic surgery back up not available. Since recurrent episodes may be subclinical, frequent follow-up echocardiograms are advocated after a successful thrombolysis, and fluoroscopy should be liberally instituted to evaluate leaflet motion. Further studies are required to substantiate the encouraging results of our study and to establish the best thrombolytic regimens.

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STRUCTURAL

A comparative study of oversizing with underdilation vs. undersizing with full dilation using Accura-Balloon in BMV

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Aims: to compare oversizing with under dilation vs undersizing with full dilation using Accura-Balloon in BMV.

Methods and results: 178 patients, who underwent BMV from Jan 2012 to Jan 2018 were selected in non-randomised manner into 2 groups of Group A (n=107) (undersizing with full dilation) & Group B (n=71) (oversizing with under dilation). Reference size (RS) for balloon calculated using Hung's formula. Oversizing defined as use of balloon 1-2 mm larger than RS, similarly undersizing defined as 1-2 mm smaller than RS. Immediate and Intermediate outcomes of the two groups compared & results interpreted. The mean balloon size in Grp A was 25.3 ± 1.1 mm vs 26.4 ± 1.4 mm in Grp B and mean intraballoon pressure in Grp A was 276 ± 24 kpa vs 249 ± 19 kpa in Grp B (p=0.02). Post procedure change in MVA in Grp A (1.06 ± 0.14 cm^2) vs (0.87 ± 0.11 cm^2) in Grp B (p=0.04). MR worsening Grade II in Grp A vs Grp B (7.5% vs 15.5%) (p=0.014). Two patient in each group developed mitral restenosis (1.9% vs 2.8%).

Conclusions: We conclude that undersizing with full dilatation gave adequate mitral valve area without increasing incidence of significant mitral regurgitation.