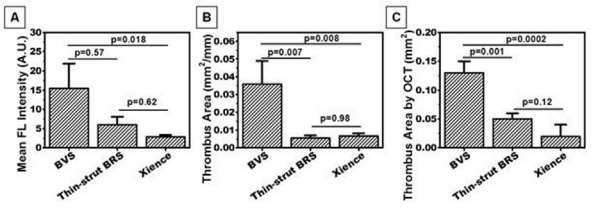

Figure 1: Mean immunofluorescence intensity (A) and thrombus area (B) quantified on immunofluorescence images of the samples. (C): Mean cross-sectional thrombus area was quantified from OCT pullback analysis of samples.

CONCLUSION In-vitro perfusion models suggest that strut thickness may impact on BRS thrombogenicity.

CATEGORIES CORONARY: Bioresorbable Vascular Scaffolds

CORONARY PHYSIOLOGY AFTER PCI

Abstract nos: 133 - 137

TCT-133

Clinical Impact of Persistent Microvascular Obstruction Following Successful Percutaneous Coronary Intervention in Acute ST segment Elevation Myocardial Infarction

Sourabh Aggarwal,[1] Feng Xie,[1] Gregory Pavlides[1]
[1]University of Nebraska Medical Center, Omaha, Nebraska, United States

BACKGROUND In the contemporary era of primary percutaneous coronary intervention (PPCI) to treat acute ST segment elevation myocardial infarction (STEMI), the frequency and predictors of persistent microvascular obstruction (MVO) have not been elucidated. Real time myocardial contrast echocardiography (RTMCE) can be utilized to detect both the presence and extent of MVO in this setting. The goal of this study was to assess MVO frequency and severity in the current era, and how it affects outcome.

METHODS 170 consecutive patients receiving successful emergent PPCI for STEMI (TIMI grade 2/3 flow) were examined with RTMCE within 24-48 hours of PPCI. RTMCE was performed with a continuous infusion or slow bolus of intravenous commercially available ultrasound contrast media and brief high mechanical index impulses to examine for both delayed microvascular replenishment and abnormal plateau intensity within the infarct zone (IZ). Patients were divided into 3 groups: Group 1 with normal microvascular flow (MVF) within the IZ, Group 2 with delayed replenishment but normal plateau intensity, and Group 3 both delayed replenishment and abnormal plateau intensity (MVO). Clinical and angiographic predictors of persistent MVO were determined using Odds Ratios (OR). Event free survival (EFS) from death, heart failure, recurrent infarction, and defibrillator placement was determined by Kaplan Meier estimates.

RESULTS Mean age was 59±12 years (79% male). Prevalence of hypertension, hyperlipidemia, DM, smoking, history of MI and door to balloon times were not different between groups, but 37% had normal MVF (Group I), 29% had only delayed replenishment (Group 2), and 35% patients had MVO (Group 3). Age (OR 1.2;CI 1.1-1.4) and LAD infarct (OR 7.3;CI 3.6-15.6) were independent predictors of MVO. One year event rates were 27% in Group 3 compared to 8% in Group 1 and Group 2. The presence of MVO was associated with significantly lower EFS when compared to Group I and II patients (p=0.008).

CONCLUSION In the contemporary era of successful PPCI for STEMI, MVO persists in over one third of the patients, especially following LAD infarction. The presence of MVO by RTMCE identifies patients at highest risk for adverse outcomes.

CATEGORIES IMAGING: Imaging: Non-Invasive

TCT-134

Impact of post-percutaneous coronary intervention fractional flow reserve measurement on procedural management and clinical outcomes: the REPEAT-FFR Study

Lorenzo Azzalini,[1] Luciano Candilio,[2] Enrico Poletti,[2] Alaide Chieffo,[3] Francesco Giannini,[3] Antonio Colombo,[4] Azeem Latib[3]
[1]Interventional Cardiology Unit, San Raffaele Scientific Institute, Milan, Milan, Italy; [2]San Raffaele Hospital, Milan, Milan, Italy; [3]Interventional Cardiology Institute San Raffaele Hospital, Milan, Milan, Italy; [4]Interventional Cardiology Institute San Raffaele Hospital - Stamford Hospital - Columbia University - Centro Cuore Columbus, Milan, Milan, Italy

BACKGROUND The role of fractional flow reserve (FFR) evaluation after percutaneous coronary intervention (PCI) has received little scrutiny. We aimed to evaluate the impact of post-PCI FFR in a prospective study.

METHODS Single-center prospective registry of patients (n=65) undergoing PCI for stable coronary artery disease (CAD) or non-ST-elevation acute coronary syndrome (ACS). Baseline and post-PCI FFR were measured with the Acist Navvus Rapid Exchange FFR Microcatheter (ACIST Medical Systems, Eden Prairie, MN). Patients were divided according to the post-PCI FFR value (<0.90 vs. ≥0.90). The primary endpoint was the proportion of cases in which an action was undertaken in light of a post-PCI FFR value <0.90. The secondary endpoints were clinical outcomes at 30 days and 1 year. Target-vessel failure (TVF) was defined as a composite of cardiac death, target-vessel myocardial infarction, and ischemia-driven target-vessel revascularization.

RESULTS Overall mean age was 68.9±6.3, 32% were diabetics. Ejection fraction was 51.8±10.0%. The majority of procedures were indicated for stable CAD (66%). SYNTAX score was 13.9±7.9. There were no differences in baseline clinical and angiographic characteristics between patients with post-PCI FFR <0.90 (n=43) and those with post-PCI FFR ≥0.90 (n=22), with the exception of a higher prevalence of left anterior descending as target vessel in post-PCI FFR <0.90 (84% vs. 59%, p=0.03). Baseline FFR was 0.72±0.08 in post-PCI FFR <0.90 vs. 0.69±0.14 in post-PCI FFR ≥0.90 (p=0.40). Overall, 86% received a drug-eluting stent, 6% a bioresorbable scaffold, and 8% a drug-eluting balloon (DEB) (p=0.25). Total stent length was 37.9±25.4 mm (1.5±1.0 implanted stents), with no difference between groups. Post-PCI FFR was 0.82±0.05 in post-PCI FFR <0.90 vs. 0.94±0.02 in post-PCI FFR ≥0.90 (p<0.001). The reasons for an FFR <0.90 were: residual distal disease not amenable to treatment (42%), residual uncovered distal (2%) and proximal plaques (14%), stent underexpansion (2%), edge dissection (2%), unknown (37%). An action was undertaken in 15/43 (35%) of patients with a post-PCI FFR <0.90: invasive imaging 19%, further stenting 26%, further post-dilatation 28%, treatment of distal vessel with a DEB 2%. In only 3/15 patients (20%) that had an FFR <0.90 after PCI, additional interventions (stenting of residual uncovered proximal plaques in all three) achieved an increase of the FFR value to ≥0.90. A statistically significant (p=0.02), albeit of little clinical relevance (0.02±0.05), increase in FFR value was observed in patients who had a post-PCI FFR <0.90. Final FFR was 0.83±0.05 in post-PCI FFR <0.90 vs. 0.94±0.02 in post-PCI FFR ≥0.90 (p<0.001). At 30 days, no TVF events were recorded. However, one patient with a final FFR <0.90 (2.6%) was admitted for chest pain (p=0.43). There was no difference in angina class between the two groups. One year follow-up is in progress.

CONCLUSION Two thirds of patients present a post-PCI FFR <0.90. This is due to a variety of reasons, often not amenable to percutaneous treatment or of unclear etiology. Further interventions (performed in about one third of cases) do not appear to have a substantial impact on final FFR. Further larger studies should assess the clinical impact of our findings.

CATEGORIES IMAGING: FFR and Physiologic Lesion Assessment

TCT-135

The index of microvascular resistance as a surrogate for myocardial infarct extension and microvascular obstruction in patients with ST elevation myocardial infarction treated by primary angioplasty

Sergio Baptista,[1] Mariana Faustino,[1] Luis Brizida,[1] Jose Loureiro,[2] Antonio Freitas,[1] João Augusto,[1] João Abecasis,[3] Célia Monteiro,[1] Paulo Leal,[1] Maura Nedio,[1] Cláudia Antunes,[1] Pedro Farto e Abreu,[1] Victor Gil,[1] Carlos Morais[1]
[1]Hospital Fernando Fonseca, Amadora, Portugal; [2]Hospital Fernando Fonseca, Lisbon, Portugal; [3]Hospital dos Lusiadas, Lisboa, Portugal

BACKGROUND The index of microcirculatory resistance (IMR) is an invasive surrogate of coronary microvascular function and and an early marker of cardiac recovery, after acute ST elevation myocardial infarction (STEMI), as evaluated by echocardiography. Our purpose in the current study was to confirm its relation with infarct extension (IE) and microvascular obstruction (MVO), measured by several

different methods, in patients with STEMI treated by primary percutaneous coronary intervention (P-PCI).

METHODS IMR was measured immediately after successful P-PCI, with a pressure-wire. IE was evaluated by contrast enhanced cardiac magnetic resonance (ceCMR), echocardiography and troponin release. MVO was evaluated by ceCMR, angiographic indicators (corrected TIMI frame count and TIMI myocardial perfusion grade) and ECG ST resolution.

RESULTS 60 patients were included. Infarct extension and MVO were evaluated according to the median IMR value (23.9 [IQR 32.9]). The results for infarct extension are presented in the Table. IMR >24 was associated with higher prevalence of MVO (45.0% vs. 13.8%, p=0.015) and with higher MVO mass (median/IQR 6.4/11.5 vs 2.9/2.9, p=0.006) in the ceCMR. Indirect indicators of MVO (cTFC: median/IQR 2.0/10.0 vs. 14.0/7.0, p<0.001; TMPG 2 or 3: 70.0% vs. 93.3%, p=0.019; 90 min ECG ST resolution: median/IQR 75.5/36.0 vs. 86.5/29.0, p=0.014) were also worst in these patients. The ROC analysis of IMR to predict MVO showed an AUC of 0.723 (CI 95% 0.500-0.896, p=0.018). The optimal IMR cutoff value for predicting MVO was 33 (sensitivity 69.2%; specificity 80.6%). Patients with higher IMR had a higher incidence of the combined endpoint of cardiovascular major events, heart failure and hospital admissions (6.9% vs. 30.0%, p=0.024).

	Variable	Total Population (n=60)	IMR>24		p value
			No (n=30)	Yes (n=30)	
Troponin	TnIpeak	117±82	91±59	142±93	0.013
	TnIAUC	1938±1283	1459±898	2418±1438	0.003
Echo	LVEF (%	52.6±7.1	54.6±6.5	50.1±7.1	0.024
	WMSI	1.24 (0.35)	1.21±0.18	1.43±0.25	<0.001
	Global longitudinal strain	-15.77±3.11	-16.81±1.86	-14.50±3.83	0.007
ceCMR	Transmural necrosis	23 (46.9)	8 (27.6)	15 (75.0)	0.001
	Total infarct mass	14.7 (12.6)	11.4 (10.9)	17.6 (15.0)	0.031
	Percent infarct mass	12.6 (14.4)	11.6 (12.1)	17.0 (15.4)	0.035

CONCLUSION IMR evaluated immediately after P-PCI in patients with STEMI predicts both myocardial infarction extension and MVO, identifying patients with worst prognosis.

CATEGORIES CORONARY: Acute Myocardial Infarction

TCT-136

Cutoff Value and Long-Term Prediction of Clinical Events by FFR Measured Immediately After Implantation of a Drug-Eluting Stent in Patients With Coronary Artery Disease: 1- to 3-Year Results From the DKCRUSH VII Registry Study

Suiji Li,[1] Shao-Liang Chen,[2] Zhen Ge,[3] Jing Kan,[3] Junjie Zhang,[4] Fei Ye,[5] Tak Kwan,[6] Teguh Santoso,[7] Song Yang,[8] Imad Sheiban,[9] Xue-Song Qian,[10] Nailiang Tian,[11] Tanveer Rab,[12] Ling Tao[13]
[1]The First Hospital of Jintan City, Changzhou, China; [2]Nanjing First Hospital of Nanjing Medical Center, Nanjing, China; [3]Nanjing First Hospital of Nanjing Medical Center, Nanjing, Jiangsu, China; [4]Nanjing First Hospital, Nanjing Medical University, Nanjing, Jiangsu, China; [5]Nanjing First Hospital, Nanjing Medical University, Nanjing, China, China; [6]Mount Sinai Beth Israel, New York, New York, United States; [7]Medistra Hospital, Jakarta, Indonesia; [8]Yixin people hospital, Yixin, Jiangsu, China; [9]Pederzoli Hospital-Peschiera del Garda (Verona)-Italy, Verona, Verona, Italy; [10]Zhangjiagang First People's Hospital, Jiangsu, China; [11]Nanjing First Hospital of Nanjing Medical Center, Nanjing, China; [12]Emory University Hospital, Atlanta, Georgia, United States; [13]The First Affiliated Hospital of The Fourth Military Medical University, Xian, Shanxi, China

BACKGROUND FFR immediately after a DES implantation correlates with clinical events. However, the cutoff of post-DES FFR for predicting long-term clinical events remains understudied.

METHODS Between May 2012 and September 2013, a total of 1,476 patients who had FFR<0.8 at maximal and at baseline underwent DES implantation were prospectively studied in 9 centers. Post-DES FFR was repeat measured. The primary endpoint was the 1-year TVF rate after procedures. Receiver-operating characteristic curves were used to calculate the post-DES FFR value for TVF, then patients were classified on the basis of this value and followed up for 3 years.

RESULTS By the end of the first year, 88 (6.0%) TVFs were recorded. A post-DES FFR ≤0.88 strongly correlated with TVF. Disease in the left anterior descending coronary artery (LAD), stent length, and stent diameter were independent factors of impaired post-DES FFR, whereas post-procedure FFR ≤0.88 was the only predictor of TVF, with 40 (4.0%) TVFs in the FFR >0.88 and 48 (8.0%) in the FFR ≤0.88 group (p = 0.001), mainly driven by target vessel revascularization (3.8% vs. 8.8%; p = 0.005) and cardiac death (0.2% vs. 1.3%; p = 0.017). The difference in TVF between 2 groups was maintained through 3-year follow-up (p = 0.002). For patients with LAD lesions, a post-DES FFR ≤0.905 predicted 1-year TVF.

CONCLUSION Post-DES FFR strongly correlated with TVF rate. Mechanisms attributed to and treatments for impaired FFR after stenting should be studied in future studies.

CATEGORIES CORONARY: PCI Outcomes

TCT-137

Gender Differences in Fractional Flow Reserve after Percutaneous Coronary Intervention

Rutger van Bommel,[1] Roberto Diletti,[2] Miguel Lemmert,[3] Jeroen Wilschut,[3] Peter P.T. De Jaegere,[4] Felix Zijlstra,[5] Joost Daemen,[6] Nicolas Van Mieghem[7]
[1]Erasmus MC, Rotterdam, Netherlands; [2]Thorax Center, Erasmus MC, Rotterdam, Netherlands; [3]Thoraxcenter Erasmus MC, Rotterdam, Netherlands; [4]Erasmus MC, Rotterdam, The Netherlands, Rotterdam, Netherlands; [5]Thoraxcenter, Erasmus Medical Centre, Rotterdam, Netherlands; [6]Erasmus MC - Thoraxcenter, United States; [7]Thoraxcenter, Erasmus Medical Center, Rotterdam, Netherland

BACKGROUND Recent studies have shown that women have higher FFR values than men when FFR is used to assess the hemodynamic severity of an intermediate coronary stenosis. This is most likely caused by microvascular dysfunction which is more frequently observed in women. Conversely, not much is known about gender specific differences in FFR values after PCI. Therefore, the aims of the current study were to investigate whether differences exist in FFR after successful PCI in men vs. women and whether there is a difference in outcome during 30-days follow-up.

METHODS The FFR SEARCH study is a prospective registry in which all consecutive patients underwent FFR evaluation after successful PCI. FFR measurements were performed with a novel over-the-wire monorail catheter inserted over the previously used coronary guidewire to approximately 20mm distal of the most distal stent edge. FFR measurements were performed under maximum hyperaemia with intravenous Adenosine.

RESULTS A total of 959 patients (695 men and 264 women) were included with 1165 successfully treated and measured lesions. Overall, mean FFR value was 0.91±0.07 under maximum hyperaemia. No significant differences were observed in absolute post PCI FFR values (0.91±0.06 in women vs. 0.90±0.07 in men, p=0.135). However, a post PCI FFR value ≤0.85 was much more frequently observed in men (n=173, 24.9%) than in women (n=40, 15.2%), p=0.001. In 798 patients, complete 30-days follow-up was achieved. In this period, 15 patients (1.9%) experienced a MACE. There were no differences in MACE-rate between men and women (1.9% vs 1.8%, p=0.903).

CONCLUSION An FFR value ≤0.85 measured directly following successful PCI was more frequently observed in men than in women. This may be indicative of microvascular dysfunction which is more common in women. Conversely, no differences in 30-days outcome were observed between men and women.

CATEGORIES IMAGING: FFR and Physiologic Lesion Assessment

HEART FAILURE

Abstract nos: 138 - 142

TCT-138

Cardiovascular Outcomes Assessment of MitraClip® Therapy in Heart Failure Patients with Functional Mitral Regurgitation (The COAPT Trial): Baseline Characteristics and Preliminary 2-Year Outcomes of the Roll-In Cohort

Michael Mack,[1] William Abraham,[2] JoAnn Lindenfeld,[3] Neil Weissman,[4] Steven Marx,[5] Jeff Ellis,[6] Lori Anne Crosson,[7] Yu Shu,[8] Hong Nie,[6] Gregg Stone[9]
[1]The Heart Hospital Baylor Plano, Plano, Texas, United States; [2]Ohio State University, Columbus, Ohio, United States; [3]Vanderbilt University medical Center, Nashville, Tennessee, United States; [4]MedStar Health