

CRT-100.47

Fractional Flow Reserve-Guided Complete Revascularization in Patients with ST-Elevation Myocardial Infarction: A Meta-analysis of Randomized Controlled Trials



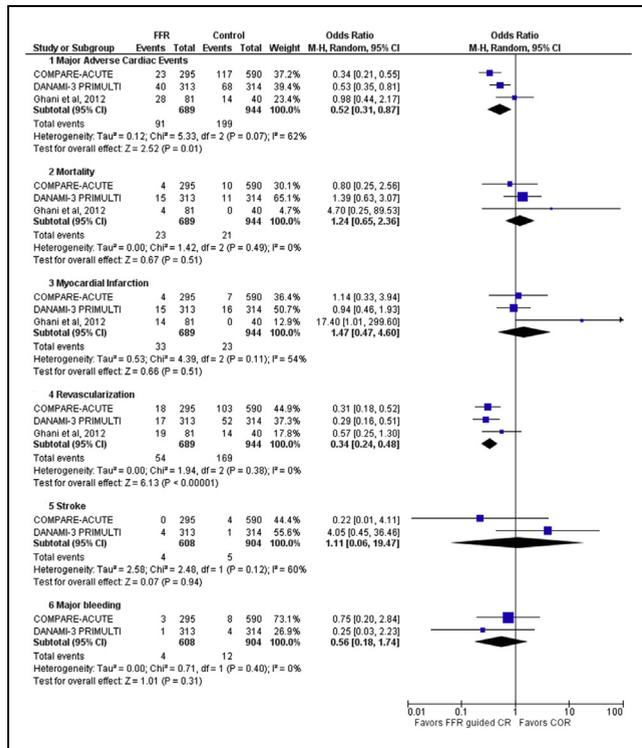
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INTRODUCTION Randomized controlled trials (RCTs) have compared the strategies of culprit-only revascularization (CoR) versus complete revascularization (CR) in patients with ST-elevation myocardial infarction (STEMI) and multivessel disease (MVD). The role of fractional flow reserve (FFR) guided complete revascularization is not well-established in patients with STEMI with MVD. We performed a meta-analysis of RCTs comparing FFR-guided CR versus CoR in patients with STEMI with MVD.

METHODS Electronic search of PubMed, Cochrane Central, and EMBASE databases was performed in addition to manual search of relevant references for the RCTs from inception through October 31, 2017. Major adverse cardiac events (MACE), mortality, non-fatal myocardial infarction (MI), revascularization, major bleeding, and stroke were the major outcomes.

RESULTS Data from three published RCTs were included in this meta-analysis with a total of 1633 patients (689 patients in FFR-guided CR and 944 in CoR). FFR-guided CR, compared to CoR resulted in a lower risk of MACE [odds ratio (OR): 0.52 (95% confidence interval: 0.31-0.87; P= 0.01), which was driven by reduction in revascularization [0.34 (0.24 - 0.48); P <0.00001]. No difference was observed in the risks of mortality [1.24 (0.65-2.36); P=0.51], non-fatal MI [1.47 (0.47-4.60); P=0.51], major bleeding [0.56 (0.18-1.74); P=0.31], and stroke [1.11 (0.06-19.47); P=0.73] between the two groups.

CONCLUSIONS In patients presenting with STEMI with multivessel disease, FFR-guided complete revascularization was associated with reduced MACE and revascularization and similar outcomes of mortality, non-fatal MI, major bleeding and stroke.



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Correlation Of Fractional Flow Reserve And Pd/Pa With Resting Diastolic Index Calculated By A Novel Algorithm: The dPR-study



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BACKGROUND iFR (instantaneous wave-free ratio) is a new vasodilator-independent index correlated to FFR (fractional flow reserve). Recent studies proved non-inferiority of iFR- as compared to FFR-guided revascularization. However, the use of iFR is restricted to a single device with software using a fully automated algorithm acting over the wave-free period of a minimum of five heartbeats. We hypothesized that a diastolic pressure ratio (dPR) calculated using different software might have similar diagnostic accuracy as compared to FFR and resting Pd/Pa.

METHODS This is an observational, prospective, single-center cohort study including 100 consecutive patients undergoing pressure wire (PW) or microcatheter-based FFR measurements. Dedicated software (Rubo DICOM, Rubo Medical Imaging BV) was used to calculate the dPR from DICOM pressure curves used to calculate Pd/Pa and hyperemic indices. By indicating the “flat” period of the Dp/Dt signal (the “wavefree” period) in 5 consecutive heartbeats, the Rubomed viewer collected the Pa and Pd values of the indicated region. Measurements were performed by 3 independent operators to assess inter-observer variability.

RESULTS One hundred patients who underwent FFR by using either the microcatheter system (n=50) or a PW system (n=50) were assessed. Mean age was 66±11 years and 80 (80%) were males. No significant differences were found in baseline characteristics between Navvus vs. PW system. Mean FFR, resting Pd/Pa and dPR calculated by the novel algorithm was 0.85±0.09; 0.94±0.05; and 0.93±0.07, respectively. There was a significant linear correlation between dPR and FFR and between dPR and resting Pd/Pa (R²=0.78, p<0.001 and R²=0.95, p<0.001, respectively). The correlation coefficient in the Navvus cohort was higher compared with the PW-system cohort (R²=0.81, p<0.001, and R²=0.76, p<0.001, respectively). Pd/Pa and dPR had good accuracy in the identification of patients with significant FFR values defined as FFR₁≤0.80 (AUC of 0.86 (95% CI: 0.79-0.94) and 0.84 (95% CI: 0.75 to 0.92) respectively).

CONCLUSION Resting, adenosine-independent diastolic pressure ratio dPR, calculated by a novel algorithm, had a linear correlation with the hyperemic index FFR and resting Pd/Pa and it had a high inter-observer reliability.

LASER

CRT-100.49

Utility Of Excimer Laser Coronary Angioplasty In Under-expanded Stents



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BACKGROUND Stent underexpansion due to underlying calcified or fibrotic lesion can be associated with increased rates of in-stent restenosis (ISR) and stent thrombosis. The aim of this study was to evaluate the feasibility, effectiveness, and safety of Excimer Laser Coronary Angioplasty (ELCA) to improve stent expansion in lesions that failed to respond to high-pressure non-compliant (NC) balloon.

METHODS Within the percutaneous coronary intervention (PCI) registry at our center, we identified eight patients presenting with either acute or ISR of underexpanded stents. These stents were treated with ELCA following an unsuccessful expansion with high

pressure NC balloon. Angiographic success was determined by visual assessment and was confirmed by change in minimal stent cross-sectional area (MSA) by intravascular ultrasound (IVUS); or by change in minimal lumen diameter (MLD) by quantitative coronary angiography (QCA).

RESULTS Baseline characteristics and procedural details are summarized (Table). ELCA was performed with highest fluency and repetition rates, 80 mJ/mm² and 80 Hz. Post-ELCA, there was a 63% decrease in luminal stenosis, a 62.5% increase in MLD and the MSA increased by 45%. Successful laser-assisted stent dilatation was achieved in all cases. There were no procedural-related complications. There were no post-procedural complications such as myocardial infarction (MI), or stent thrombosis or in-hospital death.

CONCLUSION In underexpanded stented lesions that are resistant to high pressure balloon expansion, the use of ELCA offers an effective and safe tool to modify the surrounding vessel wall and allow full stent expansion. ELCA should be considered for acute and chronic underexpanded stents.

RESULTS A total of 57 patients were included in our registry. Mean age was 72.9 years ± 9.9 years. Diabetes and chronic kidney disease were seen in 57.9% and 33.3% of patients, respectively. Fifteen patients (26.3%) presented with unstable angina, 22 patients (38.6%) with non-ST-elevation myocardial infarction, 2 patients (3.5%) with ST-elevation myocardial infarction, and 7 patients (12.3%) with cardiogenic shock. The mean ejection fraction was 37.1 ± 15%. Fifty-four patients (94.7%) had evidence of multivessel disease and 38 patients (67%) underwent rotational atherectomy with intra-aortic balloon pump assistance. Angiographic success, defined by residual stenosis of <20% and presence of TIMI 3 flow, was obtained in all patients. The mean number of implanted drug-eluting stents was 1.9 ± 0.7 and bare metal stents was 1.3 ± 0.5 per patient. Two patients (3.5%) died during the index hospitalization. In-hospital morbidity defined by acute renal failure, bleeding and vascular complications and recurrent chest pain with ischemic changes occurred in 8 patients (14%). Repeat PCI was performed in 4 patients (7%).

CONCLUSION Despite technical challenges, rotational atherectomy of left main can be completed with a high success rates in patients with low in-hospital mortality and morbidity.

Table: Baseline characteristics and procedural details:-

Age (in years)	66.7±9
Left ventricular ejection fraction(%)	51±12
Culprit coronary vessel(%)	
LAD	12.5
LCX	37.5
RCA	37.5
Saphenous graft	12.5
Presentation	
Acute stent under-expansion for denovo lesion, number (%)	2(25)
ISR due to under-expanded stent, number (%)	6(75)
Use of Excimer Laser, 0.9 mm(%)	87.5
Use of Excimer Laser, 1.4 mm (%)	12.5
Contrast medium during ELCA (%)	50
Saline medium during ELCA (%)	50
Reference diameter by QCA(mm)	
Pre ELCA	2.2±0.8
Post ELCA	2.9±0.3
Minimal Lumen Diameter(MLD) (mm)	
Pre ELCA	0.8±0.7
Post ELCA	2.1±0.4
Luminal stenosis (%)	
Pre ELCA	69.7±22
Post ELCA	24.6±15
Minimum stent cross section area (MSA) (mm ²)	
Pre ELCA	2.5±0.5
Post ELCA	4.8±1.5

	Left Main and Rotablator (n=57)
Age	72.9±9.9
Male	37 (64.9)
Smoking/Current	24 (42.1)
Diabetes Mellitus	33 (57.9)
Hypertension	51 (89.5)
Dyslipidemia	30 (52.6)
Chronic Kidney Disease	19 (33.3)
Prior CABG	20 (35.1)
Prior MI	17 (29.8)
Prior PCI	15 (26.3)
History of CVA	9 (15.8)
PVD	8 (14.0)
Cardiogenic Shock	7 (12.3)
Ejection fraction, %	37.1±15.5
STEMI	2 (3.5)
NSTEMI	22 (38.6)
Stable Angina	11 (19.3)
Unstable Angina	15 (26.3)
IABP	39 (68.4)
In-hospital mortality	2 (3.5)
In-hospital morbidity	8 (14.0)
Stroke	0
Repeated PCI	4 (7.0)

LEFT MAIN INTERVENTION

CRT-100.50

Outcomes Of Patients With Left Main Disease Who Underwent Rotational Atherectomy

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BACKGROUND Significant coronary calcification is a challenge for percutaneous coronary intervention (PCI). Rotational atherectomy is useful for plaque modification prior to stent delivery. In the present study, we report our experience with left main disease and rotational atherectomy.

METHODS From January 2008 to January 2017, all patients who underwent left main stenting with rotational atherectomy were evaluated. Clinical characteristics and follow-up outcomes are reported.

CRT-100.51

Clinical Outcome of Left Main Stem (LMS) Percutaneous Coronary Intervention (PCI) in a Large Non-surgical UK Center: A 5-Year Clinical Experience

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BACKGROUND LMS coronary disease is associated with high morbidity and mortality. CABG has traditionally been the standard treatment. PCI is increasingly regarded as a viable alternative with comparable outcome and safety profile in select groups. We evaluated the outcomes of unprotected LMS PCI in a large UK non-surgical centre.

METHODS Data on all LMS PCI procedures between 2011-2016, excluding patients with previous CABG surgery, was collected from the local BCIS database and electronic patient records. Periprocedural and 1-year MACE [all-cause mortality, MI, stroke and target vessel revascularization (TVR)] were recorded.