a clinical trial under way (clinicaltrials.gov ID: NCT02176265), such surfaces may offer safe alternatives to DES, particularly in patients in whom rapid healing is crucial.

CRT-705

Comparison of Biolimus A9-eluting Stent and Zotarolimus-eluting Stent in Patients with De Novo Coronary Artery Lesion; A Propensity Score-Matched Analysis

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BACKGROUND There have been limited data comparing efficacy and safety of Biolimus-eluting Stents (BES, Biomatrix™, Biosensors and Nobori™, Terumo) with Zotarolimus-eluting Stent (ZES, Resolute Integrity, Medtronic) in a series of Asian population in real world clinical practice.

METHODS A total of 626 patients (pts) receiving BES or ZES were pooled from our prospective percutaneous coronary intervention (PCI) registry from March 2008 to May 2013. To adjust potential confounders, a propensity score matched (PSM) analysis was performed using the logistic regression model, and clinical outcomes were compared between the two groups up to 12-month.

RESULTS After PSM analysis, 2 propensity-matched groups (135 pairs, n = 270 pts, C-statistic=0.809) were generated and the baseline characteristics of the two groups were balanced. At six to 9-month angiographic and Two-year clinical outcomes, there were similar incidence of binary in-stent restenosis and hard endpoints including mortality, myocardial infarction, target lesion revascularization (TLR), target vessel revascularization (TVR), non-target vessel revascularization (NTVR) and major adverse cardiac events (MACEs,Table).

CONCLUSIONS In our study, BES showed similar efficacy and safety compared with ZES up to 12-months in a series of Asian population in real world clinical practice.

Table. Mid-term angiographic and 12-month Clinical Outcomes after propensity score matched analysis

Variables, N (%)	Total (n=139)	BES (n=69)	ZES (n=70)	p Value
Six to 9 month angiographic outcomes				
Binary In-Stent restenosis (>50%)	22 (15.8)	13 (18.8)	9 (12.8)	0.334
Variables, N (%)	**Total (n=270)**	**BES (n=135)**	**ZES (n=135)**	**p Value**
One-year clinical outcomes				
Total death	8 (2.9)	4 (2.9)	4 (2.9)	ns
Cardiac death	5 (1.8)	1 (0.7)	4 (2.9)	0.370
Myocardial infarction: MI	6 (2.2)	3 (2.2)	3 (2.2)	ns
ST segment elevation MI	2 (0.7)	0 (0.0)	2 (1.4)	0.498
Revascularizations	24 (8.8)	13 (9.6)	11 (8.1)	0.669
Target lesion: TLR	14 (5.1)	9 (6.6)	5 (3.7)	0.272
Target vessel: TVR	18 (6.6)	10 (7.4)	8 (5.9)	0.626
Non-Target vessel: NTVR	6 (2.2)	3 (2.2)	3 (2.2)	ns
Stent thrombosis	2 (0.7)	1 (0.7)	1 (0.7)	ns
Acute	-	-	-	
Subacute	1 (0.3)	0 (0.0)	1 (0.7)	
Late	1 (0.3)	1 (0.7)	0 (0.0)	
Total MACE	32 (11.8)	18 (13.3)	14 (10.3)	0.451
TLR MACE	18 (6.6)	10 (7.4)	8 (5.9)	0.626
TVR MACE	26 (9.6)	15 (11.1)	11 (8.1)	0.409

IMAGING MODALITIES

CRT-706

Development Of Non-invasive Coronary Wave Intensity Analysis

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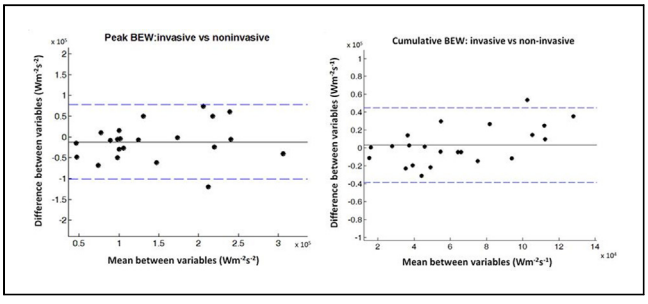
BACKGROUND Wave Intensity Analysis (WIA) has found particular applicability in the coronary circulation where it is able to quantify and qualify the energy affecting blood flow. The most important wave for the regulation of coronary blood flow is the backward-travelling decompression wave (BDW). Until now, coronary WIA has always been calculated from invasive measures of pressure and flow. However, recently it has become feasible to obtain coronary pressure and flow waveforms non-invasively. In this study we set out to validate non-invasive coronary wave intensity at rest and under exercise conditions.

METHOD AND RESULTS 22 patients (mean age 60±12, 14 male) with unobstructed coronary arteries, underwent invasive WIA in the left anterior descending artery. Immediately afterwards, non-invasive coronary flow and pressure were recorded and WIA calculated from pulsed-wave Doppler echocardiography and brachial suprasystolic blood pressure. 9 of these patients also underwent non-invasive WIA assessment during a standardized exercise regimen.

A consistent pattern of 6 predominating waves were observed both invasively and non-invasively with a very similar BDW (peak: -13.8±7.9 vs -14.9±7.2 x 10^4 $Wm^{-2}s^{-2}$, cumulative -6.5±4.0 vs -6.2±2.9 x 10^3 $Wm^{-2}s^{-1}$). As has been previously seen invasively, left ventricular hypertrophy was correlated with a decreasing percentage BDW (r=-0.52, p=0.01) and exercise produced a rise in the BDW: at maximum exercise the peak BDW increased from 10.0±6.5 to 30.2±20.4x 10^4 $Wm^{-2}s^{-2}$ (p=0.02) and cumulative from 5.4±3.8x10^3 to 14.5±8.9x10^3 $Wm^{-2}s^{-1}$ (p=0.03).

CONCLUSION Coronary wave intensity analysis can be reliably measured non-invasively and responds appropriately in physiological and pathological settings. This has potential to simplify WIA assessments and increase its applicability.



CRT-707

Value of Tissue Doppler Derived Velocity During Isovolumic Contraction in Assessment of Left Ventricular Viability After Low Dose Dobutamine Stress Echocardiography

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BACKGROUND Differentiation of dysfunctional but viable myocardium from irreversibly damaged scar tissue has important clinical implications for patients' ischemic heart disease and impaired left ventricular function.

METHODS We studied 27 male patients with ischemic cardiomyopathy (Age: 60±7 years) before and after low dose dobutamine echocardiography (LDDE). Mitral annular isovolumic contraction velocity (IVV) was obtained from septal, lateral, anterior and inferior mitral annuli. Wall motion score index (WMSI) was averaged from 18 segments in apical views. Global viability was considered if enhanced motion occurred in ≥2 segments. Difference between post and pre-LDDE IVV and WMSI were calculated as d-IVV and d-WMSI.

RESULTS 486 segments were assessed. 14 segments were normal, and 472 were abnormal, of which 67 (14%, 33 basal, 22 mid, and 12 apical) had enhanced motion post-LDDE. Global WMSI decreased post compared to pre-LDDE (2.33±0.36 vs. 2.46±0.21, p=0.07). IVV increased post-LDDE (6.1±4.7 vs. 3.7±1.6 cm/s, p=0.01). IVV of different annular positions increased similarly. IVV correlated after LDDE with global WMSI (r= -0.43, p=0.028), and d-SWMI correlated with d-IVV (-0.43, p=0.02). 12 patients (44%) showed global viability, for whom d-IVV was higher than patients without viability (4.1±SE 1.17 vs. 1.16±SE 0.59 cm/s, p=0.02). Walls with enhanced motion had higher d-IVV from the corresponding mitral annular position (4.7±SE0.84 vs. 1.9±SE0.33 cm/s, p=0.002) and wall specific d-WMSI correlated with the d-IVV of the corresponding mitral annular position (r=0.43, p<0.001). Post LDDE IVV showed no significant difference when only basal segments showed enhanced motion post LDDE compared to those who did not (p=0.134). While, post LDDE IVV was higher

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when enhanced motion occurred in mid or apical segments than when they did not (p=0.01, 0.005, respectively). d-IVV correlated with d-WMSI of the mid and apical levels (r=0.48, 0.42, p=0.01, 0.03), while it did not for the basal level (r=0.21, p=0.3). ROC-curve showed that d-IVV detects global viability effectively (AUC=0.761), however, sensitivity and specificity increased for mid and apical levels (AUC=0.790, 0.868).

CONCLUSION Mitral annular longitudinal motion during isovolumic contraction, represented by IVV and d-IVV, increase after LDDE in the presence of viable myocardium. Changes that occur in the mid and apical segments of the LV seem to contribute more to this effect than the basal segments.

OTHER

CRT-708

Development and Evaluation of a Smartphone Application for the Perioperative Care of Patients Undergoing Routine Cardiology Procedures.

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BACKGROUND Smartphone applications (apps) in healthcare are being increasingly developed with the aim of benefiting both patients and their physicians. The delivery of adequate instructions both before and after a procedure is important in ensuring the best outcome for patients. Failure to comply with instructions after a procedure can increase the risk of complications.

STUDY We conducted a prospective evaluation of a new smartphone app designed to provide pre- and post-operative instructions (TrackMyRecovery®). The app also permitted patients to securely send images of their wound and pain scores. The primary end points were patients' compliance with reading instructions, sending wound images and pain levels. The secondary endpoint was any post-procedural related complications.

METHODS The instructions were tailored according to the physician's preferences and were associated with reminders in the form of push notifications that patients would receive on their iPhones or iPads. Ten patients undergoing routine cardiac procedures were selected. Once securely registered, the patients' instructions were available on the app. Through the app, patients were prompted to read pre and post-operative instructions. Patients also received specific reminders before and after their procedure via push-notifications. The patients' progress both pre and post-procedure was sent to a newsfeed on a secured web portal, where physicians had full access. After completing use of the app, patients were asked to complete an online survey. The web portal and app were developed using a standard HIPAA compliant privacy policy.

RESULTS 10 patients undergoing pacemaker implantation or Left Heart Catheterization were prospectively accrued. All 10 patients successfully registered with the app, read and complied with instructions. There were no cancelled procedures or post-operative complications.

CONCLUSION A smartphone app developed for perioperative care was used effectively in a small cohort of 10 patients undergoing routine cardiology procedures. It ensured 100% compliance with instructions along with excellent patient satisfaction scores . The use of electronic instructions on a smartphone or tablet with built-in reminders and the ability to send secure data to physicians could improve perioperative care, ensure compliance, and reduce post-operative complications. A larger cohort of patients with long-term follow-up across various medical disciplines is necessary to corroborate these findings.

CRT-709

Cardiac Output Confusion. Why Your Cardiac Catheterization Lab Computer System May Not Give You The Results You Expect And Need?

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BACKGROUND Accurate assessment of Cardiac Output (CO) is a critical measurement in the cardiac catheterization laboratory (CCL), especially in calculation of aortic valve area (AVA). Due to known inaccuracy of Fick assumptions, many measure Thermodilution (TD) CO as well. Most physicians assume that this more accurate measurement can be chosen to determine AVA. However, we have discovered that our popular computer system [Philips Xper Connect (XIM)] will use predetermined rules to assign one of the CO methods for the reported AVA.

METHODS We randomly selected one hundred consecutive patients who underwent right and left heart catheterization from 2009-2012 for assessment of aortic valve areas and had both Fick CO calculated using femoral and pulmonary arterial saturations and thermodilution CO performed for calculation of AVA. We then examined our XIMS system records for each of these procedures and documented the timing when each CO method was performed and reviewed which CO and AVA calculation appeared on the final catheterization report.

RESULTS We found that whichever CO calculation was done first by the CCL computer system became the determinative output, appearing on the final report and being used to calculate the official AVA. In 32 patients the CO and AVA were calculated and displayed using the Fick calculation method, which had been performed first, and in 68.

patients TD was performed first and the AVA and CO were calculated and displayed using this CO. Although the second CO type could be selected on the computer during the case, and the computer screen would temporarily display the related AVA, this would never appear in the final report and may never be seen by the physician. Thus the CO used officially depended solely of the timing of the oxygen saturation samples. An intense effort of 11 non-intuitive computer clicks and multiple screen changes is required to make the second output the determinative value. The recommendation for surgery (AVA <1.0 cm2) was different between the CO methods in 12 cases (12% of patients).

CONCLUSION Our widely used computer system has an arbitrary method of selecting the determinative CO to calculate the final AVA. For the more accurate TD CO to 'trump' the Fick CO an elaborate series of computer commands needs to be performed. None of the physicians or technicians was aware of this computer selection process, which affects critical treatment decisions.

PERCUTANEOUS VALVE INTERVENTION

CRT-710

Associations Of Known Complications With Transcatheter Implantation Of First-generation Self Expandable Corevalve Aortic Valves With Peri-procedural Mortality-an Insight From Reports From The FDA Maude Database

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BACKGROUND Transcatheter implantations of aortic valves (TAVR) have revolutionized management of severe aortic stenosis. Specific complications have been noted with first-generation valves. Details of such were sought from the US Food and Drug Administration (FDA) maintained MAUDE database which houses medical device reports submitted to the FDA by mandatory reporters (manufacturers, importers and device user facilities) and voluntary reporters such as health care professionals, patients and consumers.

METHODS A detailed search was conducted in PubMed, Cochrane Library, EMBASE and CINAHL to identify adverse events reported with implantations of the first generation Medtronic CoreValve(s). Then the FDA MAUDE database was queried from January 2014 to August 31, 2014 to identify prevalence of the same complications as reported to the FDA. Individual patient reports were identified and relevant data on such complications were abstracted. Finally mortality outcomes from such patients were abstracted, and associations of same for each individual reported complication were identified in a multivariate logistic regression model.

RESULTS FDA MAUDE revealed 384 unique reports of complications with the first generation CoreValves. A total of 22 patients died peri-procedurally. The complications most strongly associated with peri-procedural mortality were development of peri-procedural cardiogenic shock, ventricular tachycardia, development of post-procedural atrial fibrillation, acute renal failure and the need for valve-in-valve procedure.(Table 1)

CONCLUSIONS Specific complications with the first-generation Medtronic CoreValves were strongly associated with mortality, and focused strategies to mitigate the same may improve outcomes with future generations of this exciting new technology.