Institute, Milan, Milan, Italy; [10]San Raffaele Hospital, Milan, Milan, Italy; [11]Reina Sofia Hospital, Cordoba, Spain; [12]Ferrarotto Hospital, Cardiology Division, University of Catania, Catania, Catania, Italy; [13]Ferrarotto Hospital, Catania, Catania, Italy; [14]Ferrarotto Hospital, Cardiology Division, University of Catania, Catania, Italy; [15]Ziekenhuis Oost Limburg, Genk, Belgium; [16]Minneapolis Heart Institute, UT Southwestern Medical Center/VA North Texas Health Care System, Minneapolis, Minnesota, United States; [17]Interventional Cardiology Institute San Raffaele Hospital - Stamford Hospital - Columbia University - Centro Cuore Columbus, Milan, Milan, Italy; [18]McGill University Health Centre (MUHC), Montreal, Quebec, Canada

BACKGROUND Chronic total occlusion (CTO) percutaneous coronary intervention (PCI) in patients with prior coronary artery bypass graft (CABG) surgery is particularly challenging. We aimed to investigate the procedural and long-term outcomes in patients with vs. without prior CABG.

METHODS We compiled a multicenter registry of consecutive patients undergoing CTO PCI at 7 participating centers between January 2009 and April 2017. Clinical, angiographic, procedural, and follow-up data were collected. Multivariable analysis was performed to identify independent predictors of target-vessel failure (TVF, a composite of cardiac death, target-vessel myocardial infarction and ischemia-driven target-vessel revascularization) on follow-up.

RESULTS A total of 2058 patients were included (post-CABG n=401, CABG-naïve n=1657). Post-CABG patients were older (69.2±8.0 vs. 64.3±10.6 years, p<0.001) and showed higher prevalence of comorbidities. Similarly, the number of diseased vessels (2.5±0.7 vs. 1.7±0.8, p<0.001) and occlusion complexity (J-CTO score 2.3±1.2 vs. 1.7±1.2, p<0.001) was higher in post-CABG subjects. Antegrade dissection/re-entry techniques (20% vs. 15%) and the retrograde approach (40% vs. 22%) were used more frequently in post-CABG patients (p<0.001). Procedural metrics were worse, and technical (82% vs. 88%, p=0.001) and procedural success (81% vs. 87%, p=0.001) lower in post-CABG subjects, who also suffered a higher rate of major periprocedural complications (3.7% vs. 1.5%, p=0.004). Mean follow-up was 552±439 days. The 24-month TVF rate was higher in post-CABG than in CABG-naïve patients (16.1% vs. 9.0%, p<0.001), with significant differences in all endpoint components. On multivariable analysis, post-CABG remained an independent predictor of TVF (hazard ratio [HR] 2.65, 95% confidence interval [CI] 1.78 to 3.95, p<0.001), together with ejection fraction (HR 0.98, 95% CI 0.97 to 1.00, p=0.03).

CONCLUSION Compared with CABG-naïve patients, CTO PCI in post-CABG subjects shows higher procedural complexity, worse success rates, and higher adjusted risk of TVF on follow-up.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

TCT-302

Impact of incomplete revascularization on long-term outcomes following chronic total occlusion percutaneous coronary intervention

Lorenzo Azzalini,[1] Soledad Ojeda,[2] Joseph Dens,[3] Alessio La Manna,[4] Susanna Benincasa,[5] Barbara Bellini,[5] Luciano Candilio,[6] Francisco Hidalgo,[7] Joren Maeremans,[8] Giacomo Gravina,[9] Eligio Miccichè,[10] Guido D'Agosta,[10] Corrado Tamburino,[11] Manuel Pan,[2] Mauro Carlino,[5] Antonio Colombo[12]
[1]Interventional Cardiology Unit, San Raffaele Scientific Institute, Milan, Milan, Italy; [2]Reina Sofia Hospital, Córdoba, Spain; [3]Ziekenhuis Oost Limburg, Genk, Belgium; [4]University of Catania, Catania, Catania, Italy; [5]San Raffaele Scientific Institute, Milan, Milan, Italy; [6]San Raffaele Hospital, Milan, Milan, Italy; [7]Reina Sofia Hospital, Cordoba, Spain; [8]Ziekenhuis Oost-Limburg, Genk, Belgium; [9]Ferrarotto Hospital, Cardiology Division, University of Catania, Catania, Catania, Italy; [10]Ferrarotto Hospital, Catania, Catania, Italy; [11]Ferrarotto Hospital, Cardiology Division, University of Catania, Catania, Italy; [12]Interventional Cardiology Institute San Raffaele Hospital - Stamford Hospital - Columbia University - Centro Cuore Columbus, Milan, Milan, Italy

BACKGROUND Incomplete revascularization (ICR) is associated with worse outcomes in all-comer patients undergoing percutaneous coronary intervention (PCI), compared with complete revascularization (CR). However, CR is difficult to achieve in multivessel coronary artery disease (CAD) subjects with chronic total occlusions (CTO). We aimed to evaluate the impact of ICR on the long-term outcomes of patients undergoing CTO PCI.

METHODS We included consecutive patients undergoing CTO PCI at 4 centers between July 2011 and January 2017. The baseline SYNTAX score (bSS; divided into low [≤22], intermediate [23-32], and high [≥33]), residual SYNTAX score (rSS; divided into 0-4, 4.5-8, and >8), and SYNTAX revascularization index (SRI: 100×(bSS-rSS)/bSS; divided into 100%, 50-99%, and <50%) were calculated. Study endpoints were major adverse cardiac events (MACE: cardiac death, any myocardial infarction [MI], any revascularization) and target-vessel failure (TVF: cardiac death, target-vessel MI, target-vessel revascularization) on follow-up. Multivariable Cox regression analysis was conducted to identify independent predictors of MACE.

RESULTS A total of 686 patients was included (low bSS: n=437; intermediate bSS: n=187; high bSS: n=62). Mean bSS was 14.0±4.7 vs. 26.0±2.6 vs. 39.7±6.0 (p<0.001). Occlusion complexity was similar across groups (overall J-CTO score 1.7±1.1, p=0.77). There were no differences in crossing strategies, or technical (low bSS 86% vs. intermediate bSS 80% vs. high bSS 84%, p=0.15) and procedural (85% vs. 79% vs. 82%, p=0.17) success rates. The degree of ICR increased with higher bSS categories (rSS was 2.5±4.7 in low bSS vs. 6.2±9.3 in intermediate bSS vs. 9.1±12.2 in high bSS, p<0.001). The SRI followed a similar pattern (82±32% vs. 76±35% vs. 77±29%, p=0.09). Median follow-up was 781 (369-1217) days. Thirty-six-month MACE (19.4% vs. 25.9% vs. 33.3%, p=0.02) and TVF (10.1% vs. 13.9% vs. 29.0%, p<0.001) rates increased with higher bSS categories. Kaplan-Meier curves showed decreased MACE- and TVF-free survival in patients with ICR, as assessed with both the rSS (>4) and the SRI (<100%). On multivariable Cox regression analysis, both an rSS 4.5-8 (hazard ratio [HR] 2.09, 95% confidence interval [CI] 1.08 to 4.05, p=0.03) and an rSS >8 (HR 3.01, 95% CI 1.86 to 4.87, p<0.001) were independent predictors of MACE, compared with an rSS 0-4. Other independent predictors were age and prior CABG.

CONCLUSION Even a mild degree of ICR is associated with worse long-term outcomes following CTO PCI. Our findings stress the importance of achieving CR in multivessel CAD patients with CTO.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

TAVR TECHNIQUES

Abstract nos: 303 - 307

TCT-303

Balloon Predilation in Transcatheter Aortic Valve Replacement with Self-Expanding Valves

Hasan Rehman,[1] Ankur Kalra,[2] John Cochran,[3] Leif Peterson,[4] Rishi Puri,[5] Sahil Khera,[6] Tanush Gupta,[7] Dhaval Kolte,[8] Colin Barker,[9] Deepak Bhatt,[10] Michael J. Reardon,[11] Neal Kleiman[12]
[1]Houston Methodist Hospital, Houston, Texas, United States; [2]Harrington Heart & Vascular Institute, University Hospitals Cleveland Medical Center, Case Western Reserve University School of Medicine, Cleveland, Ohio, United States; [3]Baylor College of Medicine, Houston, Texas, United States; [4]Houston Methodist Research Institute, Houston, Texas, United States; [5]Quebec Heart & Lung Institute, Quebec City, Quebec, Canada; [6]Westchester Medical Center, Valhalla, New York, United States; [7]Albert Einstein College of Medicine/ Montefiore Medical Center, Bronx, New York, United States; [8]Brown University, Providence, Rhode Island, United States; [9]Houston Methodist, Houston, Texas, United States; [10]Brigham and Women's Hospital, Boston, Massachusetts, United States; [11]Houston Methodist DeBakey Heart & Vascular Center, Houston, Texas, United States; [12]Houston Methodist DeBakey Heart and Vascular Center, Houston, Texas, United States

BACKGROUND The utility of routine balloon predilation in transcatheter aortic valve replacement (TAVR) with balloon-expandable or self-expanding valves is being called into question. We compared clinical outcomes at 30 days and 1 year in the "no balloon predilation" vs. conservative or aggressive balloon predilation groups in patients undergoing TAVR with self-expanding valves (CoreValve®, Medtronic, Inc., Minneapolis, MN).

METHODS Between October 2011 - September 2016, 548 patients who underwent TAVR with CoreValve® were stratified into no predilation (n=148; 27%), conservative predilation (predilation balloon size ≤ minimum annulus diameter) (n=292; 53%) and aggressive predilation

(predilation balloon size > minimum annulus diameter) (n=108; 20%) groups (Table 1).

RESULTS The need for balloon postdilation post TAVR was lower in the aggressive (23.1%) and conservative predilation (32.9%) groups compared with the no predilation group (37.2%), although the association was not statistically significant after adjusting for covariates (adjusted Odds Ratio [aOR]: 0.95, 95% Confidence Interval [CI]: 0.52 -1.74 for conservative vs. none; aOR 0.53, 95% CI: 0.25 - 1.16 for aggressive vs. none). Paravalvular leak (PVL) was lowest in the aggressive predilation group (38.5%) compared with conservative (44.0%) and no predilation (42.3%) groups. Compared with no predilation, after adjusting for covariates, conservative predilation was significantly more likely to be associated with PVL (aOR: 1.83, 95% CI: 1.03 - 3.24), while there was no significant association with aggressive predilation (aOR: 1.27, 95% CI: 0.63 - 2.54). Pacemaker implantation was higher with predilation (22.2% in aggressive; 20.5% in conservative groups) compared with no predilation group (18.2%) (aOR 1.82, 95% CI: 0.71 - 4.68 for aggressive vs. none; aOR 2.48, 95% CI: 1.09 - 5.67 for conservative vs. none). There were no differences in 30-day or 1-year rates of stroke and death between the 3 groups.

CONCLUSION Conservative predilation was associated with more PVL and permanent pacemaker requirement rates at discharge. Stroke and death rates at 30 days and 1 year weren't different between the 3 groups after adjusting for covariates.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

TCT-304

Impact of predilation before TAVI with five leading new-generation TAVI devices: early results from the RISPEVA Study

Arturo Giordano,[1] Francesco Bedogni,[2] Nicola Corcione,[1] Stefano Messina,[1] Paolo Ferraro,[1] Gennaro Maresca,[1] Luca Testa,[3] Nedy Brambilla,[4] Federico De Marco,[4] Carlo Pierli,[5] Giulio Stefanini,[6] Giacomo Frati,[7] Giuseppe Biondi-Zoccai[8]
[1]Pineta Grande Hospital, Castel Volturno, Caserta, Italy; [2]Policlinico San Donato, Milano, Milan, Italy; [3]IRCCS Policlinico San Donato, San Donato Milanese, Milan, Italy; [4]Policlinico San Donato, San Donato Milanese, Milan, Italy; [5]Le Scotte Hospital, Siena, Siena, Italy; [6]Humanitas University, Rozzano, Milan, Milan, Italy; [7]Sapienza University of Rome, Rome, Rome, Italy; [8]Sapienza University of Rome, Latina, Rome, Italy

BACKGROUND Transcatheter aortic valve implantation (TAVI) has become a mainstay in the management of significant aortic stenosis in patients at high or intermediate surgical risk. Predilation is often performed to facilitate TAVI implantation, but may be associated with embolization or rupture. It is uncertain whether predilation is needed also in the new-generation TAVI device era.

METHODS We queried the data collected in the prospective multicenter RISPEVA Study, comparing patients with vs without predilation receiving Acurate neo, Evolut R, Lotus, Portico, Sapien3, or devices. Baseline, procedural features and early (within 1 month) clinical and echocardiographic results were compared with unadjusted bivariate analysis and adjusted inverse-probability-of-treatment weighting analysis obtained from propensity scores.

RESULTS A total of 1409 subjects were included, 1055 (74.9%) receiving predilation, and 354 (25.1%) undergoing direct TAVI. Patients undergoing predilation had a higher baseline prevalence of pure aortic stenosis, lower prevalence of prior cardiac surgery, lower EuroSCORE II, higher aortic gradients and lower prevalence of aortic regurgitation 2+ (all $p<0.05$). Other significant differences between subjects undergoing predilation vs no predilation included general anesthesia, hemostasis device, and device type, with predilation being more proportionally frequent in those receiving Acurate neo, Portico, and Sapien3 (all $p<0.05$). In-hospital clinical outcomes were similar in the 2 groups, as were the 1-month rates of death (11 [3.1%] vs 15 [1.4%] in those who had undergone direct TAVI, p=0.276), stroke (6 [1.7%] vs 16 [1.5%], p=0.947), myocardial infarction (1 [0.3%] vs 3 [0.3%], p=0.315), major bleeding (9 [2.5%] vs [p=0.967), major vascular complication (18 [5.1%] vs 30 [2.8%], p=0.096), and pacemaker implantation (56 [15.8%] vs 160 [15.2%], 0.918). One-month echocardiophic follow-up showed similar results for ejection fraction (53.4±8.8 vs 51.9±10.9 in those who had undergone direct TAVI, p=0.559), peak aortic gradient (17.1±11.4 vs 18.3±9.7 mm Hg, p=0.214), mean aortic gradient (9.0±5.2 vs 9.7±5.6, p=0.151), and aortic regurgitation 2+ (61 [7.9%] vs 33 [12.6%], p=0.384), whereas aortic valve area appeared greated in patients who had received predilation (1.54±0.65 vs 1.48±0.48 cm2, p=0.036).

CONCLUSION Direct TAVI is associated with similar clinical results to TAVI after predilation with new-generation devices. Whether predilation can improve long-term echocardiographic results awaits longer follow-up of the RISPEVA study and others.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

TCT-305

Importance of Contrast Aortography with Lotus transcatheter aortic valve replacement – a post hoc analysis from the RESPOND Post-market Study

Lennart Van Gils,[1] Jochen Wöhrle,[2] David Hildick-Smith,[3] Sabine Bleiziffer,[4] Daniel Blackman,[5] Mohamed Abdel-Wahab,[6] Ulrich Gerckens,[7] Stephen Brecker,[8] Vinayak Bapat,[9] Thomas Modine,[10] Osama Soliman,[11] Andrey Nersesov,[12] Dominic Allocco,[13] Volkmar Falk,[14] Nicolas Van Mieghem[15]
[1]Erasmus Medical Center, Rotterdam, Netherlands; [2]University Hospital Ulm, Ulm, Germany; [3]Royal Sussex County Hospital, Brighton, United Kingdom; [4]German Heart Center Munich, Munich, Germany; [5]Leeds General Infirmary, Leeds, United Kingdom; [6]Heart Center, Segeberger Kliniken, Bad Segeberg, Germany; [7]University of Rostock, Rostock, Germany; [8]Cardiology Clinical Academic Group, St George's, University of London, London, United Kingdom; [9]Guy's and St. Thomas', London, United Kingdom; [10]Lille University Hospital, LILLE, France; [11]Erasmus MC- Cardialysis, Rotterdam, Netherlands; [12]Boston Scientific, Los Gatos, California, United States; [13]Boston Scientific, Maple Grove, Minnesota, United States; [14]Deutsches Herzzentrum Berlin, Klinik für Herz-Thorax-Gefässchirurgie, Berlin, Germany; [15]Thoraxcenter, Erasmus Medical Center, Rotterdam, Netherlands

BACKGROUND Contrast aortography allows for the assessment of implantation depth, relationship to the coronary ostia and paravalvular leak (PVL) during and after transcatheter aortic valve replacement (TAVR). Previous reports suggested an association between final device position and rates of permanent pacemaker implantation (PPI) and PVL. The aim of this post-hoc analysis from the RESPOND post-market study was to assess the final implantation depth on the contrast aortogram after Lotus (Boston Scientific Corporation, Marlborough, Massachusetts, USA) TAVR and to correlate with PPI and PVL.

METHODS RESPOND was a prospective, open-label, single-arm study in 41 centers evaluating outcomes after Lotus TAVR in routine clinical practice. Aortograms were collected at the Erasmus Medical Center and analyzed by researchers who were blinded to clinical outcomes. The primary analysis correlated implantation depth with PPI and PVL and required aortograms in a coaxial projection. The relation between implantation depth and need for PPI was assessed by multivariate logistic regression, adjusting for pre-defined confounders. A secondary analysis compared PVL analysis by contrast aortography with TTE performed by the independent core laboratory.

RESULTS A total of 724 angiographic studies were included in this analysis. Mean Lotus implantation depth was 6.67 ± 2.19 mm. The overall PPI rate was 35%. PPI rate was lower with shallow implants (<6.5mm: 21% vs. ≥6.5mm: 41%. $p<0.001$). Deeper implantation depth was associated with PPI by univariate analysis (Odds ratio (OR) 1.206, 95% confidence interval (CI) 1.102-1.319) per mm increment, $p<0.001$)(Figure). After adjustment for confounders, implantation depth still independently predicted need for PPI (OR 1.2 per 1mm increment in depth (95% confidence interval 1.091-1.319, p=0.002). More than trivial PVL was present in 23% by contrast aortography and in 8% by TTE. Implantation depth was not correlated with PVL by contrast aortography or TTE (p=0.342 and p=0.149, respectively). PVL grading by contrast aortography and TTE were concordant in 77%.