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HIGHLIGHTS FROM MAJOR MEETINGS

Highlights of Transcatheter Cardiovascular Therapeutics 2019

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Transcatheter Cardiovascular Therapeutics (TCT) is an annual scientific congress sponsored and organized by the Cardiovascular Research Foundation in New York, and is dedicated to the optimal management of patients with coronary, peripheral vascular, and structural heart disease. While highlighting less invasive percutaneous strategies to treat cardiovascular disorders, TCT emphasizes the appropriate integration of medical, surgical, and transcatheter therapies to improve patient outcomes, stressing a heart team patient-centered approach. The essence of TCT is the appropriate application of evidence-based medicine to an inherently procedural-based specialty. TCT equally underscores the complementary roles of rigorous scientific evidence and experiential learning through live and taped cases. Moreover, at the core of TCT is a passion for innovation and invention, which enables the next transformative breakthroughs that will change patient care.

TCT 2019, the 31st annual symposium, was held from September 25th through September 29th in the Moscone Conference Center in San Francisco, CA, and was attended by ≈11 500 attendees from 104 countries, including >1500 faculty, featuring the next generation of global interventional leaders. Highlights of TCT 2019 included 193 sessions over 5 days with >2000 lectures, >40 live case transmissions from 15 sites from 8 countries, 28 Late Breaking Trials and Late Breaking Clinical Science presentations, 36 High Impact Clinical Research presentations, ≈1000 peer-reviewed abstract presentations, ≈630 peer-reviewed challenging case presentations, 31 simultaneous peer-reviewed publications in high-impact journals, 6 Training Pavilions with >3000 physician training experiences, the FDA Town Hall Meeting and FDA University, the Shark Tank innovation competition, the 28th annual Cardiovascular Professionals course for nurses and technologists, ≈176 exhibitors with 61 satellite educational programs, and much more.

The Late Breaking Trials provided practice-changing, randomized clinical evidence across the spectrum of interventional cardiovascular medicine (Table). Among the highlights: the highly anticipated TWILIGHT trial (Ticagrelor With Aspirin or Alone in High-Risk Patients After Coronary Intervention) was a multicenter, placebo-controlled, double-blind, randomized study testing the safety and effectiveness of ticagrelor monotherapy in comparison with ticagrelor plus aspirin in 7119 high-risk patients who were stable on dual antiplatelet therapy 3 months after percutaneous coronary intervention (PCI). Ticagrelor monotherapy between 3 and 15 months resulted in lower rates of major bleeding without increasing the risk of ischemic events in comparison with aspirin plus ticagrelor.[1] These findings, in concert with prior evidence from other studies, emphasize the importance of personalizing antithrombotic regimens to minimize hemorrhagic complications while preserving ischemic efficacy.

Important messages were presented from the final 5-year report of the EXCEL trial (Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization).[2] At 5 years, there were no significant differences

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Table. Summary of the Randomized, Late-Breaking Trials Presented at TCT 2019

Trial Name, Presenter, and Registration*	No. of Patients	Patient Population	Comparator Groups	Main Findings
TWILIGHT (Roxana Mehran)[1] NCT02270242	7119	High-risk patients undergoing PCI event-free after 3 months of DAPT with ticagrelor plus aspirin	Ticagrelor monotherapy vs ticagrelor plus aspirin	Ticagrelor monotherapy was associated with a lower incidence of clinically relevant and major bleeding, without increased risk of death, myocardial infarction, stroke, or stent thrombosis in comparison with ticagrelor plus aspirin 12 months after randomization.
Onyx ONE (Stephan Windecker) NCT03344653	1996	Patients at high bleeding risk undergoing PCI	Resolute Onyx DES vs BioFreedom DES both with 1 month of DAPT	The polymer-based Resolute Onyx DES was noninferior to the polymer-free BioFreedom DES with respect to the primary end point of cardiac death, myocardial infarction, or definite/probable stent thrombosis at 1 year after PCI.
IDEAL-LM (Robert-Jan Van Geuns) NCT02303717	818	Left main PCI	Synergy DES with 4 months of DAPT vs Xience with 12 months of DAPT	Left main PCI with the Synergy DES followed by 4 months of DAPT was noninferior to the Xience DES followed by 12 months of DAPT with respect to the composite end point of death, myocardial infarction, or ischemia-driven target-vessel revascularization at 2 years.
EXCEL 5-Year (Gregg W. Stone)[2] NCT01205776	1905	Left main coronary disease with low or intermediate anatomical complexity	PCI vs CABG	At 5 years, there were no significant differences between PCI and CABG with respect to the rate of the primary end point of death, stroke, or myocardial infarction.
COAPT 3-Year (Michael J. Mack) NCT01626079	614	Heart failure and moderate-to-severe or severe secondary MR	MitraClip plus GDMT vs GDMT alone	At 3 years, MitraClip was associated with improved survival, HF-related hospitalizations, quality of life, and better functional capacity in comparison with GDMT alone.
COAPT Cost-Effectiveness (Suzanne J. Baron)[3] NCT01626079	614	Heart failure and moderate-to-severe or severe secondary MR	MitraClip plus GDMT vs GDMT alone	In comparison with GDMT alone, MitraClip was associated with greater upfront costs but lower follow-up costs. Over a lifetime horizon, MitraClip was associated with greater quality-adjusted life-expectancy, with cost-effectiveness consistent with intermediate to high economic value.
PARTNER-2A 5-Year (Vinod H. Thourani) NCT01314313	2032	Severe aortic valve stenosis, intermediate surgical risk	TAVR vs SAVR	At 5 years, there were no significant differences between TAVR with the Sapien XT valve and SAVR with respect to the rate of the primary end point of death or disabling stroke.
PARTNER 3 Computed Tomography Substudy (Raj Makkar) NCT02675114	408	Severe aortic valve stenosis, low surgical risk	TAVR vs SAVR	HALT was more common after TAVR with the Sapien 3 valve than SAVR. Although associated with RLM, HALT resulted in minimal increases in transvalvular gradients and spontaneously resolved between 30 days and 1 year in 56% of patients in the absence of anticoagulation, although new cases developed over time. The relationship between HALT and thromboembolic events was not statistically significant.
PARTNER 3 Health Status Outcomes (Suzanne J. Baron)[4] NCT02675114	943	Severe aortic valve stenosis, low surgical risk	TAVR vs SAVR	In comparison with SAVR, TAVR using the Sapien 3 valve was associated with significantly improved disease-specific health status outcomes at 1, 6, and 12 months.
SCOPE I (Jonas Lanz) NCT03011346	739	Severe aortic valve stenosis, inoperable or increased surgical risk	Acurate Neo vs Sapien 3 transcatheter valve	The Acurate Neo valve was inferior to the Sapien 3 valve with respect to the VARC-2 composite clinical safety and efficacy end point at 30 days.
PORTICO (Gregory P. Fontana) NCT02000115	750	Severe aortic valve stenosis, high or extreme surgical risk	Portico Valve vs any FDA-approved transcatheter valve	The Portico valve was noninferior to other FDA-approved transcatheter valves with respect to the primary safety end point at 30 days and the primary effectiveness end point at 1 year.
REMEDIAL-III (Carlo Briguori) NCT02489669	708	Patients at high-risk for CI-AKI undergoing coronary angiography ± PCI	UFR-guided vs LVEDP-guided IV fluids administration	An UFR-guided approach using Renal Guard was superior to an LVEDP-guided hydration regimen for prevention of the composite of CI-AKI or pulmonary edema at 48 hours after contrast media exposure.

CABG indicates coronary artery bypass grafting; CI-AKI, contrast-induced acute kidney injury; COAPT, Cardiovascular Outcomes Assessment of the MitraClip Percutaneous Therapy for Heart Failure Patients with Functional Mitral Regurgitation; DAPT, dual antiplatelet therapy; DES, drug-eluting stent; EXCEL, Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization; FDA, Food and Drug Administration; GDMT, guideline-directed medical therapy; HALT, hypo-attenuated leaflet thickening; HF, heart failure; IV, intravenous; LVEDP, left ventricular end-diastolic pressure; MR, mitral regurgitation; PARTNER, Placement of Aortic Transcatheter Valve Trial 2A; PCI, percutaneous coronary intervention; RLM, reduced leaflet motion; SAVR, surgical aortic valve replacement; TAVR, transcatheter aortic valve replacement; TWILIGHT, Ticagrelor With Aspirin or Alone in High-Risk Patients After Coronary Intervention; UFR, urinary flow rate; and VARC, Valvular Academic Research Consortium.

*ClinicalTrials.gov Identifier.

in the rates of the primary end point of all-cause death, large myocardial infarction, or stroke between PCI using a durable-polymer everolimus-eluting stent and coronary artery bypass grafting in 1905 randomly assigned patients with left main disease and low or intermediate site-assessed Synergy Between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery (SYNTAX) scores. Of note, PCI resulted in lower rates of early adverse events, whereas coronary artery bypass grafting was associated with lower rates of adverse outcomes during longer-term follow-up such that the overall time-related burden of disease was similar with both revascularization strategies through 5-year follow-up.

Multiple late-breaking clinical trials were presented in the structural heart disease space. The COAPT trial (Cardiovascular Outcomes Assessment of the MitraClip

Percutaneous Therapy for Heart Failure Patients with Functional Mitral Regurgitation), presented last year at TCT, demonstrated that among patients who have heart failure with moderate-to-severe or severe secondary mitral regurgitation who remained symptomatic despite the use of maximal doses of guideline-directed medical therapy (GDMT), transcatheter mitral valve repair with the MitraClip (Abbott) resulted in lower rates of hospitalization for heart failure and all-cause mortality within 2-year follow-up in comparison with GDMT alone.[5] The 3-year follow-up presented this year at TCT revealed an even greater cumulative benefit of MitraClip versus GDMT. Of note, patients who crossed over from the GDMT group and were treated with the MitraClip had similar clinical improvements in comparison with those originally assigned to MitraClip. In a separate cost-effectiveness analysis, the greater upfront expense of the index MitraClip procedure in comparison with GDMT alone was offset, in part, by lower follow-up costs and greater quality-adjusted life expectancy over a lifetime horizon.[3] As such, transcatheter mitral valve repair with the MitraClip met accepted cost-effectiveness utility metrics in patients with secondary mitral regurgitation.

In the area of aortic valve disease, 5-year follow-up data from the PARTNER trial (Placement of Aortic Transcatheter Valve Trial 2A), in which patients with severe aortic stenosis at intermediate surgical risk were randomly assigned to transcatheter aortic valve replacement (TAVR) using the Sapien XT valve versus surgical aortic valve replacement (SAVR) were presented, found no significant differences in the rates of the primary end point of all-cause death or disabling stroke between the groups. Echocardiographic follow-up in 600 patients showed no differences in 5-year hemodynamic performance of surgical versus transcatheter bioprosthetic valves. In patients with severe aortic stenosis at low risk for surgery, 2 important secondary analyses from the PARTNER 3 trial were presented. In the PARTNER 3 health status outcomes analysis, TAVR was associated with significantly improved disease-specific health status and quality of life during 1-year follow-up in comparison with SAVR.[4] The PARTNER 3 computed tomography study investigated the prevalence and implications of subclinical bioprosthetic valve thrombosis after TAVR and SAVR. At 30 days, the prevalence of hypo-attenuated leaflet thickening (HALT) was more common after TAVR than after SAVR, but at 1 year, the rates were similar. HALT was associated with reduced leaflet mobility, but with a minimal increase in transvalvular gradients. When present, HALT at 30 days often resolved at 1 year (even without anticoagulation), whereas new cases of HALT developed during late follow-up in 21% of patients. Of note, there were no significant differences in the rates of thromboembolic events between patients with versus those without HALT. The investigators concluded that these findings do not presently support the routine use of anticoagulation after TAVR or SAVR or the use of serial computed tomography imaging follow-up, unless clinically indicated. Longer-term follow-up is required to determine whether HALT predisposes to late bioprosthetic valve failure.

As reflected at TCT 2019, the combination of innovation addressing unmet clinical needs, dedication to high-quality clinical evidence generation, and refinements in technique and clinical practice, all made possible by the collaboration between physician-scientists, practitioners, and industry and regulators, continues to propel interventional cardiology forward for the benefit of patients. We look forward to welcoming you to the 32nd annual TCT symposium next year in Miami, FL, September 23rd through 27th, 2020.

ARTICLE INFORMATION

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Disclosures

Dr Giustino is a consultant to Bristol-Myers Squibb/Pfizer. Dr Leon is a consultant to Medtronic, Boston Scientific, Abbott, Gore, and Meril Lifescience. Dr Stone has received speaker honoraria from Terumo, Novartis, and Amaranth; is a consultant to Shockwave, Valfix, TherOx, Reva, Vascular Dynamics, Robocath, Gore, Ablative Solutions, Matrizyme, Miracor, Neovasc, V-wave, Abiomed, Claret, Sirtex, Ancora, MAIA Pharmaceuticals, Spectrawave, Orchestra Biomed, Qool Therapeutics; and has equity/options in Qool Therapeutics, Cagent, Applied Therapeutics, Biostar family of funds, MedFocus family of funds, Spectrawave, Orchestra Biomed, Aria, and Ancora.

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