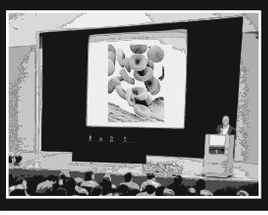
Conference Scene

ACC/STS Transcatheter Heart Valve Practicum



ACC/STS Transcatheter Heart Valve Practicum: Emerging Technology and Team-Based Care for Optimal Management of Severe Aortic Stenosis

Washington, DC, USA, 9–10 December 2011

Transcatheter aortic valve therapy is an emerging therapeutic option for severe aortic stenosis in a unique cohort of high-risk patients with significant comorbidities. A multidisciplinary team approach with close collaboration of cardiologists and cardiovascular surgeons, along with the utilization of multimodality imaging, is essential for safe and effective therapy. This conference refines traditional training by providing focused lectures, indepth case presentation discussions and interactive valve replacement simulators proctored by a distinguished faculty to review and train physicians in recent developments in this novel technology.

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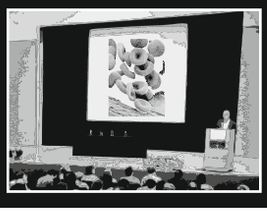
The American College of Cardiology/Society of Thoracic Surgeons (ACC/STS) Transcatheter Heart Valve Practicum was held on 9–10 December in Washington, DC, USA. The distinguished faculty consisted of 20 interventional and pediatric/adult congenital cardiologists and cardiothoracic surgeons throughout North America. The overall goal of the practicum was to enhance the knowledge of transcatheter aortic valve replacement (TAVR) through an interactive program that included lectures, case presentations and small-group, valve-replacement simulators.

This practicum was divided into a 2-day program. The first day focused on lectures dealing with the current device technologies available for TAVR, a review of their respective data, how to systematically assess patients for TAVR therapy, the intraprocedural skills necessary for successful implantation and how to identify, manage and avoid TAVR-related complications. A multidisciplinary team approach to transcatheter therapy was greatly emphasized. The second day focused on indepth discussions of taped TAVR case presentations and interactive hands-on simulator workshops. Multiple simulator stations were established and proctored by the same distinguished faculty moderating the conference.

The overview and introduction to the program were given by the program directors, J Bavaria (University of Pennsylvania, PA, USA) and E Murat Tuzcu (Cleveland Clinic, OH, USA). R Bonow (Northwestern University, IL, USA) commenced the practicum by discussing the evolution of our understanding and the therapeutic modalities of aortic stenosis (AS). Bonow highlighted that nearly one-third of elderly patients with severe symptomatic AS are denied surgical correction [1]. The striking characteristics of these patients included older age, left ventricular dysfunction and concomitant comorbidities, in order of perceived physician importance. Many of the patients not referred for surgical aortic valve replacement have calculated operative mortalities of <10%, revealing a potential for physicians to subjectively overestimate operative risk [2]. He emphasized a need for renewed clarity regarding the definition of severe AS and the potential for the treatment of high-risk patient groups including low-flow, low-gradient AS with reduced ejection fraction (EF), low-flow, low-gradient AS with preserved EF and severe AS with a reduced EF.

Indepth discussions on the devices and techniques of both balloon-expandable and self-expandable TAVR were given by A Pichard (Washington Hospital, Washington, DC, USA) and R Bonan (Montreal Heart, Montreal, Canada). The varied approaches of these devices via percutaneous and minimally invasive surgical techniques include iliofemoral, subclavian, direct aortic and transapical approaches. They provide a multitude of delivery options based on the vascular characteristics of each individual patient. With improving technology and newer device designs, a larger population of patients with annular sizes ranging from 18 to 29 mm are being treated with smaller delivery systems, 16–18 F. In addition, the use of conscious sedation instead of general

Future Medicine part of fsg



anesthesia is achievable with less-invasive percutaneous therapies, showing reduced procedural duration, intensive care unit stay and overall hospital stay [3].

Registry data presented by Murat Tuzcu and J Popma (Beth Israel Deaconess, MA, USA) and the randomized controlled trial data of PARTNERS presented by J Bavaria demonstrated the overall experience of transcatheter aortic valve therapy worldwide [4,5]. Ongoing randomized controlled trials will provide further information on the long-term performance, quality of life and best practice information necessary to effectively evaluate this therapy. Further study in intermediate risk surgical patients (STS-PROM 4–8%) and other patient groups such as degenerated surgically implanted aortic prostheses (valve-in-valve) are expanding the utility of this therapy in a broader population of patients.

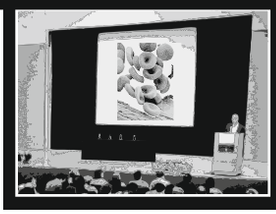
Central to transcatheter therapy is the appropriate systematic assessment of the aortic valve patient. Multimodality imaging is essential for a safe and successful TAVR procedure and includes both echocardiography presented by R Hahn (Columbia University, NY, USA) and computed tomography (CT) by J Leipsic (Providence Health, BC, Canada). The three imaging components include screening and predeployment planning, intraprocedural monitoring and guidance, and postprocedural assessment and management. Multidetector CT has proven particularly useful in annular valve sizing for reducing paravalvular regurgitation, iliofemoral assessment for reducing vascular complications, procedural choice of coaxial angle for ease of deployment, and postimplantation determination of valve depth.

Management of transfemoral access presented by CE Ruiz (Lenox Hill, NY, USA) and alternative access sites including transapical presented by V Thourani (Emory University, GA, USA) and subclavian and direct aortic presented by T Gleason (University of Pittsburgh, PA, USA) emphasized the care necessary for each TAVR approach. With preprocedural iliofemoral CT angiography, Ruiz discussed the ability to overlay CT angiography onto fluoroscopic images to provide a virtual landmark for a ventral puncture site away from atherosclerotic or calcific disease, potentially reducing vascular complications [6]. Transapical access has a clearly identified learning curve with complication rates, both fatal and nonfatal, that decrease with time. With the increasing utilization of these other alternative access sites, a similar learning curve will likely be observed.

Implantation techniques and valve assessment for balloon-expandable and self-expandable TAVR were discussed by Bonan and R Makkar (Cedars-Sinai, Los Angeles, CA, USA). The strategies to identify and manage TAVR-related complications such as conduction abnormalities, vascular complications, aortic regurgitation, stroke, coronary obstruction and renal failure were presented by Popma, E Roselli (Cleveland Clinic), W Szeto (University of Pennsylvania), Murat Tuzcu, S Kapadia (Cleveland Clinic) and Ruiz, respectively.

Rhythm disturbances occur with TAVR and are more commonly associated with the self-expandable transcatheter valves. The use of undersized and shorter valvuloplasty balloons and prevention of valve oversizing and low implantation can help reduce these rates. Vascular complications, major bleeding and post-TAVR aortic insufficiency are all associated with significantly higher 30-day mortality. Preparedness for management is essential for vascular safety and risk reduction from both paravalvular and transvalvular regurgitation. Furthermore, as pointed out by Kapadia, longitudinal remodeling of the aortic root occurs in calcific AS [7]. Reduced distances from the aortic valve annulus to the coronary ostia and sinotubular junction occur without a change in transverse diameter, making careful preprocedural aortic measurements important in reducing the risk of serious coronary complications.

The management of coronary artery disease in the setting of TAVR was also discussed by Kapadia, including the topics of timing of coronary revascularization and its associated technical challenges. The impact of coronary artery disease on long-term outcomes after TAVR remains an area of interest. Furthermore, a comprehensive assessment of frailty and dementia, as proposed by Gleason that includes gait speed, grip strength and a 6-min walk test, may help to further identify patients that



are too high-risk for a TAVR procedure. Currently, our risk tools are inaccurate for this patient population and improved recommendations for the appropriateness of TAVR will come as this therapy is carefully evaluated.

As cardiac surgery is becoming less invasive, the need for more sophisticated imaging in the operating room is required. Additionally, as interventional cardiology is becoming more invasive, increasingly complex procedures are being performed. The hybrid operating room, as presented by Thourani, provides the optimal environment where a multidisciplinary team of physicians is able to work together with a common interest in improving patient safety and outcomes. The final topics for the first day included the regulatory challenges of transcatheter valves given by J Jaschinger (US FDA) and the financial perspectives of transcatheter valves given by S Solometo (University of Pennsylvania).

The second and final day of the practicum involved a series of taped case presentations with panel discussions and hands-on stations with simulator demonstrations. The case presentations highlighted the key principles of transcatheter therapy discussed during the first day. The invited faculty that chaired these sessions added their personal experiences and insight. Small-group interactive discussions and simulated cases provided a venue that further aided in mastering transcatheter aortic techniques.

Overall, the ACC/STS Transcatheter Heart Valve Practicum provided a unique training experience. Lectures and participation in interactive valve replacement simulators led by a multidisciplinary team of interventional cardiologists and cardiovascular surgeons were distinctive and effective in communicating the complexities of TAVR and the need for close collaboration among disciplines for successful treatment of this complex and unique patient population.

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

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