INTEGRATED 3D ECHO-X-RAY IMAGE GUIDANCE FOR STRUCTURAL HEART INTERVENTIONS

i2 Oral Contributions
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Background: An integrated imaging system for structural heart disease (SHD) interventions has been developed and this presents the first worldwide clinical experience. Real-time 3D trans-esophageal echocardiography (RT 3D TEE) is registered with fluoroscopy (see images of the left (A) and right (B) sides of the septum during ASD evaluation). We hypothesize that such a technology will be advantageous for key aspects of SHD intervention.

Methods: The 3D TEE probe is registered to the C-arm by its x-ray image orientation. Three perspectives of the “target” are simultaneously displayed. As the C-arm is moved, the 3D TEE perspectives are updated and displayed based on the new gantry angle. The interventionalist controls image cropping, marker placement, and orientation to tailor image guidance.

Results: We have used this technology in 26 SHD interventions including ASD/PFO closure, mitral valvotomy, MitraClip, and paravalvular leak closure. All cases were completed successfully. Benefits of the imaging navigation system were qualitatively evaluated. Procedure-specific workflow techniques and standard approaches are being developed.

Conclusions: This is the first-in-man implementation of a new generation integrated 3D echo-x-ray navigation system specifically for the interventional lab. Enhanced anatomic understanding, improved delivery system navigation, improved team communication, optimized device alignment and efficient assessment of results are key advantages.