



Valvular Heart Disease

PREDICTION OF OPTIMAL DEPLOYMENT ANGLE FOR TAVR: FEASIBILITY OF CT ANGIOGRAPHY AND NON-CONTRAST DYNACT IMAGE REGISTRATION BASED APPROACH AND ITS POTENTIAL IMPLICATION ON LIMITING CONTRAST VOLUME

Moderated Poster Contributions

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Background: Prediction of an optimal C-arm angle that aligns the coronary sinuses for valve deployment is critical during TAVR. Current solutions derive the deployment angle from multiple angiograms, reconstruction of multi-slice CT (MSCT) or C-arm CT rotational angiography (CTRA). We evaluated a method based on co-registration of MSCT and CTRA to predict deployment angle without using additional contrast agent.

Methods: Non-contrast CTRA (syngo DynaCT[®]) was acquired using a 5-sec protocol, with breath-hold and rapid-pacing. Aortic root calcifications from CTRA and MSCT were segmented and aligned with a semi-automatic rigid image registration algorithm. Optimal deployment angle was derived using prototype software (Siemens AG, Germany). This approach also accounted for differences in patient positioning. To evaluate the adequacy of the predicted angle, we compared the number of planning aortic root angiograms before and after adopting our co-registration approach.

Results: From Oct 2011 to Oct 2012, 10 patients underwent TAVR using predicted angle from MSCT alone, and 24 patients using co-registration. 7/10 pts (70%) in MSCT group required >2 angiograms before prosthesis insertion, compared to 3/24 pts (12.5%) in the co-registered group.

Conclusion: We propose a method to predict optimal C-arm angle for valve deployment based on MSCT-CTRA (non-contrast) co-registration. Such image registration strategies can potentially help in limiting contrast usage.

