sizing by 3D TEE. Both CT and TEE were analyzed by experienced cardiologists. We compared clinical findings in these two groups. A composite end-point of 30-day major complications was defined as including death, cerebrovascular accident (CVA), myocardial infarction, cardiac shock, major bleeding, major vascular complications, acute kidney injury (AKI), and acute respiratory failure. Post-procedural para-valvular leak (PVL) and 30-day PVL were recorded by TEE and TTE respectively.

RESULTS There was no significant difference in the baseline mean eGFR (ml/min/1.73m3) in these two groups (33.0±7.5 vs 28.6±10.8, p=0.20). Total number of patients with 30-day major complications in the low-dose contrast CT group were significantly lower than the 3D TEE based group (0% vs 18.5%, p<0.05), while there was no significant difference in post procedural PVL and 30-day PVL. In the ultra-low contrast group, there was no AKI and serum creatinine did not change after the CT scan (pre-scan creatinine 1.55±0.21 mg/dl, post-scan creatinine 1.45±0.40 mg/dl, p=0.21).

CONCLUSIONS TAVR in patients with CKD by planning with ultra-low contrast dose CT was associated with similar post procedural PVL and 30-day PVL. In the ultra-low contrast group, there was no AKI and serum creatinine did not change after the CT scan. Our results offer preliminary data that ultra-low dose contrast CT appears feasible and safe to guide TAVR procedures in patients with CKD.

CATEGORIES IMAGING: Non-Invasive

KEYWORDS Computes tomography coronary angiography, OCT, Plaque

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Factors Affecting Quantitative Stent Assessment by Optical Frequency Domain Imaging: In Vivo Direct Comparison with Intravascular Ultrasound

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BACKGROUND Current catheter-based coronary imaging systems are calibrated to measure a distance from the probe to a lumen border through blood or a flushing medium with known signal propagation speed. Thus, presence of instant neointima may affect stent measurements, since the speed of signal can vary in soft tissue. Blooming artifacts from strongly-reflective metal struts can also result in a certain variability, particularly in light-based approaches. This study aimed to elucidate potential factors affecting stent measurements in comparison of conventional IVUS and optical frequency domain imaging (OFDI).

METHODS IVUS and OFDI were compared in 64 matched segment images obtained in vivo from 20 swine coronary stent models: 34 images were obtained at baseline, 17 images at 4 weeks, and 13 images at 12 weeks (corresponding to 6- and 18-month follow-up in humans, respectively). IVUS measurements were performed at the leading edge of boundaries, as ultrasound blooming mainly occurs distally. In OFDI where blooming can occur both proximally and distally at strut surface, stent contours were traced at leading edges and at highest intensity points of strut images.

RESULTS When stent was traced at leading edges of OFDI strut images, stent volume (mm/mm) by OFDI was 2.6% smaller at baseline (p<0.001), 5.1% larger at 4 weeks (p<0.001), and equivalent at 12 weeks, compared with those obtained by IVUS. In contrast, when traced at highest intensity points by OFDI, stent volume was larger in OFDI than in IVUS at all time points but to varying degrees: 2.4% at baseline (p<0.001), 10.9% at 4 weeks (p<0.001), and 3.6% at 12 weeks (p=0.03). Similar findings were also observed for minimum stent area measurements. In the assessment of instant neointima at follow-up, neointimal volume by OFDI was larger at both 4 weeks and 12 weeks than IVUS, regardless of the strut tracing methods, possibly due to indistinct neointimal border on IVUS images leading to underestimation of neo-intima particularly in stents with a relatively thin neointimal layer.