HOW TO IMPROVE EVALUATION OF PATENCY OF CORONARY ARTERIAL LUMEN SURROUNDED BY XIENCE STENT LESS THAN 2.5 MM IN DIAMETER IN 320 SLICE CT USING PULSATING PHANTOM COMPARED WITH OPTICAL COHERENCE TOMOGRAPHY

Poster Contributions
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Background: By 2010 ACCF appropriate use criteria for cardiac CT, evaluation of patency of coronary arteries surrounded by a stent <3 mm diameter is inappropriate. At present, the everolimus-eluting stent (XIENCE Prime, Abbot) is often used.

Methods: In an in vitro study, a XIENCE stent (3mm diameter) was attached to a device pulsating at 40-120 beats/min (BPM). The stent was filled outside and inside with diluted contrast material. Retrospective ECG gated 320 slice CT was performed and the most static state images were reconstructed. Profile curves were made perpendicular to the stent long axis; ratio, regarded as an indicator of free from the blooming artifact of the stent (Figure) was calculated. Stent lumen diameter was also measured in the static state using optical coherence tomography (OCT), and was regarded as the gold standard.

Results: Stent lumen diameter was 2.39mm by OCT. At 60 BPM, X ray tube focus size should be small; if large size was selected, lumen patency became more inaccurate when higher tube currents were selected. Field of view should be set as small as possible (100mm preferable). Tube voltage should be set high (135kV is maximum) and to reduce radiation dose, volume exposure control should be used for tube current reduction. Weak, mild, or standard Adaptive Iterative Dose Reduction 3D should be used for image reconstruction.

Conclusion: If these technical parameters are considered, accurate evaluation of coronary arterial lumen surrounded by XIENCE stent of <2.5mm diameter may be achieved.