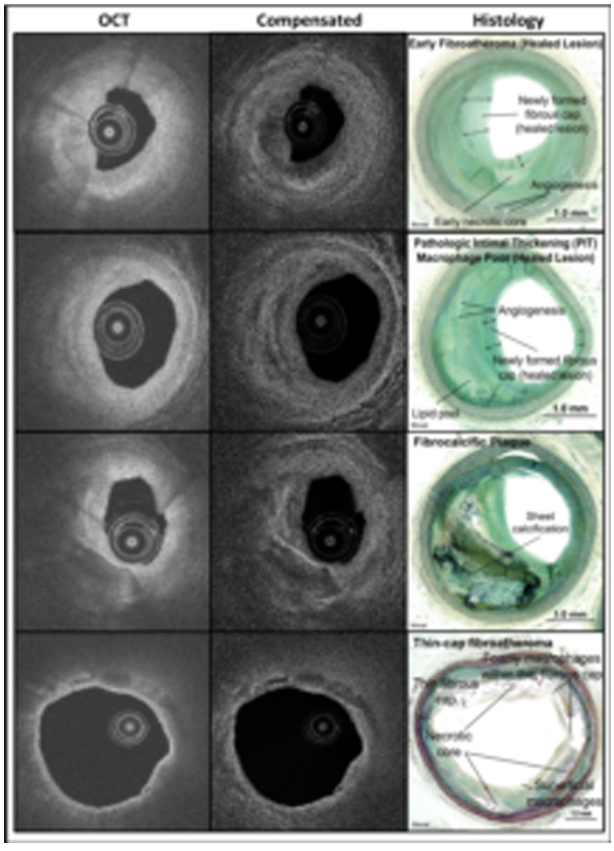
of between adjacent layers of the vessel wall (from 0.09 to 0.20; $p < 0.0001$). ii) Enhanced the visibility of deep structures which is important for accurate OCT-based identification of plaque composition and disease burden. iii) Reduced shadow artefacts (decrease in intralayer contrast between shadowed and neighboring areas.



CONCLUSIONS Compensation was effective in improving plaque interpretation from coronary OCT by enhancing the contrast in the vessel wall and removing shadow artefacts. Such compensation of OCT images may increase the accuracy of plaque assessment with OCT during Percutaneous Coronary Interventions (PCI).

CATEGORIES IMAGING: Intravascular

KEYWORDS Histological analysis, OCT, Plaque morphology

TCT-338

Head-to-Head Comparison of Two Commercially Available Automated Detection Algorithms for Lumen Contour in Optical Coherence Tomography Analysis

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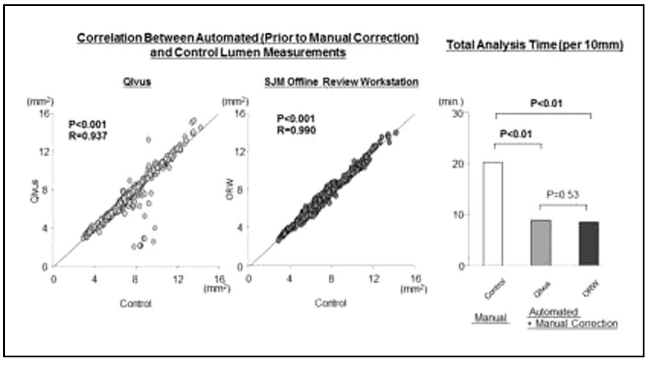
BACKGROUND In optical coherence tomography (OCT), accurate quantitative and qualitative analysis is crucial not only in offline research but in online clinical applications to formulate PCI strategy and procedural guidance. However, manual lumen contour tracing for every frame over the entire analysis segment is a tedious and time-consuming process. Automated computer-assisted approaches may facilitate rapid assessment of coronary lumen contour and avoid potential sources of interobserver variability. This study aimed to assess the accuracy and usefulness of 2 commercially available automated lumen contour detection algorithms for OCT analysis: QIvus (Medis Medical Imaging Systems) and SJM Offline Review Workstation (ORW) (St. Jude Medical).

METHODS Automated detection algorithms were tested in 713 frames obtained from 11 patients with Fourier-domain OCT imaging at post-stent implantation (length: 25.7±11.0 mm, frame interval: 0.4 mm). Using QIvus and ORW, automated lumen contour detection and additional manual correction (if needed) were performed in each frame. The automated analysis results were compared with control data provided by an expert analyst using a conventional off-line manual analysis system (echoPlaque4, Indec Systems).

RESULTS In paired-frame analysis, automated lumen measurements derived from QIvus and ORW showed good agreements with control lumen area data ($R=0.937$, $p<0.001$ and $R=0.991$, $p<0.001$, respectively), except for several frames with significant underestimation resulted from residual blood or wire artifact within the lumen. In per-segment analysis, both QIvus-, and ORW-derived mean lumen areas were comparable with control (7.43±2.53 and 7.36±2.52 vs 7.46±2.46 mm2, $p=0.72$ and 0.29, respectively); minimum lumen areas determined by automated analyses were reasonably accurate (<6% error) in 72.7% by QIvus and 81.8% by ORW ($p=0.34$). Total analysis times (including automated analysis plus, if needed, manual correction) were significantly shorter with automated systems compared to control manual analysis ($p<0.01$ for both), while they were equivalent between the 2 automated systems.

CONCLUSIONS Despite the remaining need for some manual corrections, both of the 2 automated lumen contour detection algorithms developed for OCT can facilitate rapid assessment of the coronary artery.



CATEGORIES IMAGING: Intravascular

KEYWORDS Comparison, OCT

TCT-339

Different Pattern of Neoatherosclerosis for DES versus BMS in Very Late Stent Thrombosis

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BACKGROUND There are few clinical studies on the pathophysiological mechanisms of very late stent thrombosis (VLST, >1 year from stent implantation).

METHODS We conducted a registry of stent thrombosis at 4 North American centers with OCT imaging programs (SAFE registry). Images were acquired in 51 patients (35 DES and 16 BMS) presenting with definite VLST. Neoatherosclerosis was defined as the lipid neointima (including thin-cap fibroatheroma -TCFA, defined as the fibroatheroma with fibrous cap < 65 μm) or calcified neointima.

RESULTS The median duration from implantation to VLST presentation was 54.7 months in the DES and 70.0 months in the BMS group. The frequency of cases with uncovered and malapposed struts were 76.5% (39/51) and 72.5% (37/51), respectively. The percentage of frames with malapposed struts was significantly higher in DES than in BMS (16.67% [4.35, 25.93] and 0.82% [0.00, 6.35]). Lipid neointima,