OPTICAL COHERENCE TOMOGRAPHY IN UNPROTECTED LEFT MAIN CORONARY ARTERY STENTING

Aims. Delayed or incomplete stent endothelization and stent malapposition may predispose to DES thrombosis that can be a catastrophic event in the LMCA. Optical coherence tomography (OCT) can accurately identify stent struts and arterial tissue but is limited by the need of vessel blood clearance and penetration, and no data exist on its use in LMCA. We sought to verify whether OCT can accurately assess arterial wall response after drug eluting stent (DES) implantation in the left main coronary artery (LMCA).

Methods and Results: OCT images were obtained in 15 patients (mean age 70.7±8.0 years) 6 months after LMCA DES implantation. Acquisitions were performed without proximal balloon occlusion during iso-osmolar contrast injection through a 6Fr guiding catheter without side holes at a speed of 2-3 mL/sec. Offline image analyses were performed to evaluate assessable stent area (all slices), strut coverage, apposition, and abnormal tissue responses for every 3 slices (= every 0.45mm). All OCT images were obtained without periprocedural complications. Overall, 69±20% of the stent inner area was analyzable; this corresponded to 2.7±0.8 analyzable quadrants per slice. Out of 1281 struts, 1136 (88.7%) were well-apposed and fully-covered, 101 (7.8%) were uncovered; and 45 (3.5%) were malapposed although 9 of the malapposed struts (20%) were covered by some tissue. In 5 patients OCT detected abnormal intraluminal tissue and in 2 cases this finding was related to uncovered struts.

Conclusions: OCT assessment of vascular response after LMCA DES implantation is safe and feasible. Further development of OCT imaging technology will allow a more complete evaluation of LMCA stents.