



Short Communication

Role of optical coherence tomography guided percutaneous coronary intervention to assess stent malapposition in de-novo coronary lesions



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Intra-coronary imaging has revolutionized Percutaneous Coronary Intervention (PCI) by detailed imaging of stented segment. The aim of the present study was to evaluate major stent malapposition by Optical Coherence Tomography (OCT) following standard PCI procedure.

Twenty eligible patients for PCI, having reference vessel diameter (RVD) of 2.5 mm to 4.0 mm with $\geq 70\%$ diameter stenosis (DS), lesion length ≤ 40 mm, and more than TIMI-1 flow were included in the study. Patients with cardiogenic shock, left main disease, bypass graft, in-stent restenosis, thrombotic, heavily calcified, chronic total occlusion lesions, TIMI- 0 to 1- coronary blood flow and serum creatinine of ≥ 2 mg/dl were excluded. OCT (ILUMIEN™, St. Jude Medical) was performed to assess RVD, minimum lesion diameter (MLD) and % DS, pre and post stenting. After satisfactory angiographic end-results following PCI, OCT was repeated to look for stent malapposition. Those with stent malapposition (distance between strut and vessel wall of $> 200 \mu\text{m}$ extending for a length of at least $600 \mu\text{m}$) had repeat balloon dilatation with appropriate sized balloon. All patients were followed for 12-months, to assess major adverse cardiac events (MACE):- cardiac death, myocardial infarction, hospitalization, repeat revascularization and stroke. Primary and secondary endpoint was incidence of OCT guided stent malapposition and MACE at 12 –months follow up, respectively.

Twenty lesions among 20 patients of age 55.4 ± 8.2 years, 19 men and 1 female were included in the study. Seven lesions (35%) were of type B2/C, while remaining 13 (65%) lesions were of type A/B1 type. OCT assessed MLD (1.24 ± 0.30 to 2.8 ± 0.23 mm; $p < 0.001$) and percentage DS (52.95 ± 10.66 to $12.35 \pm 5.81\%$; $p < 0.001$) were significantly improved following OCT guided PCI. The mean stent length and diameter were 29.5 ± 8.04 and

3.11 ± 0.32 mm, respectively. Seven lesions (35%) had stent malapposition on OCT examination, which were further dilated with appropriate sized balloon. One patient had heart failure related hospital admission at 6-months of follow up; rest of the patients did well at 1-year follow up.

The present study had 35% incidence of stent malapposition following satisfactory angiographic end result of PCI. This was comparable to the findings of Prati F, et al.¹ and Meneveau N, et al.,² while it was lower in comparison to study by Im E, et al.³ and Kawamori H, et al.⁴. A recent ILUMIEN III study had observed 11% incidence of major malapposition in OCT guided PCI arm.⁵ We also observed minor edge dissections in 10% of patients and small thrombi in another 10% of patients which is less than Prati F, et al.¹ and Kawamori H, et al.⁴. A lower incidence of stent malapposition, thrombus and edge dissection in present study compared to others^{1–4} could be due to enrollment of non-thrombotic, non-calcified simpler lesions. A small number and simpler lesions are the limitation of the study. In conclusion, the present study had observed a 35% incidence of stent malapposition following standard angiographic PCI in relatively simpler lesions.

Conflict of interest

There is no conflict of interest of any of the authors.

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