

Similar degree of intimal coverage and apposition among drug-eluting stents with persistent, absorbable or without polymer at 1 and 6 months after implantation

A. Calvo Fernandez¹, A. Negrete¹, H. Tizon-Marcos¹, R. Millan¹, N. Salvatella¹, J.M. De La Torre², J.L. Diez³, C. Ivern¹, J. Gomez-Lara⁴, B. Vaquerizo¹

¹Hospital del Mar, Cardiology, Barcelona, Spain; ²University Hospital Marques de Valdecilla, Santander, Spain; ³Hospital Universitario y Politecnico La Fe, Valencia, Spain; ⁴University Hospital of Bellvitge, Cardiology, Barcelona, Spain

Funding Acknowledgement: Type of funding source: None

Background: Despite technological advances in drug-eluting stents (DES) design, delayed vascular healing is still a problem, triggered by the polymers among others. This may induce restenosis and thrombosis. The development of biodegradable polymers and DES without polymer is thought to improve the vascular response and enhance earlier neointimal healing. Optical coherence tomography (OCT) is the best intracoronary imaging tool to evaluate endothelial coverage after stent implantation.

Purpose: We aimed to quantitatively assess the differences on intimal coverage between biodegradable-polymer, durable-polymer and without-polymer DES at 1 and 6-month follow-up OCT.

Methods: A total of 94 patients with de novo coronary lesions were treated with DES: 26% were treated with Biolimus A9 (BA9) stent without polymer, 30% were treated with Everolimus DES with biodegradable polymer (EESb) and 44% with Everolimus DES with persistent polymer (EESp). OCT analysis was performed blindly at an independent Core Lab at three stages: implantation, after one month and after six months.

The primary endpoint was to compare neointimal coverage and apposition of these three different types of DES with OCT at one and six months after implantation.

Results: A total of 16034 struts were analysed (24% BA9, 29% EESb and

47% EESp). No significant differences were found among the groups regarding baseline clinical characteristics. When studying the strut coverage, it is remarkable the relatively low percentage of early neointimal coverage with no significant differences among stents one month after implantation (84–87%). After six months, there was better coverage in the three stent groups compared with one month ($p < 0.001$). The stents without polymer had better neointimal coverage at six months compared with the stents with persistent polymer (99% vs 92%, $p = 0.0002$). No significant differences were found in the strut apposition after one or six months among the three stent types. However, the rate of apposition was higher after six months compared with one month in all stent groups ($p = 0.001$). No significant differences were found in the neointimal hyperplasia at one month among the three stent groups. At six months there was a higher hyperplasia in the stent without polymer compared to the stent with persistent polymer (164 μm vs 92 μm , $p = 0.003$). The degree of hyperplasia after six months was higher compared to one month in all groups ($p = 0.001$).

Conclusions: The new-generation DES with biodegradable-polymer or without polymer showed relatively poor early neointimal coverage and similar to the last generation durable-polymer EES. According to these results, DAPT may not be shortened in any of the three DES types studied.