One Fits All or Which Stent for Which Lesion for Which Patient?  
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In this issue of the Journal, Danzi et al report on their meta-analysis of randomized clinical trials of the Nobori biolimus-eluting stent vs. permanent polymer drug-eluting stents (DES) in patients undergoing percutaneous coronary intervention.1

DES with local release of antiproliferative agents have consistently been shown to reduce the risk of repeat revascularization, as compared with bare-metal stents,2 8 and it has been pointed out that interventional treatment of complex coronary lesions has favorable and durable results.3

However, the term “drug-eluting-stent” arises from 15 years of development of drug eluting stents.4 In addition to different metallic stent platforms with many possible designs and materials, the polymer coating especially has been investigated very precisely. The polymers of coronary DES provide both a stable matrix for drugs that diffuse into the damaged vessel wall and modulate drug release. Therefore, by disintegrating, all durable polymers carry the risk for local inflammation, neointimal hyperplasia, and thrombosis. In addition, DES are often used for indications that have not been investigated in clinical trials, with worse long-term results.5

One of the newest DES innovations is the Nobori® biolimus-eluting stent (BES). Its polymer is biodegradable and the coating covers only the abluminal side of the stent, which is suggested to reduce the risk of very late stent thrombosis by avoiding delayed arterial healing.7

The meta-analysis includes results from 7 randomized trials with more than 12,000 patients and compares 1-year results after Nobori DES implantation with second- and third-generation permanent-coated polymer DES. The authors found similar efficacy of the Nobori stent after 1 year compared with older DES with respect to the endpoints of target-lesion revascularization, all-cause mortality, myocardial infarction, and stent thrombosis. Importantly, the trials included in the present meta-analysis were all-comer trials. Therefore, the work of Danzi et al demonstrates excellent 1-year clinical outcome safety and efficacy of the Nobori BES in real-life settings. But the study provides non-inferiority data. In general, it should be evaluated if there is a stent design that is superior to another.

The potential benefit of the Nobori stent design might be evidenced beyond the first year: The LEADERS trial (comparing BES with the sirolimus stent) finally confirmed the hypothesis of reduced very late stent thrombosis with a 74% relative risk reduction after 5 years, whereas earlier follow-up points demonstrated only the non-inferiority of the BES to a sirolimus DES.9 Particularly appealing are the results with respect to the heterogeneous targets of the Nobori BES in bifurcations, chronic-total-occlusion, very small vessels and diabetic patients. So might the Nobori BES be a “universal weapon”?10

Should we now treat every lesion with a modern universal BES or should we keep other factors in mind? Large IVUS studies have revealed the different tissue composition of plaques and its relevance to the clinical outcome of patients after acute coronary syndrome.11 Thin-cap fibroatheroma has been identified as the most dangerous coronary lesion for a subsequent adverse cardiac event. So if we treat a coronary stenosis resulting from a high-risk-plaque formation should we use the same DES as for a stenosis caused by a stable plaque formation? Should calcified lesions be treated with the same drug/stent design as soft plaques? Clinicopathological correlations assessed by intracoronary imaging techniques may furnish important information.10 Recently, a substudy of the LEADERS trial using optical coherence tomography demonstrated significantly higher stent coverage for stents with a biodegradable polymer compared with stents with a durable polymer,12 which might explain the advantage of the Nobori BES.

We should design trials in the future with follow-up of at least 5 years, addressing morphological alternations and clinical effects of different types of DES treating different types of lesions. Maybe such data will provide additional confirmation of the performance of the ongoing “new” era of stents. Which patient and which lesion profits from the new developments?

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