INDIAN HEART JOURNAL 67 (2015) 194–195

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Editorial

Resolute zotarolimus eluting stent for treatment of long coronary lesions☆

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Historically the treatment of long coronary lesions required overlapping stents, which has been associated with higher incidence of cardiovascular events.[1] The current availability of long drug eluting stentsizes has enabled treatment of such lesions with one, or at least fewer stents – reducing cost and areas of stent overlap. However, longer lesion and stent length continues to be associated with higher risk for both stent thrombosis[2,3] and in-stent restenosis.[4–7] Stolker et al[8] reported that among patients receiving sirolimus- and paclitaxel-eluting stents, longer stent length was associated with higher risk for target lesion revascularization (TLR) within one year. Naidu et al[7] examined 8061 patients who received an everolimus-eluting stent in the Xience V trial and found that total stent length was independently associated with stent thrombosis. Nevertheless, interventionalists often need to stent long vessel segments, for example in patients with diffuse disease and those with total occlusions.[9]

In this issue of the Journal Bahuleyan et al report outcomes on 100 patients who underwent stenting of long coronary lesions (mean lesion length 24.7 ± 4.9 mm) with the Resolute™ zotarolimus eluting stent (R-ZES) in an Indian patient population. The one-year incidence of clinically-driven TLR, target lesion failure (TLF), and stent thrombosis was exceedingly low at 4.5%, 6.4%, and 0%, respectively. These excellent results are in line with the pooled analysis of the RESOLUTE Global Clinical Trial Program, in which total lesion length was not a predictor of TLR after R-ZES implantation.[10]

The R-ZES has been evaluated in over 7000 patients in the RESOLUTE Global Clinical Trial Program.[11–19] The RESOLUTE 38 mm study enrolled 223 patients worldwide (with the largest enrollment in India), and formed the basis for United States Federal Drug Administration approval. It included patients who underwent treatment with at least one 38 mm length R-ZES.[11] Baseline mean lesion length was 25.2 ± 8.8 mm and at one year, the incidence of clinically-driven TLR, TLF, and definite/probable stent thrombosis was 1.4%, 5.4%, and 0.9%, respectively.[11] Furthermore, one-year outcomes in these trials were excellent among patients with diabetes mellitus (the incidence of clinically-driven TLR, TLF, and definite/probable stent thrombosis was 2.4% 6.0%, and 0%, respectively) and similar to outcomes among non-diabetic patients.[11] The RESOLUTE Asia 38 mm cohort enrolled 109 patients (136 lesions) with overall mean lesion length of 26.3 ± 8.5 mm, and lesion length among lesions treated with R-ZES of 29.1 ± 6.5 mm[19] The two-year incidence of TLR, TLF, and definite/probable stent thrombosis were 1.9%, 4.6%, and 0.9%, respectively.[19] Furthermore, in an analysis of the RESOLUTE Global Clinical Program, patients with overlapping stents (644 patients with 1044 lesions and mean lesion length 22.9 ± 15.1 mm) had similar two-year clinical outcomes with patients who did not require overlapping stents (4486 patients with 5814 lesions and mean lesion length 14.5 ± 7.5 mm).[20] Five year follow-up in the RESOLUTE Global Clinical Trial Program demonstrate sustained low cardiovascular event rates.[21]

One possible reason why implantation with R-ZES for long lesions was not associated with increased risk of TLR may be the sinusoidal stent design that provides excellent conformability, which is particularly important at the stent edges where stress on the lumen wall from the stent can be strongest. In contrast, other stents are typically laser cut from a tube. The PREDICTION Study used 3D coronary reconstruction by angiography/intravascular ultrasound to calculate local

☆ This editorial is pertaining to the article: Prospective Study to evaluate safety and Efficacy of Zotarolimus Eluting Stent (PSEZES) in patients with long coronary artery lesions by C.G. Bahuleyan et al., in Indian Heart Journal.

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http://dx.doi.org/10.1016/j.ihj.2015.05.007

endothelial shear stress in patients who presented with acute coronary syndrome and found ZES to be associated with the least stent edge restenosis as compared with laser cut tube design sirolimus-eluting, paclitaxel-eluting, and bare metal stents.[22]

In summary, the data presented by Bahuleyan et al and the RESOLUTE Clinical Trial Program data suggest that R-ZES is an excellent choice for the treatment of long coronary lesions. The 38 mm length R-ZES allows for the treatment of longer lesions with a single stent with outcomes similar to those observed in shorter lesions. The currently available Resolute Integrity ZES improves upon R-ZES by providing continuous sinusoidal technology for further enhanced deliverability and conformability. The most recently developed Resolute Onyx™ ZES, which received CE Mark at the end of 2014 and is currently under regulatory review in India, improves upon Core Wire Technology of RI-ZES, providing thinner stent struts and enhanced radiopacity with continued use of the clinically proven R-ZES Biolinx™ coating.

Conflicts of interest

The author has none to declare.

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