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## ***Editorial Comment***

### **Debulking Plaque Before Stenting: A Resurgence of Directional Atherectomy?**

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Over the past few years there has been renewed interest in the use of atherectomy to remove plaque prior to stenting to improve the restenosis rate. There are several theoretical reasons and some clinical data to suggest that this combined approach may be beneficial. The known predictors for in-stent restenosis include stent length, artery size, and final lumen cross-sectional area by intravascular ultrasound (IVUS). However, the standard descriptors of in-stent restenosis assessed by multivariate analysis account for only 10% of the incidence of this event [1]. Genetic factors may also predispose to restenosis [2]. Clearly, there is still much that we do not understand concerning restenosis. It has been suggested that the amount of intimal hyperplasia after stenting may be dependent on the degree of vessel wall stretch. If a large residual plaque is present, expansion of the wall at the lesion site will stretch the media/adventitia to a greater degree than if the plaque bulk were diminished by rotational or directional atherectomy.

The GUIDE observational study of IVUS following PTCA or DCA found that restenosis was primarily predicted by the residual plaque area and final lumen area [3]. Although the CAVEAT trial did not demonstrate a significant reduction in restenosis with DCA compared to PTCA, more recent trials of IVUS-guided optimized atherectomy (such as BOAT and ABACAS) have shown an impressive reduction in restenosis [4–6].

In the current article by Kiesz et al. [7], directional atherectomy was used prior to placing a Palmaz Schatz stent in 89 lesions. The stenoses were selected for this combined treatment if they were chronic total occlusions or long lesions, contained thrombus, or were located at the aorto-ostial juncture. The procedure was successful in all patients, with no immediate deaths or emergent CABG and a low incidence of non-Q-wave (3.3%) or Q-wave

(1.7%) MI. In the follow-up period, 6 patients (10%) required target vessel revascularization. The final MLD was impressive at  $3.80 \pm 0.44$  mm. The follow-up late MLD loss was  $1.13 \pm 1.07$  mm, which calculates as a loss index of .39 with a restenosis rate of 13%.

Colombo et al. [8] for several years have advocated debulking plaque prior to stenting. In their series of 168 lesions treated with DCA before stenting, angiographic follow-up at 6 mo was available in 80% of lesions. Restenosis was present in 13.6%, with a loss index of 0.39 and a TLR of only 8.3% [8]. Their incidence of non-Q-wave MI was higher (13.3%) than that reported by Kiesz et al. [7], and is similar to the results from the OARS (14%) and BOAT (16%) trials [5,9]. The incidence of non-Q-wave MI post-DCA may be reduced with the use of platelet inhibitors. In the EPIC Trial, Reopro diminished the rate of non-Q-wave MI from 15.4% to 4.5% following DCA [10].

The reported loss index in the series of Kiesz et al. [7] and Moussa et al. [8] is remarkably similar at 0.39, and is less than what is usually found with stenting alone for a similar group of lesions at 0.48 [8]. This implies that the use of DCA before stenting may attenuate the biologic response of the vessel wall to the insult of balloon expansion and the persistent stress of the metallic stent. This translates into a further reduction in restenosis from about 40% with PTCA alone, and 21% with stents alone, to about 11% when DCA is combined with stenting. This combined approach may be optimized by using intravascular ultrasound to guide the atherectomy cuts and to demonstrate that the plaque-to-vessel area is <50%. The data of Moussa et al. [8] also show that the lower the residual plaque after DCA, the lower the loss index will be, with a restenosis rate below 5% in the group that achieves an optimal removal of plaque burden.

These are exciting reports that may stimulate a resurgence in the use of DCA. The main impediment to using DCA is the labor-intensive process and the concern for potential damage associated with non-Q-wave MIs. Newer, easier forms of atherectomy are needed and are being developed. In addition, these preliminary data have prompted a multicenter trial to determine if DCA plus stenting can significantly and safely reduce restenosis. The results of this SOLD (Stenting With Optimal Lumen Diameter) trial will be intensely watched.

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