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Effects of scoring or cutting balloon use on severely calcified lesions treated by percutaneous coronary intervention

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Topic(s):
Coronary Artery Disease: Non-pharmacological Treatment

Citation:
Background: Whether preparation techniques during percutaneous coronary intervention (PCI) are associated with restenosis in severely calcified lesions is not well studied.

Purpose: We aimed to clarify the effects of the preparation techniques during PCI on mid-term outcomes of severely calcified lesions.

Methods: We examined 2688 consecutive severely calcified lesions (1854 patients) treated by PCI between January 2008 and December 2017, and identified 1789 lesions (66.6%) undergoing routine follow-up angiography within one year postprocedure. The angiographic outcome measure was defined as in-stent restenosis (ISR); ISR was defined as stenosis of ≥50%. We divided the 1789 lesions into two groups on the basis of the presence or absence of ISR: ISR and non-ISR groups.

Result: ISR was detected in 337 of the 1789 lesions (18.8%). The ISR group, in comparison with the non-ISR group, had more chronic total occlusion lesions (17.9% vs. 12%, p < 0.01), less bifurcation lesions (41.9% vs. 48.5%, p = 0.03), less reference diameter (2.85 ± 0.64 mm2 vs. 2.96 ± 0.54 mm2, p < 0.01), lower use rate of scoring or cutting balloon (13.9% vs. 23.1%, p < 0.01), and lower postprocedural percent stenosis (25.9 ± 20.7% vs. 16.9 ± 9.3%, p < 0.01). After adjusting chronic total occlusion lesions, target lesions, and other factors in multiple logistic regression models, the use of scoring or cutting balloon was independently associated with ISR (hazard ratio, 0.62; 95% confidence interval, 0.44 to 0.89; p < 0.01).

Conclusion: Using scoring or cutting balloon is associated with good midterm results of severely calcified lesions treated by PCI.