Clinical Outcomes of Intravascular Ultrasound Guided Everolimus-Eluting Stents Implantation in Long Coronary Lesions

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Use of intravascular ultrasound (IVUS) promotes better clinical outcomes for coronary intervention in complex coronary lesions. However, randomized data demonstrating the clinical usefulness of IVUS is limited in lesions treated with second-generation drug-eluting stents. The objective of this trial is to determine whether the long-term clinical outcomes of IVUS-guided drug-eluting stent implantation are superior to that of angiography-guided implantation in patients with long coronary lesions. A prospective, randomized, multicenter trial was conducted at 20 centers in 1,400 patients with long coronary lesions (implanted stent ≥28 mm in length) between October 2010 and July 2014. Patients were randomly assigned to receive IVUS- (n=700) or angiography-guided (n=700) everolimus-eluting stent implantation. Primary outcome measure is the composite of major adverse cardiac events, including cardiac death, target lesion-related myocardial infarction, or ischemia-driven target lesion revascularization at 1 year. Major adverse cardiac events at 1 year occurred in 19 patients (2.9%) receiving IVUS-guidance and in 39 patients (5.8%) receiving angiography-guidance (hazard ratio [HR], 0.48; 95% confidence interval [CI], 0.28-0.83; p=0.009) (Figure). The difference was mainly driven by a lower risk of target lesion revascularization (17 [2.5%] vs 33 [5.0%], respectively; HR, 0.51; 95% CI, 0.28-0.91; p=0.022) in patients receiving IVUS-guidance compared with angiography-guidance. Cardiac death and target lesion-related myocardial infarction were not significantly different between the two groups.

In conclusion, among patients requiring long coronary stent implantation, the use of IVUS-guided everolimus-eluting stent implantation resulted in a significantly lower rate of the composite of major adverse cardiac events at 1 year compared with patients who received angiography-guided everolimus-eluting stent implantation.
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