What is the Best Way to Treat Left Main Coronary Artery Disease?

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Numerous researchers have attempted to improve the methods of percutaneous coronary intervention (PCI), with the goal of obtaining equivalent or better long-term results compared with coronary artery bypass graft (CABG). In the beginning of the drug eluting stent (DES) era, the initial success rate was very high rate and the target lesion revascularization (TLR) of PCI was dramatically improved. However, unprotected left main coronary artery (ULMCA) lesions, chronic total occlusion, bifurcated lesions and diffuse coronary atherosclerosis are still major problems in the PCI field.

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At the 2008 European Society of Cardiology (ECS) in Munich, the results of the SYNTAX (SYNergy between PCI with TAXUS and cardiac surgery) trial were reported. The SYNTAX randomized trial was a comparison of the utility of contemporary CABG and PCI with drug-eluting TAXUSTM Express^{2TM} Stents in patients with left main and/or 3 vessel coronary disease. In the randomized SYNTAX cohort, there were comparable overall safety outcomes (death, cerebrovascular accident (CVA), myocardial infarction (MI)) in CABG and PCI patients at 12 months (7.7 vs 7.6%). There was a significantly higher rate of revascularization in the PCI group (13.7 vs 5.9%), and a significantly higher rate of CVA in the CABG group (2.2 vs 0.6%). The incidence of overall major adverse cardiac cerebellar events in the PCI group was higher (17.8 vs 12.1%) due to an excess of redo revascularization compared with CABG.

There have been several studies comparing the short- or medium-term follow-up data of ULMCA lesions treated with PCI or CABG in a non-randomized form. Two of these studies, that is, those of Lee et al¹ and Chieffo et al² reported results roughly identical to those of the SYNTAX randomized trial. Bravata et al also reviewed the comparative effectiveness of PCI and CABG by meta-analysis.³ This review concluded that CABG was more effective in relieving angina and led to fewer repeated revascularizations but had a higher risk for procedural stroke. Survival to 10 years was similar for both procedures.

Several studies from Taiwan, Korea and Japan have reported excellent long-term results obtained by PCI. We

previously reported the feasibility and safety of transradial stenting for ULMCA stenosis.⁴ The 1-year TLR rate of left main coronary lesions and cardiac death rate were 14.2% and 3.5%, respectively. Park and Kim reported acceptable long-term outcomes of PCI with DES to treat ULMCA stenoses.⁵ Seung et al compared the long-term treatment effects of coronary stenting and CABG in a large-scale registry.⁶ They enrolled 1,102 patients treated with stents and 1,138 patients treated with CABG. There was no significant difference between the stenting and CABG groups in the risk of death or the risk of a composite outcome. In non-bifurcation lesions of the ULMCA, PCI with drug-eluting stents appeared safe and achieved extremely good long-term results, with a long-term major adverse clinical event rate of 7.4% and a restenosis rate of 0.9%.⁷ There was thus a tendency toward low TLR rates in the Asian reports. These impressive results were likely attributable to the strategies and techniques used in the stent implant, that is, high pressure post-dilation, shorter stent length, lower stent numbers, frequent use of IVUS and kissing balloon technique. In the future, a large-scale follow-up registry will be needed for far-east countries.

The results of this manuscript⁸ were consistent with those of the SYNTAX trial and the reports from Korea. High rates of stroke, death and in-hospital MACE were observed after the procedure in the CABG group, and high rates of post-procedural MI were observed in the PCI group. The CABG group showed excellent results in TLR-free and revascularization-free survival compared with the PCI group. But the DES group had the highest overall survival rate. PCI is an effective alternative for the management of patients with ULMCA stenosis. The next goal of PCI is to minimize the TLR of ULMCA lesions.

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