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Favorable remodeling effect of the "onlay grafting on the beating heart" in patients with diffuse coronary artery diseases

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The recent increase of diffuse coronary artery diseases in Japan forced us to performsome kind of anastomotic magic to obtain a long-term complete revascularization. [purpose] Until August 2012, we have performed "onlay grafting on the beating heart" in 80 vessels in 71 patients. We retrospectively evaluated the early and mid-term results of this technique and the favorable remodeling effect in thieranastomotic shapes. [surgical method] To obtain surgical coronary revascularization proximally and distally over the stenotic lesion, we performed onlay grafting on the beating heart over the stenotic lesion with or without endarterectomy(EA) in LAD, Cx, RCA systems. Distal coronary perfusion was performedduring anastomosis with external shunt technique obtained from the femoral artery. In cases with expected incision length shorter than 2.0 cm, we performed it off-pump. On the other hand, in cases with expected incision length longer than 2.1 cm, we do it on-pump on the beating heart for the safety. EA was usually performed when the calcified intima was spontaneously separeted during incision of the target coronary artery. [results]The average age was 70±9(43-84) years. male:female=56:15. Early results were obtained in80 vessels in 71patient, and mid-term results were obtained in 46 vessels in 41 patients who could beevaluated by follow-up coronary angiography or computed tomography. The average number of the grafts: 3.3±1.1 (1-7). Performed procedures were onlay without EA in 62 (LAD 36, RCA 2, PD 11, AV 4, OM 4, Cx 4, RCA[3-4PD] 1), EA+onlay 21 (LAD 14 including removal of stent, PD 3, Cx 1, Dg 1, RCA 2). Used grafts were LIMA 43, radial artery(RA) 6 for LAD, and GEA 8, SVG 12, RA 3 for RCA system, and LIMA 1, RA 6, SV 1 for Cx system, and GEA 1 for Dg. We had only a case of small perioperative myocardial infarction but the procedures were performed safely without any incidence of sudden ventricular fibrillation nor emergency use of cardiopulmonary bypass. We lost an emergency patient of ACS required preoperative IABP and PCPS support for maintaining hemodynamics. Anastomotic dilatation by the onlay graft and native wall irregularity were always recognized in the postoperative early phase, and aspirin+warfarin were administered to prevent thrombotic occlusion. Early graft patency: 77/78=98.7%. Re-study CAG or coronary CT was performed in 47 grafts in 41 patients in the period of 13.3±11.8 (4-55) months postoperatively. Mid-term graft patency: Arterial grafts were patent in 37/39 (95%, LIMA 26/27, RA 5/6, GEA 6/6) in which 33 anastomoses(85%) showed diameter-equalization withtheir native coronary artery, and 34/37(92%) showed luminal smoothing. SVG showed 8/9 patency (89%), in which 4 anastomoses (44%)had diameter-equalizationand 7 (78%) showed luminal smoothing. [comments] The onlay grafting on the beating heart strategy is safe, and is very encouraging to obtain complete revascularization with a long-term patency in patients with diffuse coronary lesions with a favorable remodeling phenomenon of the onlay grafted coronary arteries.

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