Remodeling of Radial Artery Anastomosed to Internal Thoracic Artery as an l-Composite Graft

Shinya Fukui, Koki Toda, Toshinori Funatsu, Kei Horiguchi, Yuji Miyamoto, Sakurabashi Watanabe Hospital, Osaka, Japan, Osaka University Graduate School of Medicine, Osaka, Japan

Background: Internal thoracic artery (ITA) remodels its diameter in response to the flow requirement. However, it is unclear whether radial artery (RA) has a capacity for remodeling when anastomosed to ITA as an l-composite graft. The purpose of this study was to elucidate the remodeling of the RA used as an l-composite graft with ITA.

Methods: We studied 16 consecutive patients who underwent coronary artery bypass grafting using RA anastomosed to ITA as an l-composite graft. The diameter of ITA and RA were evaluated before surgery and at 3 weeks and 1 year after surgery. Results: The RAs were significantly larger in diameter than ITAs (3.5±0.3 mm vs 2.2±0.3 mm, p<0.0001) and the ratio of RA to ITA was 1.6:1 before surgery. Among 16 patients 2 patients had l-composite grafts with right ITA and RA, 15 RAs had two sequential anastomoses and 1 RA had a single anastomosis. 3 weeks after surgery all grafts were confirmed to be patent by angiography and there was no significant difference in diameter between RAs and ITAs (2.3±0.6 mm vs 2.1±0.5 mm). The ratio of ITA to RA significantly reduced to 1.0:1.0 at 1 year after surgery. 4 patients were followed a year after surgery. The diameter of ITAs and RAs were increased 11% and 10%, respectively in 3 patients without changing the ratio of RA to ITA. Conclusion: This study suggests that RA adjusts the diameter in response to the ITA flow, when anastomosed to ITA as an l-composite graft. These results may support the use of ITA/RA composite graft as an extended arterial graft remodelling capacity.