CORONARY OSTIAL ENDARTERECTOMY IN TAKAYASU'S AORTITIS

— Confirmation of Patency Nine Years Postsurgically —

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A case of Takayasu's aortitis with severe bilateral coronary ostial stenosis is reported. A transaortic coronary endarterectomy was performed and sufficient patency was confirmed angiographically 9 years after the operation. This is the first report of late coronary angiography after a transaortic coronary ostial endarterectomy in Takayasu's aortitis. The efficacy of this procedure for coronary ostial stenosis in Takayasu's aortitis is emphasized.

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GRANULOMATOUS thickening of the aortic wall involving the coronary orifice in Takayasu's aortitis may induce coronary ostial stenosis and severe angina pectoris requiring surgical treatment. The surgical procedures for coronary revascularization for patients with angina pectoris in Takayasu's aortitis are now controversial.

A 17-year-old girl had a low grade fever, bilateral neck pain and exertional chest pain for about 4 months before admission to Kawasaki Medical School Hospital in December 1980. Physical examination revealed tenderness on the bilateral carotid artery and a pulseless left radial artery. During the exercise test, she complained of severe chest pain, and ST depression was recognized in all leads of her electrocardiogram. Her erythrocyte sedimentation rate (ESR) was 113 mm/lh and C-reactive protein (CRP) was 6+. Stenosis of the left subclavian artery and critical ostial stenosis of

the right and left coronary arteries without distal coronary artery disease were shown by aortography and coronary arteriography (Fig. 1-A, Fig. 2-A). After improvement of inflammation following treatment with steroids, a transaortic coronary endarterectomy was performed under deep hypothermic cardiopulmonary bypass (esophageal temperature of 20 degrees C). The ascending aortic wall was tough and thickened. The left coronary orifice was severely narrowed to less than 1 mm and right coronary orifice was 1.5 mm in diameter. After small incisions were made in 2 opposite positions of thickened endothelium at the right coronary orifice, an aortic punch instrument (Scanlane®), 4.5 mm in diameter, for aorto-coronary bypass surgery was inserted and the stenotic tissue was gouged out. Fogarty's balloon catheter was inserted into the left coronary artery and the stenotic orifice was pulled out by the inflated balloon catheter. After enlargement of the orifice by partial resection of the thickened intima, the stenotic ostia was gouged out with the aortic

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Fig.1. Left coronary arteriograms before the operation (A), 2 months (B) and 9 years (C) after transaortic ostial endarterectomy. Arrow indicates severe ostial stenosis. A sufficient enlargement of the left coronary orifice and long-term patency are shown 9 years after ostial endarterectomy.

Fig.2. Right coronary arteriograms before the operation (A), 2 months (B) and 9 years (C) after transaortic coronary ostial endarterectomy. There is no restenosis in the right coronary orifice 9 years after ostial endarterectomy.

punch instrument. After closure of the aortic wall, the cardiopulmonary bypass was discontinued uneventfully. Postoperative coronary arteriograms revealed sufficient enlargement of the bilateral coronary orifices (Fig. 1-B, Fig. 2-B). The patient did well, taking a small amount of steroids postoperatively to suppress the continued inflammatory evidence in her ESR and CRP. Nine years after the operation, in May 1990, she was readmitted to our hospital for

follow-up coronary arteriography before her marriage. She showed no clinical or electrocardiographic evidence of myocardial ischemia in the treadmill test. Her ESR and CRP values were well controlled by the administration of 5–7.5 mg of prednisolone. Her coronary arteriogram showed sufficient patency and no progression of stenosis in the right and left coronary orifices (Fig. 1-C, Fig. 2-C).

COMMENT

Approximately 10 percent of the cases with Takayasu's aortitis, characterized by chronic granulomatous inflammation of the aorta and its major branches, involve the ostia of the coronary artery^{1,2} which causes fatal cardiac complications³. As a result, many of these patients become candidates for surgery.

Takayasu's aortitis predominantly affects young women and, in many of these cases, there is evidence of active inflammatory reaction². Therefore, ensuring long-term patency is especially important in coronary revascularization surgery. As for the surgical procedures, Ohara et al⁴ reported that coronary bypass surgery was indicated for patients with total occlusion of the coronary ostia or with peripheral coronary artery lesions and that a transaortic coronary ostial endarterectomy was strongly indicated in cases with a marked thickening of the aortic wall and with stenosis localized at the ostia. In 33 surgical cases compiled by Yamazaki et al⁵; however, 38 aortocoronary saphenous vein bypass graftings were performed in 26 patients and a transaortic coronary ostial endarterectomy was performed in only 7 cases. In the literature, bypass grafting appears to be most commonly used for coronary ostial stenosis. Compared with the patency rate of vein grafts in arteriosclerotic coronary heart disease, that reported for Takayasu's aortitis is low⁴. Furthermore, occlusion is frequently seen in the proximal anastomosis of the graft^{3,4}. This may be caused by technical factors in the anastomosis of the vein graft to the thickened and sclerotic aortic wall. In addition, active inflammation of the aortic wall also may affect the graft occlusion. Morgan et al⁶, who devised a proximal anastomosis, performed an anastomosis of the vein graft to a pericardial patch placed on the ascending aorta. Sugimoto et al⁷ reported a case of coronary bypass surgery with both the internal thoracic and gastroepiploic arteries. In this disease, however, histological examinations have detected arterial lesions in 82% of brachiocephalic arteries, 75% of right subclavian arteries, 88% of left subclavian arteries, and 59% of abdominal aortas¹. Therefore, careful preoperative exploration and long-term postoperative

follow-up is necessary when using these arterial conduits. Coronary ostial endarterectomy is considered to be an anatomically reasonable operation for coronary ostial stenosis, but the risk of intraoperative hemorrhage due to intimal over-resection should be borne in mind in cases in which intimal thickening and sclerosis of the aorta surrounding the coronary orifice are not so strong. Restenosis due to intimal repopulation may be the most likely complication to occur after coronary ostial endarterectomy for Takayasu's aortitis. However, there have been no report of long-term follow-up angiography following this procedure, the case we have reported being the first. While it is possible to suppress inflammatory reactions such as ESR and CRP by steroid therapy, whether or not progression of the lesions is stopped remains unknown. In our case, steroid therapy was required pre- and postoperatively to suppress the inflammatory reactions, and good patency was confirmed angiographically without any progression 9 years after the operation. It is unclear what effect postoperative steroid therapy had in suppressing the development of intimal repopulation. In conclusion, since low long-term graft patency becomes a problem following aortocoronary vein bypass grafting, we consider endarterectomy to be a beneficial procedure for the treatment of coronary ostial stenosis in Takayasu's aortitis because long-term patency may be anticipated.

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