

## Coronary Artery Bypass Grafting and Aortic Valve Replacement in a Patient with a Tracheostoma

Satoshi Kimura, MD, Kazuhiro Kurisu, MD, Kenichiro Tanaka, MD, Hiroshi Kumeda, MD, and Ryuji Tominaga, MD

**We report a 67-year-old man with a tracheostoma who successfully underwent coronary artery bypass grafting and aortic valve replacement. He had received both a tracheostoma just above the sternal notch after total laryngectomy. As the standard full sternotomy might cause mediastinitis, we performed the operation through a lower half sternotomy with a limited skin incision. Postoperatively the wound was covered with a sterile plastic drape to prevent infection from the tracheostoma. The postoperative course was uneventful. (Ann Thorac Cardiovasc Surg 2004; 10: 311–3)**

**Key words:** coronary artery bypass grafting, aortic valve replacement, lower half sternotomy, tracheostoma

### Introduction

Wound infection, especially mediastinitis, is one of the cardiac operative complications and is potentially lethal. Median sternotomy, which we use most frequently for cardiac surgery, has further risk of mediastinitis in a patient with a tracheostoma. Alternatively we used lower half sternotomy with a T-shaped skin incision to perform coronary artery bypass grafting (CABG) and aortic valve replacement (AVR) in a patient who received a tracheostoma after total laryngectomy. This approach could offer adequate operative field for cardiac procedures including establishment of cardiopulmonary bypass (CPB).

### Case Report

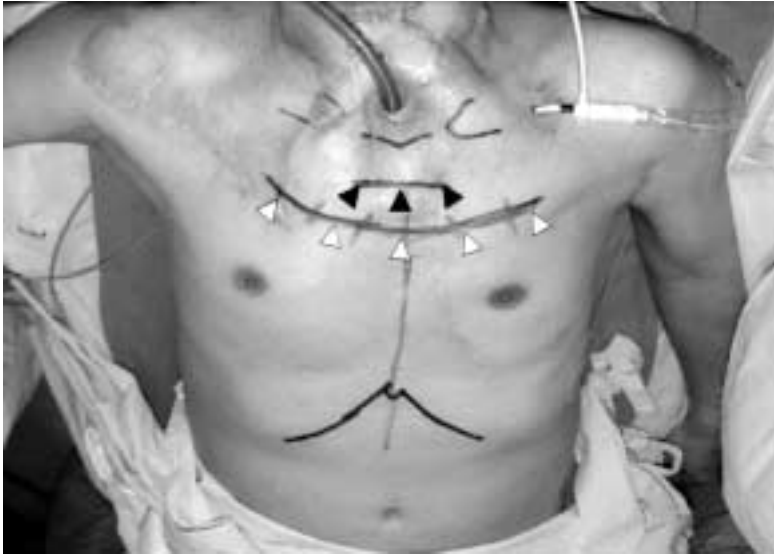
A 67-year-old man, who had received a tracheostoma just above the sternal notch due to total laryngectomy and radiation therapy for laryngeal cancer one year prior, experienced shortness of breath on exertion. Exercise elec-

trocardiography showed ST segment depression at I, II, aVL, V<sub>5-6</sub>, suggesting widespread myocardial ischemia. Coronary angiography revealed 73% stenosis in the portion of the left main trunk. Aortography also showed moderate aortic regurgitation with impairment of left ventricular function with 38% of ejection fraction. We planned to perform both CABG to the left anterior descending artery (LAD) and left circumflex artery (LCX), and AVR.

For anesthesia a spiral tracheal tube was inserted into the tracheostoma. Since he had suffered esophagopharyngostoma caused by radiation therapy following the prior operation and received multiple plastic surgeries with pedicle flap transplantation of both the pectoralis major and sternocleidomastoid muscles, it was difficult to access the neck. Thus, the pulmonary artery catheter was inserted via the left subclavian vein away from the tracheostoma (Fig. 1). A T-shaped skin incision was made from approximately 3 cm inferior to the third intercostal space to xiphoid process. The sternum was incised transversely at the level of the third intercostal space, and the sternal body was incised longitudinally. We sacrificed bilateral internal thoracic arteries (ITAs), which were firmly adhering to the sternum due to the previous radiation therapy. The aorta was cannulated and a two-staged cannula was placed in the right atrium for the venous return without any difficulties. Saphenous vein graft (SVG) was bypassed to the LAD on the beating heart. Another SVG was anastomosed to the LCX under cardioplegic

*From Department of Cardiovascular Surgery, Kitakyushu Municipal Medical Center, Fukuoka, Japan*

Received March 8, 2004; accepted for publication April 21, 2004. Address reprint requests to Satoshi Kimura, MD: Department of Cardiovascular Surgery, Graduate School of Medical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan.



**Fig. 1.** The patient was positioned supine. A spiral tracheal tube was intubated and a pulmonary catheter was inserted via the left subclavian vein. White arrowheads and black arrowheads indicate skin incision and transverse sternotomy respectively.



**Fig. 2.** A T-shaped wound healed well on postoperative day 7. He had many old scars, receiving multiple plastic surgeries with pedicle flap transplantation of both pectoralis major and sternocleidomastoid muscles.

arrest. The aortic valve was excised and a 21 mm SJM HP prosthesis (St. Jude Medical Inc., St. Paul, MN) was implanted in the intraannular position with a good operative field. After declamping the aorta, the proximal end of the SVG to LAD was anastomosed to the aortic root under aortic partial occlusion clamp. Subsequently the proximal anastomosis of SVG to LCX was performed to another SVG in an end to side fashion. Weaning from CPB was uneventful.

Postoperatively the wound was dressed with a sterile plastic drape to prevent bacterial infection and healed well (Fig. 2). Postoperative angiography showed a patent composite graft connecting to the LAD and LCX.

## Discussion

In patients with tracheostomas, it is particularly important to minimize the risk of mediastinal infection. Mediastinitis, which is a serious and potentially lethal complication of cardiac surgery, would probably occur when we perform full sternotomy. Therefore we discussed several problems including surgical approach preoperatively. Several alternative approaches have been previously reported.<sup>1-5)</sup> Marshall et al. reported a patient using bilateral thoracotomy with a submammary skin incision, which could permit CABG.<sup>1)</sup> This approach can provide an adequate operative field to establish CPB without any diffi-

culties, relatively easy harvesting ITA as a graft, and the incision distant from the tracheostoma. However, it can impair the respiratory function and be more invasive hence increasing pain. Therefore we preferred not to use bilateral thoracotomy in this case. We thought it was better that the wound was as far from the tracheostoma as possible. We adopted a lower half sternotomy with a T-shaped skin incision. This incision is useful because there is no necessity to dissect the subcutaneous tissue around the tracheostoma. We were concerned whether there would be an inadequate operative field. Doty et al. have reported that complete coronary revascularization and essentially all valve procedures could be performed with a lower half sternotomy.<sup>6)</sup> In this case, it was not difficult to establish CPB and perform AVR in spite of the limited skin and sternal incisions.

It was also a problem which graft we should select. We usually use arterial grafts in young elective cases. But we preferred not to use ITAs to avoid inadvertent tracheal injury and infection when harvesting the proximal portion of the ITA. We also considered that previous radiation therapy caused severe adhesion around the ITA. The radial artery couldn't be used because of a positive Allen test result hence we used veins grafts. We didn't use ITAs in this case, but Doty et al. suggested harvesting ITAs through lower half sternotomy with great care.<sup>6)</sup>

In addition, to prevent wound infection and mediastinitis, we covered the wound with a plastic sterile drape so as not to be contaminated with droplets discharged

from the tracheostoma postoperatively, as well as prophylactic antibiotic treatment.

In conclusion, we successfully treated a patient with a tracheostoma. We believe that a lower half sternotomy with a limited skin incision would be safe and adequate to perform CABG and valve surgeries in those patients.

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