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A tracheoinnominate artery fistula: A case report with successful treatment of an ilio-axillary bypass

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ABSTRACT

We report a case of tracheoinnominate artery fistula in a 24-year-old man who was successfully treated with an ilio-axillary bypass. There is a general acceptable monitoring system to judge the advisability of interruption of the innominate artery intraoperatively. However, we constructed the ilio-axillary bypass prior to the excision of the fistula. The patency of the bypass graft was confirmed by computed tomography 2 months after surgery. *Ryukyu Med. J.*, 17(2)109~110, 1997

Key words: tracheostomy, tracheoinnominate artery fistula, ilio-axillary bypass

INTRODUCTION

A tracheoinnominate artery fistula is a rare but usually fatal complication of a tracheostomy if not treated immediately by emergency surgery. The conventional treatment for this complication is excision of the injured innominate artery. Most agree that interruption of the innominate artery does not cause neurological sequelae¹⁻³⁾. However, there is a possibility of brain damage because of reduction of brain blood flow. We treated a case of a tracheoinnominate artery fistula with subacute sclerosing panencephalitis (SSPE) by constructing an ilio-axillary artery bypass prior to interruption of the innominate artery. This is a suitable operative procedure to ensure proper blood flow and effectively reduce the risk of brain damage.

CASE REPORT

A 24-year-old man with a long history of SSPE underwent a tracheostomy in May 1995. Due to hemoptysis and subsequent transient massive bleeding from the tracheal stoma, the patient was transferred to this university hospital. A tracheoinnominate artery fistula was diagnosed by aortography, which showed protrusion of the portion of the innominate artery in contact with the trachea (Fig. 1), and the patient underwent emergency surgery. To ensure proper blood flow to the brain, an ilio-axillary artery bypass was made prior to interruption of the innominate artery. The patient's limbs were extremely contracted, therefore the femoral artery could not be used as the bypass. An ilio-axillary extra-anatomic bypass was performed with an 8 mm-ringed



Fig. 1 The protrusion of the innominate artery (indicated by arrow) is shown by aortogram. This protrusion is in contact with the affected area of the trachea.



Fig. 2 Enhanced computed tomography shows the patency of the implanted graft (indicated by arrow) in the thoracic and abdominal walls, 2 months after surgery.

expanded polytetrafluoroethylene (EPTFE) graft. The wounds, including the skin incision for the bypass procedure, were closed to prevent infection before sternotomy. The aortic arch and the innominate artery were exposed by a median sternotomy and pericardiotomy. The innominate artery was clamped at the levels between the proximal and distal position of the fistula and excised. Massive bleeding did not occur during surgery. The patency of the EPTFE graft was confirmed by enhanced computed tomography 8 weeks after surgery (Fig. 2). The patient was uneventful postoperatively and was discharged 10 weeks after surgery.

COMMENTS

The conventional treatment for a tracheoinnominate artery fistula has been excision of the injured innominate ar-

tery. Some authors have reported the safety of sacrificing the innominate artery¹⁻³. However, Deslauriers et al have reported a case of hemiparesis after the resection of the innominate artery⁴, and accordingly other authors have suggested bypass grafting of the distal innominate artery^{5,6}. Moreover, since our case had a history of brain disease, we considered that the possibility of brain damage by reduction of brain blood flow could be high. It is therefore essential that the surgeon judge whether blood flow to the brain will be compromised. To determine the advisability of interrupting the innominate artery, some surgeons have recommended using an electroencephalogram or stump pressure measurements³. However, in emergency situations it may not be possible to employ such monitoring systems. An operative procedure preserving the blood flow from the innominate artery should therefore be employed. Attempts at reconstruction of the innominate artery by a graft in the anatomic position have not been successful. The procedure is contraindicated because almost all cases have resulted in graft infection and rupture of the innominate artery. Our operative procedure using an extra-anatomical bypass is simple and of short duration. There is no need for a monitoring system, and there is minimal risk of reduction of blood flow to the brain.

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