



Surgical Repair of Aorta-Right Atrial Tunnel in an Adult

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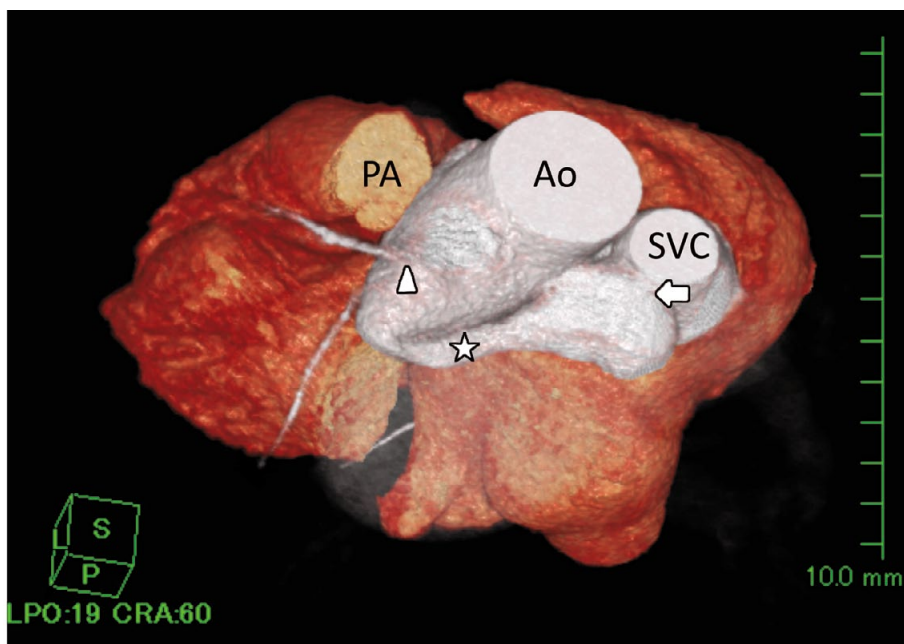


Figure 1. Three-dimensional reconstructed computed tomography of the close relationship between the tunnel and the left main trunk (arrowhead) in the left aortic sinus; the tunnel's retroaortic course; and its termination (arrow). Star, tunnel; Ao, aorta; PA, pulmonary artery; SVC, superior vena cava.

A 50-year-old woman was referred for dyspnea and lower leg edema. She had been diagnosed with heart disease 25 years previously, but had ignored it. Continuous grade 3/6 heart murmur was best heard along the right upper sternal border. Chest X-ray showed cardiomegaly and severe pulmonary congestion. Cardiac echocardiography indicated severe tricuspid regurgitation and enlargement of right atrium and right ventricle. Three-dimensional multidetector computed tomography (MDCT) angiography showed a posterior vascular tunnel with left aortic sinus and right atrium openings (**Figure 1**). Catheter angiography showed no significant coronary stenosis, but the left main trunk arose precariously close to the abnormal tunnel orifice. On the basis of these find-

ings and anatomical features, definitive repair was scheduled.

Intraoperatively, the tunnel was seen to course along the antero-inferior aspect of the right pulmonary artery and to terminate at the posteromedial aspect of the dilated superior vena cava-right atrium junction. After elective cardiopulmonary bypass (CPB), we were able to loop and ligate the tunnel at the proximal end on electrocardiogram monitoring (**Figure 2A**). Then, cardiac standstill was achieved following administration of cardioplegic solution. Oblique right atriotomy showed an orifice 7 mm in diameter in the lateral aspect of the right atrium, 2 cm below the orifice of the superior vena cava (**Figure 2B**). The orifice was obliterated with a 4-0 monofilament running suture. Finally tricuspid valvuloplasty using an artificial ring

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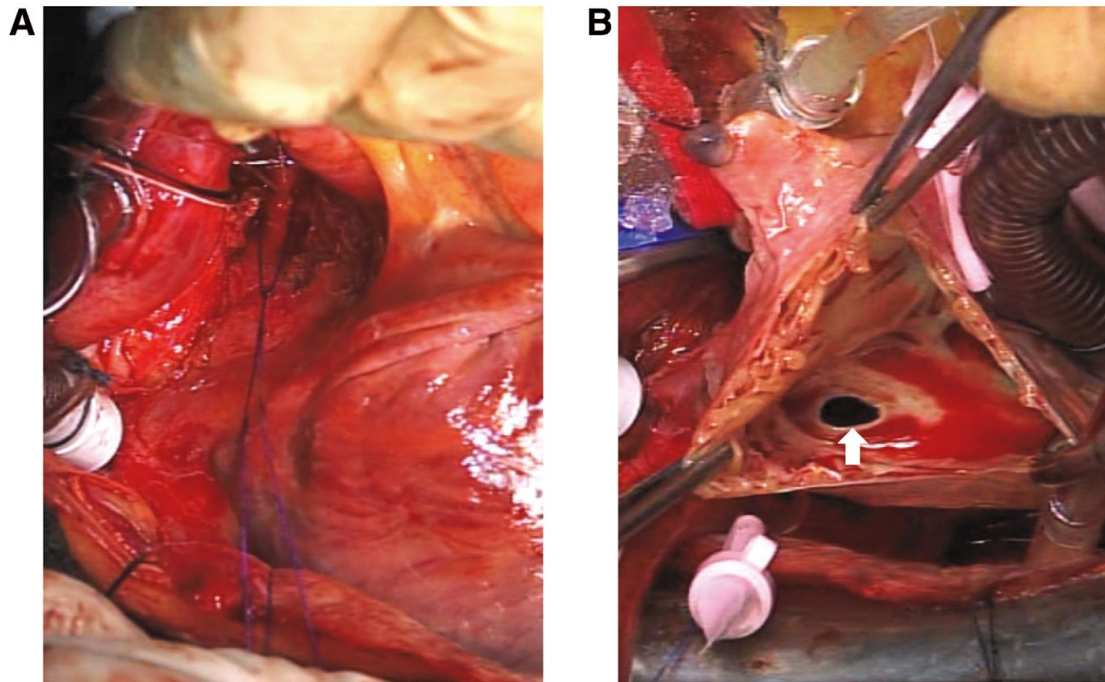


Figure 2. Intraoperative views: (A) the looped tunnel in the retroaortic space; (B) the right atrial opening of the tunnel (arrow).

was performed.

The patient came through CPB smoothly without the need for allogenic blood transfusion. Her condition improved dramatically after surgery. Postoperative CT indicated a satisfactory outcome with no coronary artery complication. Plasma brain natriuretic peptide had decreased from 816.3 pg/ml preoperatively to 59.7 pg/ml postoperatively.

To our knowledge, this is the first case in Japan and the oldest patient among 22 cases previously reported.¹⁻⁸ Although aorta-right atrium tunnel is a very rare condition, recent advances in 3-D CT can help to differentiate this from ruptured sinus of Valsalva aneurysm and coronary cameral fistula, and to facilitate decision making in the repair, as in heart valve disease and coronary artery disease.^{9,10} If the origin of the coronary artery is deep in the tunnel, it should be reimplemented with a section of the tunnel into the sinus of Valsalva.

Disclosures

The authors have no financial conflicts of interest to disclose concerning this paper.

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