

Case Report

Operation for Adult Patent Ductus Arteriosus using an Aortic Stent-Graft Technique

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Available online 21 January 2005

Patent ductus arteriosus is a condition usually diagnosed and treated in childhood but in some instances is not detected until adult life. Although surgical closure remains the accepted treatment in most cases, stent-grafting has emerged as a possible alternative treatment for persistent ductus arteriosus in the adult. We describe a case of elective repair of a patent ductus arteriosus using an aortic stent-graft technique in a young man. Successful use of the endoprosthesis approach may allow more widespread use of this technique in adult patent ductus arteriosus.

(Heart Lung and Circulation 2005;14:54–57)

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Keywords. Patent ductus arteriosus; Stent; Endovascular graft

Case Report

A 23-year-old man from the Solomon Islands was referred to our institution with an underlying diagnosis of patent ductus arteriosus (PDA). He was reported to have congenital heart disease in childhood but was apparently well until December 2003 when he presented with malaise, lethargy, and anaemia. He was readmitted to the Solomon Islands Ministry of Health National Referral Hospital in March 2004 with cough, exertional dyspnoea, and fever. Cardiovascular examination revealed peripheral cyanosis, palor, anaemia, fever, dyspnoea, systolic and diastolic thrill and a machinery murmur at the left sternal border. Two-dimensional echocardiography demonstrated an enlarged pulmonary trunk with large turbulent flow (peak velocity 4.0 m/s) directed into the right ventricular outflow tract, features consistent with a large PDA. The left ventricle was dilated with a volume overloaded appearance but systolic function was normal (LV dimensions: end diastole 68 mm, end systole 50 mm). A mobile vegetation within the pulmonary trunk suggested the presence of endocarditis. Blood cultures, however, did not isolate any organisms. The patient was treated with intravenous antibiotics for four weeks and following discharge in April 2004 was referred to our institution in August 2004 for definitive management of the PDA. Repeat echocardiography revealed a dilated left ventricle with normal systolic function (LV dimensions: end diastole 72 mm, end

systole 53 mm), and a PDA with a left-to-right shunt (peak systolic gradient 120 mmHg). There was systolic and diastolic flow reversal in a dilated pulmonary trunk, which measured 36 mm. There was no evidence of vegetation or valve disease. A computed tomography (CT) scan of the thorax with three-dimensional reconstructions was performed to assess the size and position of the PDA and the regional vascular anatomy. The scan demonstrated a broad flat communication between the anterior aspect of the proximal descending thoracic aorta and the posterior aspect of the left main pulmonary artery marked by a small focus of calcification. The communication measured approximately 10 mm in diameter but there was no tubular component and appearances suggested that the two vessels were fused over a short segment. There was considerable post-ductal dilatation of the proximal descending thoracic aorta and moderate isthmic narrowing at the level of the PDA but no aortic stenosis. The pulmonary conus was larger in diameter than the ascending aorta, but the left main pulmonary artery was not grossly dilated. Aortic arch angiography demonstrated fusiform ectasia of the proximal descending thoracic aorta (Fig. 1A), and arising from the anterior aspect of the ectatic segment was a PDA in association with a dilated pulmonary artery (Fig. 1B). Ultrasonography was used to assess the size and patency of both common femoral arteries (CFA) prior to insertion of the stent delivery system. Both arteries were patent, the right CFA measuring 7.6 mm and the left CFA 7.0 mm.

Informed consent was obtained. Under general anaesthesia, the endoluminal stent delivery system was inserted

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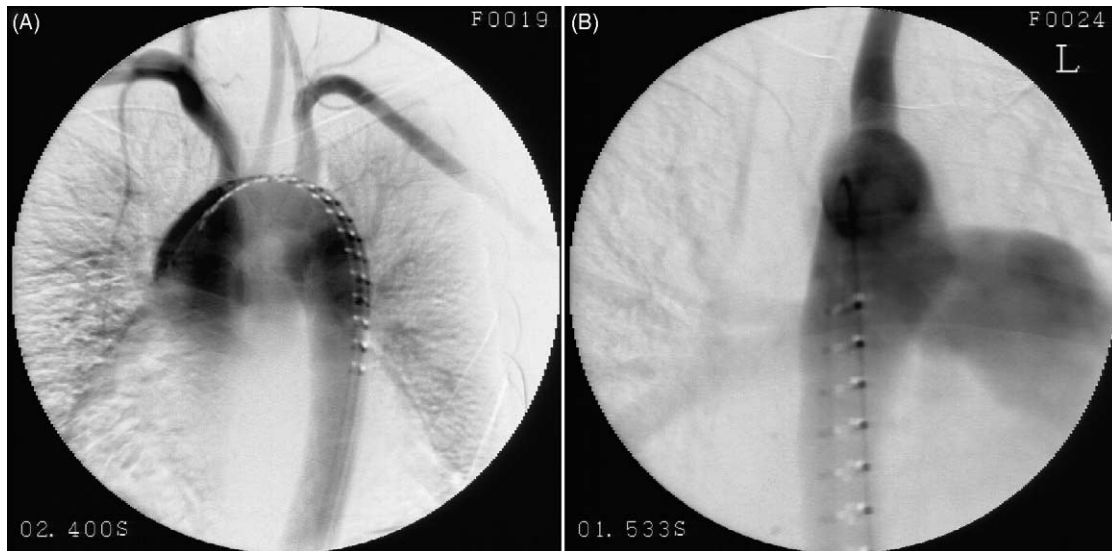


Figure 1. (A) Aortic arch angiogram demonstrating a fusiform ectasia of the proximal descending thoracic aorta. (B) Patent ductus arteriosus arising from the anterior aspect of the ectatic segment in continuity with a dilated pulmonary artery.

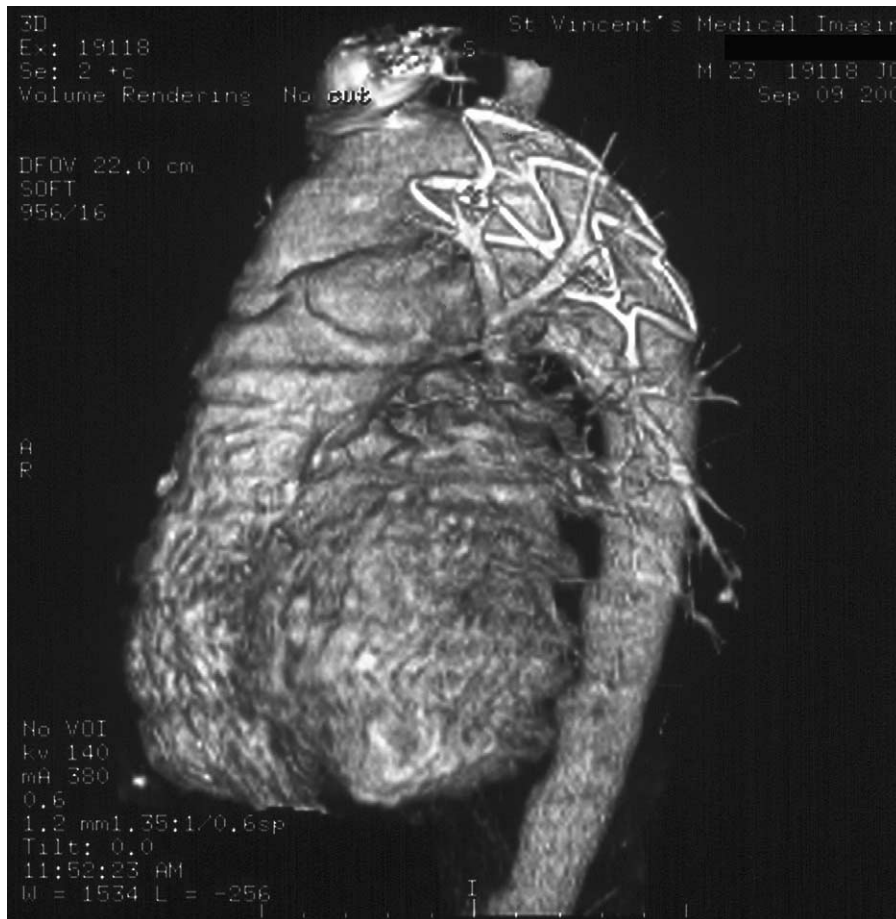


Figure 2. A three-dimensional reconstruction of the heart and aortic arch demonstrating satisfactory stent-graft position and a patent left subclavian artery.

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