CASE REPORT

Persistent root abscess after emergency repair with an aortic homograft

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Abstract

A fifty eight year old man with Marfan's syndrome and an aortic composite graft with a Björk-Shiley mechanical prosthesis presented with a large aortic root abscess caused by *Staphylococcus aureus* endocarditis. Despite extensive surgical

debridement and implantation of an aortic homograft as a composite graft, early postoperative transoesophageal echocardiography continued to demonstrate a large aortic root abscess and the patient died in a septic shock.

(Br Heart J 1994;72:495-497)

Figure 1 Horizontal transoesophageal view showing a huge abscess (bold arrow) that protrudes posteriorly into the left atrium (LA) as well as towards the interventricular septum. RV, right ventricle; LV, left ventricle.

Figure 2 Horizontal transoesophageal view with the transducer withdrawn to the level of the aortic homograft (H). Large abscess masses (small arrows) surround the intact homograft, which is free of vegetations.

Aortic root abscess is a frequent and serious complication in aortic valve endocarditis, affecting about a third of the patients with native valves and more than half of those with prosthetic valves.¹ The abscess is usually caused by *Staphylococcus aureus*.² The diagnosis can be made by Doppler echocardiography, especially transoesophageal echocardiography,³ or less often computed tomography.⁴ Surgical treatment of aortic root abscess, particularly in patients with prosthetic valves, consists of aortic root reconstruction with autologous pericardium² or implantation of an aortic homograft.⁵

Case report

A 58 year old man with Marfan's syndrome presented with a two week history of pyrexia, rigors, weight loss (7 kg), and confusion unrelieved by ambulatory antibiotic treatment. When he was 30 he had had a graft replacement of the ascending aorta because of a true aneurysm. Eight years later, graft dysfunction and progressive aortic regurgitation occurred, necessitating reoperation and implantation of a composite graft with an aortic Björk-Shiley mechanical prosthesis.

On admission the patient was pyrexial (39.2°C) with discrete subungual splinter haemorrhages; blood pressure was 120/80 mm Hg, heart rate 98 beats/min, and respiratory rate 24 breaths/min. A 2/6 grade ejection murmur was heard over the aortic prosthesis.

Staphylococcus aureus was grown in three consecutive broths. The initial electrocardiogram showed sinus tachycardia and first degree atrioventricular block. Transoesophageal Doppler echocardiography showed a large perfused abscess cavity in the posterior aortic root that extended towards the left atrium and the interatrial and interventricular septum, leading to a discontinuity between the aortic root and the composite graft. Emergency surgical repair with a 22 mm aortic homograft was performed.

Figure 3 Posterior half of the heart showing the abscess (A), left atrium (LA), right atrium (RA), interventricular septum (IVS), right ventricle (RV), and left ventricle (LV).

Examination and culture of intraoperative material showed no growth of infectious agents. Transoesophageal echocardiography 2 days postoperatively continued to show a huge abscess cavity extending towards the left atrium and the interatrial and the interventricular septum (fig 1); there was no compression of the homograft and its cusps were free of vegetations (fig 2). Despite these findings the patient's early postoperative course was uneventful with a normal temperature and stable haemodynamic function.

Six days after operation a highly septic state with acute respiratory distress and increasing catecholamine demands suddenly developed. Transoesophageal examination showed further extension of the aortic root abscess towards the left atrium and the interatrial and interventricular septum as well as perfusion of the abscess cavity from the left ventricular outflow tract. The patient died in acute septic shock after rapidly progressive haemodynamic destabilisation. Necropsy examination of the heart confirmed the Doppler echocardiographic findings; there was a large aortic root abscess that penetrated into the interatrial and the interventricular septum (fig 3) as well as extending backwards towards the left atrium; the cusps of the homograft showed no vegetations (fig 4).

Discussion

Acute endocarditis of the aortic prosthetic valve is known to be associated with a high rate of complication and mortality.^{1 2 5}

View of the left ventricular outflow tract showing the aortic homograft (H) and the aortic root (AO). Abscess masses (A) surround the aortic root and penetrate towards the interventricular septum (bold arrow).

Patients with aortic root abscess usually show extension to adjacent structures and dehiscence of the prosthetic valve.¹ Early surgical intervention with scrupulous debridement of all infected material and reconstruction of the aortic root with a homograft or autologous or heterologous patch is the recommended treatment. The use of an aortic homograft has been reported to be particularly promising; Glazier *et al* reported that only two of their 21 hospital survivors had recurrence of endocarditis after homograft aortic root replacement.⁵

Our patient was unusual because transoesophageal echocardiography showed that the abscess persisted for two days after operation. The abscess may have extended

too far into the adjacent structures to permit thorough debridement.

We thank Dr Jakob Schneider, Institute of Pathology, University Hospital, Zurich for providing the prepared specimens shown in figures 3 and 4.

1 Arnett EN, Roberts WC. Valve ring abscess in active infective endocarditis. Frequency, location and clues to clinical diagnosis from the study of 95 necropsy patients. *Circulation* 1976;54:140-5.

2 David TE, Komeda M, Brofman PR. Surgical treatment of aortic root abscess. *Circulation* 1989;80:I 269-74.

3 Mulcahy D, Shapiro LM, Westgate C, Ross DN, Donaldson RM. The diagnosis of aortic root abscess by cross-sectional echocardiography. *Clin Radiol* 1986;37: 235-8.

4 Cowan JC, Patrick D, Reid DS. Aortic root abscess complicating bacterial endocarditis. Demonstration by computed tomography. *Br Heart J* 1984;52:591-3.

5 Glazier JJ, Verwilghen J, Donaldson RM, Ross DN. Treatment of complicated prosthetic aortic valve endocarditis with annular abscess formation by homograft aortic root replacement. *J Am Coll Cardiol* 1991;17: 1177-82.

CORRECTION

The electrocardiogram is a more sensitive indicator than echocardiography of hypertrophic cardiomyopathy in families with a mutation in the MYH7 gene S Al-Mahdawi, S Chamberlain, L Chojnowska, E Michalak, P Nihoyannopoulos, M Ryan, B Kusnierczyk, J A French, D M Gilligan, J Cleland, R Williamson, W Ruzyllo, C Oakley.

We regret that the traces for leads V1 to V6 in an electrocardiogram in fig 2 of this article (*Br Heart J* 1994;72:105-11) were incorrectly mounted during relabelling. The correct version of this trace is reproduced below.