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# An Aortic Root Abscess Presenting as a Suprasternal Pulsatile Mass

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Prosthetic valve endocarditis with aortic root abscess is a serious condition requiring urgent surgical intervention. We present a case caused by an infected Bentall mechanical valve conduit after cardiac surgery in a patient who was referred for a suprasternal pulsatile mass. The patient also had 1 episode of sentinel haemorrhage.

*Key words:* 1. Root abscess
2. Pulsatile
3. Supra sternum

## Case report

A 49-year-old man presented with a pulsatile suprasternal mass of 14 days' duration. He had undergone an emergency Bentall procedure (aortic valve replacement using a 25-mm mechanical bileaflet valve and a 28-mm unigraft) for an acute Stanford type A dissection at another institution. Two months later, he developed fever and breathlessness, requiring hospital admission. An evaluation revealed growth of *Pseudomonas aeruginosa* in blood culture, which was treated with appropriate antibiotics for 6 weeks. In the meantime, he developed a pulsatile swelling in the suprasternal region. He presented to another institution, where he had an episode of sentinel haemorrhage, after which he was referred to Madras Medical Mission Hospital, Chennai. Computed tomography (CT) of the chest revealed an aortic root abscess (ARA) tracking to the suprasternal region (Fig. 1), presenting as a pulsatile swelling.

On admission, the patient was febrile (101°F) and hemodynamically stable. A pulsatile swelling measuring 2×3 cm (Supplementary Video 1) was observed in the suprasternal region, with a horizontal scar in the right infraclavicular region. Blood culture at our institution upon admission was negative. We planned a redo Bentall operation with an aortic homograft. Cardiopulmonary bypass was established through right femoral vessel access electively. Through a left anterolateral thoracotomy in the fifth intercostal space, the left ventricle was vented through the apex. Upon reaching an 18°C core temperature and instituting low-flow cardiopulmonary bypass, a redo sternotomy was done. Upon opening the chest, the Dacron aortic graft was visualised within the pseudoaneurysm and cross-clamped, and full-flow bypass was resumed. The prosthetic graft was transected proximally. Antegrade cold-blood cardioplegia was given through the coronary ostia and repeated intermittently every 20 minutes. The coronary buttons were harvested. The entire Dacron graft, along with the bileaflet mechanical valve, was excised thor-

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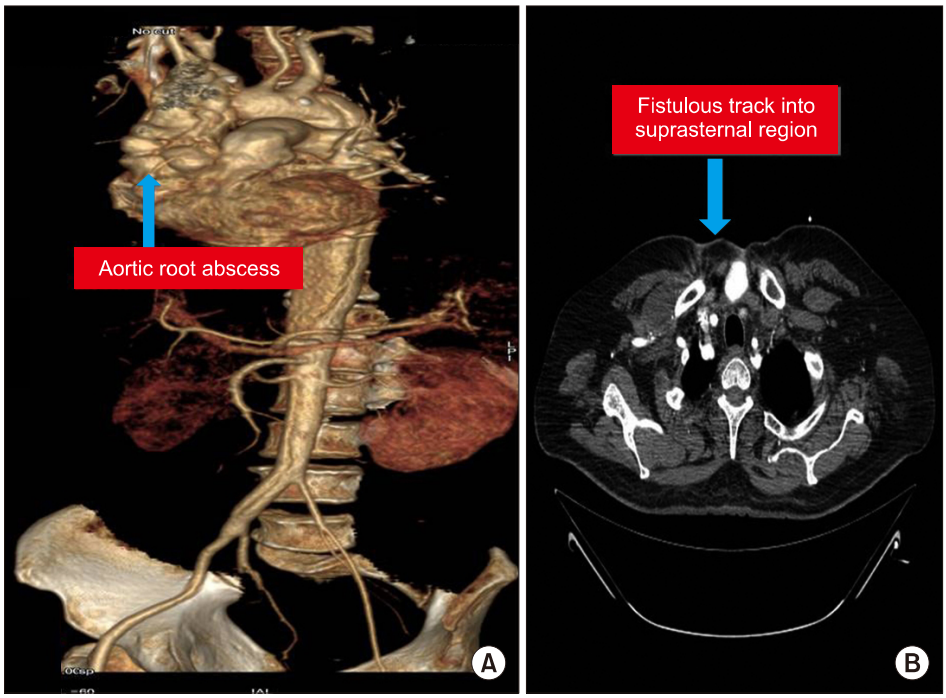


**Fig. 1.** Computed tomography scan showing (A) a reconstructed image of the aortic root abscess and (B) a coronal section showing the fistulous tract.

oughly by sharp dissection and sent for a bacteriologic analysis. A ventriculo-aortic dehiscence was observed posteriorly. The entire aortic root was assessed and reconstructed with a collar of bovine pericardium from the aortomitral curtain and the membranous and musculo-ventricular septum. A 23-mm cryopreserved aortic homograft was sutured to the newly constructed aortic root. Left and right coronary buttons were implanted to the neo-root at appropriate locations independently as Cabrol extensions. The cross-clamp was released under a brief period of circulatory arrest with bilateral antegrade cerebral perfusion through the innominate and left common carotid arteries by means of a Foley catheter from within. The distal aortic anastomosis was completed to the native aorta at the hemi-arch level. The homograft was reclamped after de-airing the arch. Full systemic perfusion was resumed. The aortic cross-clamp was released. The patient was weaned off bypass uneventfully, and discharged in a clinically stable condition on the seventh postoperative day (Fig. 2). The intraoperative specimen grew *P. Aeruginosa*, and the patient was accordingly placed on appropriate intravenous antibiotics for 6 weeks. At a 6-month follow-up, postoperative CT showed an intact geometry with no evidence of ARA (Fig. 3).

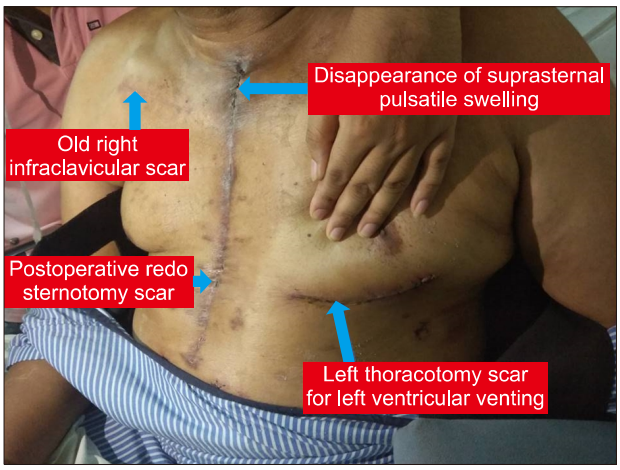


**Fig. 2.** Postoperative scars of the patient.

The written informed consent was obtained from the patient for publishing.

## Discussion

ARA following aortic valve replacement is a devastating complication with high mortality [1]. ARA most commonly presents as cardiocutaneous fistulae in the form of a pulsatile subcutaneous swelling, tracking up to the chest wall, mostly in the lower part of the

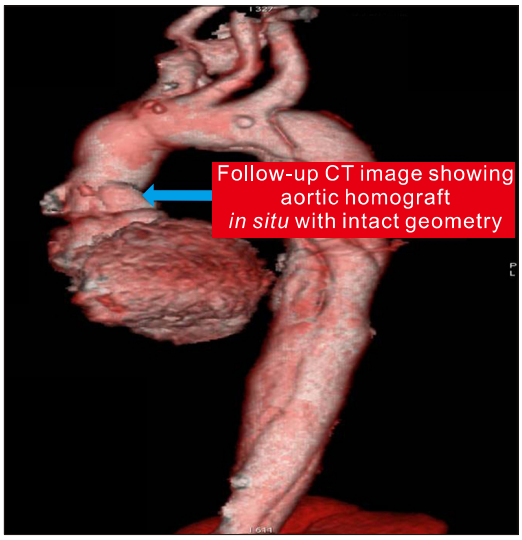


**Fig. 3.** Six-month postoperative follow-up CT scan. CT, computed tomography.

sternum [2]. To our knowledge, the patient presented herein is the first to present with a suprasternal swelling.

The choice of a replacement conduit for ARA requires availability, reasoning, scientific evidence, experience, and appropriate local anatomy after debridement. Some considerations for the ideal graft conduit include: (1) The conduit should be made of viable tissue, as it is resistant against bacterial invasion. (2) Its mechanical properties should include being well-fitting and malleable due to the geometrically irregular plane of the aortic root after debridement. (3) The conduit should be readily available.

The aortic homograft conforms to the shape of the natural aortic root. It has an anterior mitral leaflet (AML), which is very useful for reconstructing the sub-aortic membrane and leaflet if necessary. It has an adequately thick muscle bar/annulus, which gives excellent suture purchase by either continuous or interrupted sutures [3]. Additionally, the epiaortic vessels present in the homograft can be used for fashioning coronary buttons, as in our case. Some operative techniques to be considered while using homografts include: (1) Pericardial strips can be used as haemostatic buttresses between the native and homograft tissue. (2) The AML of the homograft should always be utilised to bridge tissue leaflets. (3) While making sutures, care should be taken not to damage the aortic leaflet. (4) Before tying sutures, an appropriately sized Hegar dilator can be kept across the homograft in order to prevent tissue crimping or bucking [3].

Published reports have indicated that allografts are the ideal material for aortic root replacement [4,5]. The other options are a prosthetic composite graft (PCG), pulmonary autograft, or stentless tissue valve. PCG has superiority in terms of availability, and Leyh et al. [6] have reported that excellent long-term results could be achieved with PCG. In our opinion, some difficulties occur with PCG in obtaining complete tissue adaptation for the destroyed annulus. There are even anecdotal reports of antibiotic penetration into biological tissue, which helps to avoid placing the patient on life long antibiotics [7]. Anticoagulation can also be deferred. In our personal experience, we have found biological tissue to be superior in an environment of macro-purulence.

## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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## Supplementary materials

Supplementary materials can be found via https://doi.org/10.5090/kjtcs.2019.52.3.178. Supplementary Video 1. Pulsatile suprasternal region swelling with previous sternotomy scar.

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