

Intercostal Artery Aneurysm Postcoarctation Repair Diagnosed by Magnetic Resonance Angiography

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A 69-year-old man was referred for investigation of a right upper chest mass. In 1965 he had an aortic coarctation resected with Dacron graft insertion. He remained asymptomatic for the intervening 33 years before presenting with breathlessness on exertion. A chest x-ray showed a right upper lobe mass, and computed tomography showed a descending aorta aneurysm. Cardiovascular magnetic resonance (CMR) imaging, however, demonstrated a huge intercostal artery aneurysm (height 13cm × width 8 cm × depth 12 cm; Fig. 1). Gradient-echo cine imaging identified significant afferent blood flow, and a central core of thrombus and digital subtraction angiography with three-dimensional reconstruction was performed to identify the origin of the vessel. The short proximal segment arose from the descending aorta, distal to the site of coarctation (Fig. 2). Of interest, the operation note in 1965 recorded a 15-mm aneurysm in the first intercostal artery distal to the coarctation segment, though this was resected along with the coarctation segment.

The occurrence of intercostal artery aneurysms in association with aortic coarctation was noted by Cleland et al. in 1956 (1), who expressed surprise at the lack of any reported rupture of these, given the size of the vessel. It was not until 1991 that such a report was published (2). There have been few reports of intercostal artery aneu-

rysms postcoarctation repair (2–6), the most extensive of which is Schuster and Gross' review of 500 cases of aortic coarctation repair (4). Of the 45 (9%) with aneurysms, 37 (82%) were intercostal, 7 (16%) aortic, and 1 (2%) in Abbots artery, an anomalous artery arising from the posterior aortic arch (7). Most intercostal artery aneurysms in this study (91%) occurred at the junction with the aorta, usually distal to the site of coarctation repair, and therefore it is possible that some of these have been mistaken for aortic aneurysms with subsequent under-reporting of their incidence.

Distinguishing intercostal from aortic aneurysms and other chest masses can be difficult, and this is aided by CMR, with its free choice of image planes and range of techniques. Spin-echo imaging has been used to identify this condition previously (8), but angiography, especially with three-dimensional reconstruction, can be particularly useful in identifying the anatomy, as in this case. CMR is increasingly used in the follow-up and review of coarctation repair, and practitioners should be aware of this uncommon, but not rare, complication.

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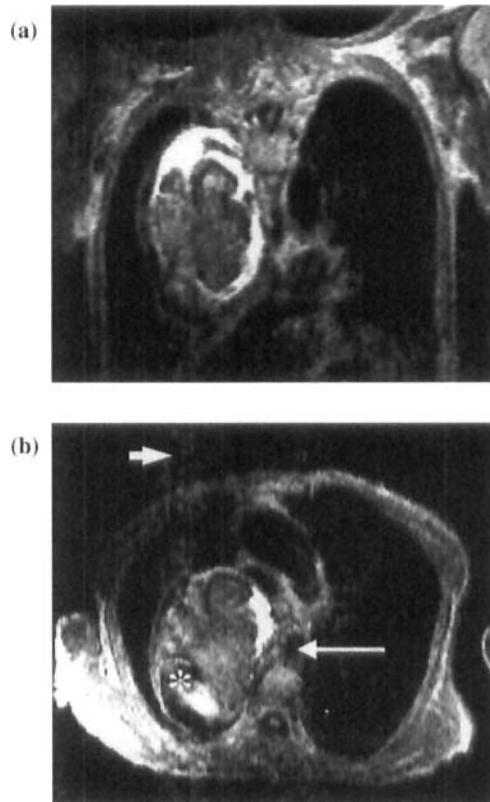


Figure 1. Conventional spin-echo images (TE 40) of the intercostal artery aneurysm. (a) Coronal and (b) transverse view at the level of the aortic arch. The aneurysm is right-sided, posterior, and closely applied to the spine and descending aorta (long arrow). Note the high signal from slow-moving blood, moderate signal from thrombus, and artifact (short arrow) from blood flowing into the posterior section of the mass (*), which propagates across the image in the phase-encode direction.

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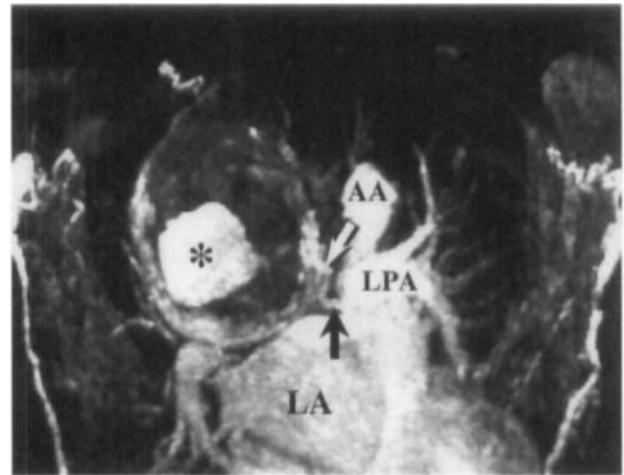


Figure 2. Magnetic resonance angiogram of the intercostal artery aneurysm (coronal view from three-dimensional reconstruction). The origin of the intercostal artery is visible arising from the descending aorta (black arrow) and follows a tortuous course before entering the aneurysm (white arrow). The flowing blood within the aneurysm is also visible (*), surrounded by thrombus. The left pulmonary artery (LPA) overlies the descending aorta in this view. AA, aortic arch; LA, left atrium.

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