

## Large intercostal arteriovenous aneurysm: successful surgical correction

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**Swank, M., Lepley, D., Jun., Mullen, D. C., Flemma, R. J., Bonchek, L. I. (1978). Thorax, 33, 406-408. Large intercostal arteriovenous aneurysm: successful surgical correction.** A large aberrant systemic artery to superior vena cava communication associated with normal lungs and normal pulmonary arteries has never been reported. This lesion, its diagnosis, and successful surgical management are discussed.

Several cases (Maier, 1954; Ferencz, 1961) of large systemic arteries supplying a hypoplastic lung with venous drainage to the superior vena cava (SVC) have been described but in each case the pulmonary arteries were small or absent. A retrospective search and review of the *British Anatomical Record* failed to find a case report of a large aberrant systemic artery to superior vena cava communication associated with normal lungs and normal pulmonary arteries. Our case demonstrates this interesting lesion, its diagnosis and surgical management.

### Case history

An 18-year-old white youth had been noted to have an asymptomatic harsh murmur along the left sternal border and scapular area at the age of 7 years.

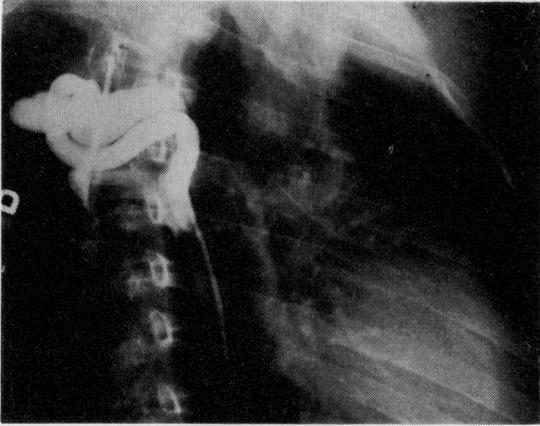
Cardiac catheterisation failed to show the suspected patent ductus arteriosus, and no other lesions were found. The presence of an arteriovenous fistula somewhere in the thoracic cavity or mediastinum was suspected.

The patient remained asymptomatic, but because of a persistent murmur he was recatheterised in January 1977. A chest radiograph showed a soft tissue density in the right paratracheal region. On physical examination he was found to have a regular sinus rhythm with a blood pressure of 130/70 mmHg in both arms. A grade IV/VI continuous murmur along the left sternal border radiated into the axilla and left scapular area. First and second heart sounds were normal. The

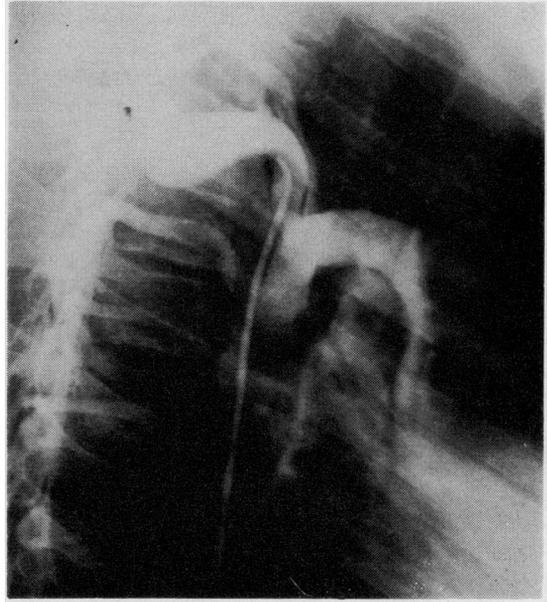
remainder of the physical examination was unremarkable.

Catheterisation and angiography showed the lesion illustrated in Figs. 1, 2, and 3. A large aberrant systemic artery arose from the descending thoracic aorta about 6 cm distal to the origin of the left subclavian artery. It followed a cephalad, posterior course communicating with an enlarged upper right intercostal vein that emptied into the azygos vein and thence into the superior vena cava. The large opacified area was thought to be an intercostal arteriovenous aneurysm. A left-to-right shunt of 1.5-1 was calculated with a cardiac output of 10.7 l/min. Oxygen saturation in the superior vena cava was 89%. Saturation in the inferior vena cava was 84% and in the right ventricle 82%. All intracardiac pressures were normal.

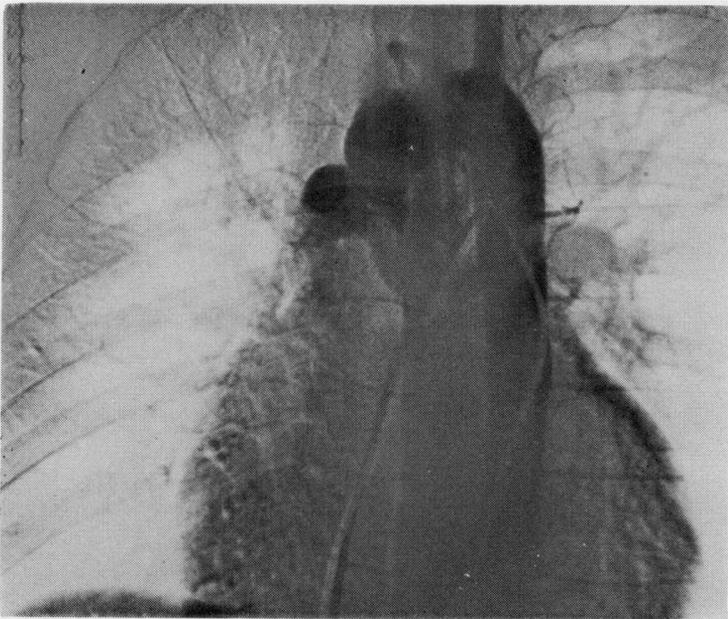
The patient was prepared for elective ligation of the arterial side of this large arteriovenous communication. The lesion was approached via a standard left posterolateral thoracotomy. The aberrant arterial branch of the descending aorta arose posterolaterally about 6 cm distal to the left subclavian artery. It was about 1.5 cm in diameter and coursed superiorly and posteriorly (Fig. 4). There were no other abnormalities. The artery was tied and suture-ligated without difficulty (Fig. 5). Complete collapse of the vessel was noted, indicating no other significant arterial source. No murmur was heard in the immediate postoperative period. The patient had an uneventful postoperative course and was discharged on the seventh day after operation.



**Fig. 1** *Catheter positioned at origin of systemic artery shows its connection with an 'aneurysmal' venous lake superiorly.*



**Fig. 2** *Superior vena cava is filled after contrast material empties from intercostal arteriovenous aneurysm via azygos vein.*



**Fig. 3** *Subtraction film shows point of origin (posterolateral aorta 6 cm distal to left subclavian) and course of aberrant systemic artery.*

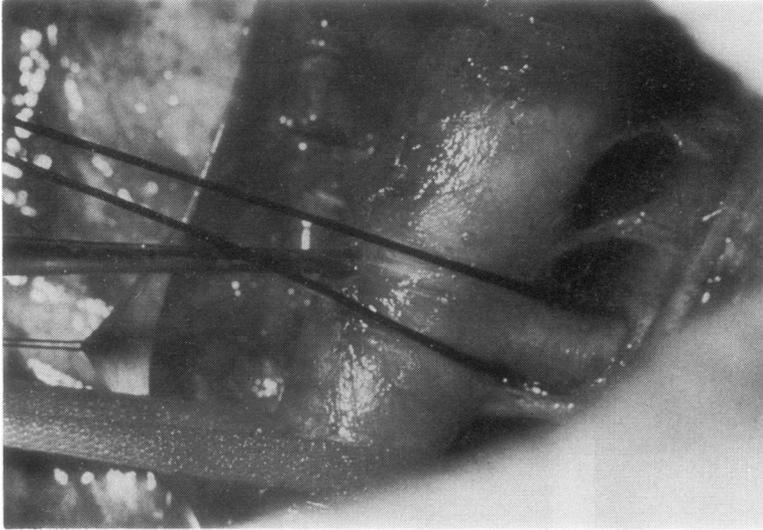


Fig. 4 Black silk is around aberrant artery posterolaterally just superior to a large intercostal artery. Tape is inferior and aorta is rotated medially.



Fig. 5 Artery is suture-ligated at its posterolateral origin 6 cm distal to left subclavian artery. Tip of clamp is cephalad.

This unusual case illustrates two points: (1) with present-day catheterisation techniques it should be possible to define accurately any persistent, continuous murmur so that a properly planned surgical procedure can be carried out; and (2) in the case of a large aortic to vena caval communication with aneurysmal venous lakes, simple ligation of the arterial side of the fistula without dissection of the angiomatous venous plexus is the procedure of choice.

#### References

- Ferencz, D. (1961). Congenital abnormalities of pulmonary vessels and their relation to malformations of the lung. *Pediatrics*, **28**, 993–1010.
- Maier, H. C. (1954). Absence or hypoplasia of a pulmonary artery with anomalous systemic arteries to the lung. *Journal of Thoracic Surgery*, **28**, 145–162.

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