

# Unusual arm collateralisation post classical Blalock–Taussig shunt revealed post haemoptysis

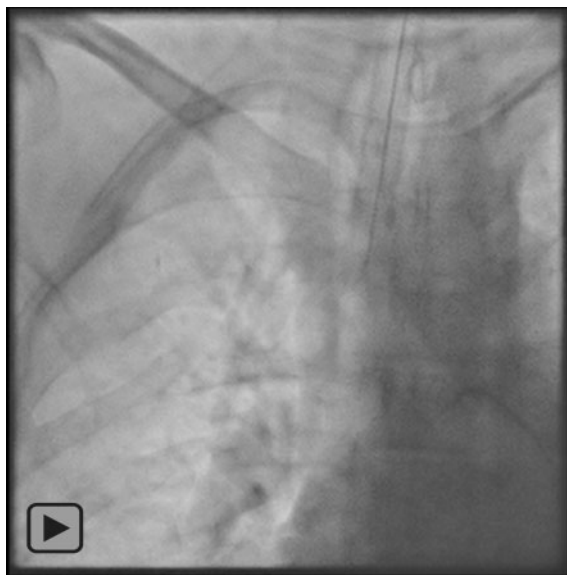
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A 46-year-old woman presented with sudden haemoptysis. On arrival, she was distressed, unable to maintain her airway, with blood pressure dropping less than 80 mmHg systolic and blood gas revealing respiratory acidosis (pCO<sub>2</sub> 13.5 kPa, pH 6.97 with normal lactate and pO<sub>2</sub>). She underwent emergency intubation, ventilation, and inotropic support commenced. A relative reported a prior history of congenital heart disease with neonatal and childhood operations. On

examination, a right lateral thoracotomy scar was seen, consistent with neonatal classical or modified right Blalock–Taussig (BT) shunt, in addition to a midline sternotomy scar. The left radial pulse was good and switching radial arterial line from right to left revealed normal blood pressure (peak systolic changing from 85 to 180 mmHg). Admission chest radiograph and computed tomography (CT) pulmonary angiogram with CT aortography two days later (*Figure 1*) suggested the right upper lung was the bleeding source. A tied-off BT shunt and anomalous vessel from the descending aorta was seen.



**Video 1** Angiography of anomalous aortic vessel in anteroposterior projection, panning laterally revealing it reforming the axillary artery.



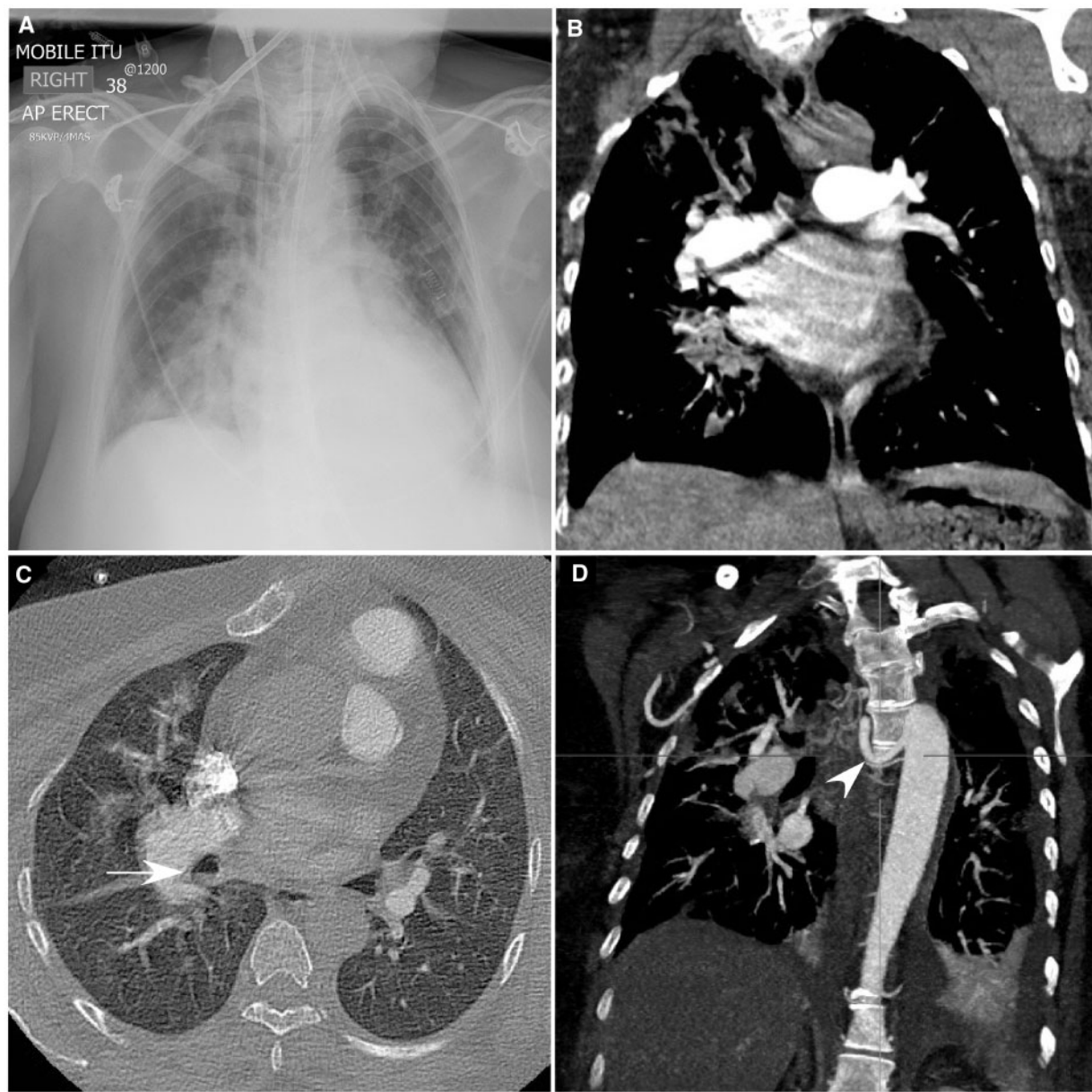
**Video 2** Angiography of tied-off classical BT shunt and right internal carotid artery in anteroposterior projection revealing no head and neck vessel collateralisation of axillary artery.

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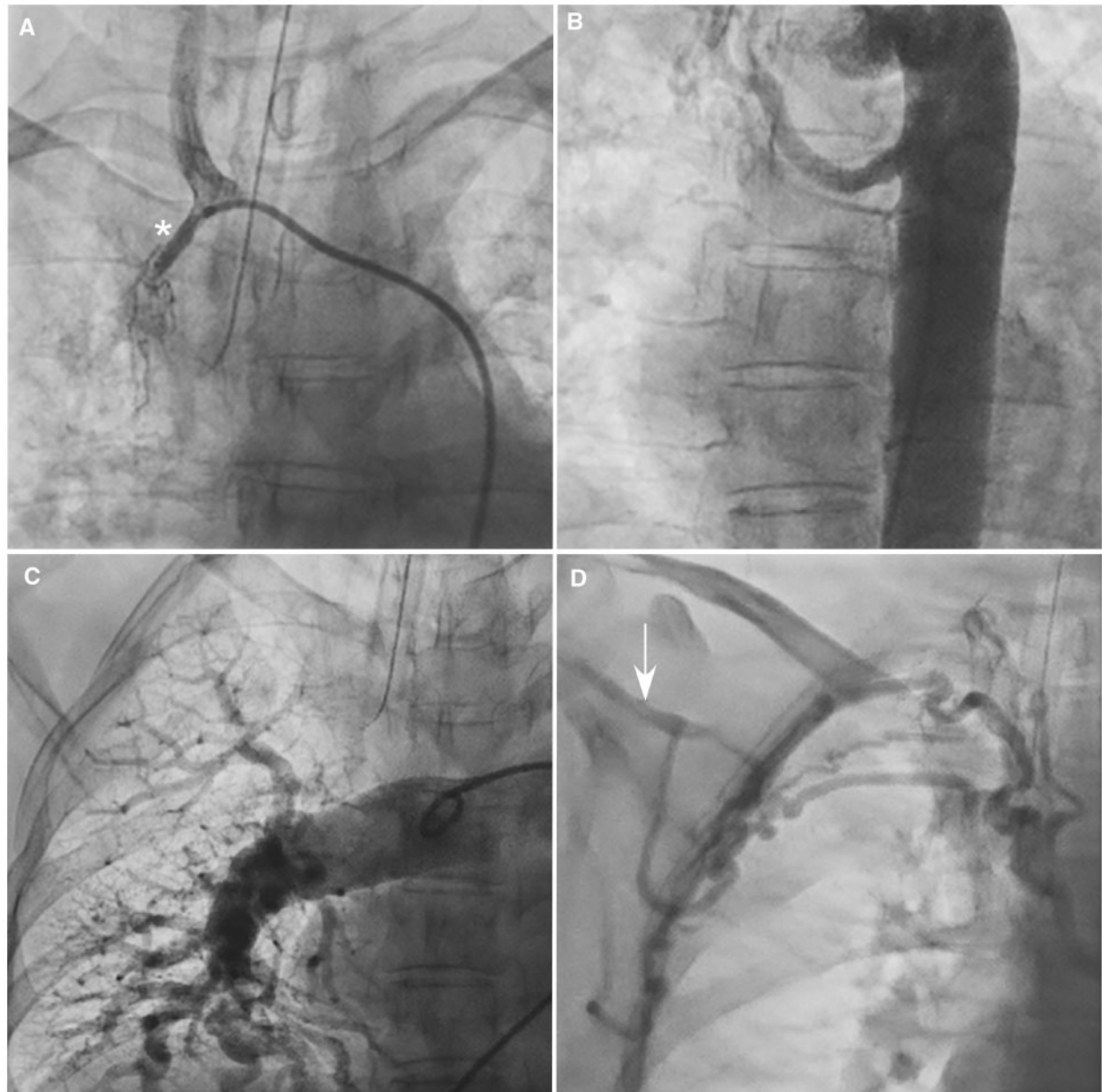


**Figure 1** Chest radiograph, computed tomography (CT) pulmonary angiogram and CT aortogram. Anterior–posterior chest radiograph (A) showing water dense opacification particularly in the right lower lobe consistent with haemorrhage. Coronal CT slice showing diffuse haemorrhage in right and left lungs, most pronounced in the right upper and lower lobe (B) and horizontal slice showing blood fluid level in the right bronchus intermedius (C, arrow). CT aortogram two days later showing possible major aortopulmonary collateral (arrowhead) and bibasal effusion/consolidation. The Blalock–Taussig shunt was seen as a small vessel off the innominate artery (not shown).

Bleeding settled without intervention, ventilation was weaned with lung consolidation treated with Tazocin antibiotic cover. Subsequent history confirmed previous BT shunt and childhood Tetralogy of Fallot repair.

Right and left heart catheterization was performed after one week with pulmonary and aortic angiograms (Figure 2), revealing a classical right BT shunt tied distally (A,\*). Descending aortography showed a large vessel ascending towards the lung apex (B). Pulmonary arterial arborization seemed normal (C).

The classical BT shunt was discounted and investigation performed of the anomalous vessel. Branches were followed laterally (D, Video 1). Panning out to the arm, in the axilla, these merged forming the right axillary artery (arrow). No head/neck collaterals descended to the arm (Video 2). Occlusion of the anomalous vessel would stop right arm blood supply, the axillary artery reforming from these intercostal vessels. On 2 year expectant follow-up, there were no further events, original



**Figure 2** Angiography of Blalock–Taussig shunt, descending aorta, right pulmonary artery, and anomalous vessel. Right subclavian artery angiogram revealed a small classical right Blalock–Taussig shunt, tied distally (A,\*). No distal subclavian artery was seen. Descending aortogram revealed a large artery ascending towards the right lung apex (B). Right pulmonary angiogram suggested normal arborisation (C). Anomalous vessel angiography laterally revealed it reformed the axillary artery (D, arrow). Patient was intubated, arms raised in case biplane angiography was needed.

haemoptysis likely being secondary to infection or small arteriovenous malformation.

Care is required in patients with previous BT shunts regarding arm arterialisation. Aortic access from the radial access site is not possible with pressure attenuation on radial arterial cannulation and arm arterialisation can arise from unusual routes.

**Consent:** The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

**Conflict of interest:** none declared.