Spontaneous expectoration of a Blalock-Taussig shunt a decade after operation

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ABSTRACT

An eleven-year-old boy expectorated a foreign body in cough that was identified as the prosthetic graft used for a Blalock-Taussig shunt. The shunt procedure was done 10 years earlier, and a definitive repair for tetralogy of Fallot was done a year later. He had no other symptoms, and a computed tomography (CT) angiogram did not reveal any other significant anomaly. The reason for this extremely rare event is unclear.

Keywords: Blalock-Taussig Shunt, foreign body, tetralogy of Fallot

INTRODUCTION

Expectoration of a foreign body in cough can be quite alarming and baffling, although well reported. Pieces of bullets, surgical staples, gallstones, and tumor masses[1-4] have been recovered with cough and the diagnosis become clearer in the light of the patient's clinical profile and the past history. However, expectoration of a prosthetic graft used in the cardiac surgical procedure years earlier is extremely rare. We document such an occurrence in an asymptomatic child.

CASE REPORT

An eleven-year-old boy presented for cardiac consultation with a foreign body that he had coughed up a week earlier. He reported a sudden bout of cough that brought out this unusual material, which was blood-tinged but denied any history of significant hemoptysis, fever, or chest discomfort. There was no recurrence of symptoms and he did not seek any further medical attention locally. The foreign body was the entire prosthetic vascular graft [Figure 1] with sutures at either end and was easily identified as the graft of a Blalock-Taussig (BT) shunt.

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The patient was diagnosed to have tetralogy of Fallot (TOF) at birth and had undergone BT shunt procedure for recurrent spells at the age of nine months. Subsequently, corrective surgery for TOF was done at the age of 2 years. The BT shunt was occluded by ligating in the middle, as is routinely done at the time of corrective surgery. At the postoperative follow up 6 months later, right pulmonary artery stenosis was identified that required a balloon dilatation with relief of gradients. The right ventricular systolic pressure fell to 60 mmHg (from 100 mmHg), and the relief was maintained at further evaluation 6 months later. The patient was lost to follow up thereafter, but was asymptomatic until the present episode. His present physical examination showed heart rate of 84 /min, blood pressure 100/70 mmHg, and a precordial ejection systolic murmur. The chest X-ray showed cardiomegaly, dilated pulmonary artery segment, and normal lung fields. The echocardiogram was consistent with the postoperative TOF but showed significant pulmonary regurgitation, mild tricuspid regurgitation, smaller right pulmonary artery, and mild right ventricular dilatation and dysfunction.

A CT angiogram documented normal right subclavian artery, smaller but normal right pulmonary artery with no focal stenosis, or pseudoaneurysm. There was no pneumomediastinum, any soft tissue shadow, or evidence of inflammation in the lungs. [Figure 2] A doubtful irregularity in the right upper bronchus was noted in light of his history, [Figure 3] but airways were generally unremarkable.

No active intervention was done.

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Figure 1: The entire prosthetic graft of Blalock-Taussig shunt expectorated by the patient

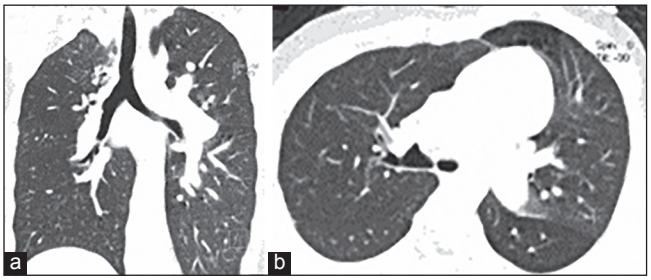

Figure 2: (a) Oblique coronal view. (b) Axial view of chest CT, lung window, showing normal lung parenchyma. No cavity, consolidation were seen

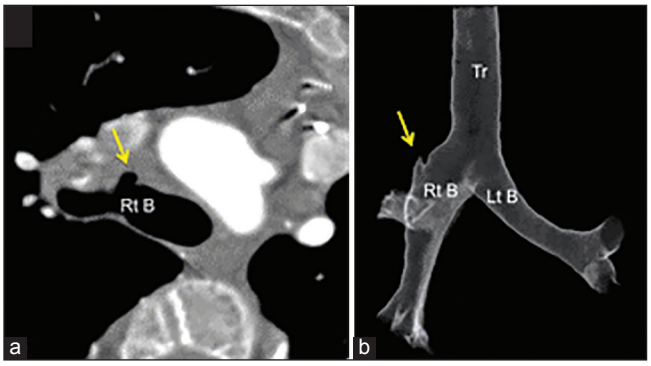

Figure 3: (a) Oblique axial view of CTA. (b) Virtual bronchoscopy reformat image, anterior oblique projection view, showing a small air-filled diverticular out pouching (yellow arrow) arising from the anterosuperior wall of the right main bronchus (RtB) and is directed anteriorly and superiorly. (Lt B, left main bronchus; Tr, trachea)

DISCUSSION

That a BT shunt can be expectorated spontaneously seems improbable, but happened in this child. In fact, 4 similar cases have been reported in the literature to the best of our knowledge.[5-8] Carell *et al.*, reported an identical case of spontaneous expectoration of a BT shunt graft without infection, hemoptysis, or other symptoms nine years after the BT shunt surgery.[5] The patient reported by Rumman *et al.* presented with hemoptysis 14 years later and had undergone pneumonectomy previously.[6] He also did not require active management after the expulsion of the shunt. The other 2 patients presented 4 years after the operation, and in both of these cases, a foreign body was removed bronchoscopically that was found to be the migrated BT shunt eroding the bronchus.[7,8]

The complications of a BT shunt include thrombosis, anastomotic stenosis, subclavian or pulmonary artery pseudoaneurysm, pulmonary artery distortion, seroma, and infection. The inability of the graft to grow with the growth of the patient is a disadvantage, and whether it played any role in the spontaneous migration of the graft years later is conjectural. All reported cases had shunt expulsion several years later. As such, the mechanism of BT shunt migration in all cases remains unclear. In one case, infection around the graft and pressure necrosis of the bronchus with growth was incriminated,[7] and pneumonectomy stump was thought to have facilitated the expulsion in another.[6] Fortunately, the expulsion in our case and in 2 of other reported cases also, was almost "uneventful" after the initial fright.[5,6] The outcomes in all cases have been remarkably excellent. Thus, a vascular conduit can migrate and erode the bronchus without the presence of psedoaneurysm, host artery occlusion, or severe bleeding.[5-8] , Whether any technical factor was common to these reported cases of BT shunt migration is not known.

In conclusion, we document an extremely unusual occurrence of spontaneous expectoration of a BT shunt in an asymptomatic child a decade after the original operation.

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