Case report

Management of aortobronchial fistula following coarctation repair

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Abstract

Aortobronchial fistula is a rare complication following thoracic aortic operations and is invariably fatal if not promptly diagnosed and repaired. Direct prosthetic repair carries a risk of graft repair sepsis and fistula recurrence. We describe two cases presenting with aortobronchial fistula following coarctation repair which were successfully treated by different surgical approaches. © 2002 Published by Elsevier Science B.V.

Keywords: Aortobronchial fistula; Coarctation repair

1. Introduction

Aortobronchial fistula is a rare entity resulting in exsanguinating haemoptysis and is fatal if the diagnosis or the surgical intervention is delayed. The commonest cause of aortobronchial fistula is chronic thoracic aorta aneurysm and it is also a complication of surgical repair [1,2]. Aortobronchial fistula may also occur as a complication following surgical correction of coarctation [3–5]. Surgical management involves aortic suture repair or replacement with a graft. However, as a consequence of inflammation and infection, there is a potential for graft infection and erosion leading to recurrence of the fistula. We report two cases of aortobronchial fistula presenting 11 and 30 years after the surgery of aortic coarctation and describe the operative technique used for the repair.

2. Case reports

2.1. Case 1

A 54-year-old man presented with a history of recurrent haemoptysis and left sided chest pain of 2 months duration, 11 years after repair of coarctation of the aorta with a diamond shaped prosthetic patch. This first operation was complicated by bleeding requiring revision of the patch anastomosis and resulted in transient paraparesis. On representation the chest roentgenogram and CT scan were suggestive of thoracic aortic aneurysm with no clear-cut evidence of aortobronchial fistula. A bronchoscopy revealed the entire left bronchial tree to be pulsatile and blood was noted in the left main and left lower lobe bronchi. No discrete fistulous communication could be identified. Operation was carried out through a left fourth interspace thoracotomy extending across the sternum into the right third intercostal space. There was a false aneurysm containing clot overlying the previous patch repair. After disturbing the aneurysm, an ascending to descending aorta extra-anatomic conduit was constructed using a 24 mm gelatin impregnated polyester (Sulzer Vascutek UK) graft routing it anterior to the hilum. After this the lung was mobilized from the aorta and proximal and distal control of the involved aorta was achieved. After clamping, attention was diverted to the aneurysm, which revealed a fistula extending into the superior bronchus of the left lower lobe. The false aneurysm was evacuated of thrombus, foreign material excised and the aortic defect closed with 3-0 prolene suture. This undoubtedly stenosed the aortic lumen, but lower body perfusion was safeguarded by the previously constructed extra-anatomic conduit. The left lung was debrided of all necrotic and foreign material and the bronchus repaired with 4-0 prolene suture. Following this the omentum was mobilized through the separate laprotomy incision and delivered to the mediastinum. An interposition omentoplasty was performed between the bronchial tree and aorta overlying the fistula repair site to prevent any fistula recurrence. The patient recovered without any complication and was discharged 12 days later. He has been on regular follow-up and the latest CT scan 10 years later.
after this repair shows patent conduit and native descending aorta (Fig. 1).

2.2. Case 2

A 52-year-old man presented with acute onset of left sided chest pain and severe haemoptysis. He had undergone repairs of aortic coarctation at the ages of 13 and 22 years by patch aortoplasty. The second operation was complicated by paraparesis and transient cortical blindness, resolved substantially at the current admission. Chest radiograph was suggestive of large distal arch aneurysm and digital subtraction angiography through the right brachial approach confirmed a normal calibre aorta with a large false aneurysm (Fig. 2). Bronchoscopy demonstrated severe compression of the left main bronchus, consistent with the diagnosis, although there was no blood in the bronchial tree. A left posterolateral thoracotomy was performed through the fourth intercostal space extended transternally into the right third space. There was a large pseudo-aneurysm in the region of the distal arch due to the disruption of the previous patch. The aneurysm was eroding into the adjacent lung. Cardiopulmonary bypass was instituted by right atrial and ascending aorta cannulation and repair done during one period of hypothermic circulatory arrest, as proximal aortic clamping was not possible. The aneurysm was opened and after identifying the proximal and distal opening in the aorta, an 18 mm gelatin impregnated polyester graft was interposed between the distal arch and proximal descending aorta. The left internal mammary artery pedicle was then mobilized from the chest wall and wrapped around the graft within the pseudo-aneurysmal sac which was approximated over the graft. The patient had an uneventful postoperative course and was discharged home on the eleventh day. This patient too has been on regular surveillance and the last CT scan 3 years later reveals a patent graft and no aneurysmal formation.

3. Discussion

Aortobronchial fistula is a rare but often lethal complication of thoracic aortic aneurysms or their repair [1]. Aortobronchial fistula usually results from a communication between the pseudo-aneurysm formed at the site of previous surgery on the aorta and the tracheobronchial tree and lung parenchyma. It may occur more than a decade after the successful surgery and presents with intermittent episodes of haemoptysis [5]. The aetiology of the aortobronchial fistula appears to be secondary to ongoing local inflammation and infection with erosion of the aneurysm or the suture line into the adherent lung parenchyma [2,6]. The correct preoperative diagnosis is made in over 50% of cases and suspicion of aortobronchial fistula should be maintained in any case with haemoptysis and history of surgery on the thoracic aorta [6]. Surgical intervention can be successful in the majority of patients with aortobronchial fistula but requires careful planning [7].

The principles of surgery include control of the airway using a double lumen tube, maintenance of distal perfusion, aortic repair or replacement and repair of the pulmonary defect. The various procedures described include direct aortic repair [1], resection with the graft replacement [1,8] and extra-anatomic bypass graft with resection of the involved aorta [9]. The technique of choice will depend upon the individual anatomy but should include appropriate steps to maintain distal perfusion. It appears essential that
all infected native and prosthetic material should be excised and that a viable autologous biological barrier should be inserted between the repaired aorta and the debrided lung to avoid fistula recurrence [7]. This barrier may be pleura, diaphragm, a vascularized intercostal or internal thoracic artery pedicle, omentum or non-infected residual aneurysm sac. Xenograft pericardium has also been used but may be less than ideal [10].

References