Case Report

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Video-assisted thoracoscopic double lobectomy for bronchiectasis: A case report and literature review

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ABSTRACT

Although thoracoscopic lobectomy for severe bronchiectasis has been reported in children, this is the first report of double lobectomy of the right middle and lower lobes performed using the video-assisted thoracoscopy in a 9-year-old girl. The post-operative course was uneventful and she is currently well after 18 months' follow-up.

Key words: Bronchiectasis, children, double lobectomy, video-assisted thoracoscopy

INTRODUCTION

Bronchiectasis causes severe, chronic destruction of the major airways, with a chronic aspiration, cystic fibrosis, tuberculosis and necrotizing lung disease being the most common causes.[1] It often spreads to previously unaffected lung, even contralaterally. Complete surgical excision of the involved segment is thought to arrest progression and may result in improved oxygenation. Although, thoracoscopic lung resection is now a well-established technique in children,[2,3] one of the most difficult and complicated thoracoscopic procedures is lobectomy. There is one series of thoracoscopic lobectomies performed for patients with severe bronchiectasis confined to a single lobe in the literature.[4] However, despite recent advances in technology and technique, thoracoscopic double lobectomy has yet to be described in children.

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Here, we report a successful case of double lobectomy of the right middle and lower lobes for bronchiectasis using video-assisted thoracoscopy (VATS).

CASE REPORT

A 9-year-old girl was admitted because of recurrent cough and high fever. Computed tomography of the chest identified bronchodilation and chronic pneumonia of the right middle and lower lobes [Figure 1]. Bronchiectasis was diagnosed and the thoracoscopic lobectomy was planned. General anaesthesia was induced with a left mainstem endobronchial intubation with a cuffed endotracheal tube and the appropriate monitoring. Under single lung ventilation, she was placed in the left lateral decubitus position. Thoracoscopy was commenced using two 5 mm trocars and one 12 mm trocar. The 12 mm trocar was an inserted in the seventh intercostal space in the anterior axillary line. The two 5 mm trocars were placed as follows; one in the posterior axillary line in the fifth intercostal space and the other in the sixth intercostal space on the ventral side of the anterior axillary line. Because enlarged lymph nodes were found severely adhered to the pulmonary artery and vein, a 6 cm minithoracotomy was performed in the sixth intercostal space in the mid-axillary line. The lung was retracted effectively with a pair of laparoscopic forceps inserted through one of the trocars. A4, A5, and V4 + 5 were freed, divided and ligated through the minithoracotomy, while A6 and A7-10 were divided en

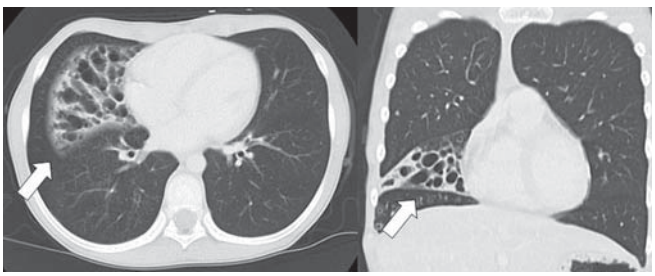


Figure 1: Computed tomography scan of the chest identified bronchodilation and chronic pneumonia of the right middle and lower lobes

bloc with an articulating 35 mm linear cutter (Ethicon Endo-Surgery, Cincinnati, OH). The right inferior pulmonary vein was also divided with an articulating linear cutter. Bronchus distal to the upper lobe branch bronchus was divided by using an ENDO GIA 30 mm vascular stapler (Ethicon Endo-Surgery, Cincinnati, OH), thus completing the double lobectomy of the right middle and lower lobes. A chest tube was placed, but removed the next day because there was no air leak noted. The patient was discharged home on day eight post-operatively in a stable condition and she has been well for 18 months' follow-up. Histopathology revealed bronchiectasis of both lung lobes.

DISCUSSION

Children with bronchiectasis most often present with a chronic production of excessive sputum. The condition is progressive, either due to continued cross contamination from infected sputum or from some other cause, such as recurrent aspiration or chronic sinusitis,[5] and patients can develop pneumonitis or chronic hypoxia and often require supplemental oxygen therapy.[1] Pre-operative work-up should include assessment to exclude other causes of pulmonary parenchymal destruction to ensure that the lungs have the best chance to function normally after surgery.

The safety and efficacy of thoracoscopic lung resection in children[6,7] has been reported and at several institutions it is performed routinely for patients ranging in size from 3 kg neonates to full-size teenagers. However, the majority of these patients had congenital cystic lung disease, many of whom were diagnosed *in utero*; thus, they tended to be in good health and in the majority, not suffered any significant pulmonary infection. The advantage of pulmonary resection for treating chronic bronchiectasis has also been reported;[8] however, lobectomy is technically more difficult in these patients, especially, when there is a history of chest infections because the lung parenchyma is friable and fissures can become fused. Thus, dissection is more difficult, as evidenced by the longer average operating times and increased the blood loss in bronchiectasis patients.[4] It is generally recommended that the pulmonary artery should be ligated and divided prior to the ligation of the pulmonary vein to prevent lung congestion. However, in our case, there was a thickened fused fissure and enlarged lymph nodes attached to the pulmonary artery. We, therefore, decided to ligate and divide V4 + 5 first, allowing A4 and A5 to be divided safely. Bronchiectasis can be associated with varying degrees of anatomic disruption and ligation/division should be individualised.

Table 1: Thoracoscopic lobectomy for bronchiectasis

Author	Number	Procedure
Pu	9	SL
Rothenberg	19	SL
Garrett-Cox	4	SL
Anselmo	1	P
Glinjongol	1	SL
Our case	1	DL

SL: Single lobectomy, P: Pneumonectomy, DL: Double lobectomy

There are several reports of thoracoscopic lobectomy for bronchiectasis in the literature [Table 1]. Pu *et al*. reported 9 cases treated by VATS from May 2006 to December 2009 and concluded that their treatment is feasible and safe.[9] Rothenberg *et al*. reported their experience of thoracoscopic lobectomy for the treatment of severe bronchiectasis confined to a single lobe,[4] treating 19 cases with severe bronchiectasis between July 1994 and August 2008. Although no case required conversion to thoracotomy, they concluded that thoracoscopic lobectomy for severe bronchiectasis with recurrent infection is technically challenging, but appears to be safe and effective. Garrett-Cox *et al*. reported on their early experience of paediatric thoracoscopic lobectomy for 4 patients with bronchiectasis at two UK centres between February 2000 and November 2005.[10] Anselmo *et al*. described a case of thoracoscopic pneumonectomy in a 9-year-old female with severe bronchiectasis.[11] Glinjongol *et al*. reported their experience of and advantages of diagnosing and managing intrathoracic disease by using a non-trocar VATS technique.[12] One of their case was a patient with bronchiectasis in whom their technique was reported to be safe and effective. All these reports involve single lobectomy or total pneumonectomy only.

To the best of our knowledge, we are the first to report double lobectomy for treating bronchiectasis in the right middle and lower lobes using the VATS. We found the procedure to be a safe, technically feasible approach for treating severe bronchiectasis in two lobes of the lung in a child.

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