Thoracoscopic resection of mediastinal bronchogenic cysts in adults

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Abstract

Objective: Bronchogenic cysts are uncommon congenital anomalies of foregut origin usually located within the mediastinum and the lung and rarely diagnosed in adults. Surgical excision is recommended to establish diagnosis based on histologic examination, alleviate symptoms if present, and prevent future complications. Thoracoscopic approach is becoming the primary therapeutic option.

Methods: Between January 1995 and July 2008, 30 patients with mediastinal bronchogenic cyst (MBC) underwent thoracoscopic operation (19 male, 11 female with a mean age of 39 years, range 19—59 years). Symptoms were present in 11 patients (37%). Results: The cysts averaged 5.2 cm in their greatest diameter (range 3—10.5 cm). In two cases thoracoscopy was converted to thoracotomy because of major pleural adhesions. There were no operative deaths and no intra-operative complications. Postoperative course was uneventful in all cases and the 28 patients who underwent thoracoscopy were discharged after a mean of 3.7 days (range 2—5 days). Conclusions: Considering the low conversion and complication rate, thoracoscopic excision of bronchogenic mediastinal cyst should be considered the primary therapeutic option.

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Keywords: Video-assisted thoracoscopy; Bronchogenic cyst; Mediastinum

1. Introduction

Bronchogenic cysts are congenital lesions thought to originate from the primitive ventral foregut and may be mediastinal, intrapulmonary, or, less frequently, in the lower neck. Approximately two-thirds are within the mediastinum, and one-third are intraparenchymal [1,2]. They account for 40—50% of all congenital mediastinal cysts, and there is a slight male predominance. The true incidence of bronchogenic cysts is unknown presumably because most patients are asymptomatic. However, once the condition is diagnosed, surgical excision is indicated either to relieve clinical symptoms, or because of enlarging cysts or to prevent possible complications, such as infection, malignent transformation, tracheal compression, superior vena cava syndrome or hemoptysis [3,4]. The complete excision of the cyst is the gold standard and recurrence is extremely rare. Since 1991 thoracoscopic resection of bronchogenic cysts has been published in numerous reports and thoracoscopy is becoming the primary surgical option [5—7]. We describe our experience with thoracoscopic excision of mediastinal bronchogenic cysts and long-term follow-up recorded over the last 13 years. (Fig. 1)

2. Materials and methods

Between January 1995 and July 2008, 30 patients with mediastinal bronchogenic cyst (MBC) underwent the operation (19 male, 11 female with a mean age of 39 years, range 19—59 years). Symptoms were present in 11 patients (37%) including cough (n = 4), pain (n = 5) and dysphagia (n = 2). In the remaining patients the surgical indication was increase in cyst size (n = 5), patient’s request (n = 10) and histology clarification (n = 4). Preoperative evaluation included chest X-ray, fiber-bronchoscopy and computed tomography (CT) or magnetic resonance imaging (MRI). Esophagoscopy was performed in five patients and esophageal compression was documented in three cases. After double lumen intubation, with the patient in lateral decubitus position, the first trocar was placed usually in the seventh or eight intercostal space, while the remaining two or three trocars were placed after visualization of the cyst. Anterior or posterior rotation of the operative table was helpful in lung retraction and cyst visualization. Cysts were excised with blunt and sharp dissection using hook-electrocautery or endoscopic scissor. Great care was taken to avoid injuries to the phrenic, vagus or laryngeal nerves. Dissection was performed keeping the cyst intact in most of the cases and usually we prefer to aspirate the cyst fluid at the end of the dissection just before extracting it. Gram staining and
cultures were done on the fluid. In cases where the cyst was particularly adherent to vital structures, a portion of the cyst wall was left in place after obliteration of the mucosa using electrocautery or laser beam to prevent the recurrence. At the end of the procedure, before lung re-expansion one or two chest tubes were placed. Postoperative pain control was assured by intravenous analgesia.

3. Results

There were no operative deaths and no intra-operative complications. The cysts averaged 5.2 cm in their greatest diameter (range 3—10.5 cm). Twenty-one cysts were located in the posterior mediastinum and nine in the middle mediastinum. In 26 cases the cyst was completely removed thoracoscopically. In two cases a small portion of the cyst mediastinum. Differential diagnosis includes esophageal duplication cyst, neuroenteric cyst and congenital cystic adenomatoid malformation [2]. Intrapulmonary bronchogenic cysts are usually located in the lower lobes. The cysts are filled with serous or mucous fluid, so usually appear as water-density mass lesions in chest radiographs. Two-thirds of the patients are symptomatic; symptoms are due to the size and position of the cyst. Symptoms are most frequently caused by compression of the trachea or bronchi, which leads to coughing, wheezing, stridor, dyspnea, cyanotic spells, and pneumonia. However, most bronchogenic cysts are found incidentally when imaging is performed for other reasons. Surgery is indicated for symptomatic or complicated cysts. The reported incidence of clinical symptoms varies from 9% to 67% [3,4,7,9]. In our series symptoms were present in only 11 patients (37%); asymptomatic patients frequently requested surgical resection because of enlarging cysts, the risk of complication or fear of malignancy. Since the first thoracoscopic excision of bronchogenic cyst reported in 1991 by Mouroux et al. [10], many case reports or limited series have been published [5,7,11,12].

The main advantage offered by thoracoscopy is less trauma and discomfort for the patient. The lack of intercostal muscle incision and the lower risk of rib fracture reduce the postoperative pain and when compared to thoracotomy, thoracoscopy reduces the chest tube duration and length of hospital stay [5]. Conversion to thoracotomy is mainly related to major pleural adherence as was the case in our study (7%) similar to those observed in other single center experience [7], and considerably lower than the 35% reported by the French multicenter study [13]. Cyst rupture during the dissection usually does not interfere with the thoracoscopic completion of the procedure. Hazelrigg and associates [12] suggested the aspiration of the fluid of the cyst before starting the dissection in order to make easier handling and preparation. We prefer to aspirate the fluid at the end of the dissection just before the extraction of the cyst, since we have found that an intact cyst is helpful in dissection and preparation. Nevertheless in some cases it may be useful to partially evacuate the cyst during the procedure to expose better deep anatomical structures.

Although transthoracic and transbronchial needle aspirations have been proved useful procedures as well, both diagnostically and therapeutically [14—17], complete excision of a bronchogenic cyst is still the goal and the recurrence is extremely rare. In fact, the most important point for preventing recurrence of the cyst is the complete resection of the mucosal lining and aspiration of the content of the cyst if it does not allow lining removal. Operative difficulties from adhesions to adjacent organs are possible, and a small patch of cystic wall may be left in place after destruction of the mucosal lining to avoid recurrence. We adopted this strategy in two cases without evidence of recurrence. If there is no discussion concerning the surgical indication of symptomatic or complicated cysts, the management of asymptomatic lesions is controversial but we believe that in no case a patient can be completely assured about the future since bronchogenic cysts have the potential for complications and malignant changes [18]. Video-assisted thoracoscopic surgery might be better accepted by those patients who refuse thoracotomy and the low rate of complications and

4. Discussion

Bronchogenic cysts account for 10—15% of all mediastinal tumors and about 60% of mediastinal cysts. Usually this is a benign condition and some clinicians accept a conservative management with simple observation in asymptomatic patients [8]. Bronchogenic cysts do not initially communicate with the tracheobronchial tree. They usually present as a unilocular, fluid-filled cyst in the middle or posterior mediastinum. Differential diagnosis includes esophageal duplication cyst, neuroenteric cyst and congenital cystic adenomatoid malformation [2]. Intrapulmonary bronchogenic cysts are usually located in the lower lobes. The cysts are filled with serous or mucous fluid, so usually appear as water-density mass lesions in chest radiographs. Two-thirds of the patients are symptomatic; symptoms are due to the size and position of the cyst. Symptoms are most frequently caused by compression of the trachea or bronchi, which leads to coughing, wheezing, stridor, dyspnea, cyanotic spells, and pneumonia. However, most bronchogenic cysts are found incidentally when imaging is performed for other reasons. Surgery is indicated for symptomatic or complicated cysts. The reported incidence of clinical symptoms varies from 9% to 67% [3,4,7,9]. In our series symptoms were present in only 11 patients (37%); asymptomatic patients frequently requested surgical resection because of enlarging cysts, the risk of complication or fear of malignancy. Since the first thoracoscopic excision of bronchogenic cyst reported in 1991 by Mouroux et al. [10], many case reports or limited series have been published [5,7,11,12].

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conversion seem to make thoracoscopic excision the primary therapeutic option.

References