

Video-Assisted Thoracoscopic Surgery of Mediastinal Cysts: Report of 13 Cases

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Abstract Mediastinal cysts are rare anomalies. The purposes of this study were to present our experience with mediastinal cysts, which were thoracoscopically treated in our clinic, and to discuss our findings along with those from the literature. We retrospectively investigated 13 patients who were diagnosed and thoracoscopically treated for mediastinal cysts in our clinic between January 2008 and December 2011. Seven patients were female and six were male. The average age of the patients was 41.3 ± 20.3 (7–82 years old). The mediastinal cysts comprised five pericardial cysts: four bronchogenic cysts, one hydatid cyst, one benign cystic teratoma, one thymic cyst, and one neurenteric cyst. In the case of a ruptured hydatid cyst, we passed it to thoracotomy intra-operatively due to the presence of advanced adhesion related to inflammation. Postoperative complications and mortality did not occur in any

case. The average postoperative hospitalisation period was 3.8 days (2–7 days). Video-assisted thoracoscopic surgery in mediastinal cysts is a reliable and effective approach with low morbidity and a shorter hospital stay.

Keywords Mediastinal cyst · VATS

Introduction

Mediastinal cysts are rare benign lesions that originate from various embryological tissue types and are classified according to their structures. Although mediastinal cysts can be detected at any age, they are commonly diagnosed in childhood and young adulthood [1]. There is a case for argument regarding the follow-up or surgical resection of mediastinal cysts. The purposes of this study were to present our experience with mediastinal cysts that were thoracoscopically treated in our clinic and to discuss our findings along with those from the literature.

Materials and Methods

We retrospectively investigated 13 patients who were diagnosed and thoracoscopically treated them for mediastinal cysts in our clinic between January 2008 and December 2011. Direct chest roentgenography and computed tomography were used in all cases of diagnostic work-up. Additionally, seven patients were evaluated using magnetic resonance imaging (MRI).

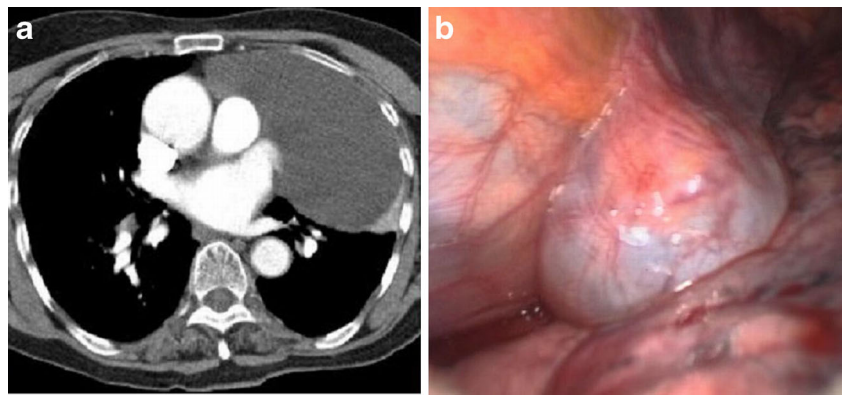
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Fig. 1 **a** Computed tomography scan showing a left cardiophrenic pericardial cyst. **b** Appearance of the pericardial cyst at operation



Investigated criteria were age, sex, symptoms, personal history, localisation of the mediastinal cyst, the pathologic type of cyst, the morbidity and mortality rate, and the hospitalisation period. Patient data were collected from in-patient clinic records, surgical records, outpatient clinic records, and pathology laboratory records. Patients who were not managed surgically or who had either benign or malign mediastinal lesions other than cysts were excluded from the study.

Results

Seven patients were female and six patients were male. The average age of the patients was 41.3 ± 20.3 (7–82 years old). The mediastinal cysts comprised five pericardial cysts (Fig. 1), four bronchogenic cysts (Fig. 2), one hydatid cyst (Fig. 3), one benign cystic teratoma (Fig. 4), one thymic cyst, and one neurenteric cyst (Fig. 5).

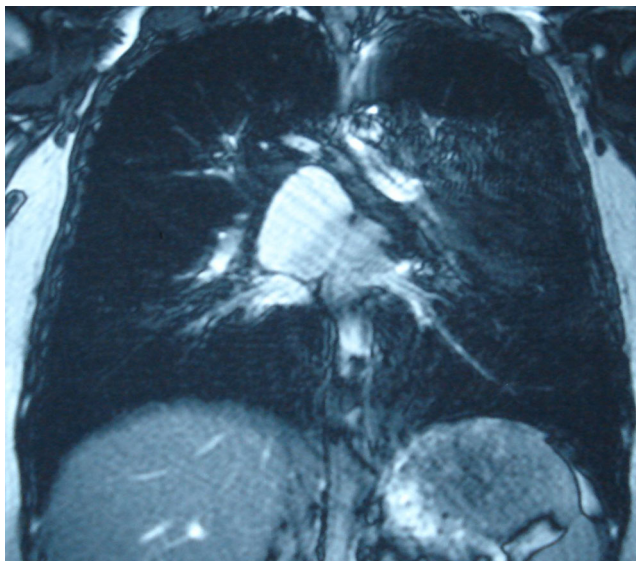


Fig. 2 An MRI image showing a bronchogenic cyst in the posterior mediastinum with high-signal-intensity contents

Common presenting symptoms of the patients were dyspnea (six patients), cough (six patients), and chest pain (five patients). Other symptoms were weakness–anorexia (three patients), sputum (one patient), nausea–vomiting (one patient), and weight loss (one patient). Two of the cases were asymptomatic and were incidentally diagnosed after direct chest roentgenography.

Following a physical examination, nine (69.2 %) of the patients were regarded as normal. Depression and coarsening of pulmonary auscultation sounds according to lesion localisation was detected in the other four (30.8 %) patients.

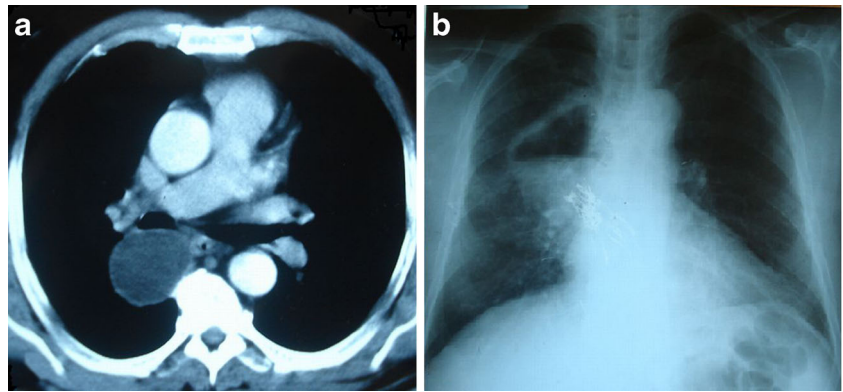
According to radiologic findings, localisation of the cysts was anterior–superior mediastinum in seven (53.8 %) of the patients (four pericardial cysts, one bronchogenic cyst, one benign cystic teratoma, and one thymic cyst), posterior mediastinum in five (38.5 %) of the patients (three bronchogenic cysts, one hydatid cyst, and one neurenteric cyst), and visceral mediastinum in one (7.6 %) of the patients (one pericardial cyst).

All the cases were intubated using a double-lumen Carlens endotracheal tube. The cysts were excised via a thoracoscopic approach in 12 of the patients. In the case with a ruptured hydatid cyst, we passed it as thoracotomy intra-operatively due to the presence of advanced adhesion related to inflammation. Albendazole was administered to the hydatid cyst patient as postoperative medical therapy. We intra-operatively detected the connection between a mediastinal cyst with the pericardial cavity in one of our patients who was managed using the video-assisted thoracoscopic surgery (VATS) technique. Postoperative complications and mortality did not occur in any case. The average postoperative hospitalisation period was 3.8 days (2–7 days).

Discussion

The incidence rate of mesothelial pericardial and pleural cysts is 1 in 100,000 [2]. There is conflict in the treatment of

Fig. 3 **a** Computed tomography scan demonstrating an intact hydatid cyst at the posterior mediastinum a year before operation. **b** A week before the operation, direct radiographic appearance of a ruptured hydatid cyst



pericardial cysts; although some of the authors prefer to follow the cyst without any intervention, others support resection of the cyst in order to prevent complications such as rupturing or cardiac compression [3]. In the present study, five of the pericardial cysts cases were treated via thoracoscopic resection.

Diagnosis of a bronchogenic cyst frequently requires surgical excision. Excision of a cyst enables amelioration of clinical symptoms, prevention of cyst enlargement, prevention of cyst infection, malignant transformation, tracheal compression, superior vena cava syndrome, and possible prevention of haemoptysis [4–6]. Due to the fact that the bronchogenic cyst was the most commonly observed cyst of the mediastinum, it was the most reported cyst that was treated with the thoracoscopic approach. Mediastinal cyst excision via the VATS technique was first reported in 1991 by Mouroux et al. [7]. From this time, results of mediastinal cyst excision via the thoracoscopic approach were reported either as case reports or as a short case series [4]. Today, VATS works safely through the surgical excision of bronchogenic cysts using minimally invasive surgical techniques. In the present study, four of the bronchogenic cyst cases were treated via thoracoscopic resection.

Mediastinal hydatid cysts form only 0.5 to 1 % of all hydatid cysts [8]. If total excision of the cyst is not possible due to cyst localisation or invasion of vital

organs, a hydatid cyst can be managed by partial pericystectomy after excision of the germinative membrane. Although thoracotomy was commonly preferred in the case of mediastinal cysts, there are rare reports of thoracoscopic cases [9]. In our case, the cyst ruptured 1 week before the operation. The operation began using the thoracoscopic method. However, due to the presence of advanced adhesion, we passed it to thoracotomy intra-operatively. As a result of these findings, we assume that cases with intact hydatid cysts can be managed via simple thoracoscopic resection.

A mature cystic teratoma is commonly located in the anterior mediastinum [10]. Surgical intervention in benign lesions has excellent results. Furukawa et al. [11] reported that they successfully treated a mediastinal cystic teratoma case in 1994 via the thoracoscopic approach. Similarly, our case was also successfully treated via the thoracoscopic approach.

Mediastinal thymic cysts are some reported cases of thymoma adhering to the cyst wall, cysts involving basaloid carcinoma, and thymic carcinoma developing from the thymic cyst [12]. Thymic cysts can be excised safely via VATS such as in our case [9].

Thoracic enteric cysts are commonly located in the right posterior mediastinum and are rarely isolated [13]. Resection of an enteric cyst can be amenable via postero-lateral thoracotomy or thoracoscopy. In our case, we excised the cyst completely via thoracoscopy.

Fig. 4 **a** Computed tomography scan of the chest demonstrating a mature cystic teratoma in the right anterior mediastinum. **b** Appearance of the cystic teratoma at operation

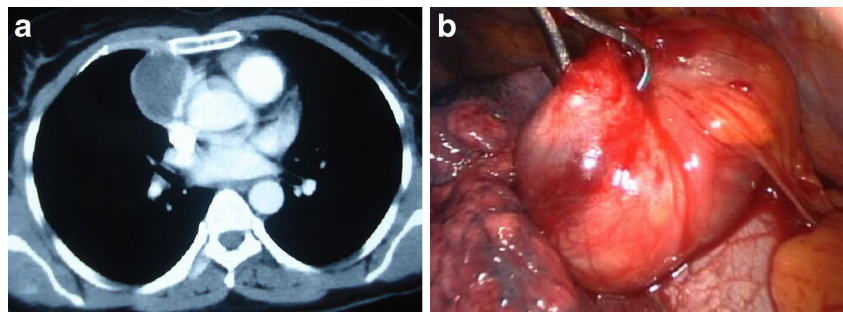
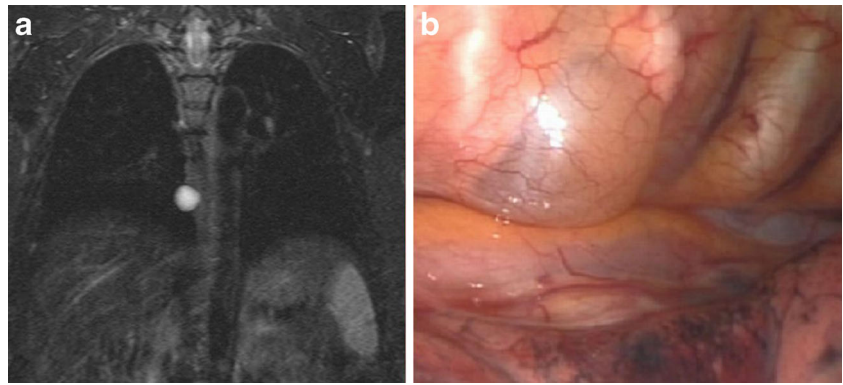


Fig. 5 **a** A coronal T1-weighted MRI image showing a neurenteric cyst in the right posterior mediastinum. **b** Appearance of the neurenteric cyst at operation



During the last decade of the nineteenth century, mediastinal cysts were treated via sternotomy or thoracotomy. VATS was highly preferred to thoracotomy due to advantages on postoperative pain, pulmonary complication, costs, and hospital stay.

Cyst aspiration during thoracoscopy enables the operator to catch the cyst and manipulate it with ease. With increased experience in thoracoscopy, passing to thoracotomy was rarely required. However, in the case of severe pleural adhesion such as in our case, open thoracotomy had become ineluctable [4, 6]. Reported intra-operative passing to thoracotomy ratios was between 0 and 35 % [4, 7, 14].

It should be given full weight by the operator to completely excise the mediastinal cyst. However, like most surgeons, we also think that a part of the cyst wall may be left in case of adhesion to vital structures [4, 7, 14]. It was reported that destruction of mucosal line via electro-cauterisation can be effective in protecting against recurrence in such cases [4]. However, incomplete cyst excision is applied not only in the thoracoscopic approach but also in cases of open surgery [7, 14].

In conclusion, although most of the mediastinal cysts were benign in nature, thoracoscopic resection can be applied easily and safely with minimal morbidity. Due to this reason, even in asymptomatic cases, thoracoscopic resection can be applied to prevent complications with the suspicion of malign transformation and to gain definite diagnosis. We believe that thoracoscopy should be the first choice of treatment for mediastinal cysts.

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