Thymic Cyst with Rare Clinical Presentations: Report of Ten Cases over 13 Years

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ABSTRACT

BACKGROUND: Thymic cysts of the mediastinum are uncommon. The incidence rate of thymic cysts is between 1 to 4.8 %. They usually present as an asymptomatic mediastinal mass. The purpose of this study was to report some rare presentations of ten cases with thymic cyst.

METHODS: In this retrospective study, signs, symptoms, imaging features and surgical approaches of ten cases with mediastinal thymic cyst were recorded between 2000 and 2013 in the Razi Hospital of Rasht, Iran.

RESULTS: Age of patients was between 12 and 60 years. Three patients presented with hydrothorax. Two cases were found incidentally. One patient with hydropneumothrax, one with infected thymic cyst and one with neck mass were observed. Other signs were palpitation, chest pain and dyspnea. The most common surgical approaches were median sternotomy in four cases and postero-lateral thoracotomy in three cases. Complication happened in one patient with left phrenic nerve damage. There were no mortalities.

CONCLUSION: Thymic cysts should be considered in the differential diagnosis of the mediastinal and cervical masses. The treatment of choice is complete excision of the cyst.

Keywords: Thymic cysts; Mediastinal mass; Hydropneumothorax; Mediastinal cyst

INTRODUCTION

Thymic cysts are usually found in the anterior mediastinum. They comprise 1 to 4.8% of all the mediastinal cysts [1, 2]. Thymic cysts can also be found in the neck [1, 3]. Cervical thymic cysts often appear as a mass in the lateral part of the neck. Investigations have shown that about fifty percent of the cervical thymic cysts can extend into the mediastinum [4, 5]. Although mediastinal thymic cysts are rarely symptomatic, dyspnea, cough and chest pain have been reported in some cases [1, 5].

Computed tomography (CT) scan of the cervical lesions can be used to identify the cystic nature and determine the extension of lesions to the mediastinum[1, 6, 7]. Fine needle aspiration (FNA) under CT guidance, video-assisted thoracoscopic surgery (VATS) and thoracotomy are common procedures for the management of thymic cysts[1, 7, 8]. The purpose of this study was to report rare clinical features, diagnostic workup and surgical approaches in the management and outcome of patients with thymic cyst.

METHODS

In this retrospective study, we reviewed the data of ten patients with thymic cyst in Respiratory Inflammatory Diseases Research Center, Razi Hospital of Rasht, Iran, between 2000 and 2013. We collected data on presenting symptoms, signs, imaging features including chest X-ray (CXR), CT scan and magnetic resonance imaging (MRI), surgical approaches and outcome. Patients underwent various surgical approaches, dependent on the location of the cyst and final diagnosis was established for each patient by pathological examination.

RESULTS

Eight patients were symptomatic; three had

dyspnea, chest pain and pleural effusion, simultaneously. Symptoms of other patients are shown in table 1.

The most common tool for diagnosis was CT. CT was used in all patients for the diagnosis of unilocular or multilocular, unilateral or bilateral, extension or invasion of cyst and also pleural effusion or pneumothorax (Table 2). One patient had a huge bilateral thymic cyst (Figure 1). One patient had hydropneumothorax and three patients had hydrothorax (Figure 2, 3, 6, 7).

Surgical approaches for cyst excision were postero-lateral thoracotomy, sternotomy and antero-lateral thoracotomy (Table 3).

Complications occurred in one patient as left phrenic nerve damage. Mortality was zero. Recurrence of the thymic cyst was not detected in any of patients during 4 years follow up by evaluation of CXR, CT-scan and MRI. Moreover, outcome of patients including previous symptoms and signs, working and social activities was good.

DISCUSSION

Thymic migration, during fetal development, may cause deposition of thymic remnants in the anterior mediastinum and neck [5]. Nowadays, it is believed that thymic cysts are either congenital or acquired [1, 5]. Investigations have shown that about fifty percent of the cervical thymic cysts extend into the mediastinum and most are found in the anterior mediastinum [1, 4]; however, the incidence rate of the mediastinal thymic cysts is low and comprises up to 4.8% of all mediastinal masses [1]. For example, a study in Japan showed that of 108 mediastinal masses in children, the incidence rate of the thymic cysts was less than 1% [9].

Thymic cysts involve males 3 times more often than females and are often found in children. The mean age of our patients was 34 years, which illustrates that the thymic cysts can present in any age group. Thymic cysts may be unilobular (Figure 4, 5) or more frequently multilobular (Figure 1). Unilobular thymic cysts are usually found in the neck while multilobular are generally bigger and may extend into the mediastinum [10, 11].

Generally, thymic cysts are encompassed by a smooth fibrous capsule. Although the fluid of cysts is usually clear, it may be turbid or bloody in some cases [12]; in our study, the fluid of cysts in most of the patients was clear. Cholesterol clefts and foreign body granulomas may be found in cyst walls [9]. Four patients in our study had cholesterol granuloma (Figure 3, 5). It seems that unilocular thymic cysts are congenital or are caused by bronchial pouch remnant [1]. Multilocular cysts often result from an acquired inflammatory reactive process and have multiple adhesions to the adjoining structures [1, 10, 11]. The thymoma and thymic carcinoma were reported in the wall of the multilocular thymic cysts [1, 10] but none of our patients had thymoma or thymic carcinoma.

Although most patients with thymic cyst are asymptomatic, symptoms can appear in some cases, usually between 5 and 7 years old [1, 5]. Eight of our patients had symptoms such as palpitation, dyspnea, chest pain, fever and neck mass. The symptoms of thymic cysts depend on their location. Cervical thymic cysts often appear with a mass in the lateral neck [3, 5]. Graeber et al, reported pain and vocal cord paralysis in the cysts which were located in the neck [13]; vocal cord paralysis was not detected in any of our cases. Allee and his colleagues found a thymic cyst accompanied with cardiac tamponade and pericarditis [14], which was also not found in our study. Similarly, Graeber et al reported four cases of dysphagia with large thymic cysts [13]; none of our cases had dysphagia. Gönülü et all reported five cases with dyspnea associated with very large thymic cysts in the hemi-thorax [15]; in our study, one patient had a huge thymic cyst in the right hemithorax who suffered from palpitation. Moreover, three patients had hydrothorax similar to a case reported by Lachanas [16]. Horner's syndrome and intermittent brachiocephalic vein obstruction are other rare signs associated with thymic cysts [1]; these were not observed in our study.

Although some investigators emphasized the advantage of ultrasonography in the evaluation of cervical thymic cyst, nowadays, most believe that CT of the neck and chest should be used to

Figure 1: Computed tomography of a patient with a huge bilateral thymic cyst

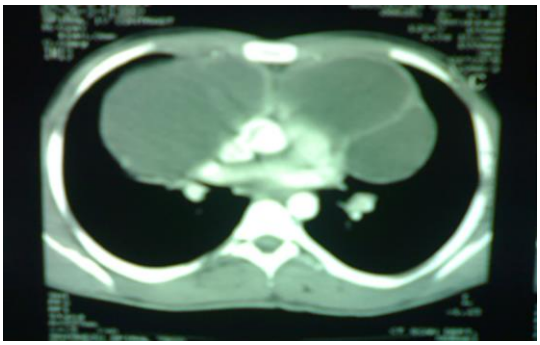


Table 1: Symptoms and signs of cases

No	Male / Female	Age	Incidentally	Palpitation	Dyspnea	Hydrothorax	Chest pain	Fever	Neck mass	Hydro pneumothorax
1	M	22	+	-	-	-	-	-	-	-
2	M	18	-	-	+	-	+	+	-	-
3	M	60	-	+	+	-	+	-	-	-
4	M	55	-	+	+	+	+	-	-	-
5	M	32	-	-	+	+	-	-	-	-
6	F	34	-	+	+	+	+	-	-	-
7	F	36	-	+	+	-	+	-	-	-
8	F	12	-	-	-	-	-	-	+	-
9	F	23	+	-	-	-	-	-	-	-
10	F	34	-	+	+	-	+	-	-	+

Table 2: Diagnostic workup and definitive diagnosis

No	Chest X-Ray	Computed Tomography	Pathologist Repot	Location	Unilocular	Mulilocular
1	Cyst lesion	Cyst lesion peripheral calcification	Thymic cyst	Anterior mediastinum	-	-
2	Cyst lesion	Cyst lesion	Infected thymic cyst	Anterior mediastinum	+	-
3	Cyst lesion	Cyst lesion	Thymic cyst +CG*	Left anterior mediastinum	-	+
4	Cyst lesion	Hydropneumothorax	Thymic cyst +CG	Right anterior mediastinum	-	+
5	Pleural Effusion	Pleural Effusion	Thymic cyst	Left anterior mediastinum	+	-
6	Pleural Effusion	Pleural Effusion	Thymic cyst +CG	Left anterior mediastinum	-	+
7	Cyst lesion	Cyst lesion	Thymic cyst +CG	Right and left anterior mediastinum	-	+
8	-	Neck mass	Thymic cyst	Right neck	+	-
9	Cystic lesion	Cystic lesion	Thymic cyst +CG	Anterior mediastinum	-	+
10	Cystic lesion	Cystic lesion	Cystic lesion	Left anterior mediastinum	+	-

* CG=Cholesterol Granuloma

Table 3: Surgical Approaches

No	Postero-lateral thoracotomy	Antero-lateral thoracotomy	Median sternotomy	Cervical Approach
1	-	-	+	-
2	-	-	+	-
3	-	+	-	-
4	+	-	-	-
5	+	-	-	-
6	+	-	-	-
7	-	-	+	-
8	-	-	-	+
9	-	-	+	-
10	-	+	-	-

Figure 2, 3: Computed tomography of a patient with thymic cyst associated with hydro-pneumothorax Thymic cyst membrane during thoracotomy

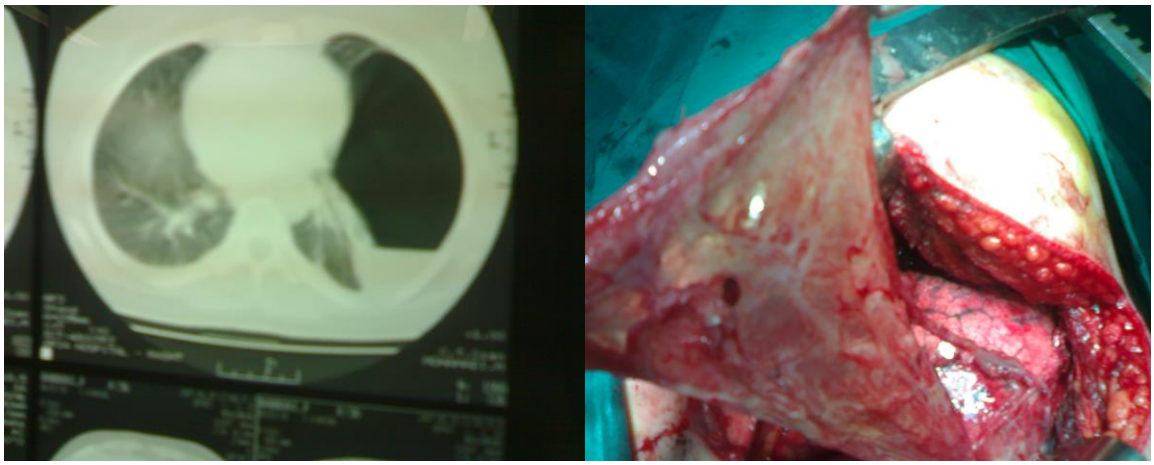


Figure 4, 5: Computed tomography of a patient with a huge left side thymic cyst and thymic cyst membrane during thoracotomy

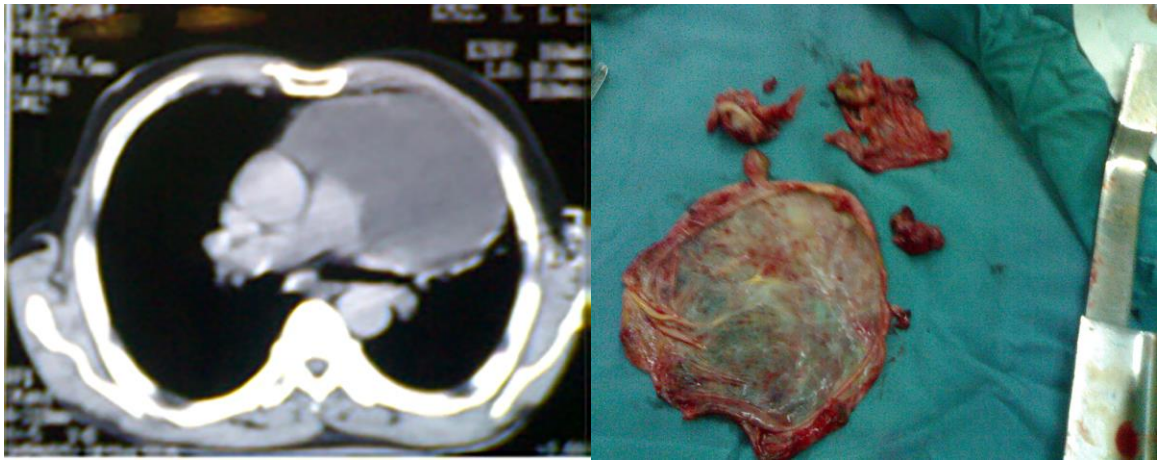
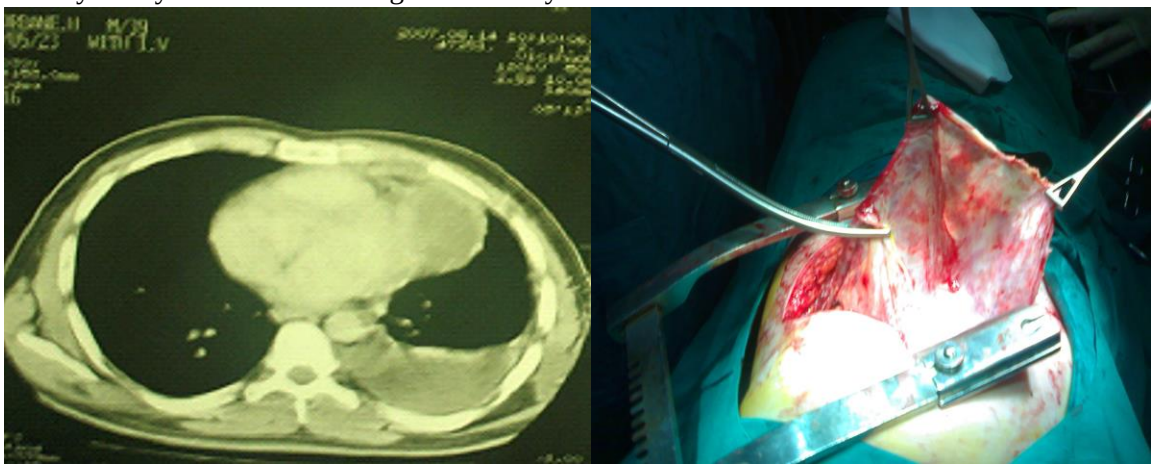


Figure 6, 7: Computed tomography of a patient with thymic cyst associated with pleural effusion and thymic cyst membrane during thoracotomy



distinguish the cystic nature of the lesions and extension into the surrounding tissue [1, 5]. CT with contrast provides excellent visualization of thymic cysts and better margination with adjacent vessels. CT scanning was used for all of our cases. MRI and CT scan provide precise data on the position, depth and anatomical relationships of the cyst and demonstrate a connection between the cervical mass and the mediastinal thymus [6, 17].

There is much controversy about the treatment methods for the unilocular congenital thymic cysts. Some believe that for the definitive diagnosis of the lesions, all should be resected [8]. Others believe that, intervention is often not necessary when typical CT findings exist for the thymic cyst [18]. Yet others suggest FNA under CT guidance for similar conditions [1]. Malignant transformations are also indications for surgery [19]. All multilocular cysts should be resected by thymectomy to identify the neoplastic changes [1]. Multilocular cysts should also be removed because surgical resection is usually curative and can be performed safely through video thoracoscopy, median sternotomy or thoracotomy. Surgical excision is accomplished either by open methods or VATS [1, 9]. In our patients, surgical procedures were postero-lateral thoracotomy, antero-lateral thoracotomy and sternotomy. Although one of our patient developed left side phrenic paralysis but in most patients, surgical excision was curative without any long term recurrence and complications such as hemothorax, phrenic paralysis, wound, empyema and other infections.

CONCLUSION

Although thymic cysts are rare, they should be considered in the differential diagnosis of cervical or mediastinal masses. The true origin of these masses is unknown and preoperative diagnosis is difficult. The treatment of choice is complete excision of the cyst but a normal thymus in the mediastinum must be confirmed preoperatively to avoid the risk of total thymectomy. If cervical thymic cyst is in continuity with a normal thymus, preservation of the thymus should be considered, particularly in younger patients.

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