

Surgical Approach in Mediastinal Cystic Lesions: A Single-Centre Experience

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1. Abstract

1.1. Background: Mediastinal cysts are benign lesions that may be seen in adulthood as well as in childhood. Mostly congenital lesions constitute 20-32% of lesions located in the mediastinum. The main cystic masses are congenital benign cysts (bronchogenic, esophageal duplications, neuro-enteric, pericardial and thymic cysts), meningocele, mature cystic teratoma and lymphangioma. In this study, we aimed to analyze the mediastinal cysts operated in our clinic according to the histopathological type, surgical type, morbidity rates and to contribute to the literature on these rare lesions.

1.2. Methods: The records of patients with mediastinal cysts who were operated in Gazi University Faculty of Medicine Department of Thoracic Surgery, between January 2013-December 2019 were reviewed retrospectively.

1.3. Results: A total of 32 patients were included the study. 13 (40.6%) of the patients were male and 19 (59.4%) were female. The mean age was 45 (range: 12-71). The most common symptom in patients was chest pain with 12 patients. Histopathologically;

the most common subtype was thymic cyst. There was no mortality.

1.4. Conclusion: Our results show that surgery for mediastinal cysts has low morbidity very low rate.

2. Introduction

Mediastinal cysts are well-margined, round or oval lesions originating from the mediastinum compartments. These lesions develop as a result of cystic degeneration of a congenital, acquired or solid tumor. Most of congenital lesions constitute 20-32% of the lesions in the mediastinum [1, 2]. Mediastinal cysts are classified as congenital and acquired, according to the time of formation; foregut cysts, mesothelial cysts, lymphatic cysts, thymic cysts and rare cysts, according to the originating from tissue. The incidence of cysts may differ according to age. Foregut origin cysts are common in the neonatal and childhood, while mesothelial cysts are more common in adulthood. In treatment, surgery has low mortality and morbidity rate, surgery approach such as thoracotomy, cervical, trans sternal, Video Assisted Thoracic Surgery (VATS) or mediastinoscopy is determined depending on location of lesion [2,

3]. In this study, we aimed to analyze the mediastinal cysts operated in our clinic according to the histopathological type, surgical type, morbidity and recurrence rates and to contribute to the literature on these rare lesions.

3. Materials and Methods

Following the approval of the local ethics committee (My institution does not have an Institutional Review Board) the records of mediastinal cysts patients who were operated in Gazi University Faculty of Medicine Department of Thoracic Surgery, between January 2013-December 2019 were reviewed retrospectively. We analyzed patients' data in terms of age, gender, histopathology, lesion size, lesion localization, surgical technique, symptom, additional disease, length of hospital stays and complications.

4. Statistics

Data were analyzed with SPSS (IBM, version 20, NY, USA) program. Descriptive data were mean \pm standard deviation, median (minimum-maximum) or number and frequency. The Chi-Square Test was used for categorical variables, and the Log Rank Test was used for continuous variables.

5. Results

A total of 32 patients were included in the study. The demographic and characteristic information of the patients were given in the Table. 13 (40.6%) of the patients were male and 19 (59.4%) were female. The mean age was 45 (range: 12-71). The most common

symptom in patients was chest pain with 12 patients. Histopathologically, thymic cyst was in the first place with 11 patients (34.40%). Pericardial cyst (15.62%) and bronchogenic cyst (15.62%) were in second place with 5 patients each. Cystic teratoma in 4 patients (12.50%), mullerian cyst in 3 patients (9.37%), lymphoepithelial cyst in 2 patients (6.25%), duplication cyst in 1 patient (3.12%) and gastro enteric cyst in 1 patient (3.12%) were observed. In the distribution of lesion histopathology depending on age, in the pediatric group consisting of one patient each 12 and 17 years old; thymic cyst was seen in the 12-year-old patient, and gastro enteric cyst was seen in the 17-year-old patient. There were 7 cases in the 20-40 age group, and the most common lesion was bronchogenic cysts with 3 patients. There were 23 cases in the group over age of 40, and the most common lesion was thymic cysts with 8 patients. The mean lesion size was determined as 5.73 cm (range: 2-12). The lesions were located in the anterior mediastinum in 21 patients, in the posterior mediastinum in 6 patients and in the middle mediastinum in 5 patients. When the patients were examined in terms of the surgical method, it was seen that VATS was applied in 19 patients (59.3%), thoracotomy in 8 patients (25%), and sternotomy in 5 patients (15.63%). The mean length of stay was 4.53 days (SD:1.1). No postoperative complications were observed in 25 of the patients who were followed up. 4 patients had wound infection, 2 patients had arrhythmia and 1 patient had pneumonia. Morbidity rate was 21.9%. All of the patients who were followed up were discharged without any problem. There was no mortality.

Table: Data analysis of our series

		Study population	
		N=32	%
Gender	Male	13	%40.6
	Female	19	%59,4
Mean Age	43,4		
Age Range (years)	Dec-71		
Symptoms	Chest Pain	12	
	Cough	5	
	Asymptomatic	12	
	Shortness of breath	2	
	Diffucilty in Swallowing	1	
Mean Tumor Diameter	5.73 cm		
Tumor Diameter Range (cm)	12-Feb		

Mean length of stay (days)	4.53	
Histopathological Type	Thymic Cyst	11
	Pericardial Cyst	5
	Bronchogenic Cyst	5
	Cystic Teratoma	4
	Mullerian Cyst	3
	Duplication Cyst	1
	Lymphoepithelial Cyst	2
	Gastroenteric Cyst	1
Postoperative Complications	No Complications	25
	Wound Infection	4
	Arrhythmia	2
	Pneumonia	1
The lesion location	Anterior Mediastinum	21
	Posterior Mediastinum	6
	Middle Mediastinum	5
Resection Type	VATS	19
	Thoracotomy	8
	Sternotomy	5

6. Discussion

Mediastinal localization cysts constitute 20-32% of all mediastinal lesions [1]. Although they are generally congenital, most of cases are asymptomatic because of lesions are detected after the 2nd decade [2]. The incidence of cysts may differ according to age. For example, although cysts originating from foregut are most of the neonatal and childhood cysts, they are rare in adults. Similarly, pericardial cysts occur in approximately one third of mediastinal cysts seen in adulthood [3]. In our series, age range was between 12 and 71 years and mean age was 45 years. In the distribution of lesion histopathology depending on age, in the pediatric group consisting of one patient each 12 and 17 years old; thymic cyst was seen in the 12-year-old patient, and gastro enteric cyst was seen in the 17-year-old patient. There were 7 cases in the 20-40 age group, and the most common lesion was bronchogenic cysts with 3 patients. There were 23 cases in the group over age of 40, and the most common lesion was thymic cysts with 8 patients. In the literature, it was reported that lesions were mostly seen in the pediatric age group and generally congenital [3]. We consider that the reasons why the patient group who were operated in our series was mostly over the age of 40 are the lesions do not reach symptomatic sizes in childhood, it is not considered as a priority

in diagnosis due to the lesions do not cause obvious symptoms and parents avoid radiological imaging considering that it may be detrimental to their children.

In general, all cysts have intrathoracic organ compression and related symptoms depending on their size. Some cysts are known to cause specific symptoms related to their structure, location and formation mechanisms. Gursoy S. et al. reported that patients were usually symptomatic (61%), chest pain was most common symptom, other symptoms were dyspnea, cough and hemoptysis respectively in their series [4]. Bastos P. et al. stated that the rate of symptomatic patients was 68% and the most common symptom was chest pain [5]. Similar to the literature, 62.5% of our patients were symptomatic in our series, and the most common symptom was chest pain. Histopathologically, there are variable results for mediastinal cyst in the literature. In the study of Petkar M. et al., 39 mediastinal cysts surgically excised for 22 years were encountered, histopathologically foregut cysts (19 cases, 50%) were most common cysts, teratomatous cysts (10 cases, 26.3%) and thymic cysts (4 cases, 10.5%) were reported [6]. Brzeziński D. et al. reported that in the study of 50 patients, histopathologically the most common cysts were bronchogenic cysts in 28 patients (56%), pericardial cysts in 13 patients (26%), enteric cysts in 8 patients (16%),

respectively [7]. Nanqing J. et al. stated that 45 patients with mediastinal cysts underwent surgical treatment, histopathologically the most common cysts were bronchogenic cysts in 16 patients (35.5%), pericardial cyst in 14 patients (31%), thymic cysts in 12 patients (26.5%), respectively [8]. In our study, histopathologically, thymic cyst was in the first place with 11 patients (34.40%). Pericardial cyst (15.62%) and bronchogenic cyst (15.62%) were in second place with 5 patients each. Cystic teratoma in 4 patients (12.50%), mullerian cyst in 3 patients (9.37%), lymphoepithelial cyst in 2 patients (6.25%), duplication cyst in 1 patient (3.12%) and gastroenteric cyst in 1 patient (3.12%) were observed.

The general opinion in the treatment of mediastinal masses is complete resection, and the process that started with sternotomy and thoracotomy has historically evolved towards video-assisted surgery with the advancement in endoscopic imaging methods. In study of Aravena C. et al., it was reported that although trans bronchial needle aspiration with endo bronchial ultrasound (EBUS-TBNA) was indicated as a new method that have a role in the treatment of bronchogenic cyst, EBUS-TBNA for mediastinal cysts was limited in diagnostic and therapeutic efficiency and surgical resection continued to be preferred treatment [9]. In the study of Ulas AB. et al., video assisted thoracoscopic surgery and thoracotomy results were compared in the treatment of mediastinal cystic lesions. Thoracotomy or VATS were applied 60 mediastinal cyst patients. It was stated that main treatment method for mediastinal cysts is surgery, and the thoracoscopic approach significantly reduces the patient's surgical procedure time and postoperative hospital stay [10]. In our series, VATS was applied in 19 patients (%59.3) and it provides adequate exposure for all anterior, visceral, and posterior mediastinal lesions. Thoracotomy was performed in 8 patients, and sternotomy in 5 patients. The general opinion of our clinic is to perform surgical total excision for cysts other than mesothelial cysts.

7. Conclusion

In patients with mediastinal cyst, prognosis after complete excision is excellent and rates of morbidity and mortality associated with surgery are low. However, for asymptomatic mediastinal cysts that do not compress the surrounding structures, expand gradually, do not show atypical features or have low suspicion of malignancy, radiological follow-up and symptom follow-up may be recommended. It is very important that patients' follow-up and examinations are carried out completely.

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