PJSS Vol. 68, No. 1, January-March, 2013

PJSS PHILIPPINE JOURNAL OF SURGICAL SPECIALTIES

Experience with Mediastinal Cysts at a Tertiary Specialty Hospital

Armand G. C. Sarmiento, M.D. and Jose Luis J. Danguilan, M.D., F.P.C.S.

Department of Surgery, Lung Center of the Philippines

Objective: To analyze the different approaches in diagnosing and managing mediastinal cysts in a single tertiary specialty hospital.
Methods: A retrospective study on patients with mediastinal cysts who underwent surgery from January 2002 to December 2009 in a single tertiary hospital. The authors analyzed demographic data, clinical presentation, diagnostic procedures, lesion location , size, type of surgery carried out, histological diagnosis, postoperative morbidity and mortality.
Results: Thirty seven patients with mediastinal cysts; 21 female (57%) and 16 male (43%). Mean age was 33.5 years. Most of the patients were asymptomatic (27%) but among those with symptoms most common were dyspnea and chest pain. The right side was the most common laterality 24 (64.9%). The anterior mediastinum was the most commonly involved site 34(91.9 %). Sizes ranged from 4 to 27cm with a mean of 11.5cm. Most of the cystic lesions were benign except for 1 which showed malignancy. There was no postoperative death. Morbidities were atelectasis, airleak and chylothorax.
Conclusion: Surgical excision of mediastinal cyst is indicated to prevent complications from rupture andfurther enlargement leading to respiratory embarrassment, low morbidity and no mortality.

Key words: Mediastinal cyst, mediastinum

Mediastinal cysts form a group of heterogeneous and uncommon benign lesions of neoplastic, congenital or inflammatory conditions.[1] Although almost all mediastinal cysts are benign there are few reported cases of mediastinal cyst that are malignant. The presence of a mediastinal cyst may be an incidental finding on chest x-ray however symptoms may arise if the cyst is large or compressing vital structures. Several diagnostic possibilities are available and this can be narrowed if the patient's age, tumor location, association of a specific systemic disease, radiographic findings, and biochemical markers are considered. Controversy arises as to how to manage mediastinal cyst whether observation or outright surgical removal.

The objective of this paper was to describe the different diagnostics and management of primary mediastinal cysts at the Lung Center of the Philippines (LCP).

Methods

All patients with a mediastinal mass who underwent operation for removal at the LCP from January 2002 to December 2009 were included in the study.

Demographic profiles of the patient included age and sex. Patients' symptoms were noted and tallied to determine which were the most common. Masses found incidentally were included in the no symptoms category of the patients. The location of the mass was categorized whether anterior, middle or posterior mediastinal area. In addition to this the laterality is noted whether it is on the left or right or located medially. Depending on the bulk of the tumor, the surgical approach was noted.

In all patients, chest x-ray and CT scan were done pre-operatively. (Figures 1, 2 & 3) Those who underwent preoperative biopsy with their different approaches included ultrasound guided aspiration biopsy, CT guided needle aspiration biopsy, mediastinotomy and thoracoscopy. Tumor markers used were alpha-fetoprotein, beta HCG and LDH.

The surgical approaches whether postero-lateral thoracotomy, axillary thoracotomy, median sternotomy,

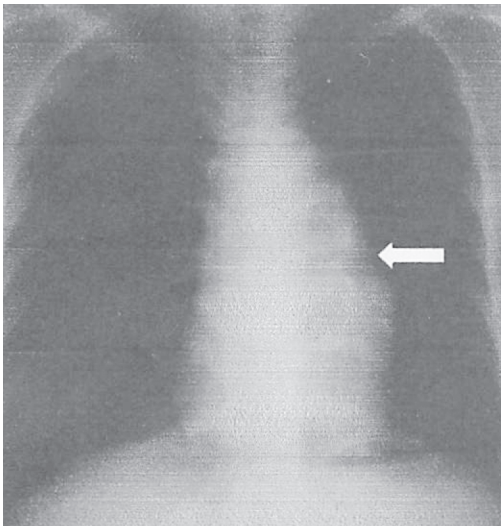

Figure 1. Chest X-ray PA view of patient with mediastinal cyst located on the left of the mediastinum.

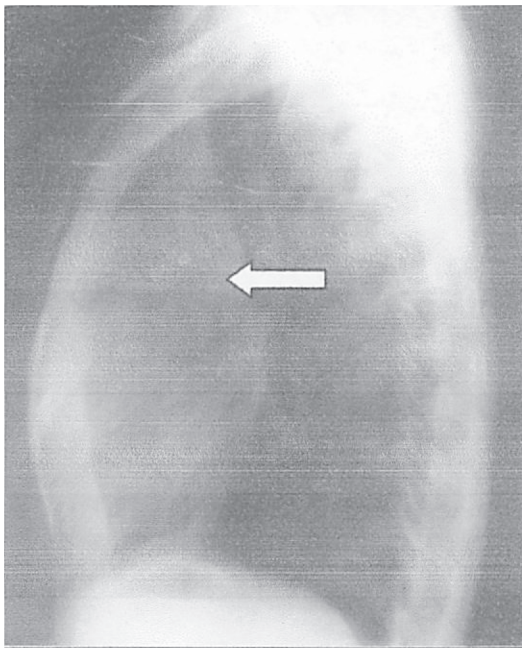

Figure 2. Chest X-ray lateral view mediastinal cyst located in the anterior compartment.

clamshell, hemiclamshell, video-assisted thoracic surgery, or straight forward surgery were noted, as well as any conversions to other thoracotomy incisions. Additional procedures included were resection of the lung which

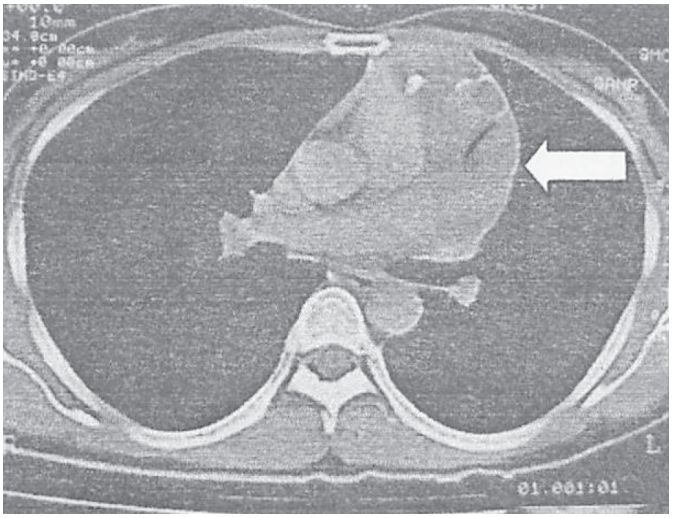

Figure 3. CT scan showed a cystic teratoma histopath.

were adherent to the cyst, resection of adjacent structures like pericardium with repair using mesh and innominate vein involvement with reconstruction using the pericardium. Patients were followed up from 7 days to 4 weeks.

Results

Thirty seven patients with mediastinal cysts were included in the study. There were 21 (57%) females which account for the majority of the patients and 16 (43%) males. Ages ranged from 13 to 71 years with a mean of 33.5 years. (Table 1) Most common symptoms encountered by the patients were dyspnea 9 (24.3%), chest pain 8 (21.6%), cough 6 (16.2%), easy fatigability 2 (5.4%), emoptysis 1 (2.7%) and dysphagia with supraclavicular fullness 1(2.7%). There were 10 (27%) patients who were asymptomatic and were discovered on routine chest x-ray examination for work. (Table 2)

In terms of laterality, the right side is the most commonly involved 24(64.9%) followed by the left side 9(24.3%) and the middle 4 (10.8%). (Table 3). In terms of compartment, the anterior mediastinal area is the most commonly located 34 (91.9%), followed by the posterior mediastinum 2 (5.4%) and the middle mediastinum 1 (2.7%). (Table 4). These areas were confirmed by chest radiographic studies. Sizes of the

Table 1. Age ranges of patients per sex.

	Male	Female	All patients
Age range [years old]	13 - 71	13 - 51	13 - 71
Mean age [years old]	33.8	33.3	33.5

Table 2. Symptoms experienced by the patients.

	No. of Patients (%)
Dyspnea	9 (24.3)
Chest pain	8 (21.6)
Cough	6 (16.2)
Easy fatigability	2 (5.4)
Hemoptysis	1 (2.7)
Dysphagia and supraclavicular fullness	1 (2.7)
Asymptomatic	10 (27)

Table 3. Laterality of the mediastinal cysts.

	No. of Patients (%)
Right side	24 (64.9)
Left side	9 (24.3)
Middle	4 (10.8)

Table 4. Location of the cysts in relation to mediastinal compartments.

	No. of Patients (%)
Anterior	34 (91.9)
Middle	1 (2.7)
Posterior	2 (5.4)

Table 5. Biopsies done prior to operation.

	No. of Patients (%)
Ultrasound guidance	8 (21.6)
Ct guided	3 (8.1)
Mediastinotomy	2 (5.4)
Thoracoscopy	1 (2.7)

cyst ranged from 4cm to 27cm in widest diameter with a mean of 11.5cm. Biopsies of the said masses were done in 14 patients. Most of the patients underwent ultrasound guidance transthoracic needle aspiration 8 (21.6%), followed by CT guided in 3 (8.1%), mediastinotomy in 2 (5.4%) and thoracoscopy in 1 (2.7%) which later was converted to open procedure. (Table 5). Tumor markers were requested in only 3 patients, alpha-fetoprotein in 3 (8.1%), beta HCG in 2 (5.4%) and LDH in 1 (2.7%). The patient who had germ cell tumor which was malignant unfortunately did not have tumor markers requested.

All of the tumors were excised totally. Approaches to the operation were mostly by posterolateral thoracotomy in 19 (51.3%), axillary thoracotomy in in 6 (16.2%), median sternotomy in 4 (10.8%), VATS in 3 (8.1%), VATS with conversion to open thoracotomy in 3 (8.1%), clamshell in 1 (2.7%), and hemiclamshell in 1 (2.7%). (Table 6). Two patients had involvement of the lung requiring additional excision. One patient who had a cystic teratoma involved the innominate vein which was included in the excision using the pericardium as a conduit. Another patient had a large part of the pericardium involved needing a mesh for repair.

Most of the tumors were cystic teratoma in 21 (56.8%), thymic cyst in 9 (24.3%), bronchogenic cyst in 3 (8.1), dermoid cyst in 1 (2.7%) and Schwannoma with degenerative changes in 1 (2.7%). There was one (2.7%) malignant teratoma which was excised totally. Patient later underwent chemotherapy and radiotherapy. (Table 7)

In the study, problems encountered postoperatively were atelectasis which was resolved by fiberoptic bronchoscopy and incentive spirometry, airleaks from the lungs due to involvement in the resection which resolved spontaneously through negative suctioning and chylothorax wherein another operation was done to resolve the problem were included in the morbidity. Fortunately, there was no reported mortality and it was included in the study. One patient who was positive for malignancy underwent postoperative chemotherapy and radiotherapy. Chylothorax patient had to undergo another procedure to ligate the thoracic duct and talc poudrage.

Table 6. Different approaches done per patients.

	No. of Patients (%)
Posterolateral thoracotomy	19 (51.3)
Axillary thoracotomy	6 (16.2)
Median sternotomy	4 (10.8)
VATS	3 (8.1)
VATS with conversion	3 (8.1)
Clamshell	1 (2.7)
Hemiclamshell	1 (2.7)

Table 7. Histologic result of the mediastinal cyst.

	No. of Patients (%)
Cystic teratoma	21 (56.8)
Thymic cyst	9 (24.3)
Bronchogenic cyst	3 (8.1)
Dermoid cyst	1 (2.7)
Schwannoma with degenerative changes	1 (2.7)
Malignant teratoma with yolk sac tumor	1 (2.7)

All patients were followed up from 7 days to 4 weeks. Patient with malignancy followed up with oncology service.

Discussion

The mediastinal cysts form a group of heterogeneous and uncommon benign lesions of neoplastic, congenital, or inflammatory conditions. The forgoing controversy is how to manage them; surgical removal or observation.[1]

The only radical and definitive treatment is complete surgical resection of the cyst. It allows suppression of symptoms, procurement of a formal diagnosis and prevention of complications. This resection, generally indicated for all symptomatic cysts, large-sized even asymptomatic and in case of non-formal diagnosis, is now recommended.[2] This strategy is justified considering morbidity and mortality rising rates in patients treated by surgical resection at time of local complications of the cyst.The more conventional thoracotomy is performed in surgery for cysts, which are adhesive to nearby structures.

In total, surgical indications for mediastinal cyst are large and accepted because of null postoperative mortality and very low rate of morbidity. This militates for early surgery, without waiting for cystic complications leading to peri-operative difficulties and increasing risks. This review presents the characteristics of those different cysts and the strategies currently acknowledged for the treatment. Many histologically different tumors and cysts that affect people of all ages arise from the multiple anatomic structures present in the mediastinum. The number of diagnostic possibilities can be narrowed by considering the patient's age, tumor location, presence or absence of symptoms and signs, association of a specific systemic disease, radiographic findings and biochemical markers. Pathologic diagnosis is often required to confirm a presumed diagnosis and to select the optimal treatment modality. A variety of biopsy techniques for obtaining tissue from the mediastinum have been described, including ultrasound-guided endoscopic biopsy, CT guided percutaneous image-guided needle biopsy, parasternal anterior mediastinotomy and video-assisted thoracoscopic surgery. The choice of biopsy technique depends on the localization of the lesion, clinical factors such as the age and the condition of the patient, and the availability of special techniques with the required expert and the equipment.[3] Although cyst is generally benign lesion there are still some reports of a presence malignancy as a result of malignant degeneration of the epithelial lining of the cyst.[4]

In conclusion, practically all mediastinal cysts are benign, surgical excision is indicated to prevent complications from further enlargement and rupture. Morbidity is low and acceptable with no mortality.

References

1. Gürsoy S, Ozturk A, Ucvet A, Erbaycu AE. Benign primary cystic lesions of mediastinum in adult: the clinical spectrum and surgical treatment. Arch Bronconeumol 2009;45(8): 371-5.
2. Le Pimpec-Barthes F, Cazes A, Bagan P, et al. Mediastinal cysts: clinical approach and treatment. Rev Pneumol Clin 2010; 66(1):52-62.
3. Date H. Diagnostic strategies for mediastinal tumors and cysts. Thorac Surg Clin 2009; 19(1):29-35
4. Yang S. Mastery Cardio-Thoracic Surgery 2nd edition. 2004; 330-332.