

SURGICAL MANAGEMENT OF MEDIASTINAL MASSES: Review of 20 cases

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ABSTRACT

Background: Mediastinal tumors and cysts continue to be the prominent indications of general thoracic surgery. This study was designed to evaluate the clinical manifestations, diagnostic policies and surgical outcomes of the patients with mediastinal masses. **Methods:** Twenty patients who underwent elective surgery due to mediastinal masses performed by the same surgeon in the cardiothoracic units of Arbil and Gazi University were documented over a period of 15 years. **Results:** 5 patients (25%) were confirmed to have malignant and 15 patients (75%) benign lesions. Surgical outcome was satisfactory with no perioperative mortality. **Conclusion:** Clinical presentations, diagnostic procedures as well as surgical outcomes are discussed within the scope of the current literature. Early diagnosis and prompt surgical removal continue to be the best form of management of mediastinal masses.

Key Words: Mediastinum, Mediastinal Tumors, Mediastinal Cysts.

INTRODUCTION

The mediastinum, an important compartment of the thoracic cavity, is the site for many cystic and tumoral lesions of various histological origins (1). Since it contains various vital organs that could be compromised by such lesions, early diagnosis and appropriate treatment should be performed as soon as possible. However, the evaluation and treatment of mediastinal masses continue to present challenging problems to the surgeons.

Recent advances in diagnostic techniques and the availability of multimodality treatment regimens subsequent to surgery have enabled better therapeutic outcomes.

In this report, we present the management of 20 cases suffering from different forms of mediastinal masses and discuss the most appropriate approach.

PATIENTS AND METHODS

During the period from 1985 to 2000, 20 patients with mediastinal lesions were operated on in the cardiothoracic clinics of Arbil and Gazi University.

Patients were within an age range of 2 to 55 years with an average of 25±11 years. Nine of the patients were symptomatic (45%) and 11 were asymptomatic (55%).

The presenting symptoms were chest pain in a patient with invasive thymoma; myasthenia in 2 patients with thymoma; superior vena cava

syndrome, fever and chest pain in a patient with yolk sac tumor; dysphagia with back pain in a patient with oesophageal mass; cough and fever in 2 patients with bronchogenic cysts; back pain in one patient with chondroma and generalized pain as well as fever in one patient with Hodgkin lymphoma. The remaining 11 patients were diagnosed coincidentally while they were evaluated for other disorders. Table 1 demonstrates the diagnosis and complaints of the patients on admission.

Patients were evaluated with chest X-ray, with additional Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) whenever needed. The size, location and extent of tumors were meticulously confirmed. (Fig. 1).

Routine bronchoscopy was performed to rule out tracheobronchial invasion or external compression. Fig 1 demonstrates the mediastinal localization of the masses. CT guided needle biopsy was preferred in a patient with yolk sac tumor (Fig 2).

After premedication with diazepam (10 mg I.M.), a radial artery catheter, two peripheral intravenous catheters and a subclavian vein catheter were inserted at the start of surgery. Hemodynamic parameters; heart rate, mean arterial pressure, central venous pressure and arterial blood gases were monitored throughout the procedure. Anesthesia was induced by fentanyl (15 µg/kg) and muscle relaxation was established with pancronium (0.1 mg/kg). The patients were intubated endotracheally and ventilated with 100% oxygen.

Table 1: Preoperative diagnosis and presenting symptoms of the patients.

DIAGNOSIS	SYMPTOMS
Invasive thymoma	Chest pain
Non-invasive thymoma (2)	Myasthenia gravis
Enteric cysts (3)	-
Hodgkin lymphoma	Fever
Non-Hodgkin lymphoma	-
Bronchogenic cyst (2)	Cough
Oesophageal mass	Dysphagia
Chondroma	Back pain
Lipoma	-
Hydatid cyst (2)	-
Neurofibroma (2)	-
Neuroblastoma	-
Yolk Sac tumor	Sup. V. Cava Syndrome
Pericardial cyst	-

Median sternotomy was employed for anterior lesions; right thoracotomy for posteriorly localized tumors and left thoracotomy in a patient with superior mediastinal hydatid cysts. The data of the patients were recorded within the perioperative period.

RESULTS

Surgical outcome was satisfactory with no perioperative mortality. Five patients were confirmed to have malignant lesions (25%) and appropriate chemotherapy and/or radiotherapy was planned accordingly. The remaining 15 patients were diagnosed to have benign lesions (75%). A patient with right cardiophrenic cyst was found to have a pericardial cyst

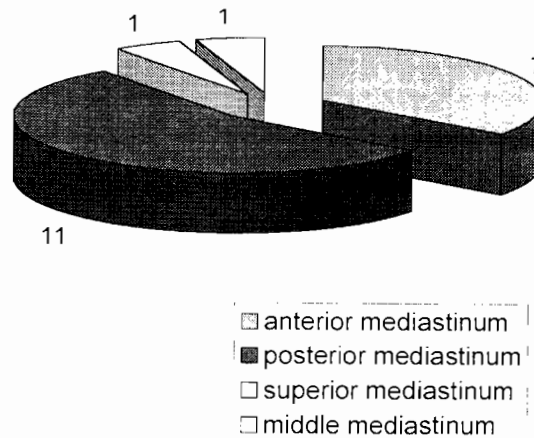


Fig. 1: Localization of mediastinal masses.

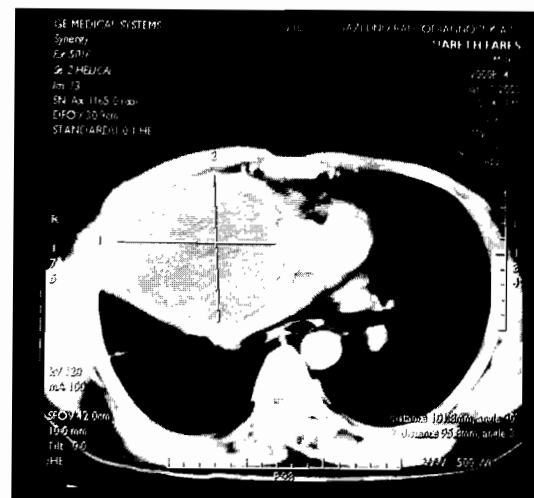


Fig. 2: Computed tomographic image of Yolk Sac tumor.



Fig. 3 : Photomicrograph of the wall of enteric cyst demonstrating the characters of gastric wall morphology (HE X200).



Fig. 4 : Specimen of lipoma.

A mediastinal chondroma located in the posterior mediastinum was completely removed via left thoracotomy.

Patients with enteric cyst, bronchogenic cysts and anterior mediastinal lipoma did well in the postoperative follow-up (Fig. 3).

A patient diagnosed to have a yolk sac tumor, who underwent complete resection for his huge capsulated mass extending to pericardium, right hilum and compressing superior vena cava, received urgent postoperative chemotherapy. Preoperative alpha-feto protein level was 300 IU/ml which decreased to 62.9 IU/ml in the early postoperative period. Two patients with thymoma and myasthenia responded well to thymectomy.

Table 2 : Surgical management of patients with mediastinal masses.

The purpose of surgery in patients with lymphoma was only diagnostic. One patient with oesophageal mass underwent total oesophagectomy and oesophagogastronomy followed by postoperative radiotherapy. A patient diagnosed to have lipoma coincidentally, underwent right thoracotomy (Fig. 4).

Table 2 summarizes the surgical interventions.

DISCUSSION

Primary mediastinal tumors and cysts are common in young and middle-aged patients. Most masses are discovered on routine radiographic examinations in asymptomatic patients, but many lesions produce non-specific clinical manifestations. Approximately two thirds of the patients have the symptoms at the time of

DIAGNOSIS	SURGERY
Invasive thymoma	Surgical removal (sternotomy)
Non-invasive thymoma (2)	Surgical removal (sternotomy)
Enteric cysts (3)	Surgical removal (right thoracotomy)
Hodgkin lymphoma	Open biopsy
Non-Hodgkin lymphoma	Open biopsy
Bronchogenic cyst (2)	Surgical removal (right thoracotomy)
Oesophageal mass	Oesophagectomy+oesophagogastronomy+radiotherapy
Chondroma	Surgical removal (left thoracotomy)
Lipoma	Surgical removal (right thoracotomy)
Hydatid Cyst (2)	Surgical removal (left thoracotomy)
Neurofibroma (2)	Surgical removal (right thoracotomy)
Neuroblastoma	Debulking+radiotherapy+chemotherapy
Yolk Sac tumor	Surgical removal (right thoracotomy)+chemotherapy
Pericardial cyst	Surgical removal (right thoracotomy)

presentation (2). The absence of symptoms is a reasonably good indicator that the tumor may be of benign origin (3). As in our series, the majority of primary masses are benign. 75% of our patients were demonstrated to have benign lesions.

Advances in imaging technology (4,5), radioisotopic improvement in cytology techniques and the introduction of radioimmunoassay, have enhanced the ability to assess more precisely the anatomic extent and the type of mediastinal process (6). CT guided needle biopsy, although not a routine procedure, may be valuable in the verification of malignancy in about 80-90% of cases. We utilized this technique in one case. In addition to advanced imaging techniques, histopathological evaluation is still the gold standard for the diagnosis.

A proper preoperative evaluation should be done to determine the location and extension of the lesion. Since compression of the vital organs may be a significant risk, early diagnosis and proper surgical removal are mandatory. Mediastinoscopy may be necessary to make a diagnosis and establish resectability in this sense. Also novel approaches in anaesthesia, surgical techniques, postoperative care, chemotherapy, immunotherapy and radiotherapy have improved mortality and morbidity, increasing survival and quality of life (7).

In this report, we did not give detailed information about the postoperative medical therapy of patients with malignant lesions, attempting only to discuss the surgical aspect.

We had no mortality in our series. Especially the patients with benign lesions demonstrated dramatic improvement in the early postoperative period.

Since the surgical series of mediastinal masses are somewhat small in the literature, in this study we aimed at demonstrating the experience of different kinds of lesions during a rather long period.

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