



## Epidemiological and Pathological Study on Mediastinal Masses Through a Ten-year Time Period (2001-2011) in Sari (North of Iran)

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### Abstract

**Introduction:** Mediastinal masses divided into three major categories, inflammatory masses, cysts and tumors. Meanwhile, the tumors in the most dangerous. The aim of this study was to assess demographic characteristics, clinical signs and histopathology in patients with mediastinal masses.

**Materials and methods:** we design a retrospective study between the 2001-2011 in sari (north of Iran) to review patient records and pathology reports that they have mediastinal masses.

**Results:** This study consist of 60 patients with mean age of  $40.41 \pm 17.58$  years. 41.7% patients were between 20-40 years old age. our study show that exist of the 56.7% of mass in anterior mediastinum, 21.7% in medial mediastinum and the 21.7% in posterior mediastinum. the most common clinical manifestation was cough (28.3%), dyspnea (21.7%) and pain (18.3%). furthermore, 8 patients (13.3%) don't have any clinical manifestation. lymphoma (36.7%), thymoma (11.7%) and metastatic cancer (10%) were common tumors. a significant difference between the age and tumor type was detected ( $P=0.033$ ).

**Conclusion:** our study showed that the mediastinum mass more involvement patient in the 3 and 4 dace of their age. the common clinical manifestation was cough and dyspnea. the major cusses of mediastinal mass were tumors and the common tumors type included lymphoma, thymoma and metastases.

**Key words:** Mediastinal tumor, Thymoma, Lymphoma, Neurogenic tumor

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### 1. Introduction

Mediastinal tumors are uncommon tumors originating from one of three mediastinum parts (anterior, intermediate, posterior). These tumors are more common among youth and middle-aged adults (1,2)

Generally, mediastinal masses are classified into three main classes of inflammatory, cysts and tumors. Thymus gland tumors and lymphoma are more common in the anterior mediastinum, mediastinal cysts and lymphoma are mainly found in the intermediate mediastinum, while neural tumors are more common in posterior mediastinum (3, 4).

Mediastinal tumors may have no symptoms or be along with clinical symptoms such as fever, cough, shortness of breath, weight loss, change in voice, facial congestion and prominent neck veins (obstruction of the superior vena syndrome) and mediastinum causing patients reference. In cases where the patient has no clinical symptoms, the mediastinal tumor could be accidently diagnosed in chest radiography or CT scan (3,5).

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In last two decades, new and significant information have been attained through mediastinal tumors assessment and diagnosis by CT scan, interventional radiology biopsy, tumor markers and Immunohistochemical methods (6).

In terms of treatment, benign mediastinal tumors could be removed by Video Assisted thoracoscopy (VATS) or thoracotomy. Inflammatory masses would be treated by drug therapy and malignant tumors could be treated through surgery, chemotherapy and radiotherapy (7).

Studies show that different types of mediastinal tumors have different prevalence in various regions (3). Present study is conducted with the aim of investigating the demographic, clinical and histopathological symptoms of mediastinal masses in Sari city.

## 2. Methods

Through a retrospective descriptive study, files of patients with mediastinal masses who underwent biopsy or surgery from 2001 to 2011, were investigated. Pathological reports of patients were verified by supervisor pathologist through slides' reexamination, and then the information of the mentioned patients were completely recorded. The information included age, sex, type of lesion (cyst, benign or malignant tumor), clinical symptoms at the time of radiologic diagnosis, tumor site (anterior, intermediate, posterior) and the method of obtaining pathological sample. For statistical analysis, SPSS 16 software was applied. Descriptive statistics was employed for analysis of obtained data and central, dispersion and absolute frequency were also used.  $P < 0.05$  was considered statistically significant.

## 3. Results

Patients in the study were 60 people (29 men). Their average age was  $40.41 \pm 17.58$  years old (median=39). 10% of patients were under 20 years old, 41.7% were aged 20-40 years old, 31.6% between 40 to 60 years old and 16.7% of them were more than 60 years old. The most common mass site was anterior mediastinum where 56.7% of masses were found (34 cases). 21.7% of masses were in intermediate mediastinum (13 cases) and 21.7% of them were found in posterior mediastinum (13 cases). The most common symptoms were cough (28.3%), shortness of breath (21.7%) and pain (18.3%).

Pathological results of mediastinal masses show that among these 60 patients, 36 patients (60%) had malignant tumors, 8 patients (13.3%) had benign tumors and the remaining 16 patients (26.7%) had benign tumor-like masses. Among 36 patients with malignant tumors, 20 were men (55.55%) and 16 patients were women (44.45%). There was no statistically significant difference between the two genders in terms of having malignant tumors ( $p=0.087$ ). There was no significant difference in the site of malignant mediastinal tumors neither ( $p=0.11$ ) (table 1).

**Table 1.** Location of mediastinal masses on base of malignant or benign type

Tumor location	Frequency	Malignant tumors	Benign tumors	Benign Masses
Anterior mediastinum	34 (56.7%)	23 (63.88%)	4 (50%)	7 (20.59%)
Intermediate mediastinum	13 (21.7%)	8 (22.22%)	0	5 (38.47%)
Posterior mediastinum	13 (21.7%)	5 (13.88%)	4 (50%)	4 (30.77%)

Studies also showed that lymphoma, with 36.7% of cases, (22 patients), was the most common tumor. After that, thymoma and metastatic carcinoma were the most common tumors, respectively. Frequency of other findings in terms of sex and average age of involvement are listed in table 2. In addition, in studying the age of patients versus pathological findings, there was significant difference between patients' age and having different types of tumors ( $p=0.033$ ).

**Table 2.** The frequency of tumors pathologic type on base of demographic data

Pathologic Diagnosis	Frequency	Frequency in men	Frequency in women	Age (Mean±SD)
Lymphoma	22 (36.7%)	10 (45.45%)	12 (54.55%)	35.17±59.50
Thymoma	7 (11.7%)	3 (42.85%)	4 (57.15%)	40.10±28.96
Metastatic carcinoma	6 (10%)	4 (66.66%)	2 (33.34%)	51.8±66.23
non-casefice granulomatosis	5 (8.3%)	2 (40%)	3 (60%)	54.14±40.57
Neurogenic tumor schwannoma	4 (6.7%)	0	4 (100%)	33.18±25.64
Thymic hyperplasia	3 (5%)	2 (66.66%)	1 (33.33%)	35.14±33.46
Thymic cyst	2 (3.3%)	1 (50%)	1 (50%)	44.26±50.16
Germ cell tumor	2 (3.3%)	2 (100%)	0	23.00±0.0
Small round cell tumor	2 (3.3%)	2 (100%)	0	25.22±00.62
Bronchogenic cyst	2 (3.3%)	0	2 (100%)	43.9±50.19
Reactive lymphadenitis	1 (1.7%)	1 (100%)	0	-
Reactive histiocytosis	1 (1.7%)	1 (100%)	0	-
Necrosis Inflammation	1 (1.7%)	1 (100%)	0	-
Epidermal inclusion cyst	1 (1.7%)	0	1 (100%)	-
Ganglioneuroma	1 (1.7%)	0	1 (100%)	-

#### 4. Discussion

Mediastinal tumors are rare tumors with annual occurrence of 8-10 cases, observed mainly in youth and middle-aged adults (1). The average age of the patients in this study was  $40.41 \pm 17.58$ . 10% of patients were under 20 years old, 41.7% were aged 20-40 years old, 31.6% between 40 to 60 years old and 16.7% of them were more than 60 years old. In a study conducted in Saopaulo hospital of USA, the average age of patients was 43.8 years old (8) and in the study of Whooley *et al.*, the average age was 35 (7). In the study of Mohammad Vaziri *et al.*, 39.9% of patients were 20-40 years old and the age of 27.6% of patients placed in the range of 40-60 years' old which is similar with the present work (9). As it was anticipated, this type of tumor is more observed among young and middle-aged people (10).

The most common tumor site was anterior mediastinum with 56.7% prevalence. 21.7% of tumors were in intermediate mediastinum and 21.7% of them were found in posterior mediastinum. In the study by Jahanshahi *et al.*, the most common tumor site was anterior mediastinum (78.33%), intermediate (16.66% and posterior (5%) placed in the next ranks (3). Study of Vaziri *et al.*, showed that 65% of tumors formed in anterior, 14% in intermediate and 21% in posterior mediastinum (9).

Up to two third of mediastinal tumors have no signs in adults and were accidently diagnosed in radiographies performed for other purposes. If they have symptoms, their probability of being malignant will increase (11). Pain, cough, shortness of breath, weight loss and SVC syndrome are some of the symptoms of mediastinal tumors (13). In the present work, only 13.3% of patients had no symptoms, which is in good agreement with other studies mentioning 12-28% of tumors had no symptoms (9,12,13).

Pathological investigation of biopsy samples showed that lymphoma with 36.7% (22 patients) is the most common tumor. After that, thymoma (11.7%) and metastatic carcinoma (10%) had the next highest prevalence. In the study of Jahanshihi, lymphoma had the highest prevalence (51%), this rate was 42% in the work of Vaziri, while the study of Temer R showed 55% of cases were associated with lymphoma (3,9, 10). Hesami study indicated thymoma as the most common tumor (25.7%) and lymphoma had only 15.7% prevalence (13). Metastatic carcinoma involved 10% of patients in our study, regarding other studies reporting 2-3% prevalence for metastatic carcinoma, our study showed higher occurrence (9, 13).

In the present study, 11.7% of patients had thymoma. Hesami study reported 25.7% (13) and Dubashi *et al.* indicated 30.7% prevalence of thymoma (14). In the study by Jahanshahi, the rate of the tumor occurrence was 3.3% (3) and Vaziri reported prevalence of 7.5% (9), also Temes R *et al.*, in studying 219 patients, reported 14.7% frequency for this type of tumor (10). These results showed different prevalence for thymoma, which suggests that that various factors could affect this disease.

Germ cell tumors are the most common malignancies among young men with 15-35 years old. Most of these tumors have gonadic origins. In the present study, the average age of patients having this type of tumor was 23 with prevalence of 3.3% which is very close to results of Hesami (5.5%) (13). However, Dubashi *et al.* reported 15.3% prevalence for this type of tumor (14).

#### Conclusion

Finally, our study revealed that mediastinal tumors mostly involve patients in their 3rd or 4th decade of their lives manifesting themselves by cough, and shortness of breath. In many cases, mediastinal masses are malignant mostly caused based on pathology of lymphoma, thymoma and metastases.

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