



Clinical and radiological profile of mediastinal masses in a tertiary care centre

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ABSTRACT **BACKGROUND:** Mediastinal masses constitute a wide histopathological and radiological spectrum. Computed Tomography (CT) is the imaging modality of choice in the evaluation of mediastinal lesions.
AIM: To determine the causes of mediastinal masses and to correlate the CT findings with the histopathology reports.
MATERIAL & METHOD: A prospective study of 40 consecutive patients who had undergone CT evaluation for suspect mediastinal mass lesions.
RESULTS: Mean age of patients was 46.4yrs. Commonest symptoms were dyspnoea(57.5%), cough(42.5%), chest pain(32.5%) and fever (20%), CT revealed anterior mediastinum lesions in 52.5 %, posterior in 27.5% and in middle mediastinum in 20%. Majority lesions were benign (67.5%). Histopathological diagnosis correlated well with CT diagnosis with an accuracy of 94%.
CONCLUSION: Computed Tomography plays a significant role in the assessment of various mediastinal pathologies. Thymic masses (33.3 %), neural tumors (54.5 %) and tubercular lymph node masses (50 %) were the most common mediastinal masses in the anterior, posterior and middle mediastinal compartments, respectively.

KEYWORDS : Mediastinum, masses, computerized tomography(CT)

Introduction

Mediastinal masses span a wide histopathological and radiological spectrum. Neurogenic tumours, germ cell neoplasms and foregut cysts represent 80 % of childhood lesions, whereas primary thymic neoplasms, thyroid masses and lymphomas are the most common in adults [1]. Anterior mediastinal tumours account for 50 % of all mediastinal masses, including thymoma, teratoma, thyroid disease and lymphoma [2]. Masses of the middle mediastinum are typically congenital cysts while those arising in the posterior mediastinum are often neurogenic tumours [3].

Computed Tomography (CT) is the imaging modality of choice in the evaluation of mediastinal lesion. CT apart from evaluating the mediastinal morphologically, also helps in performing guided biopsies.

Aims and objectives

1. To study the clinical and CT characteristics of mediastinal lesions / masses.
2. To study the anatomical distribution of mediastinal masses.
3. To compare the CT findings with pathological diagnosis wherever possible.

Materials and methods

The study was conducted approximately over a period of 2 years from Oct 2014 to March 2016 in the department of Radio diagnosis at a tertiary care hospital in New Delhi. This was an observational study in 40 patients who were referred with the clinical / chest radiograph suspicion of mediastinal mass. Thorough clinical history and clinical examination was done before CT examination. All the cases taken up for the study were evaluated using 16 Slice Philips CT Scanner with a slice thickness of 5 mm at a pitch of 1.0 and reconstruction at 1 mm interval in soft tissue, lung and bone windows. Non – Ionic, monomeric, triiodinated, water soluble Contrast Media was used. The diagnosis was confirmed with the pathological diagnosis by FNAC/ Histopathology.

Inclusion criteria

1. Clinically suspected cases of mediastinal mass/lesion.
2. Patients where the chest radiograph raises the suspicion of a mediastinal mass.

Exclusion criteria

1. Pregnancy.
2. Contraindication to contrast medium administration.
3. Patient unwilling for CT evaluation.

Results

In this study, out of 40 cases, 25 cases (62.5 %) were males and 15 cases (37.5 %) were females and their mean age was 46.4 yrs .The most common age group to present with the mediastinal mass was more than 45 yrs and it comprised of 18 cases(45%).

Dyspnoea was present in 57.5 % of these patients followed by cough in 42.5 %, chest pain in 32.5 % and fever in 20%. Among the anterior mediastinal masses, thymic masses formed the majority 33.3 % followed by lymphoma in 23.8 % of the total. Middle mediastinal masses comprised 20 % of the total mediastinal lesions. Amongst them the TB lymph node enlargement formed the majority i.e. 50 % followed by metastatic lymph node involvement in 37.5 %.

Posterior mediastinal masses comprised 27.5 % of the total mediastinal masses. The majority was contributed by neural tumors constituting 54.5 % followed by para vertebral abscess constituting 18.5 %. Lymph nodal masses constituted 42.5 % of the total mediastinal masses. Among these, TB lymph node enlargement is predominant and constitutes 41.2 % followed by metastatic lymph node involvement 29.4 %. 33 cases were histologically verified and three cases were of vascular origin – aortic disorders were confirmed with conventional angiography, one was cystic nature (Bronchogenic cyst) and two cases were of paravertebral abscess and one para vertebral hematoma(1). On contrast studies majority showed heterogeneous enhancement i.e. 42.5 % (n=17) followed by homogenous enhancement 37.5 % (n=15). Non - enhancing masses constituted 10 % (n=4); 2 cases showed intense vascular enhancement and were cases of Aortic aneurysm with / without dissection. The mass effect was noted in 70 % of the cases and it was predominantly on the tracheo- bronchial tree.

Discussion

The mediastinum is the site for variety of diseases, ranging from tumors - both benign and malignant, cysts, vascular lesions, lymph node masses and mediastinitis. Although conventional radiographs can show recognizable abnormalities in many patients with mediastinal abnormalities but they are limited in their sensitivity and ability to delineate the extent of mediastinal abnormalities and the relationship of masses to specific mediastinal structures. With the computed tomography these problems are overcome because of its excellent density resolution and tomographic format and therefore CT plays an important role in the evaluation of the mediastinum. CT has helped the clinicians and radiologists in identifying the precise location, extent and characterization of these masses.

This study was undertaken with the objectives of determining the disease pattern affecting the mediastinum and to correlate the CT findings with the histopathology reports whenever possible. Majority

of the symptoms were of non-specific nature liked dyspnoea, cough, chest pain, fever, dysphagia etc. These symptoms were mainly due to the mass effect from the mediastinal lesions and were dependent on the location of the mass. Anterior mediastinal masses mostly presented with dyspnoea and cough probably due to tracheal compression.

The majority of the mediastinal masses were in the anterior mediastinum constituting 52.5 % followed by middle and posterior mediastinal compartment which is similar to the study conducted by Strollo et al in 1997 where in anterior mediastinum constituted 50 % of the masses [4,5]. Lymphoma constituted 12.5 % of the mediastinal masses, which is similar to study conducted by Wychulis et al [6]. Majority of mediastinal masses in our patients were of benign nature (67.5%).

Malignant lesions were more predominant in the male population while benign lesions have occurred with equal frequency in both genders. Majority of the benign lesions have occurred in the 2nd to 4th decade. In the case of malignancy, majority of the cases have occurred between 4th and 6th decade.

Tubercular granulomatous lesions constituted 17.5 %, which is greater in comparison to Wychulis et al study (6.3 %) probably due to higher prevalence of Tuberculosis in India as compared to the western population (6). Our study had 2 cases of paravertebral abscess (5 %) which was associated with vertebral body destruction. According to Im et al [7] 52 % of the enlarged TB lymph nodes showed central areas of low attenuation with rim enhancement on contrast study. Our study showed this pattern in 28.5 % cases. Thymoma formed the majority (100 %) of thymic masses which is similar to previous studies [8,9]. In another study by Chen et al [10] on 34 patients with CT diagnosis of thymic mass, thymoma constituted 91 % and thymic cyst 2.9 %. Intrathoracic goiters are a common cause of mediastinal enlargement. We found only one such case (2.5%). According to A. Prasad et al, thyroid lesions account for 11-15 % of mediastinal masses [11].

Conclusion

Computed Tomography plays a significant role in the assessment of various mediastinal pathologies which are initially detected on the chest radiographs. The maximum number of cases occurred in 4th to 6th decade. Mediastinal masses occur more commonly in males. The anterior mediastinum was the most common compartment to be involved (52.5 %) followed by posterior mediastinum (27.5 %) and then middle mediastinum (20 %). Thymic masses (33.3 %), neural tumors (54.5 %) and tubercular lymph node masses (50 %) were the most common mediastinal masses in the anterior, posterior and middle mediastinal compartments respectively.

In the pediatric group the neurogenic tumour is the most common mediastinal mass. Mass effects upon the adjacent mediastinal structures is observed in 70 % of the cases and is predominantly noted on the airways. 32 out of 40 cases (80%) were histologically confirmed. With an accuracy of 94 % (30/32) CT is a highly useful modality for investigation of mediastinal masses. So we conclude that computed tomography definitely has a major role to play in the evaluation of a mediastinal mass regarding the distribution pattern, diagnosis and mass effect upon adjacent structures.

Table 1: Clinical characteristics of patients (n= 40)

s.no	characterstics	no	%
1.	Age (Mean)	46.4 Yrs	-
2.	Sex		
	a. Male	25	62.5
	b. Female	15	37.5
3.	Symptoms		
	a. Cough	17	42.5
	b. Dyspnoea	23	57.5
	c. Fever	08	20.0
	d. Chest Pain	13	32.5
4.	Location of mass		
	a. Anterior	21	52.5
	b. Middle	08	20.0
	c. Posterior	11	27.5
5.	HPE Diagnosis	32	80
6.	Benign	27	67.5
7.	Malignant	13	32.5

Table 2: Radiological pathological diagnosis concordance

S. no	Radiological diagnosis (n)	Pathological diagnosis (n)
1.	Thymoma (7)	Thymoma (7)
2.	Tubercular lymphadenopathy (7)	Granulomatous lymphadenitis (7)
3.	Germ cell tumour (2)	Germ cell tumour (2)
4.	Lymphoma (5)	B cell lymphoma (4)
5.	Carcinoma lung with adenopathy (5)	Adeno ca lung (1)
		Small cell carcinoma (1)
		Squamous cell carcinoma (3)
6.	Retro sternal goitre (1)	Multi nodular goitre (1)
7.	Neurogenic tumour (6)	Neuroblastoma (5)
		Nerve sheath tumour (1)
8.	Ascending aortic aneurysm (2)	-
9.	Type b aortic dissection (1)	-
10.	Para vertebral abscess (2)	-
11.	Broncho genic cyst (1)	-
12.	Para vertebral hematoma (1)	-

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