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Role of CT in the diagnostic evaluation of Mediastinal Masses: Institution based Prospective Study

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ABSTRACT

Background: Computed Tomography (CT) is the most commonly used modality for identification and characterization of mediastinal masses. These abnormalities often manifest initially in conventional radiography. However in this era of cross-sectional imagining, CT provides better understanding of the origin, characterization and extent of the mediastinal masses. The present study aims to identify the CT features of different mediastinal masses and their impact on adjacent structures.

Materials and Methods: This study was conducted in Department of Radiodiagnosis, Sree Mookambika Institute of Medical Sciences, Kulasekharam in 2015. This study was ethically cleared by the Institutional Human Ethics Committee. Patients with radiographic suspicion of mediastinal masses were subjected to CT in this study. A total of 53 cases were selected. Demographic data and informed consent were obtained. On CT the pattern, nature and calcification of mediastinal masses, mass effect on adjacent structures were observed and the association of dyspnoea secondary to mass effect on airways was calculated.

Results: In the 53 cases, most showed homogenous enhancement (16) and were solid (35). There was a significant association between the dysponea and mass effect on airways. Few lesions had calcification within. This study concludes that homogenous solid nature forms the majority pattern among mediastinal masses. Dysponea is the most common symptom among mediastinal masses and is secondary to the mass effect upon the airways.

Conclusion: Identification and characterization of masses is crucial for further approach and clinical management. Hence, CT is the modality of choice.

KEYWORDS: Computed Tomography, Mediastinal masses, Solid masses, Dyspnoea, homogeneity, vascular masses.

Introduction

Computed tomography is the modality of choice in the detection, evaluation and characterization of mediastinal masses. Although conventional radiographs detect the mediastinal abnormality, it is limited in delineating the extent, origin and characterization of mediastinal mass [1]. Thymic lesions, bronchogenic cysts and neurogenic masses forms the most common mediastinal masses in the anterior, middle and posterior mediastinum respctively [2]. Anatomically mediastinum is limited by the pleural cavity, thoracic inlet and diaphragm. It further divided into anterior, posterior and middle mediastinum [3]. The most common mass in the anterior mediasstinum are thymoma, teratoma, lymphoma and thyroid lesions. Congenital cysts and neurogenic masses form the most common in the middle and posterior mediastinum respectively [4]. Dyspnoea is the most common symptom followed by cough, fever, chest pain, hemoptysis and dysphagia [5]. The present study aimed to highlight the features of common masses in midiastinum.

Study settings

The study was conducted in the Department of Radiodiagnosis, Sree Mookambika Institute of Medical Sciences, Kulasekharam in 2015 for a period of 12 months (2015-16).

Inclusion criteria

- Chest radiographs suspicious for mediastinal mass lesions

Exclusion criteria

- Trauma
- Cardiac cases
- Allergy to contrast
- Pregnant women
- Who are not willing to give consent

Procedure

A total number of 53 cases, selected based on the inclusion and exclusion criteria. Informed consent was obtained. All the patients were nil oral 4hr prior to the CT scan. All the cases studied on SEIMENS SOMATOM (Factors employed 130kV and 70mA). Routine AP topogram of the thorax obtained in supine position withholding breath. Spiral sections of 10mm thickness were taken from the level of thoracic inlet to the suprarenals. All cases were followed by post contrast study using, non ionic intravenous OMNIPAQUE (IOHEXOL) 350 mgI/ml was given and axial section were taken from thoracic inlet to the level of suprarenals. Sagittal and coronal reconstructions were made wherever necessary [6, 7].

Statistical analysis

The data is expressed in number and percentage. Microsoft Excel 2010 version used for calculation of percentage

Results

In the present study most of the mediastinal masses are homogenously enhancing (16) and few intense enhancement (3). 14 masses were heterogenous. 11 were non enhancing and 9 showed rim enhancement. 66.04 % were solid; 5.66% fatty; 5.66% vascular; 5.66% solid and cystic component; 15.09% were cystic in nature. Significant association was observed between dyspnoea and mediastinal mass effect on airway. 11 masses showed calcification and 42 masses had no calcification (Table-1,2,3 & Graph-1&2).

Discussion

The mediastinal masses can be divided into benign and malignant conditions based on various CT features of mediastinal masses. Age of the patient and location of masses are the major parameters in the diagnosis of medisatinal masses. Based on the age there is a difference in characteristics and site of origin of various mediastinal masses [8,9]. Most of the benign masses are asymptomatic. Patients with malignant lesions usually had

symptoms [10]. Strollo et.al study shows predominance of anterior mediastinal mass and similar results are observed in our study [11]. Merten DF et al showed lymphoma in the anterior mediastinum and neurogenic masses in the posterior mediastinum as the most common lesions and similar results are observed in our study [12]. Most of the mediastinal masses are diagnosed by combination of clinical and imaging findings. With radiograph, evidence of mediastinal abnormality can be screened however there are limitations in further characterization. This drawback is overcome by CT [13].

Conclusion

CT is the modality of choice in the detection, characterization and localization of various meadistinal masses which is of utmost importance in the further management in day to day clinical practice.

Table-1: CT enhancement pattern of mediastinal masses

Pattern	Number	Percentage (%)
Hoogenous enhancement	16	30.19
Heterogenous enhancement	14	26.42
Non enhancement	11	20.75
Rim enhancement	9	16.98
Intense enhancement	3	5.66
Total	**53**	**100.00**

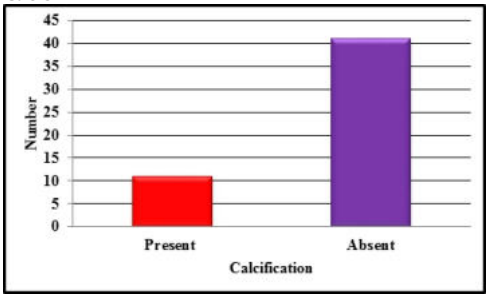
Table-2: Distribution of the masses based on the nature

Nature	Number	Percentage (%)
Solid masses	35	66.04
Cystic masses	8	15.09
Fatty masses	3	5.66
Vascular masses	3	5.66
Soild+cystic masses	3	5.66
Fatty+Cystic+Solid masses	1	1.89
Total	**53**	**100.00**

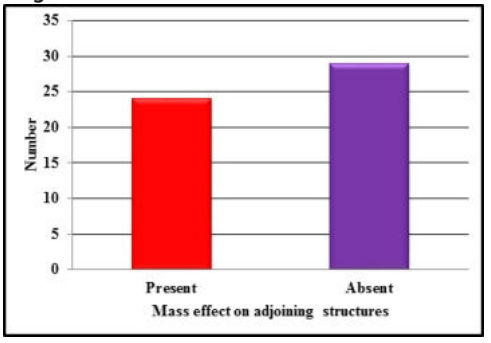
Table-3: Association between dyspnoea and mass effect airway

Symptom	Mass effect on airway		Total
Dyspnoea	**Present**	**Absent**	
Present	18	13	**31**
Absent	6	16	**22**
Total	**24**	**29**	**53**

Graph-1: Number and percentage of masses with calcification



Graph-2: Number and percentage of masses effect on adjoining mediastinal structures



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