Original Research Paper

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Radio-Diagnosis

ROLE OF COMPUTED TOMOGRAPHY IN THE EVALUATION OF ANTERIOR MEDIASTINAL MASSES

Dr T Ramakrishna Naidu — Postgraduate, Department of Radio-Diagnosis

Dr. Anindita mishra* — MBBS, MD.Professor, Department of Radio-Diagnosis. GSL MEDICAL COLLEGE AND GENERAL HOSPITAL, Rajahmundry. *Corresponding Author

ABSTRACT **Background:** To study the characteristics and determine the differential diagnosis of anterior mediastinal masses by Computed Tomography and correlate the histopathological diagnosis to the findings of CT scan where possible. Materials and methods: The study was a hospital-based prospective study conducted over a period of 6 months at the department of Radio-Diagnosis GSL MEDICAL COLLEGE AND GENERAL HOSPITAL, Rajahmundry.**Results:** In 10 study samples of anterior mediastinal masses lymphoma occ 40% and is seen most commonly in 26-50 yrs. age group with 3:1 male predominance. **Conclusion:** Through this study we concluded that lymphoma is the most commonly occurring neoplasm among all anterior mediastinal masses with 3:1 male preponderance. All the cases were verified with histopathology and CT accurately predicts the diagnosis in 93.4 % of cases. From the above results, we conclude that computed tomography definitely has a major role to play in the evaluation of anterior mediastinal masses regarding the imaging features and mass effect upon adjacent structure and provisional diagnosis.

KEYWORDS : Anterior mediastinal masses, lymphoma thymoma, thymic carcinoma, tubercular adenitis, and germ cell tumors, computed tomography.

INTRODUCTION:

The mediastinum is the region between the two lungs divided into three compartments anterior, middle and posterior.[2]

The multitude of diseases affecting the anterior mediastinum varies considerably, ranging from tumors (benign to extremely malignant), cysts, vascular anomalies and lymph node masses.[2]

Computed Tomography has revolutionized in the diagnosis of mediastinal lesions.[1]

It is one of the finest non-invasive imaging modalities available for imaging of the thorax.[1]

Besides being less expensive and being more widely available. It is capable of defining the precise anatomical details and characterizing the nature, site and extent of the disease.[1]

CT gives much more detail of extent and involvement of disease. This also underlines the importance of close cooperation with the histopathologist and the clinicians in diagnosis and management.[1]

MATERIALS AND METHODS:

Study area: GSL MEDICAL COLLEGE AND GENERAL HOSPITAL, RAJAMAHENDRAVARAM

Study subjects: All cases referred to the department of Radio-Diagnosis for clinically suspected Mediastinal masses at GSL MEDICAL COLLEGE AND GENERAL HOSPITAL over a period of 6 months were included in the study.

Research design: Prospective Study.
Equipment: All the cases were studied on a SIEMEN'S HEALTHINEERS computed tomography machine.

Study sample: 10 study samples.
Duration of study: Period of 6 months

RESULTS:

Table .1: DISTRIBUTION OF ANTERIOR MEDIASTINAL MASSES

Anterior mediastinal masses	No of cases	Percentage
Thymoma	2	20
Thymic carcinoma	1	10
Lymphoma	4	40
Tubercular adenitis	2	20
Germ cell tumour	1	10

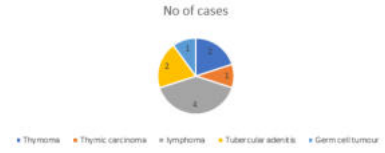

Table.1: In 10 study samples of anterior mediastinal masses lymphoma occupied 40%, thymoma and tubercular adenitis were 20%, thymic carcinoma and germ cell tumors were 10%. So in this study, the most common anterior mediastinal mass is lymphoma.

Table.2: AGE AND SEX DISTRIBUTION

AGE	MALES (%)	FEMALES (%)	TOTAL (%)
1-25	1(10%)	1(10%)	2(20%)
26-50	2(20%)	1(10%)	3(30%)
50-75	2(20%)	2(20%)	4(40%)
>75	0(0%)	1(10%)	1(10%)
TOTAL	5(50%)	5(50%)	10(100%)

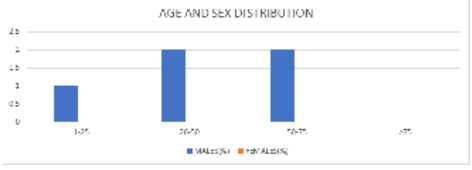

Table.3: DISTRIBUTION OF ANTERIOR MEDIASTINAL MASSES IN AGE GROUPS

Anterior mediastinal masses	<25		26-50		51-75		>75	
	males	females	males	females	males	females	males	females
Thymoma	0	0	0	0	1	0	1	0
Thymic carcinoma	0	0	0	0	1	0	0	0
lymphoma	1	0	1	1	1	0	0	0
Tubercular adenitis	0	1	1	0	0	0	0	0
Germ cell tumour	0	0	1	0	0	0	0	0

Table 2&3: Lymphoma is seen most commonly in 26-50 yrs. age group with 3:1 male predominance.

Thymoma is seen most commonly in 51-75 yrs. and >75yrs age group with 1:0 male predominance.

Thymic carcinoma is seen most commonly in 51-75 yrs. age group with 1:0 male predominance.

Tubercular adenitis is seen most commonly in <25yrs and 26-50 yrs age group with 1:1 equal bimodal distribution.

Germ cell tumors is seen most commonly in 26-50 yrs age group with 1:0 male predominance.

IMAGES:

1.TUBERCULAR LYMPHADENITIS

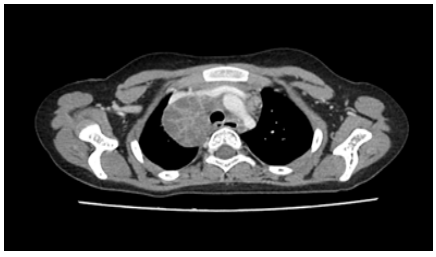

Figure.1: CECT thorax of 9y old female shows multiple discrete conglomerate necrotic lymph nodes are noted in the bilateral cervical, right paratracheal, AP window, right hilar and subcarinal region.

2.LYMPHOMA:

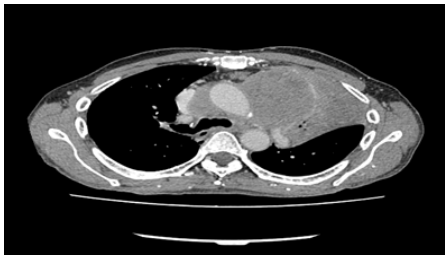

Figure.2: CECT thorax of 62y old male shows large homogenously enhancing anterosuperior mass in noted encasing the arch of aorta, right brachiocephalic trunk, left CCA, left subclavian artery, left pulmonary artery, left superior pulmonary vein, trachea and left main bronchus.

3.GERM CELL TUMOUR:

Figure.3: CECT thorax of 30y old male shows a Large well defined heterogeneous density mediastinal mass noted in the right hemithorax with the contralateral mediastinal shift. Mass has both solid and cystic components, a predominantly multilocular cystic component with fat and a focal solid component with nodular calcifications.

DISCUSSION:

Computed tomography has been playing a major role in characterization, detection and staging of mediastinal masses.

In the present study, an attempt has been made to study the characteristics of various anterior mediastinal masses and to correlate the CT findings with the histopathology findings.

Our study comprises a total of 10 patients from the in-patient department and is conducted for a period of 6 months in the department of Radio-diagnosis. In our study, among all anterior mediastinal masses, lymphoma occupied 40%, thymoma, and tubercular adenitis were 20%, thymic carcinoma and germ cell tumors were 10%. So I concluded that the most common anterior mediastinal mass is lymphoma.

CT characteristics:

In our study majority of the masses are well defined, Hypodense and show moderate and Heterogenous contrast enhancement.

All the lesions were soft tissue attenuating. However, other attenuations like Calcification, Fluid and Fat were also seen. Mass effect on adjacent structures also seen.

Lymphoma: Primary lymphoma accounts for 20% of all mediastinal neoplasms in adult population and 50% in children population. it's usually seen in anterior mediastinum. 50-70% are due to Hodgkin's disease. it presents with bimodal age distribution and has no gender predilection. [3]

A homogeneous soft-tissue anterior mediastinal mass with mild to moderate contrast enhancement, uneven contours, surface lobulation, lack of vascular involvement, and a significant amount of concomitant mediastinal lymphadenopathy are characteristic imaging findings. One can spot cystic and necrotic alterations.[4]

Fever night sweats and weight loss, cough, dyspnea, and chest pain are the most common presentation. Non-Hodgkin's disease is of two types large B-cell lymphoma (in middle-aged adults) and t cell lymphoma (in children and adolescents).[3]

Germ cell tumors: Germ cell tumors are a heterogeneous group of lesions originating from primitive germ cell layers and usually affect gonads.[3]

Aberrant migration of primordial germ cells may permit this tumor to develop in extragonadal location most commonly anterior mediastinum (15% mediastinal masses in adults and 24% in children). [3]

A well-defined unilocular or multilocular cystic lesion with fluid, soft tissue, and fat attenuation is how teratomas are most frequently seen on CT scans. Calcifications can be rim-like, focal, or in very rare circumstances, indicative of teeth or bone.[4]

Thymic neoplasms: Tumors involving the thymus are classified as epithelial, lymphoma, thymo lipoma, carcinoid, germcell tumors, sarcomas, and metastasis. Thymomas represent 20% of anterior mediastinal neoplasms in adults.[3]

On CT thymoma appears as a homogenous enlargement of the gland containing areas of fat and lymphoid attenuation with normal vessels and smooth contour. If it has irregular margins heterogenous content with necrosis, calcifications, hemorrhage, and cystic changes raise the possibility of malignancy.[3]

CONCLUSION:

Through this study we concluded that lymphoma is the most commonly occurring neoplasm among all anterior mediastinal masses with 3:1 male preponderance.

Lymphoma occurs most commonly in the 51-75yrs age group. GCT occurs most commonly in the 26-50yrs age group. TB lymphadenitis occurs most commonly in the <50yrs age group. Thymoma occurs most commonly in the 51-75yrs age group. Thymic carcinoma most commonly occurs in the 51-75yrs age group.

All the cases were verified with histopathology and CT accurately predicts the diagnosis in 93.4 % of cases.

From the above results, we conclude that computed tomography definitely has a major role to play in the evaluation of anterior mediastinal masses regarding the imaging features and mass effect upon the adjacent structure and provisional diagnosis.

REFERENCES:

1. Nam JG, Goo JM, Park CM, Lee HJ, Lee CH, Yoon SH. Age- and gender-specific disease distribution and the diagnostic accuracy of CT for resected anterior mediastinal lesions. Thorac Cancer. 2019 Jun;10(6):1378-1387. doi: 10.1111/1759-7714.13081. Epub 2019 Apr 29. PMID: 31033234; PMCID: PMC6558486.
2. Bhalla S, Marom E. Approach to Imaging of Mediastinal Conditions in the Adult. 2019 Feb 20. In: Hodler J, Kubik-Huch RA, von Schulthess GK, editors. Diseases of the

Chest, Breast, Heart and Vessels 2019-2022: Diagnostic and Interventional Imaging [Internet]. Cham (CH): Springer; 2019. Chapter 3. PMID: 32096941.

3. Patnaik S, Malempati AR, Uppin M, Susarla R. Rare mediastinal masses - imaging review. J Cancer Res Ther. 2021 Jan-Mar;17(1):13-21. doi: 10.4103/jcrt.JCRT_587_19. PMID: 33723126. Shahrzad M, Le TS, Silva M, Bankier AA, Eisenberg RL. Anterior mediastinal masses. AJR Am J Roentgenol. 2014 Aug;203(2):W128-38. doi: 10.2214/AJR.13.11998. PMID: 25055288.
4. Juanpere S, Cañete N, Ortuño P, Martínez S, Sanchez G, Bernado L. A diagnostic approach to the mediastinal masses. Insights Imaging. 2013 Feb;4(1):29-52. doi: 10.1007/s13244-012-0201-0. Epub 2012 Dec 6. PMID: 23225215; PMCID: PMC3579993.