



ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF RADIOLOGY

**Correlation between chest radiographic findings and chest
computed tomography findings in patients presenting with
mediastinal masses at St. Paul's Hospital Millennium Medical
College, Addis Ababa, Ethiopia**

January-December 2023

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Addis Ababa, Ethiopia

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College, Addis Ababa, Ethiopia 2023**

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**A Research report of senior paper to be submitted to the
Department of Clinical Radiology, St. Paul's Hospital Millennium
Medical College in preparation for Partial Fulfillment of the
Requirements for the post graduate study in radiology.**

Addis Ababa, Ethiopia

December, 2023

Acknowledgements

First of all, I would like to thank the Department of Radiology for providing me such an opportunity of going through such research work, which impacted me with knowledge and skills. I am deeply indebted to my advisors, Dr. Yared (MD,Radiologist) and Dr. kumlachew abate (MD,Radiologist) for their understanding, answering my frequent questions without any hesitation, for their countless suggestions, assistance, kindness and enlightening guidance throughout the development of this work.

Abstract

Background: The mediastinum is a common site for both non-neoplastic and neoplastic lesions, often presenting as mediastinal masses. Accurate diagnosis requires a thorough evaluation of imaging features and distribution. Comparing chest X-ray findings with chest CT scans is crucial in this process. Manifestations on chest radiographs include soft tissue masses, mediastinal widening, or pneumomediastinum. CT imaging provides a detailed assessment of texture (cystic versus solid) and content (calcium or fat), enhancement pattern of the mass relations to the adjacent structures.

Objective: To correlate the radiographic findings with the computed tomography findings in mediastinal masses at St. Paul's Hospital Millennium Medical College.

Methods: A retrospective cross-sectional study was conducted at St. Paul's Hospital including 55 patients with mediastinal masses who underwent both chest X-ray and chest CT scan between January and December 2023. Data entry was performed using Epi-Info version 3.5.1, and analysis utilized SPSS version 23.0. The study employed descriptive statistics and Pearson correlation to compare chest X-ray and CT findings for an overall assessment of mediastinal masses

Result: This study was conducted on 55 patients consisting of 29 (52.7%) men and 26 (47.3%) women. Chest x-ray were diagnosed 44 (80%) out of 55 patients, 11 (20%) patient chest out of the 55 patient were not detected in chest x-ray, while chest CT scan were diagnosed 55 out of 55 patients of our study. regarding compartmental distribution of mediastinal masses 35 out of 44 patients were diagnosed chest x-ray are localized showed that the anterior mediastinal masses were the most common lesions 57%, followed by middle mediastinal masses 25%, posterior 11% and multiple 7% while compartmental distribution of mediastinal masses on CT scan showed that anterior mediastinum formed the majority of total masses, 34 (61.8%) followed by middle compartments, 15 (23.6.0%), posterior mediastinum, 5(9.1.0%) and multiple 3 (5.5%).The study established significant correlations between chest X-ray and CT in mass detection ($P = 0.01$) and compartment localization ($P = 0.00$), underscoring the complementary role of both modalities for a thorough evaluation.

The sensitivity of CT in detecting anterior, middle, posterior and multiple were 61.8%, 23.6%, 9.1%and 5.5%respectively. The overall CT sensitivity for diagnosis of mediastinal masses were appears 100.0%. And the overall chest x-ray sensitivity for diagnosis of mediastinal masses were appears 70.9%.

Conclusion There was a significant correlation between chest x-ray detection and x-ray localized of mediastinal masses with chest CT. Regarding sensitivity chest CT was superior and more sensitive to chest x-ray in terms of detection, localization, and characterization of the mediastinal masses. Over all, the most common location detected was anterior mediastinal mass in both chest CT and X-ray, while lymphoma and thymic masses were the most common anterior mediastinal masses.

Acronyms/Abbreviations

CT	Computed Tomography
PI	Principal Investigator
SPHMMC	St. Paul's Hospital Millennium Medical College

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1. Introduction

1.1 Background

The mediastinum is the central region of the thoracic cavity that houses different vital structures such as thymus, heart, large blood vessels, lymph nodes, nerves, and portions of the esophagus and trachea. This anatomic cavity is bordered anteriorly by the sternum, posteriorly by the thoracic vertebrae, superiorly by the thoracic inlet, inferiorly by the diaphragm, and laterally by the pleural space. It divides into anterior, middle, and posterior compartments (1,2). Grossly, the mediastinum is divided into four major compartments based on certain anatomic landmarks. The superior mediastinum spans the thoracic inlet to an imaginary line between the angle of Louis and the fourth thoracic vertebral body. The anterior mediastinum extends from the posterior aspect of the sternum to the front of the ascending aorta and pericardium. The posterior mediastinum is located between the posterior pericardium and the spine. The middle mediastinum lies between the anterior and posterior mediastinal compartments (3,4).

Mediastinal masses, masses of cells that appear in the mediastinum, encompass a broad histopathological spectrum, ranging from benign to malignant. Approximately two-thirds of mediastinal masses are benign although nearly 59% of masses in the anterior compartment are malignant (5). The most common lesions affecting the mediastinum are thymomas, neurogenic tumors (NTs) and benign cysts, altogether representing 60% of the cases (6,7). About half of mediastinal masses occur in the anterior compartment, and they typically include thymoma, teratoma, thyroid goiter, and lymphoma. The most frequently identified middle mediastinal masses are congenital cysts including foregut and pericardial cysts, while posterior mediastinal masses are often neurogenic tumors, including schwannomas (5,8).

Most mediastinal masses are usually asymptomatic, but many can be associated with specific clinical features. In general, symptoms vary depending on the size of the lesion, aggressiveness of the neoplasm, and the presence or absence of concomitant infection, with malignant lesions being more likely to be symptomatic than their benign counterparts (2,9). Typically, symptoms relate to invasion or obstruction of nearby structures and can include dyspnea, dysphagia, cough owing to airway compression, superior vena cava syndrome, hoarseness secondary to laryngeal nerve involvement or symptoms resulting from spinal cord compression (2).

Mediastinal lesions are frequently encountered in daily imaging practice. Although the radiologic evaluation of mediastinal lesions depends on the location of the lesion, radiologic examination usually can narrow the differential diagnosis significantly. In some cases, imaging features enable the radiologist to reach to a specific diagnosis. Chest radiograph, a basic investigation that is easily available and a part of routine diagnostic workup, provides a baseline for evaluation for mediastinal diseases. A number of mediastinal reflections are visible at conventional radiography that represent points of contact between the mediastinum and neighboring lung. The presence or distortion of these reflections is the key to the detection and interpretation of mediastinal abnormalities. However, mediastinal masses remain an engrossing diagnostic challenge affecting people of all ages (10,11).

Computed tomography (CT) is a good diagnostic choice for mediastinal masses, specifically for those localized within the anterior compartment. It provides information regarding the precise location of the lesion and its relative location with respect to adjacent mediastinal structures. CT can also determine texture (cystic versus solid) and content (whether it contains calcium or fat). In many cases, non-contrast-enhanced CT is sufficient, but in others, contrast-enhanced CT can further characterize the mass in terms of enhancement and its relation to adjacent vascular structures. Correlation of CT findings with other imaging findings is complex and requires adequate clinical data for optimum diagnostic confidence (4,12,13). Thus, this study is meant to correlate the radiographic findings with the computed tomography findings and to study the whole spectrum of mediastinal masses at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

1.2 Statement of the problem

This study addresses the critical need to correlate chest radiographic findings with chest computed tomography (CT) findings in patients with mediastinal masses, particularly in the anterior compartment. These masses pose a risk of life-threatening scenarios due to their compressive effects on vital structures. The wide-ranging radiological spectrum of mediastinal masses, encompassing tumors, cysts, and more, emphasizes the necessity for accurate diagnosis through comparison with chest x-ray and CT scan findings. (14,15). With mortality rates reaching up to 16.4%, early detection is crucial for differentiating and treating benign and malignant lesions up (16).

High order imaging modalities are geographically unevenly distributed in Ethiopia with the concentration of specialists and sophisticated equipment in tertiary healthcare facilities in the major cities (21). Again, in developing countries like Ethiopia where an estimated 24% of the

population live below the poverty line, and health insurance coverage in Ethiopia is very minimal (28.1%), and high (34%) household out-of-pocket healthcare expenditure (22,23), it would be fair to say that using CT would be a challenge with out-of-pocket (OOP) payments constituting the main gateway to accessing CT. Thus, the study aimed to systematically assess the spectrum of mediastinal masses at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, considering the challenges posed by the geographical uneven distribution of high-order imaging modalities and the economic constraints of the population, where out-of-pocket payments remain a primary obstacle to accessing CT.

1.3. Objective of study

1.3.1 General objective

- To correlate the radiographic findings with the computed tomography findings in mediastinal masses at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

1.3.2 Specific objective

- To describe imaging (chest x-ray and chest CT scan) characteristics and distribution of mediastinal masses. at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia
- To identify the prevalence of the various mediastinal mass among patients present with mediastinal mass.
- To assess the correlation between the radiographic findings and the computed tomography findings of mediastinal masses at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia
- To find out the sensitivity of chest x-ray and chest CT for diagnosing mediastinal masses.

1.4 Significance of this study

This study holds significant value by enhancing our understanding of the correlation between chest radiographic and chest computed tomography findings in the context of mediastinal masses in Ethiopia. It aims to document the spectrum of these masses, providing insights into their characteristics. The research has broader implications, potentially improving clinical

diagnosis and patient management, leading to cost reduction by avoiding unnecessary interventions. With the scarcity of CT resources, the study aims to promote rational CT use. It will guide practitioners in selecting appropriate medical imaging for patients with mediastinal masses and serve as a valuable benchmark for researchers in developing countries

2. Literature review

2.1 Radiological and morphological spectrum of mediastinal masses

A retrospective study that enrolled 92 patients with mediastinal lesions at three health facilities of Egypt was carried out between 2017 and 2018. Mediastinal lymphadenopathies were the most frequently identified pathologies. Endobronchial ultrasound was the sampling modality most used successfully (39.13%) to achieve the final diagnosis, followed by computed tomography-guided trucut biopsy (25%). The most common pathological finding was lymphomas (34.78%) followed by adenocarcinomas, which constituted 26% of the cases (24).

In India, a retrospective study was conducted on 166 mediastinal masses diagnosed on surgically resected specimens as well as needle biopsies over a period of two years (January 2012-December 2013). Most of the lesions were in 21–30-year age group, with male to female ratio of 1.7:1. Anterior mediastinal compartment was most commonly involved (70.1%). Majority of the cases (62.1%) were of neoplastic nature, with benign tumours (34.5%) representing more cases than malignant ones (27.6%). Thymoma followed by lymphoma constituted the most common mediastinal tumours. One-third of the total cases were diagnosed on needle biopsy samples. All cases where needle biopsy was followed by resection specimen showed concordant diagnosis. The percentage adequacy of biopsy was 91.7 per cent and the diagnostic accuracy was 100 per cent (25).

2.2 Role of radiograph and CT in evaluating mediastinal masses

With conventional radiography, many mediastinal reflections can be appreciated, and their presence or distortion is the important to the interpretation of mediastinal abnormalities. Anterior mediastinal masses can be identified when both the hilum overlay sign and the posterior mediastinal lines are intact. Widening of the right paratracheal stripe and convexity relative to the aortopulmonary window reflection both indicate abnormality in the middle mediastinum. Disruption of the zygoesophageal recess can result from abnormalities in either the middle or posterior mediastinum. Paravertebral masses disrupt the paraspinous lines, and

the location of masses above the level of the clavicles can be inferred by their lateral margins; posterior masses have sharp margins owing to their interface with lung, whereas anterior masses do not (26).

In several clinical conditions of the chest, CT was documented to better differentiate mediastinal masses from typical mediastinal structures, characterize its density, localize, and discriminate vascular from avascular lesions (27). Sens et al. tried to compare the results of CT and conventional tomography examinations of the thorax of 137 patients with each other and with the final results. They found that in most of investigated items, CT proved to be superior to conventional tomography, especially of the evaluation of mediastinum (90 % vs. 35 %). Additionally, they concluded that CT is the method of choice in the staging of intrathoracic tumours and especially in the evaluation of hilar and mediastinal masses, abating the no need for conventional tomography in these cases (28).

Vedaraju et al. conducted a prospective study done in the Radiodiagnosis department, Narayana medical college by studying 30 patients who underwent CT evaluation from January 2018 to December 2020 for clinically suspected mediastinal masses with symptoms and incidentally detected mediastinal masses on chest radiograph. Results: Out of all, the most commonly involved compartment was the anterior mediastinum (19 cases), followed by the posterior (8 cases) and middle mediastinum (3 cases). Among the 30 cases, 28 cases (94%) were predicted accurately by CT compared with histopathology (11).

In summary, the reviewed literature reveals that mediastinal masses range across the spectrum, ranging from benign to life threatening ones. Both conventional radiograph and CT have diagnostic values in evaluating mediastinal masses. However, the correlation of radiographic and CT findings has not been systematically performed before in resource-limited settings such as Ethiopia, where chest radiograph can be the only imaging modality available, validating the undertaking of the current study.

3. Methods and Materials

3.1 Study area

The study was conducted at St. Paul's Hospital Millennium Medical College (SPHMMC), one of the largest government hospitals located in Addis Ababa, the capital city of Ethiopia. The college has more than 2800 clinical, academic and administrative and supporting staffs that provide medical specialty service to patients who are referred from all over the country. Built in 1969, the hospital serves about 200,000 patients annually on average, with a catchment population of more than 5 million. On top of this, this referral hospital is a teaching center for both undergraduate and postgraduate health science students. The hospital has more than 700 beds dedicated to inpatient service..

3.2 Study period

The study period was from January 1st to December 30th, 2023

3.3 Study design

A facility-based, cross sectional study was used.

3.4 Population

3.4.1 Source population

There was a significant correlation between chest x-ray detection and x-ray localized of mediastinal masses with chest CT. Regarding sensitivity chest CT was superior and more sensitive to chest x-ray in terms of detection, localization, and characterization of the mediastinal masses. Over all, the most common location detected was anterior mediastinal mass in both chest CT and X-ray, while lymphoma and thymic masses were the most common anterior mediastinal masses.

All patients with mediastinal masses attended and recorded in RIS at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

4.4.2 Study population

All patients with mediastinal masses imaged at the Department of Radiology of St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia during the study period

3.5 Eligibility criteria

3.5.1 Inclusion criteria

- Patients with mediastinal masses imaged at Hospital and recorded data in the RIS.

3.5.2 Exclusion criteria

- Patients with radiological diagnosis imaged but incomplete recorded data in the RIS.

3.6 Sampling technique and sample size

- All patients with mediastinal mass within the study period and who have both chest x-ray and CT scan was included in the study.

3.7 Sampling technique

The study were used patients with radiological imaged and recorded in RIS at SPHMMC

3.8 Data collection tools and procedures

Data was collected by the principal investigator using data extraction format. All patients with clinical diagnosis of mediastinal mass seen at radiology CT scan and x-ray units were identified from the daily registry. Patient's card collected from archives and RIS. All data regarding demographic, clinical information and imaging result will be retrieved from the chart, reports and RIS.

3.9 Data analysis and interpretation

Data was entered and cleaned in Epi Info for windows version 3.5.1 and exported to SPSS version 23 statistical software for analysis. Frequency, proportion, mean with standard deviation will be conducted to describe the data used. Then sensitivity with 95% confidence intervals (CIs) will be calculated for each mediastinal mass and for the overall mediastinal mass.

Study variables

3.9.1 Dependent variable

- Patients have mediastinal masses

3.9.2 Independent variables

- Age
- Size of the lesion
- Compartment location of the mass
- Symptomatology
- Infection

3.10 Data quality management

An English version checklist was used to collect data. Brief training for the data collectors (two radiology residents) about the process of data collection was given before the process of data collection. Close supervision was maintained during data collection and filled checklists was double-checked daily for consistency and completeness by data collectors and the principal investigator before proceeding to statistical analysis.

3.11 Ethical consideration

Ethical clearance was obtained from Review Committee of Department of Radiology of SPHMMC. A support letter was submitted to the director of the study hospitals from the Department of Radiology to proceed with the study. Following this step, the data collectors were introduced with the onsite practitioners. The collected data was kept anonymous and confidential.

3.12 Dissemination of the study findings

The findings of this study were submitted to the Department of Radiology of SPHMMC as a partial fulfillment of the specialty certificate in Clinical Radiology. The findings will also be presented and disseminated to other concerned stakeholders through presentation in different workshops and seminars. Finally, the manuscript will be submitted to a peer-reviewed scientific journal for possible publication.

4. RESULT

4.1 Socio-demographic and clinical presentations of the participants

This study was conducted on 55 patients consisting of 29 (52.7%) men and 26 (47.3%) women. The mean age of the patients was 37.5 with SD ± 11.09 years. Of 55 cases, 2 cases (4.0%) were pediatrics. The most common age group to present with the mediastinal mass was found between 16 and 30 years. Most of the study participants, 22 (40.0%) were evaluated in 2023 (Table 1)

Regarding clinical presentation of the participants; Cough was the most common clinical symptom constituting 18 (32.73%) followed by dyspnea 12 (21.82%), and dysphagia 7 (12.73%). In the study, out of 55 cases, 2 (3.64%) cases had no symptoms pertaining to the chest and CT showed the incidental involvement of the mediastinum (Figure 1).

4.2 Chest X-ray detection, localization and characterization of mediastinal masses

Chest x-ray were diagnosed 44 (80%) out of 55 patients, 11 (20%) patient chest out of the 55 patient were not detected in chest x-ray. 35 out of 44 patients were diagnosed chest x-ray are localized according to the its location of the mediastinum compartment. 37 out of 44 patients chest x-ray were characterized as solid lesion while 7 out of 44 patients became non solid. 10 out of 44 patients were detected intra-lesional calcifications while 34 out of 44 patients were not detected any intra-lesional calcifications in the table 2. Chest x-ray mediastinal masses compartmental distributions showed that the anterior mediastinal masses were the most common lesions 57%, followed by middle mediastinal masses 25%, posterior 11% and multiple 7% (figure 2).

4.3 Chest CT detection, localization and characterization of mediastinal masses

Chest CT scan were diagnosed 55 out of 55 patients of our study and regarding compartmental distribution of mediastinal masses on CT scan showed that anterior mediastinum formed the majority of total masses, 34 (61.8%) followed by middle

compartments, 15 (23.6.0%), posterior mediastinum, 5(9.1.0%) and multiple 3 (5.5%) (Figure3).

On Chest CT diagnosis among, anterior mediastinal masses are the most common masses of the mediastinum thyroid mass and lymphoma formed the majority constituting 20 (36.4%) each, followed by thymic masses 7 (12.7%). The majority of the middle masses were granulomatous and lymphoma tumors 10 (18.2%).The majority, 3 (5.5%), of the posterior mediastinal mass were neurogenic tumors. (Table3).

CT characteristics of the common mediastinal masses among study participants who were evaluated at SPHMMC in pre-contrast CT study 34 out of 55 patients' mediastinal lesions were solid, 14 out of 55 patients were mixed solid and cystic and 3 out of 55 patients were pure cystic. In post contrast study 15 out of 55 patients were homogenous enhancement, 26 out of 55 were heterogeneous enhancement and 14 out of 55 patients were no enhancement. 16 out of 55 patients were showed intra-lesional cystic component while 39 patients didn't show any cystic component. 21 out of 55 patients were showed intra-lesional calcifications while 34 out of 55 patients didn't show any calcifications. (Table4).

There was a significant correlation between chest x-ray detection of mediastinal masses ($P = 0.01$) and chest CT scan detection of mediastinal masses ($P = 0.01$) with mean (1.36 and 1.05) and standard deviation (.485 and .229) respectively. There was a significant correlation between x-ray localized lesion of mediastinal masses ($P = .000$) and CT scan compartment location of the mass ($P = 0.00$). Significant level was considered as $P < 0.05$ (2-tailed) used Pearson Correlation.

The sensitivity of CT in detecting anterior, middle, posterior and multiple were 61.8%, 23.6%, 9.1% and 5.5% respectively. The overall CT sensitivity for diagnosis of mediastinal masses were appears 100.0%. And the overall chest x-ray sensitivity for diagnosis of mediastinal masses were appears 70.9%.

Table 1:- Socio demographic characteristics of study participants who are evaluated for Mediastinal mass at SPHMMC, from January, 2023 to May, 2023 Addis Ababa, Ethiopia.

Variable		Frequency	Percentage
Age	0-15	2	3.6
	16-30	22	40.0
	31-45	13	23.6
	46-60	13	23.6
	>60	5	9.1
Sex	Male	29	52.7
	Female	26	47.3

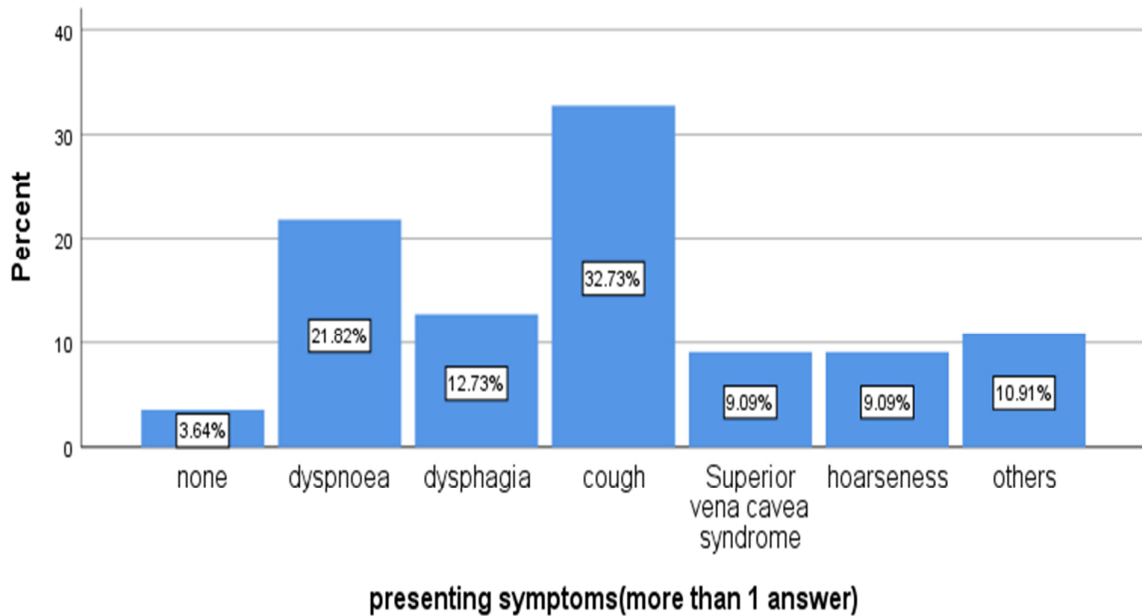
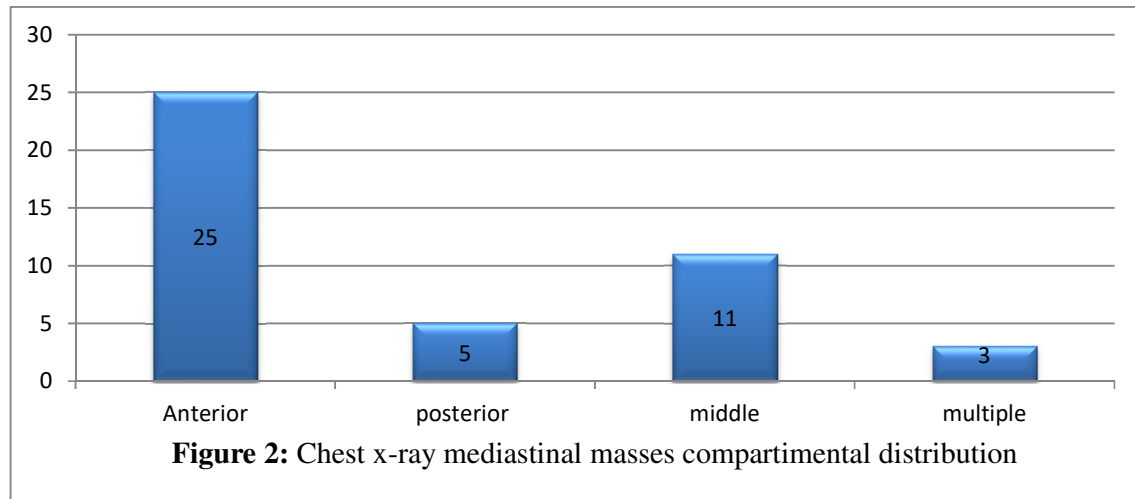


Figure 1: Clinical Presentation of study participants who are evaluated for Mediastinal mass at SPHMMC, from January, 2023 to December, 2023 Addis Ababa, Ethiopia.

Table 2: Chest x-ray characteristics of the common mediastinal masses among study participants who are evaluated at SPHMMC, from January, 2023 to December, 2023, Addis Ababa, Ethiopia

Variable	Frequency	Percentage
Chest x-ray in mediastinal lesion	Detected	44
	Non detected	11
X-ray localized lesion	Yes	35
	No	9
X-ray mass density	Solid	37
	Non-solid	7
Chest x-ray calcification of mediastinal masses	Yes	10
	No	34



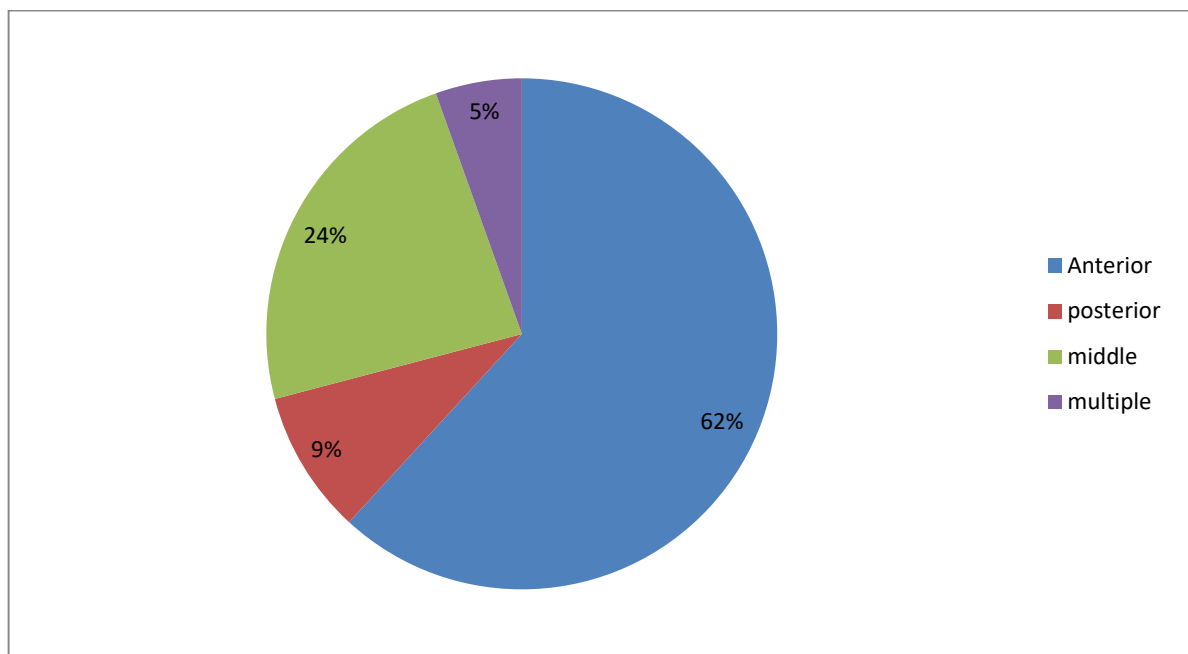


Figure 3: Chest CT scan mediastinal masses compartmental distribution.

Table 3: Mediastinal mass compartment distribution of study participants who are evaluated by CT at SPHMMC from January, 2023 to December 23, Addis Ababa, Ethiopia.

Compartment	Various mediastinal masses	Frequency	Percentage
Anterior (34)	Thymic mass	7	18.2
	Germ cell tumor	2	3.6
	Thyroid mass	10	12.7
	Lymphoma	10	18.2
	Anterior Pericardial cyst	1	1.8
	Inconclusive	4	7.3
Middle (13)	Granulomatous	5	9.1
	Metastasis	3	5.5
	Lymphoma	5	9.1
Posterior (5)	Neurogenic tumor	3	5.5
	Inconclusive	2	3.6
Multiple (3)	Hydatid cyst	1	1.8
	Fibrosing mediastinitis	1	1.8
	Lymphangiomas	1	1.8

Table 4: CT characteristics of the common mediastinal masses among study participants who are evaluated at SPHMMC, from January, 2023 to December, 2023, Addis Ababa, Ethiopia

Variable		Frequency	Percent
CT scan pre-contrast density of composition	Solid	38	69.1
	Mixed	14	25.5
	Cystic	3	5.5
CT scan post-contrast enhancement	Homogenous	15	27.3
	Heterogeneous	26	47.3
	Non-enhancing	14	25.5
CT scan cystic component	Yes	16	29.1
	No	39	70.9
CT scan calcification component	Yes	21	38.2
	No	34	61.8

5.1 Discussion

Mediastinum is a site of non-neoplastic and neoplastic lesions, many of which present as mediastinal masses. In the study of the imaging appearance, distribution, and other features of various mediastinal masses comparison with the chest x-ray findings and chest CT scan finding diagnosis is important to make an accurate diagnosis.

Mediastinal disease is usually initially demonstrated on a chest radiograph and appears as mediastinal soft tissue mass, widening of mediastinum

However, many times chest radiograph appears normal in presence of mediastinal disease. After invention of computed tomography (CT), it emerged as the choice for assessing the mediastinal masses. It is the most useful investigation for localizing, characterizing, and demonstrating the extent of a mediastinal mass and its relationship to adjacent structures.

This study was conducted on 55 patients consisting of 29 (52.7%) men and 26 (47.3%) women. The mean age of the patients was 37.5 with SD ± 11.09 years.

The most common age group to present with the mediastinal mass was found between 16 and 30 years.

Regarding clinical presentation of the participants; Cough was the most common clinical symptom constituting 18 (32.73%) followed by dyspnea 12 (21.82%), and dysphagia 7 (12.73%).

Chest x-ray were diagnosed 44 (80%) out of 55 patients, 11 (20%) patient chest out of the 55 patient were not detected in chest x-ray. 35 out of 44 patients were diagnosed chest x-ray are localized according to the its location of the mediastinum compartment.

Regarding compartmental distribution of mediastinal masses this study showed that anterior mediastinum formed the majority of total masses, 34 (61.8%) followed by middle compartments, 15 (23.6.0%), posterior mediastinum, 5(9.1.0%) and multiple 3 (5.5%).

On Chest CT diagnosis among, anterior mediastinal masses are the most common masses of the mediastinum thymic mass and lymphoma formed the majority constituting 20 (36.4%) each, followed by thyroid masses 7 (12.7%). The majority of the middle masses were granulomatous and lymphoma tumors 10 (18.2%).The majority, 3 (5.5%), of the posterior mediastinal mass were neurogenic tumors.

CT characteristics of the common mediastinal masses among study participants who were evaluated at SPHMMC in pre-contrast CT study 34 out of 55 patients' mediastinal lesions were solid, 14 out of 55 patients were mixed solid and cystic and 3 out of 55 patients were pure cystic. In post contrast study 15 out of 55 patients were homogenous enhancement, 26 out of 55 were heterogeneous enhancement and 14 out of 55 patients were no enhancement. 16 out of 55 patients were showed intra-lesional cystic component while 39 patients didn't show any cystic component. 21 out of 55 patients were showed intra-lesional calcifications while 34 out of 55 patients didn't show any calcifications.

The sensitivity of CT in detecting anterior, middle, posterior and multiple were 61.8%, 23.6%, 9.1%and 5.5%respectively. The overall CT sensitivity for diagnosis of mediastinal masses were appears 100.0%. And the overall chest x-ray sensitivity for diagnosis of mediastinal masses were appears 70.9%.

In our study, Cough was the most common clinical symptom constituting 18 (32.73%) followed by dyspnea 12 (21.82%), and dysphagia 7 (12.73%).which is similar to the study of Harmeet Kaur et al. (2012) comprising of 120 patients with mediastinal masses, cough constituted the most common symptom i.e. in 53% followed by Shortness of breath in 50% and dysphagia 7 (12.73%). The findings of our study are also consistent with study done by 25 Kireet Pulasani et al. (2013) comprising of 50 cases The mean age of the patients was 40.5 with SD $\pm$ 11.09 years. With clinical or radiological suspicion of mediastinal lesions [24].

Regarding compartmental distribution of mediastinal masses this study showed that anterior mediastinum formed the majority of total masses, 34 (61.8%) followed by middle compartments, 15 (23.6.0%), posterior mediastinum, 5(9.1.0%) and multiple 3 (5.5%) (Figure2). Which is similar to the study conducted by Varsha V Jadhav et al. [27] which depicted that in all age group anterior mediastinum constituted 52% of the masses followed by posterior and then middle which constituted 30% and 18% respectively. This is also consistent with study done by Harmeet Kaur et al. (2012), Venkateshwaran Arumugam et al. (2014) and study done in Ethiopia by Bekele A et al (2011). [25,26,28]. In our study multiple compartment lesions were the second accounted for 22.0% of the cases followed by posterior lesions accounting for 16.0%.

The prevalence of tumors varies with respect to the mediastinal compartments. Anterior mediastinal masses are the most common masses of the mediastinum thyroid mass and lymphoma formed the majority constituting 20 (36.4%) each, followed by thymic masses 7 (12.7%). The majority of the middle masses were granulomatous and lymphoma tumors 10 (18.2%).The majority, 3 (5.5%), of the posterior mediastinal mass were neurogenic tumors.

These findings of our study were consistent with study by Marom EM et al (2010) and Duwe BV et al. (2005). [17,29].

CT characteristics of the common mediastinal masses among study participants who were evaluated at SPHMMC in pre-contrast CT study 34 out of 55 patients' mediastinal lesions were solid, 14 out of 55 patients were mixed solid and cystic and 3 out of 55 patients were pure cystic. In post contrast study 15 out of 55 patients were homogenous enhancement, 26 out of 55 were heterogeneous enhancement and 14 out of 55 patients were no enhancement. 16 out of 55 patients were showed intra-lesional cystic component while 39 patients didn't show any cystic component. 21 out of 55 patients were showed intra-lesional calcifications while 34 out of 55 patients didn't show any calcifications. The CT diagnose mediastinal masses with reference to characterizations were similar compared with study by Varsha V Jadhav et al (2012) which states characterizations of CT in diagnosing mediastinal mass lesions is 94% [27] and also low compared to study by Kireet Pulasani et al.(2013) which depicted that CT plays a significant role in the assessment of various mediastinal pathology with an accuracy of 92% [24]. The reason for this might be due to observer bias for chest x-ray and CT diagnosis, small sample size, and the set up.

5.2 Limitation of the study

- Poor recording system of the patients chart that results small sample size.
- Small number of included pediatrics patient to see variations on age

5.3 Conclusion

There was a significant correlation between chest x-ray detection and x-ray localized of mediastinal masses with chest CT. Regarding sensitivity chest CT was superior and more sensitive to chest x-ray in terms of detection, localization, and characterization of the mediastinal masses. Over all, the most common location detected was anterior mediastinal mass in both chest CT and X-ray, while lymphoma and thymic masses were the most common anterior mediastinal masses.

5.4 Recommendation

Since anterior mediastinal masses are the commonest in our set up, we need to pay more attention to any abnormality that is detected accidentally in a routine chest X-ray

To increase the sensitivity and diagnostic accuracy; there need to be a feedback mechanism from chest CT scan side for each mediastinal mass chest x-ray diagnosis.

For researcher; need to conduct this study on large scale by focusing on a single type of mediastinal mass with prospective type of design.

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Annex II: English Version Checklist

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF RADIOLOGY

001. Data collector: code ____/____/____ Name _____

002. Date of data collection ____/____/____ Time _____

003. Checked by supervisor: Signature _____ day _____ month _____ year _____

004. Serial number _____

Section 1: Background data		
S.N.	Question item	Possible answer
1	Age	
2	Sex	1. Male ☐ 2. Female ☐
3	Pre-existing comorbid condition (more than 1 answer possible)	1. None 2. Diabetes mellitus 4. Cardiac disease 3. Hypertension 5. HIV/AIDS 6. Other _____
Section 2: Clinical details		
4	Presenting symptoms (more than 1 answer possible)	None ☐ Dyspnoea ☐ Dysphagia ☐ Cough ☐ Superior vena cava syndrome ☐ Hoarseness ☐ Neurologic symptoms ☐ Other (specify _____) ☐
5	Mediastinal compartment involved	Anterior ☐ Posterior ☐ Multiple ☐ Middle ☐
6	Size of the mass	a) <3cm b) 3-5cm c) >5cm

7	Various mediastinal masses in	Anterior ☐ Posterior ☐ Middle ☐
8	Chest CT Ca	Yes ☐ No ☐
9	Chest CT cyst change	Yes ☐ No ☐
10	Chest CT density	a) Solid b) Mixed c) Cyst
11	Post-contrast	a) Homogenous b) heterogeneous c) non enhanced
12	Chest x-ray mass detected	A) Yes B) No
13	Chest x-ray localization	A) Yes B) No
14	Chest x-ray calcification	A) Yes B) No
15	Chest x-ray density	A) Yes B) No