ORIGINAL ARTICLE

Role of CT Scan in the Detection of Mediastinal Masses

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ABSTRACT

Aim: To determine the role of Computed Tomography in the detection of mediastinal masses
Methods: Study was conducted at CT machine 64 slice Toshiba Aquilian in radiology department at The University of Lahore Teaching Hospital, Lahore. Data was collected according to the age, gender, masses and the sites of masses. Total number of 60 patients comprising 41 males (68.3%) &19 females (31.7%) were detected during suitable sample procedure.
Results: Total of 60 patients were included in this research comprising 41 males (68.3%) and 19 females (31.7%). According to the result of the study of the following segments of lungs were involved, in which bilateral anterior segments were 4(6.7%), left anterior segment were 9(15%), left medial segment were 2(3.3%), left posterior segment were 6(10%), right anterior segment were 28 (46.7%), right medial segment were (3.3%), right posterior were 2(3.3%) and normal were 7(11.7%) patients with no pathologies. According to CT findings of 60 patients in which normal were 7(11.7%), benign were 31(51.7%) and malignant were 22(36.7%). On the basis of appearance of masses on CT adenocarcinoma were 9 (15%), adenomas were 13(21.7%), mediastinal carcinoma were 5(8.3%), lungs cell carcinoma were 5(8.3%), lymphadenopathy were 8(13.3%), nodular 2(3.3%), papilloma were 2(3.3%) and normal were 7(11.7%).
Conclusion: Men are more prevalent for mediastinal mass than females for mediastinal masses. Computed tomography is considered a reliable technique for evaluating patients with Mediastinal masses.
Keywords: Computed Tomography, Mediastinal Mass, Carcinoma

INTRODUCTION

Mediastinal masses comprise a large range of tumors distressing inhabitants of different age & stay an appealing analytic confront. They may be innate or attained which can be primary or secondary tumors. Secondary mediastinal tumors are further ordinary than primary tumors as well as mainly often symbolize lymphatic participation commencing primary tumors of lung or infra diaphragmatic parts like pancreatic, gastro esophageal as well as testicular cancer[1.] While 1970s, CT has reformed analytic assessment creation[2]. It has consequence in enhanced surgery, analysis moreover cure the cancer, improved cure following wound as well as main disturbance, improved cure of caress as well as of cardiac situations[3]. Computed tomography has several benefits in excess of additional imaging modalities in that it may be carried out in minutes as well as extensively obtainable that may permit physician to quickly corroborate or keep out analysis among better confidence. It had main contact upon meadow of surgery wherever it has lessened require for disaster surgery from 13%-5% as well as approximately completed numerous investigative surgical processes died out[4].

Extensive uptake of computed tomography in clinical follow up has been exposed to reduce amount of patients need in patient admittance. Progressive annual technical proceed in computed tomography as well assist to create it an more and more attractive imaging modality among advanced spatial decree as well as shorter scanning time foremost to very much augmented numeral of clinical submissions, e.g., computed tomography colonography, computed tomography angiography, computed tomography urography etc[5].

Known these benefits, it is not disclosure that computed tomography has seen detonation in consumption as beginning. In 2007, it was predictable to approximately 62 million computed tomography examines were creature gained every year in US, contrast by approximately 3 million for each year in 1980[6]. One of main apprehensions connected by extensive uptake of computed tomography is connected enlarged rays contact incurs through patients[7].

This enlarged dependence upon computed tomography scanning has consequence in increasing per capita effectual emission amount conventional from medical-imaging in United States to boost roughly six fold among years 1980 to 2006 as well as medical-imaging is currently main foundation of rays contact to human other than normal backdrop rays[8].

Since mid 1990 there erstwhile a yearly augment of approximately 10% in consumption of computed tomography scan. This dependence upon computed tomography scan is frequently more intensified through be short of option imaging modalities, particularly in minor centers[9]. Computed tomography imaging lets early on analysis as well as more precise characterization of mediastinal masses than is possible with plain film radiograph[10].

Anterior mediastinal mass report for 50% of every mediastinal mass[11]. Mediastinum is distinguished through pleural cavities creatively, thoracic cove commandingly as well as diaphragm inferiorly[13]. It is further divided into front, middle & later compartment through several anatomists. The most common location for a mediastinal mass is anterior, of which an estimated 35% are thymic

Received on 03-10-2020
Accepted on 13-01-2021

malignancies, approximately 25% are lymphomas, 15% are either thyroid or other endocrine tumors, 10% tend to be benign teratomas and another 10% being malignant germ cell tumors, with the remaining 5% usually consisting of benign thymic masses[14].

In various series of study on mediastinal masses, incidence of malignant lesions ranged from 25-49%. CT is considered to be the most noninvasive choice of study for the diagnosis of mediastinal masses[15]. A lot of articles that entail mediastinum write to anatomical variant or mass happen from spine or else digestive tract, furthermore should not be measured factual mediastinal masses. Lymph node rise represent common reason of mediastinal masses[16].

Mediastinal main cysts symbolize 15% to 20% of every primary mediastinal mass. Teratoma is mainly ordinary mediastinal germ cell tumor. Adult teratomas are typically asymptomatic as well as symbolize 60% to 70% of all mediastinal masses[17]. They are calm well differentiated benign tissues among main ectodermal constituent. If teratomas contain fetal tissue or neuro-endocrine tissue, it is distinct as undeveloped as well as malignant among meager prediction[18]. Due to their location, mediastinal masses that are not treated can cause serious problems, even if they are not cancerous. These complications include spreading to the heart, pericardium and great vessels.

This study is trying to find out the early detection mediastinal masses so that the mobility and mortality could be reduced in the society due to these complications. Mediastinal masses due to their location are difficult to diagnose by other modalities. This research is providing a way to use CT as first choice to diagnose mediastinal masses. As per patients are usually advised CT but in the very late course of their disease.

METHOD AND MATERIALS

Study was conducted at CT machine 64 slice Toshiba Aquilian in radiology department at The University of Lahore Teaching Hospital, Lahore. Data was collected according to the age, gender and masses and site of masses. Total number of 60 patients comprising 41 males (68.3%) & 19 females (31.7%) were detected during suitable sample procedure. Inclusion Criteria: Both male and female of all age group. Exclusion Criteria: All other patients except mediastinal masses. Data was evaluated and analyzed with SPSS version 21, Microsoft Excel 2016. The quantitative data (gender) will be presented in the form of descriptive statistics, mean±S.D, and qualitative data will be presented by percentage, frequency and bar charts or pie charts. Collected data will be stored in Microsoft Excel.

RESULTS

Total of 60 patients were included in this research comprising 41 males (68.3%) and 19 females (31.7%) from Table 1. According to result of study of the following segments of lungs were involved, in which bilateral anterior segments were 4(6.7%), left anterior segment were 9(15%), left medial segment were 2(3.3%), left posterior segment were 6(10%), right anterior segment were 28(46.7%), right medial segment were (3.3%), right posterior were 2(3.3%) and normal were 7(11.7%) patients with no pathologies. According to CT findings of 60 patients in which normal were 7(11.7%), benign were 31(51.7%) and malignant were 22(36.7%). On the basis of appearance of masses on CT adenomas were 13(21.7%), mediastinal carcinoma were 5(8.3%), lungs cell carcinoma were 5(8.3%), lymphadenopathy were 13(23.3%), nodular 2(3.3%), papilloma were 2(3.3%) and normal were 7(11.7%)

Table 2 shows segment of lungs in which bilateral anterior segments were 4(6.7%), left anterior segment were 9(15%), left medial segment were 2(3.3%), left posterior segment were 6(10%), right anterior segment were 28(46.7%), right medial segment were (3.3%), right posterior were 2(3.3%) and normal were 7(11.7%)
Table 3 shows diagnosis on CT in which malignant were 22 (36.7%), benign were 31 (51.7%) and normal were 7 (11.7%).

Table 4 shows that tumor in which adenocarcinoma were 9 (15.0%), adenomas were 13 (21.7%), carcinoma were 5 (8.3%), lungs cell carcinoma were 5(8.3%), lymphadenopathy were 17 (23.3%), nodular 2 (3.3%), papilloma were 2 (3.3%) and normal were 7 (11.7%).

Table 1: Total numbers of 60 patients were included in this research comprising 41 males (68.3%) and 19 females (31.7%).

	Frequency	Percent
Female	19	31.7
Male	41	68.3
Total	60	100.0

Fig.1: Gender

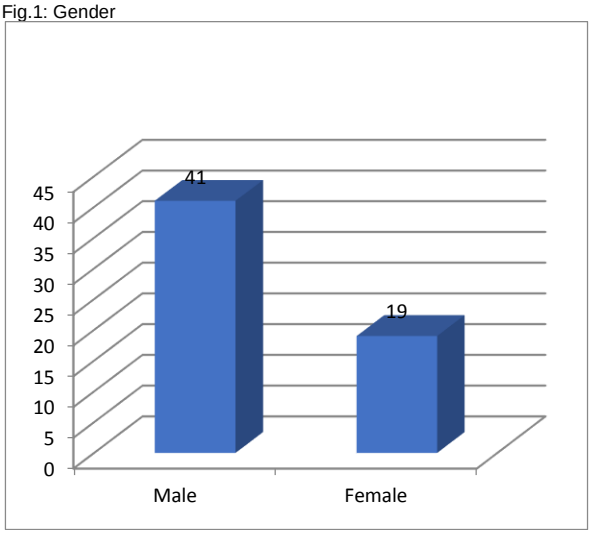


Table 2: Frequency of Lesion in Different Segments of Lungs

	Frequency	Percent
Bilateral Anterior	4	6.7
Left Anterior	9	15.0
Left Medial	2	3.3
Left Posterior	6	10.0
Right Anterior	28	46.7
Right Medial	2	3.3
Right Posterior	2	3.3
Normal	7	11.7
Total	60	100.0

Fig.2: Segment of lungs

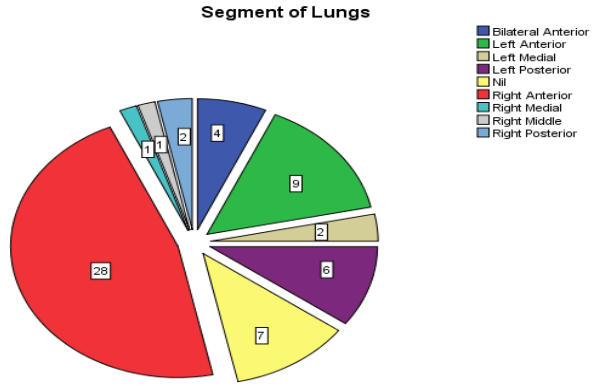


Table 3: App

	Frequency	Percent
Benign	31	51.7
Malignant	22	36.7
Normal	7	11.7
Total	60	100.0

Fig. 3: Final diagnosis

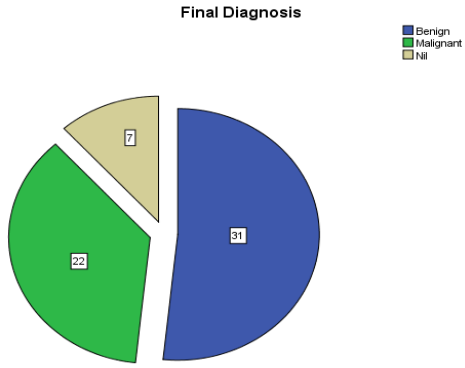
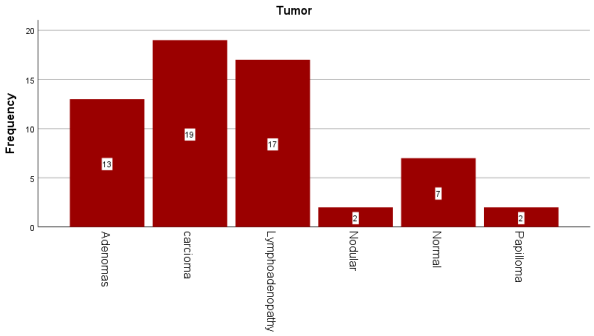


Table 4: Mediastinal Tumors

	Frequency	Percent
Adenomas	13	21.7
carcinoma	19	31.7
Lymphadenopathy	17	28.3
Nodular	2	3.3
Normal	7	11.7
Papilloma	2	3.3
Total	60	100.0

Fig. 4: Tumour



DISCUSSION

Study was designed to study the role of computed tomography in detection of Mediastinal masses. On the basis of analytic performance for recognition of mediastinal masses, Computed tomography is considering a consistent technique for evaluating patients with Mediastinal masses.

This study attempt was made to identify the mediastinal masses in patient. Data was collected according to the age, gender, mediastinal masses and tumor. Data of total numbers of 60 patients with suspected of mediastinal masses were included in this research comprising 41 males (68.3%) and 19 females (31.7%) were collected. Out of 60 patients, our results showed the final diagnosis in which normal were 7, benign were 31 and malignant were 22. A similar study performed by Takeda et al. in Japan which is based on the evaluation of mediastinal mass in adult and pediatric population in which the most prevalent location was the anterior compartment, i.e., 68% in case of adults and 52% in the posterior compartment in case of children[19].

Another project reported by Kumar et al., which is based on mediastinal masses in which the age group of samples ranges from 7 to 80 years was included and 86% cases having the involvement of anterior mediastinal masses, whereas, in our present study, 42.5% of mediastinal masses were found in the anterior mediastinum, followed by 37% in the posterior mediastinum and 20.5% lesion found in the middle mediastinum which is similar to the study conducted by Davis et al., 54% mass are found in the anterior mediastinum, followed by 26% in the posterior mediastinum and 20% in the middle mediastinum.[20] Hence, it concluded that the majority of the masses were seen in the anterior compartment, followed by the posterior and middle. Results of their study support our study where 46.7% mediastinal mass mostly found on right anterior mediastinum, 11% mass posterior mediastinum.

The study of EurRespir J et al., showed carcinoma of the bronchus is the most common malignancy in the Western world. It is also the leading cause of cancer-related death accounting for 32% of all cancer deaths in males and 25% in females. Douglas A. Corley et al., described the adenoma detection rates ranged from 7.4 to 52.5%[20]. Shahrzad Mohseni et al., studied that seventy five percent of all LAPs are localized, with more than 50% being seen in the head and neck area. LAP may be localized or generalized. Another study of Maxine S. Jochelson showed that prevalence of IMN adenopathy was 16%[21] whereas in our study where adenocarcinoma were 15%, adenomas were 21.7%, adenopathy were 15%, carcinoma were 8%, lungs cell carcinoma were 8%, lymphadenopathy were 13.3%, nodular 3.3%, papilloma were 3.3%. From our study, it is concluded that male patients are more affected than females.

CONCLUSION

Men are more prevalent for mediastinal mass than females for mediastinal masses. Computed tomography is considered a reliable technique for evaluating patients with Mediastinal masses.

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