

Diagnostic evaluation of mediastinal lesions: Analysis of 144 cases

Ramakant Dixit, Narender Singh Shah¹, Mukesh Goyal, Chetan B Patil, Mukesh Panjabi², Rakesh C Gupta, Neeraj Gupta, Sabarigiri Vasan Harish

Departments of Respiratory Medicine, ¹Radiation Oncology and ²Pathology, J.L.N. Medical College, Ajmer, Rajasthan, India

ABSTRACT

Background: Mediastinum is a “Pandora’s box” with many neoplastic and nonneoplastic lesions. The purpose of this study was to analyze our institutional experience of mediastinal lesions on fine-needle aspiration cytology (FNAC) and/or biopsy. **Materials and Methods:** This study was an analysis of 144 patients who had undergone ultrasound-guided FNAC and/or core biopsy for mediastinal lesions. **Results:** A total of 144 cases of suspected mediastinal masses were seen, and in 139 cases, tissue diagnosis was attempted. Out of 139 cases, 93 cases were neoplastic in nature (67%), 32 were nonneoplastic (23%), and 14 remained inconclusive (10%). Among neoplastic mediastinal lesions, metastatic carcinoma (37.4%) was the most common neoplastic lesion, followed by non-Hodgkin’s lymphoma (12.2%), Hodgkin’s lymphoma (7.1%), thymic lesions (3.5%), etc. Among nonneoplastic conditions, tuberculosis was the most common lesion (20.1%). An accurate tissue diagnosis was made in 89.9% cases by FNAC or core biopsy of mediastinal lesions in this study. Procedure-related mortality was nil. Complications were mostly minor and included chest pain in 24.5%, small pneumothorax in 13.6% requiring closed tube thoracostomy in 1.4%, and scanty hemoptysis in 9.3% cases. **Conclusion:** Neoplastic mediastinal lesions are more common than nonneoplastic lesions, with metastatic carcinoma being the most common cause followed by tuberculosis. A wide variety of lesions observed in this study stress on the importance of cytohistological diagnosis in all cases of mediastinal lesions for the final diagnosis and management planning. A guided FNAC or core biopsy is still accurate, well tolerated, and devoid of major complications.

KEY WORDS: Core biopsy, fine-needle aspiration cytology, malignancy, mediastinal mass

Address for correspondence: Dr. Ramakant Dixit, Department of Respiratory Medicine, J.L.N. Medical College, Ajmer - 305 001. Rajasthan, India.
E-mail: dr.ramakantdixit@gmail.com

INTRODUCTION

Diagnosis of mediastinal lesions is a challenging task for all pulmonologists, radiologists, and pathologists as numerous benign and malignant conditions can present as a mass lesion at this very site. Mediastinum occupies the thoracic cavity between the two pleural cavities and lungs laterally, sternum anteriorly, and vertebral column posteriorly. It extends from the thoracic inlet down to the diaphragm. The mediastinum is a site having many vital anatomic

structures. It is being a site for both nonneoplastic and neoplastic lesions, benign and malignant, primary and metastatic, many of them present as mediastinal masses.^[1]

The mediastinum is divided into many compartments, and location of a lesion also provides useful information in formulating a differential diagnosis. Accurate and reliable diagnostic procedures are necessary for the management of mediastinal lesions to facilitate timely treatment. Fine-needle aspiration cytology (FNAC) is

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commonly used to sample tumors in all mediastinal compartments. Precise location and site for FNAC or core biopsy are utmost important in view of complex structures in the mediastinum. Although clinical history, physical examination, radiological findings, and location of masses in the mediastinum often help in making the diagnosis, tissue diagnosis is the gold standard for the final diagnosis and plan management of mediastinal lesions.^[2] This study shares our institutional experience of diagnostic intervention in mediastinal lesions.

MATERIALS AND METHODS

Study design

The study population consisted of 144 patients who had undergone diagnostic evaluation by imaging techniques, FNAC, and/or biopsy of the mediastinal lesions at our center during the last 8 years. All details of the patients, relevant clinical history, etc., were obtained from the case record file in the department.

As a part of the workup, we recorded detailed clinical information, physical examination findings, and routine blood investigations such as complete hemogram, bleeding profile, HIV status, chest radiography, and computed tomography (CT) findings. Ultrasonography and CT scan of the mediastinum were helpful in identifying the location, size, and morphology of the lesion before FNAC and subsequent core biopsy if needed were performed.

Inclusion criteria

- All patients referred to our department with widened mediastinum on the chest radiograph
- Definite or suspected mediastinal masses on the chest radiograph
- CT scan of the thorax showing well-defined mediastinal mass
- Normal bronchoscopy or unyielding bronchoscopic and other samples.

Exclusion criteria

- Bleeding diathesis (international normalized ratio >2) or severe thrombocytopenia (platelet count <50,000/mm³)
- Moderate to severe pulmonary artery hypertension
- Presence of dyspnea at rest
- Vascular lesions evident on contrast CT scan, i.e., dilated pulmonary artery, vascular aneurysm, etc.
- Specific diagnosis of certain lesions on imaging, i.e., achalasia cardia and diaphragmatic hernia where FNAC/biopsy is not needed
- Patients refusing consent for the procedure.

Procedure

The radiological evaluation of all such patients included standard chest radiographs (posteroanterior view and corresponding lateral views). Ultrasound was performed in suspected anterior mediastinal masses. Sonographic measurement of the needle path was made from the skin surface to the mass. The needle path was measured along

the direction of the needle using electronic calipers used in ultrasonography.

Contrast-enhanced CT was performed using nonionic iodinated contrast. CT scans of the thorax were viewed with slice acquisition thickness of 8 mm and reconstruction interval of 8 mm. Additional thin sections were taken for multiplanar reconstructions and three-dimensional image analysis. CT scan images were viewed in lung window, mediastinal window, and bone window. The approach for biopsy of the mediastinal lesion was chosen according to the clinical circumstances, location, and size of the target lesion. Patients were placed supine, prone, or in lateral decubitus position depending on the location of the lesion and safe approach for needle placement.

The FNAC was performed using short, beveled, sharp 23-gauge, 15-cm long needle attached to 20 ml disposable syringe under all aseptic precautions after informed consent. The needle was introduced toward the lesion through different route depending on the site of the lesion. Two percent lignocaine was used as a local anesthetic agent for skin and soft tissue infiltration after sensitivity testing. Aspirated material was smeared on clean glass slides evenly and as thin as possible, air-dried and/or wet fixed with 90% ethyl alcohol, and sent for cytological analysis and reports were collected. If FNAC was inconclusive and the site was appropriate, core biopsy of the lesion was attempted using manually operated trucut biopsy needles or automated spring-loaded biopsy gun needle. The biopsy tissue specimens were fixed in 10% formalin solution for further processing in routine fashion and embedded in paraffin. Four-millimeter thick sections were cut and stained with hematoxylin and eosin. As a standard protocol, all patients were observed under clinical monitoring following the procedure for at least 3 h and an expiratory chest X-ray was performed to detect complications such as pneumothorax.

Statistical analysis

The data were entered into Microsoft Excel, and statistical analysis was performed using the statistical package for social sciences (SPSS version 10; SPSS Inc., Nie, Bent & Hull, 1983). Data were expressed as mean \pm standard deviation or number with percentage. Differences between variables in the two groups were compared using Pearson's Chi-square test.

RESULTS

There were 144 cases having abnormal mediastinal lesions detected on initial diagnostic workup on the chest radiology. Five cases were not included in this analysis as their diagnosis was confirmed on the CT scan thorax and not requiring invasive diagnostic workup by FNAC/core biopsy. The latter include three cases having vascular lesions (one each having dilated ascending aorta, enlarged main pulmonary artery trunk, and aneurysm of descending aorta) and two cases having diaphragmatic hernia.

A total of 139 patients were included in the final analysis, and in all of them, tissue diagnosis was attempted either by means of FNAC or by core biopsy of the lesion. The age range of the patients was between 14 and 76 years, with a mean age of study population to be 45.5 years. One hundred and sixteen patients were male and 23 patients were female, with a male to female ratio of 5:1.

The mean duration of symptom was 110 days (range: 16–810 days). 27.3% patients were chronic smoker. 95.3% patients were symptomatic at the time of presentation with cough as the prominent symptom seen in 91.3% cases, followed by shortness of breath (83.4%), chest pain (60.4%), fever (31.6%), dysphasia (13.6%), and dysphonia (10.7%). Among the clinical signs, superior vena cava obstruction was the most common seen in 28.7% cases, followed by cervical lymphadenopathy (14.3%), pleural effusion (8.6%), and stridor (2.8%). Three patients presented with features of paraneoplastic syndromes (two with myasthenia gravis and one with pure red cell aplasia).

There were 95 cases (68.3%) confined to the anterior mediastinum, 23 cases (16.5%) to the middle, and 11 cases (2.5%) to the posterior mediastinum. In 10 cases (7.1%), two or more than two compartments of the mediastinum were simultaneously affected.

Nature of the mediastinal lesions is shown in Table 1. Among males ($n = 116$), 79 cases (68.1%) had malignant lesion, 23 (19.7%) had benign lesions, while 14 (12%) were inconclusive on tissue diagnosis attempt. Among females ($n = 23$), 14 cases (61%) had malignant and 9 (39%) had benign nature of the lesion.

In the nonneoplastic subset ($n = 32$), tuberculosis was the predominant pattern seen in 28 cases (87.5%), followed by one case each having mediastinal lipomatosis, benign angiomatous lymphatic hyperplasia, Castleman disease, and sarcoidosis on tissue diagnosis.

In the neoplastic subset ($n = 93$), metastatic mediastinal lymphadenopathy and/or mediastinal invasion by carcinomas (35.5%) were most common, followed by mediastinal invasion due to central small cell carcinoma lung (20.5%), non-Hodgkin's lymphoma (18.3%), and Hodgkin's lymphoma (10.8%) Table 2. There were four cases of thymomas, one case of thymic carcinoma, two cases each of germ cell tumors, teratomas, and liposarcomas, and one case each of neuroendocrine tumor, synovial sarcoma, and neurofibrosarcoma on cytological and/or histological examination [Figures 1-4].

Table 3 shows age-wise distribution of patients along with the final diagnosis. In our study, we had 125 patients of which 62 patients in age group <40 years and 63 patients in age group >40 years. In both groups, the number of patients with neoplastic lesions was more (age group <40 years $n = 32$; 52% and age group >40 years $n = 61$; 96%).

Table 1: Distribution of mediastinal lesions according to gender distribution

Sex	Type of disease			Total ($n=139$) (%)
	Nonneoplastic ($n=32$)	Neoplastic ($n=93$)	Inconclusive ($n=14$)	
Male	23	79	14	116 (83.45)
Female	9	14	0	23 (16.54)

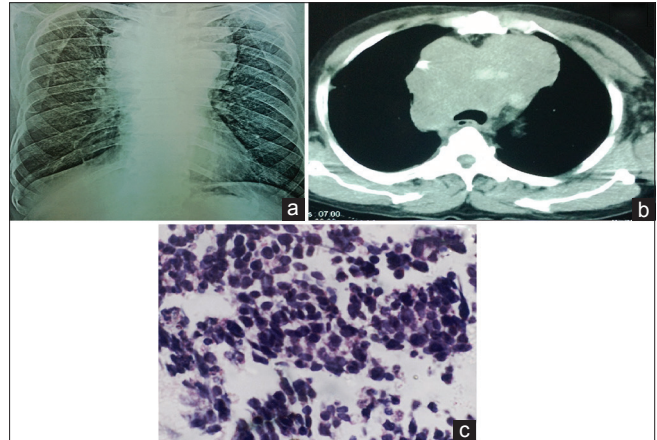


Figure 1: (a and b) Mediastinal mass involving anterior and middle mediastinum on X-ray chest and computed tomography scan; (c) metastatic small cell carcinoma lung on core biopsy (H and E, $\times 400$)

We applied Pearson's Chi-square test to find out the association between age and patients with neoplastic and nonneoplastic lesions. We found that there was a strong association between age >40 years and patients with neoplastic lesion ($P < 0.0001$).

Fine-needle aspiration material alone could diagnose 104 cases (75%), and 21 cases (15%) required additional core needle biopsy for arriving at a diagnosis. Among the 14 (10%) cases who remained undiagnosed, the initial FNAC was nondiagnostic; ten cases among them refused for core biopsy, and in other four cases, the biopsy material was scanty for making the final diagnosis. The FNA with subsequent biopsy helped in making the final diagnosis in 125 out of 139 (89.9%) patients.

Procedure-related mortality was nil. Among the complications, local self-limiting chest pain was experienced by 34 patients (24.5%), small pneumothorax developed in 18 (13.6%) patients requiring no intervention and managed conservatively, large pneumothorax was encountered in two cases (1.4%) which was managed by intercostal chest tube drainage with underwater seal system, and scanty hemoptysis was noted in 13 cases (9.3%).

There were few limitations in this study. First, it was not possible to compare FNAC results with core biopsy in all cases to rule out false negative or false positive results because core biopsy was only performed in those cases where FNAC could not find a firm diagnosis. Second, marker studies, i.e., immunocyto/histo-chemistry could

Table 2: Frequencies of various histological diagnoses of mediastinal lesions

Serial number	Diagnosis established	Number of total cases (n=139)	Percentage of total cases
Nonneoplastic conditions (n=32)			
1	Tuberculosis	28	20
2	Sarcoidosis	1	0.7
3	Castleman disease	1	0.7
4	Benign angiomatous lymphatic hyperplasia	1	0.7
5	Pericardial cyst	1	0.7
Neoplastic conditions (n=93)			
1	Metastatic carcinomas Small cell carcinoma lung (n=19) Other metastatic carcinoma with mediastinal invasion and/or lymphadenopathy (n=33)	52	37.4
2	NHL	17	12.2
3	HL	10	7.1
4	Thymic diseases Thymoma (n=1) Thymic carcinoma (n=1)	5	3.5
5	Germ cell tumors	2	1.4
6	Liposarcoma	2	1.4
7	Teratoma	2	1.4
8	Neuroendocrine tumors	1	0.7
9	Neurofibrosarcoma	1	0.7
10	Synovial sarcoma	1	0.7
Inconclusive (n=14)			
1	Inconclusive	14	10
Total		139	100

NHL: Non-Hodgkin's lymphoma, HL: Hodgkin's lymphoma

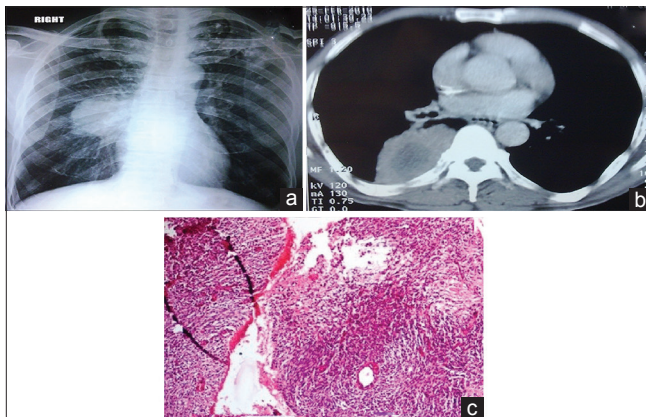


Figure 2: (a) Mediastinal mass at right hilar region on chest X-ray; (b) on computed tomography scan, the lesion is at the posterior mediastinum; (c) neurofibrosarcoma lung on core biopsy (H and E, x200)

not be performed due to financial and infrastructure constraints. Finally, we could not also use newer techniques such as endobronchial ultrasound (EBUS) and other surgical, diagnostic methods for evaluation of those cases where FNAC and biopsy were inconclusive due to same reasons.

DISCUSSION

Mediastinal lesions represent a wide diversity of disease states in view of multiplicity of the anatomical structures located in this area. An accurate and early tissue diagnosis is warranted in mediastinal lesions to separate malignant lesions from the nonneoplastic and benign conditions as

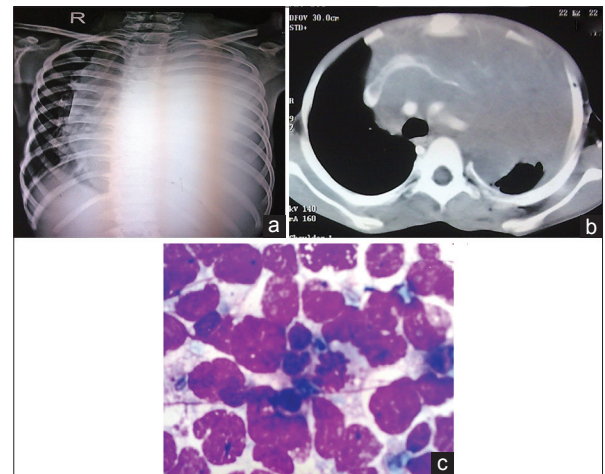


Figure 3: (a) Huge mediastinal mass involving left hemithorax on chest X-ray; (b) large mediastinal mass with involvement of vascular mediastinal structures and loss of vascular planes; (c) fine-needle aspiration cytology showing features of non-Hodgkin's lymphoma (Giemsa, x1000)

the treatment goals are different. These lesions often pose diagnostic problems because of their location and difficult access. Complex vascular structures further make the situation problematic at times if tissue sample planning is considered. For the same reason, imaging techniques are often required to guide the biopsy needle to sample the target area.^[3]

Optimal evaluation and diagnosis of mediastinal tumors require an integrated clinical, radiological, and histological approach. The clinical approach includes in-depth history

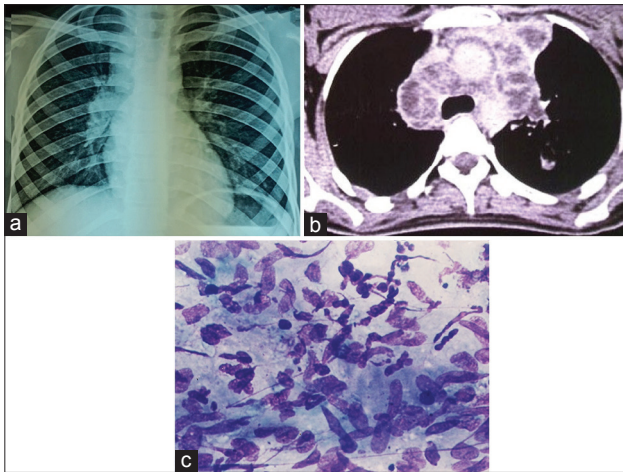


Figure 4: (a) Hilar and paratracheal mediastinal opacity on chest X-ray; (b) typical mediastinal lymphadenopathy due to tuberculosis with central hypodense area and peripheral rim enhancement on computed tomography thorax; (c) fine-needle aspiration cytology of the lesion showing epithelioid cells, lymphocytes with areas of microcaseation (MGG, $\times 400$)

Table 3: Diagnosis of common mediastinal lesions in relation to age distribution of patients

Age group (years)	Number of patients					Total
	Metastatic carcinoma	HL	NHL	Tuberculosis	Others*	
0–10	-	-	-	1	2	3
11–20	-	1	1	7	2	11
21–30	1	5	2	17	5	30
31–40	2	-	8	2	6	18
41–50	4	1	6	1	1	13
51–60	22	3	-	-	1	26
61–70	21	-	-	-	1	22
>71	2	-	-	-	-	2
Total						125

*Others were: Four nonneoplastic nontubercular and 14 other neoplastic conditions. HL: Hodgkin's lymphoma, NHL: Non-Hodgkin's lymphoma

of symptoms, demographic features, and close search for physical signs. The currently available modalities for further evaluation include chest radiographs, ultrasound, CT scan, magnetic resonance imaging (MRI), and nuclear medicine studies. Chest X-ray with posteroanterior and lateral views is indicated in all cases. It provides information on the size, anatomical location, density, and at time composition of the mass. CT scan with intravenous contrast enhancement is an essential tool to evaluate further that provides additional information, i.e., relationship of the mass with adjacent structures, vascularity within the mass, content, and nature (cystic or solid) of the mass. MRI provides useful information in evaluating spinal, vascular, or cardiac invasion. It is more sensitive than CT for evaluating the involvement of the neural foramen or spinal canal invasion in posterior mediastinum and for evaluating thyroid masses. Given its superior tissue contrast resolution and lack of ionizing radiation, MRI has been increasingly utilized for mediastinal mass evaluation nowadays.^[4,5] Transesophageal echocardiogram, barium

swallow, and testicular ultrasound may be needed in selected cases. Nuclear medicine studies available for mediastinal mass evaluation primarily include positron emission tomography (PET) often coregistered with CT (PET/CT) and metaiodobenzylguanidine imaging. Nuclear scans and biochemical studies are useful in diagnosing and evaluating the suspected thyroid lesions, catecholamine-secreting tumor, and malignancy. Recently, a new CT-based mediastinal division scheme, approved by the International Thymic Malignancy Interest Group, has received considerable attention as a potential new standard.^[6]

Although clinical assessment along with radiographic imaging often narrows the differential diagnosis, definitive tissue diagnosis is often required before initiating therapy. There are several modalities to obtain tissue samples for cytological or histological diagnosis of mediastinal lesions, and each modality has its own advantages and disadvantages. These include percutaneous image-guided transthoracic needle biopsy (under CT or ultrasound guidance); endoscopic biopsy without ultrasonography (transbronchial through a fiberoptic bronchoscope); endoscopic biopsy with ultrasonography, i.e., bronchoscopically (EBUS) or through the esophagus (endoscopic ultrasound [EUS]) using a fine needle.^[7] Various surgical procedures to get tissue diagnosis are cervical mediastinoscopy, mediastinotomy, thoracoscopy, i.e., video-assisted thoracoscopic surgery, sternotomy or thoracotomy, etc. Video-assisted mediastinoscopy has now been introduced and is more safe and accurate compared with conventional mediastinoscopy. Other more targeted surgical approaches introduced in recent times are left anterior mediastinotomy, extended cervical mediastinoscopy, video-assisted mediastinal lymphadenectomy, and transcervical extended mediastinal lymphadenectomy.^[8] The choice of these techniques in diagnostic evaluation of mediastinal lesions depends on local availability and expertise. Endoscopic biopsies are generally preferred nowadays in view of lesser complications and ease compared to surgical interventions.

The present study is our institutional experience of diagnostic evaluation of various mediastinal lesions over 8 years. The patient demographics in this study showed that mean age of the patient was 45.5 years (age range 14–76 years), with male to female ratio of 5:1. The mean age of 52 years was observed in studies by Pandey *et al.*^[9] and Shaheen *et al.*^[3] Karki and Chalise.^[10] and Bagheri *et al.*^[11] observed a mean age of 35 years in their series. The findings of our series show that mediastinal mass can be seen in a wide age range, but they are more prevalent in the age range of 30–50 years. Variation in the mean age in different studies may be explained by the fact that some studies included infant and pediatric age group patients also in their series. A number of study patients may be an additional factor too.

Mediastinal lesions can be benign or malignant in behavior and solid or cystic in nature, and they can involve every compartment of the mediastinum.^[1] The likelihood of malignancy is influenced by several factors that include the location of the lesion, age of the patient, and presence or absence of symptoms.^[12] The malignant mediastinal lesions are mostly seen at the anterior mediastinum, in patients having symptoms and with the advanced age. Most of the patients above the age of 40 years in our study had malignant lesions compared to those below 40 years (61 patients vs. 32 patients).

The percutaneous transthoracic FNAC and/or biopsy of the mediastinal lesion under local anesthesia are minimally invasive, cost-effective, easy to perform, and associated with reduced complication rates when performed under ultrasound or CT scan guidance.^[13] The accuracy of transthoracic biopsy in the diagnosis of mediastinal lesions ranges from 75% to 90%.^[14-16] The diagnostic accuracy of mediastinal lesions approached in the present study was 89.9% that is similar to the diagnostic yield in studies by Shaheen *et al.*^[3] and Güllüoğlu *et al.*,^[17] superior compare to studies by Morrissey *et al.*^[18] (77%), Assaad *et al.*^[19] (82%), Rosenberger and Adler^[20] (83%), Adler *et al.*^[21] (79%), Pedersen *et al.*^[22] (81%), Dubashi *et al.*^[23] (50%), and Neyaz *et al.*^[24] (74%) and inferior to the studies by Nasit *et al.*^[25] (97%) and Annessi *et al.*^[26] (100%). Core biopsy of the lesions provide better yield with more precise diagnosis compared to FNAC^[25,27] and the same was observed in the present study.

A variety of the mediastinal lesions were diagnosed in the present study including benign (3.6%), malignant (63.3%), and nonneoplastic (23%). A 66% prevalence of malignant nature of mediastinal lesions by Pandey *et al.*^[9] is comparable to the present study. Adler *et al.*^[21] and Jareb and Krasovec^[28] reported a slightly higher occurrence of about 72% prevalence of malignancy in their study while Karki and Chalise^[10] observed only 26% malignant lesions in a small series of 27 cases. In our study, metastatic carcinoma was the most common etiology in 52 cases (37.4%) compared to primary mediastinal tumors in 41 cases (29.5%). This observation is in contrast to the study by Shabb *et al.*^[1] and Karki and Chalise.,^[10] where primary mediastinal lesions were more common than metastatic lesions. Studies conducted by Adler *et al.*^[21] and Assaad *et al.*^[19] showed an appreciable proportion of metastatic lesions in the mediastinum (48% and 45%, respectively). Similar to our study, Nasit *et al.*^[25] also observed metastatic malignant lesions in 38% of their series. These variations may be contributed by difference in the number of patients, age range, and inclusion of additional hilar mass lesions in different studies. Certain unusual mediastinal lesions are also described in literature, i.e., langerhans cell histiocytosis, mesothelioma, malignant gastrointestinal stromal tumor, solitary fibrous tumor, melanocytoma, etc., that may exhibit wide diversity in clinical appearance, radiological impression, and morphological interpretation therefore at times require

high index of suspicion and immunohistochemical profile.^[29]

Among the primary mediastinal lesions, the lymphomas (Hodgkin's and non-Hodgkin's lymphoma) were the most common diagnosis in 27 cases (19.4%), followed by thymic lesions in 5 (3.5%) cases in our study. Lymphomas were also the most common primary mediastinal lesion in series by Adler *et al.*^[21] (21%) and Nasit *et al.*^[25] (36%). It is important to note that the diagnosis of thymic neoplasm, especially requires correlation with clinical and radiological findings.^[30] In primary mediastinal lymphomas, critical examination of basic immunohistochemical markers is also important, i.e., percentage, intensity, patterns, and type of positivity expressed by neoplastic cells to make a sufficient diagnosis and additionally special markers in doubtful cases.^[31]

Among the nonneoplastic conditions, tuberculosis was most common (28 cases, 20.1%) in our series. Similar studies were done by Kaur *et al.*,^[32] who reported tubercular in 33.3% cases and Shaheen *et al.*^[3] in 5% cases, whereas Adler *et al.*^[21] reported tuberculosis in none of the patients. This gross difference in the occurrence of tuberculosis is probably due to low prevalence of tuberculosis in western countries compared to developing countries. It is also important to note that tubercular mediastinal lymphadenopathy has characteristic CT feature of the central area of low attenuation with rim enhancement.^[33] This feature was seen in more than half of patients with mediastinal lymphadenopathy due to tuberculosis in our study [Figure 4b]. EUS through the esophagus has also described certain features of tubercular mediastinal lymph node, i.e., location at station 7 and 4 L, discrete as well as confluent with preserved outer border and hypoechoic areas in most of such lesions. Abnormal hyperechoic foci or calcification within such nodes is another unique feature.^[34] Apart from tuberculosis, certain fungal infections can also present as mediastinal mass,^[35] but such events are very uncommon and not observed in our study also.

Neurogenic tumors were commonly seen in the posterior mediastinum that is in accordance with the other studies.^[36] In posterior mediastinum, a total of three cases were sarcomatoid in nature (7.3%) and other studies had reported sarcomas in 2%–8% of primary mediastinal tumors.^[37-39]

We could diagnose 104 cases (75%) by FNAC alone and further 21 cases (15%) needed core tissue biopsy to confirm the nature of the lesion. Fourteen cases (10%) remained undiagnosed on FNAC. The FNAC material was also inconclusive in 8% cases of Nasit *et al.*,^[25] 11% cases of Adler *et al.*,^[21] 18% cases of Assaad *et al.*^[19] and Desai *et al.*^[40] The failure to achieve diagnosis by FNAC may be contributed by several factors, i.e., scanty material, poor smear preparation, poor fixation, low cellularity, etc. Further, FNAC is more diagnostic in the majority

of carcinomas including metastatic carcinoma, and for benign disease, the diagnosis may be difficult to establish by FNAC as it requires more tissue specimen than in malignant lesions.^[41]

The procedure-related complications in our study were very less and are comparable with previously published studies.^[3,24,42] Localized chest pain (24.5%) was most common followed by pneumothorax (14.4%). Only two patients (1.4%) required surgical intervention for large symptomatic pneumothorax. This low episode of complication might be due to the real-time observation of needle during the procedure.

CONCLUSION

We conclude with a remark that a precise and specific diagnosis is must in mediastinal lesions as numerous benign and malignant processes occur at this site with different management plan to facilitate timely treatment. FNAC and/or core biopsy under ultrasound or CT scan allows adequate tissue sampling with the least risk to the patients. The procedure is largely safe, easy to perform, and well tolerated with reduced medical care cost as it eliminates the need for more extensive diagnostic surgical procedures and hospital stay. Clinical background and radiological correlation further support the cytopathologist to make a firm diagnosis. Although other diagnostic modalities such as transsternal approach, transbronchial approach, EUS of the esophagus, and EBUS approaches are recently introduced,^[43] the conventional transthoracic FNA and/or biopsy for mediastinal lesion still hold its role due to easy procedure, low cost, easy to train, and learn in low infrastructure units. Ultrasonographic or CT-guided FNAC is not only a simple technique, due to its very low complication rate and high diagnostic accuracy, but it also should be considered as the initial method of choice in mediastinal lesions at centers where more sophisticated newer techniques such as EBUS or EUS are not available.

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Conflicts of interest

There are no conflicts of interest.

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