



Original Article

Cyto-histopathological study of Mediastinal lesions

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ABSTRACT

Background: Broad ranges of non-neoplastic and neoplastic lesions are encountered in mediastinum depending on the patient's age and anatomical site. This study was performed to review our institutional experience of mediastinal masses and to compare the results with various other studies.

Materials and Methods: This was a retrospective study conducted on 112 patients with mediastinal masses who underwent fine needle aspiration cytology and/or biopsy from 14th April 2009 to 4th March 2014 in Department of Pathology, Institute of Medicine, Tribhuvan University Teaching Hospital.

Results: Out of 112 cases, 70 cases (62.5%) were benign, 38 cases (33.92%) malignant and 4 cases (3.57%) were inconclusive. Mean age of presentation was 34.94 yrs with male to female ratio of 1.2:1. Ninety-nine cases (88.4%) were seen in anterior compartment, 12 cases (10.7%) in posterior compartment and 1 case (0.9%) in middle compartment. Thymoma (26 cases) was the most common lesion followed by Non Hodgkin lymphoma (17 cases) and germ cell tumor (16 cases).

Conclusion: Mediastinal lesions occur more commonly in males with higher frequency of benign lesions, among which thymoma is the predominant lesion.

INTRODUCTION

The mediastinum can be defined as those tissue and organs that occupy thoracic cavity between pleural cavities and lung laterally, between sternum anteriorly and vertebral column posteriorly and from thoracic inlet down to diaphragm.¹ It is usually divided into anterior, middle and posterior compartments to help categorize tumors and disease according to their site of origin and location.²

Specific tumor types show proclivities to occur in specific compartments.¹ The relative frequency of various lesions are considerably different in these compartments and also in different age groups.³

Many mediastinal masses are serendipitously discovered on chest radiograph obtained for other reasons. Some patients will come to clinical attention with vague chest complaints or with sign and symptoms related to compression or invasion of mediastinal structure.² FNA is a good diagnostic tool in lesions of mediastinum as a first attempt to tissue diagnosis.⁴ Cutting needle techniques are used when FNA diagnosis is uncertain.⁵ This study was done to review and

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analyze all the cases of mediastinal lesions of the last 5 years period.

MATERIALS AND METHODS

This is a retrospective descriptive study performed on 112 patients with mediastinal lesion who underwent FNAC and/or tissue biopsy over 5 years period from 14th April 2009 to 4th March 2014 in Department of Pathology, Institute of Medicine, Tribhuvan University Teaching Hospital. Permission was obtained from institutional review committee. FNAC was done using 23 gauge needle attached to 10 ml syringe. Cytological material was smeared on clean glass slide. The smear was immediately immersed in 95% alcohol for papanicolaou stain and air-dried for Giemsa stain. The surgical specimen were formalin fixed, routinely processed and stained with Hematoxylin and Eosin stain. The slides were reviewed by pathologist and diagnosis was made. Computer database in the department was used to extract all the information pertinent to the cases. Statistical analysis was performed using Epi info wherever required.

RESULTS

Out of 112 patients, 39 underwent FNAC, 62 underwent histopathological examination and in 11 cases both FNAC and histopathological examination was done.

Sixty-three cases (56.25%) were males, 49(43.75%) were females with male female ration of 1.2:1. Age range was between 4 months to 82 years with mean age of 34.94 years. (Table 1) Seventy cases (62.5%) were benign, while 38 cases (33.9%) were malignant and 4 cases (3.6%) were inconclusive. Anterior mediastinum was the most common site (n=99; 88.4%) followed by 10.7% (n=12) in middle mediastinum and 0.9% (n=01) of the lesions were in posterior mediastinum.

Out of 112 cases, 70 (62.5%) were benign, 38 (33.9%) were malignant and 4 (3.5%) were inconclusive. Most common lesion was thymoma (n=26; 23.2%) followed by nonhodgkin lymphoma (n=17; 15.2%). Detail diagnoses

Table 1: Frequency of mediastinal tumors in different age groups:

| Age | Frequency (%) | Malignancy rate |
|--------------------------|---------------|-----------------|
| 1st decade(0-9) | 8(7.1%) | 25% |
| 2nd (10-19) | 17(15.2%) | 53% |
| 3rd (20-29) | 24(21.4%) | 37.5% |
| 4th (30-39) | 18(16.1%) | 16.6% |
| 5th (40-49) | 16(14.3%) | 31.3% |
| 6th (50-59) | 11(9.8%) | 18.2% |
| 7th (60-69) | 10(8.9%) | 30% |
| 8th above (70 and above) | 8(7.2%) | 62.5% |

Table 2: Different mediastinal lesions and their frequencies

| No. | Lesion | No. of cases | Percentage(%) |
|-----|---|--------------|---------------|
| 1 | Thymoma | 26 | 23.2% |
| 2 | NHL | 17 | 15.2% |
| 3 | Germ cell tumors | 16 | 14.3% |
| 4 | Lymphadenitis | 14 | 12.5% |
| | Granulomatous lymphadenitis | 5 | |
| | Necrotizing granulomatous lymphadenitis | 7 | |
| | Reactive lymphadenitis | 2 | |
| 5 | Neural tumors | 10 | 8.9% |
| 6 | Metastatic tumors | 9 | 8% |
| 7 | Others | 8 | 7.1% |
| 8 | Sarcoma | 4 | 3.6% |
| 9 | Cysts | 4 | 3.6% |
| 10 | Inconclusive | 4 | 3.6% |

of mediastinal lesions are tabulated in table 2. Most mediastinal lesion 21.4% were identified in third decade of life. The highest incidence of malignancy occurred in eighth decade and above followed by second decade of life. Non Hodgkin lymphoma was most common in second and third decade while Germ cell tumors in second-fourth decade of life. Metastatic tumors were common in later decades and thymoma in fourth to sixth decade of life.

Out of 112 cases with FNAC diagnosis, 11 cases were available for correlation with histopathology. Detail of these correlations is shown in table 3. From this data, overall sensitivity of FNAC in diagnosing mediastinal lesion is 63.6% and specificity in diagnosing malignant lesion is 100%.

DISCUSSION

The types of mediastinal mass examined in this study broadly reflect range of pathological conditions seen in our clinical practice. Biopsy of mediastinal mass can be performed by variety of techniques ranging from FNAC to surgical procedures allowing resection or biopsy.⁶ A major advantage of FNAC is that immediate cytological examination of specimen is possible.⁵

Demographics in this study is similar to those in previous reported series with wide range of age (4 months-77 years) and mean age of 34.94 yrs. In a study of Shabb N.S. et.al age range was 10-72 yrs and similar to their study our study also showed male predominance.⁴

Sixty one and half % cases in our study were benign followed by 33.9% malignant. This was in contrast to study by Zafar N. et.al⁷ who detected higher rate of malignancy about 74% but show concordance with study done by Strollo

Table 3: Correlation between FNAC and tissue biopsy in mediastinal lesions

| No. | Age/sex | Location | FNAC diagnosis | Histopathological diagnosis |
|-----|------------|-----------|---|---|
| 1 | 30/F | Anterior | Inconclusive | Thymoma |
| 2 | 36/F | Posterior | Chondrosarcoma | Chondrosarcoma |
| 3 | 1/M | Anterior | Inconclusive | Thymoma |
| 4 | 70/M | Anterior | Inconclusive | Thymoma |
| 5 | 22/M | Anterior | NHL | NHL |
| 6 | 60/M | Anterior | Thymoma | Thymoma |
| 7 | 16/F | Anterior | NHL | NHL |
| 8 | 22/F | Anterior | Thymoma | Thymoma |
| 9 | 4 months/M | Anterior | Granulomatous lymphadenitis | NGL |
| 10 | 43/F | Anterior | Poorly differentiated Squamous cell carcinoma | Poorly differentiated Squamous cell carcinoma |
| 11 | 47/F | Anterior | Thymoma | Thymoma |

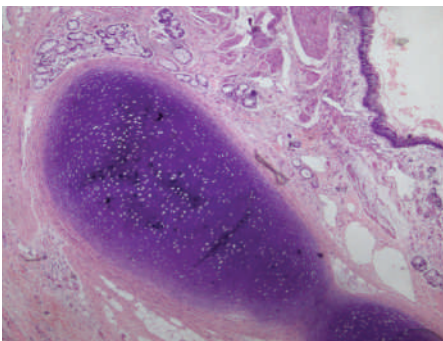


Figure 1: Mature Cystic Teratoma showing ectodermal and mesodermal tissues. (HE stain X40).

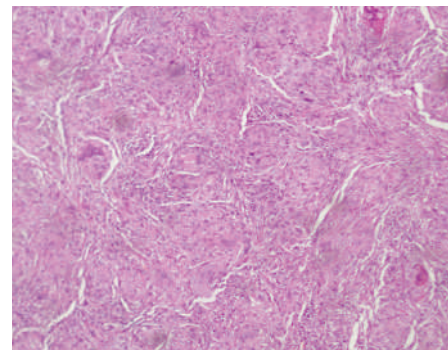


Figure 2: Granulomatous lymphadenitis showing multiple discrete granulomas formed by epithelioid histiocytes. (HE stain X40).

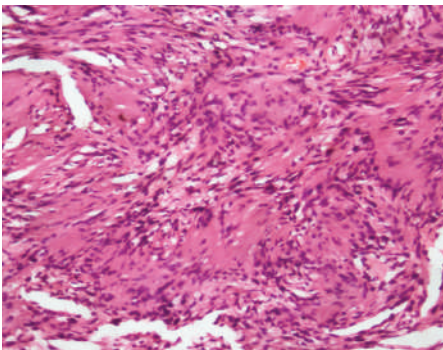


Figure 3: Hypercellular Antoni A areas seen in Schwannoma. (HE stain X100).

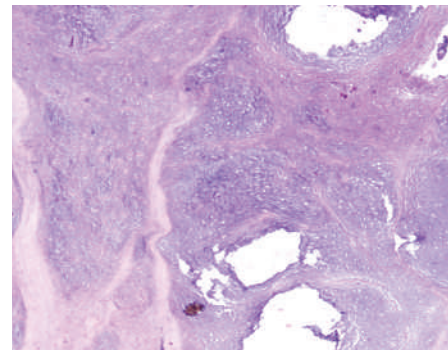


Figure 4: Chondrosarcoma showing irregularly shaped lobules of cartilage with hypercellularity. (HE stain X40).

D.C. et.al² who demonstrated two third of all mediastinal masses as benign. Majority of lesions were seen in anterior mediastinum. In a study by Sterret G et.al also majority of lesions were seen in anterior mediastinum.⁸ Previous studies by Mohan N. et.al⁹ and Vaziri M. et.al¹⁰ mediastinal lesions were more common in third decade of life which is true in our case too.

This study showed most common lesion of mediastinum

was thymoma followed by NHL and Germ cell tumor. This was in contrast to study by Temes R et.al who showed lymphoma as commonest lesion.^{11,12} NHL were common in 2nd-3rd decade and germ cell in 2nd-4th decade of life which is in accordance with other studies.¹³ The sensitivity of FNAC in diagnosing mediastinal lesions is 72.7% in this study. This is lower than that found by Shabb N.S. et.al in his study which was about 83%.¹³ Similarly to the study done by Morrissey B. et.al specificity of FNAC in diagnosing

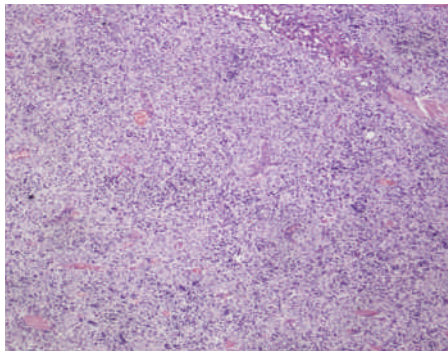


Figure 5: Sheets of neoplastic Thymic epithelial cells with scattered lymphocytes in Thymoma (HE stain X40).

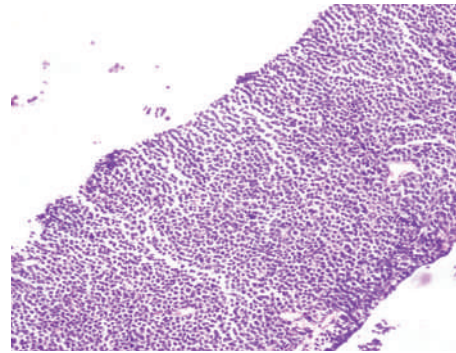


Figure 6: NHL showing sheets of monomorphic lymphoid cells. (HE stain X100).

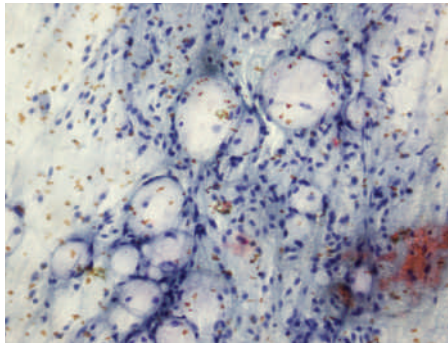


Figure 7: Prominent chicken wire vasculature with few lipoblasts in Myxoid liposarcoma (FNAC) (Pap stain X200).

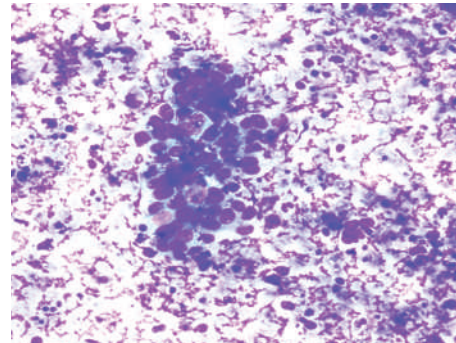


Figure 8: Tumor cells showing cytoplasmic vacuolation in Seminoma (FNAC). Background is tigroid and shows scattered lymphocytes. (Giemsa stain X200).

malignancy is 100%. This shows FNAC is fairly accurate in diagnosing malignant lesion in Mediastinum.⁵

CONCLUSION

Mediastinal lesions are more common in males and in the anterior mediastinum with a higher frequency of benign lesions, most of them being Thymoma. FNAC is a good diagnostic tool in lesions of the mediastinum as a first attempt to tissue diagnosis.

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