YIELD OF ABRAMS NEEDLE PLEURAL BIOPSY IN EXUDATIVE PLEURAL EFFUSION

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Background: Pleural effusion is the abnormal collection of fluid in the pleural space resulting from excessive fluid production or decreased absorption and it is one of the most common clinical conditions that we come across in pulmonology clinics and in hospitals. The objective of prospective study was to evaluate the diagnostic role of Abrams Needle Biopsy in Exudative Pleural Effusion **Methods:** The study was performed at the Department of Pulmonology, Ayub Teaching Hospital, Abbottabad over a period of 1 year, i.e., January 2008 to December 2008. Sixty-three patients of either sex and all ages with exudative pleural effusion, on whom Abrams Needle Biopsy was performed were included in the study. Minimum of four specimens from each patient were taken and histopathology done. **Results:** Out of 63 patients, histopathology revealed the cause in 60 (95%) cases. Tuberculosis, malignancy and rheumatoid pleurisy were confirmed in 34, 24, and 2 cases respectively. Specimens of 3 patients did not reveal any result and showed non-specific inflammation and were further investigated accordingly. **Conclusion:** The diagnostic yield of Biopsy was 95%. Pleural biopsy is still a reliable and valuable investigation in diagnosing pleural effusion, provided that adequate pleural specimen is taken.

Keywords: Pleural biopsy, Exudative pleural effusion, malignant pleural effusion, Tuberculosis

INTRODUCTION

Pleural effusion is defined as the abnormal collection of fluid in the pleural space resulting from excessive fluid production or decreased absorption.[1] Pleural Effusion is one of the most common clinical conditions that we come across in pulmonology clinics and in hospitals. The relative annual incidence of pleural effusion is estimated to be 320 per 100,000 people in industrialized countries.[2] After extrapolating these figures and its application to other countries, the distribution and incidence of causes of pleural effusion vary from population to population. In areas where tuberculosis (TB) is prevalent, a higher percentage of pleural effusions from TB is possible.[2] Pleural effusion is classified as exudative and transudative depending upon protein and LDH concentration in the fluid. Pleural effusion is exudative when protein concentration is 3 gm% or more; and transudative when protein concentration is less than 3 gm%.[3]

Pleural biopsy is a valuable and time tested investigation in diagnosing tuberculous and malignant pleural effusion. However, it can also be used to diagnose sarcoidosis, anthracosis, rheumatoid and fungal pleurisy.[4]

The yield of pleural biopsy depends on age of patient, number of biopsy specimens, technique and histopathological expertise. This study was carried out to evaluate the diagnostic role of Abrams Needle Biopsy in exudative pleural effusion

PATIENTS AND METHODS

This prospective study was carried out in the Department of Pulmonology, Ayub Teaching Hospital Abbottabad over a period of 1 year from, January 2008 to December 2008. Patients with exudative pleural effusion of both sexes and all ages were included; and those with transudative effusion, or on diuretics therapy, and with bleeding diathesis were excluded.

Fully informed, understood and voluntary consents were taken from all patients. Patients were made to sit on bench with their hands resting on the table for easy approach of the operator to the patient. After selecting the site, i.e., 2 intercostal spaces below the fluid level and cleaning and draping with Pyodine, area was anaesthetized with 2% lignocaine and a small incision made with surgical blade parallel to the ribs. Abrams needle inserted, fluid aspirated to confirm the position and then biopsy taken, minimum of four biopsy specimens were taken, stored and sealed in 10% formaldehyde. All specimens were accurately labelled and sent for Histopathology laboratory of Ayub Medical College, Abbottabad. Therapeutic aspiration of pleural fluid was done where required.

The fluid was considered an exudate if protein concentration in the pleural fluid was $\geq$3 gm% or as per any of the following criteria: ratio of pleural fluid to serum protein greater than 0.5; ratio of pleural fluid to serum lactate dehydrogenase (LDH) greater than 0.6; or pleural fluid LDH greater than ⅔ of the upper limits of normal serum value

RESULTS

A total of 63 patients were included in the study. Bilateral lungs were involved in 7 (11.11%) patients, 21 (33.33%) patients developed pleural effusion in their left lung while right lung was affected in 35 (55.55%) patients as shown in Figure-2. Adequate tissue was

obtained in 60 (95%) patients and confirmed diagnosis on histopathology was established. The remaining 3 (5%) had inadequate biopsy. Out of 63 patient 47 (74.6%) were males and 16 (25.4%) were females, Thirteen (20.63%) patients were below the age of 40 years and 50 (79.36%) patients were above the age of 40. Shortness of breath, chest pain and fever were the commonest symptoms with frequencies of 44 (69.8%), 36 (57.1%), and 31 (49.2%) respectively. Histopathology was conclusive in 60 (95%) of cases. 34 (56.6%) were chronic granulomatuos inflammation. 24 (40%) showed malignant neoplasm and only 2 (3.3%) showed rheumatoid pleurisy Table-2. Routine examination of the pleural fluid revealed lymphocytic dominance in 59 (93.6%) cases, while 2 (3.17%) cases showed lymphocytes and neutrophils in 60:40 ratio respectively, Table-3.

As shown in Figure-1, haemorrhagic effusion was found in 21 (33.3%) cases, out of which 14 (66.66%) were neoplastic, and 6 (30%) were tuberculous. Straw coloured pleural effusion was noted in 31 (49.2%) cases, 22 (70.96%) were tuberculous, 8 (25.8%) neoplastic, and 1 (3.22%) rheumatoid pleurisy. Yellow coloured fluid was obtained in 11 (18.3%) cases out of which 8 (72.7) were TB, and 3 (27.27%) were neoplastic.

Table-1: Age group, sex and symptoms in patients

Age in years	Male	Female	Total
<40	12	1	13
40 and above	35	15	50
Total	**47**	**16**	**63**

Table-2: Cause, sex distribution, age range and side effected

Cause	Total	Male	Female	Age	Side		
					Bilateral	Left	Right
Tuberculous Effusion	34	29	5	18–100	4	12	18
Malignant Effusion	24	14	10	52–95	2	8	14
Rheumatoid Pleurisy	2	1	1	55–57	1	-	1
Total:	**60**	**44**	**16**	**18–100**	**7**	**20**	**33**

Table-3: Diagnosis and cytology of pleural fluid

Diagnosis	Lymphocytic predominant	Nutrophilic predominant	Lympho/Nutro 60/40%	Malignant cells
Pleural effusion TB (n=34)	33	0	1	0
Malignant pleural effusion (n=24)	22	1	1	5
Rheumatoid Pleurisy (n=2)	2	0	0	0
Total (n=60)	**57**	**1**	**2**	**5**

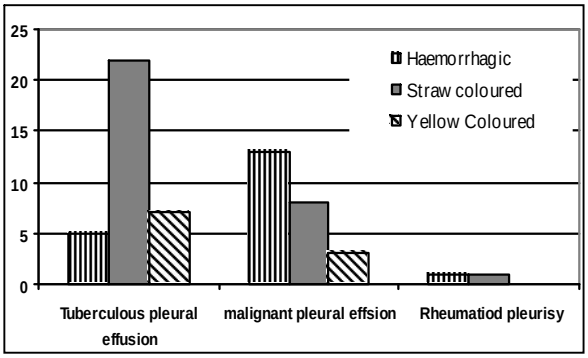

Figure-1: Gross Appearance of fluid and diagnosis

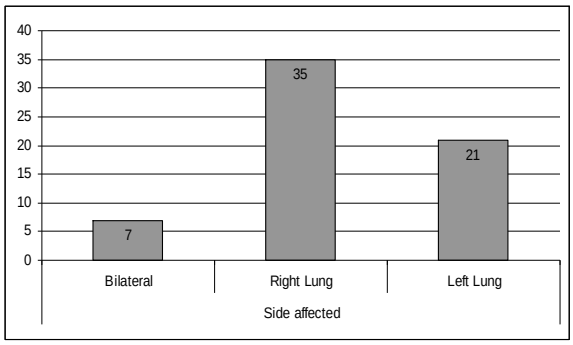

Figure-2: Side of lungs affected by pleural effusion

DISCUSSION

A study undertaken by Heidariet *et al*[5] on 100 patients suggested that pleural biopsy shows 97% results in diagnosing tuberculous pleural effusion and 91% in Malignant Pleural effusion. Another study done by Frank[6] showed the diagnostic yield of pleural biopsy in 40–70% cases in both tuberculous and malignant pleural effusion. In our study the diagnostic yield of pleural biopsy was found to be 95% in malignant, tuberculous and Anthracosis.

Khadadah *et al*[7] suggested that taking 4 or more specimens increases the yield of closed pleural biopsy. Another study by Chakarbarti *et al*[8] suggested that taking pleural specimens yields 72% results in pleural effusion, compared to 4–6 pleural specimens increased the yield to 80%, which is in line with our study in which a minimum of 4 and maximum of 6 specimens were taken is the reason that the yield was increased to as high as 95%.

Furthermore we noted that positive result of biopsy is more in young people than older patients owing to the fact that pleura is more elastic in young people, thus easier to get a good pleural specimen. Another interesting statistic is that haemorrhagic effusion was found to be malignant in 65% cases.[9]

CONCLUSION

Our study shows that pleural biopsy is still a reliable and valuable investigation in diagnosing pleural effusion, provided that adequate pleural specimen is taken. Pleural biopsy is the mainstay in diagnosing pleural effusion in our setup, where modern techniques like VATS is not available which allows direct visualization of the pleura.

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