



Pleuroscopy in Undiagnosed Exudative Pleural Effusion, Early Experience in Tertiary Hospital in Bangladesh

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Abstract

Introduction: Pleural effusion is a clinical condition which caused by a variety of illnesses such as TB, cancer, parapneumonia, congestive heart failure, pulmonary embolism, and many more and most often it seen in patients with lung cancer.

Objective: The main objective of this study is to determine the diagnostic accuracy and problems associated with flexible pleuroscopy.

Materials and Method: This prospective study was conducted at tertiary hospital in Bangladesh. The duration of this study was one year (January 2020 to December 2020). Sample size: Total 60 patients with exudative pleural effusion was selected as sample diagnosed by chest x-ray, CT scan of chest and pleural fluid study (Protein, sugar, LDH) in whom diagnosis couldn't be confirmed were consider for this study. Flexible pleuroscopy was performed aseptically under local anaesthetic in the 5th or 6th intercostal gaps in the mid-axillary line, and many (5-6) parietal pleura samples were collected in questionable locations.

Results: the patients were on average 56.7 years old, with 58.83 percent male and 41.67 percent female. Nearly 46.67 percent of individuals acquired flexible pleural effusions and 48.33 percent developed left pleural effusions. Three individuals had bilateral illness. Average value of pleural fluid for sugar is 6.6 mmol/L, protein is 4.2 g/dl and ADA is 46 U/L. In all, 95.7% of patients had a conclusive diagnosis. Only 8.7% of patients tested positive for malignant cells in a pleural fluid investigation, despite the fact that 60.8% of those tested had primary and secondary malignancies. Only 26.1% of patients were found to have TB, despite the fact that no tubercular organism could be found in either cytology or culture on any of them. Among the patients who underwent testing, 4.3% had empyema thoracis identified, and the same number of patients had normal pleura. Only two individuals (4.3 percent) had data that might be considered definitive.

Conclusion: Flexible pleuroscopy is a very important method for diagnosing previously undiscovered exudative pleural effusions when thoracentesis failed to provide an appropriate diagnosis.

Keywords: Pleural effusion, Flexible pleuroscopy, TB.

Introduction

Pleural effusion is a clinical condition that may be caused by a variety of illnesses such as TB, cancer, parapneumonia, congestive heart failure, pulmonary embolism, and many more. It is most often seen in patients with lung cancer^[1,2]. It affects around 300 subjects per 100,000 people each year all across the globe^[3]. Exudative pleural effusions in children and adolescents are often caused by infectious agents, while malignancies are more frequent in the elderly^[4,5]. It is difficult to make an accurate diagnosis of pleural effusion because, even after thoracentesis and/or closed pleural biopsy, 25-40 percent of pleural effusions go undetected^[6,7]. Pleuroscopy, also known as medical thoracoscopy, is a procedure that is commonly characterized as the assessment of the pleural cavity. Jacobaeus invented it in 1910 as a diagnostic method^[8]. Pleuroscopy procedures that are often done include visual evaluation of the pleural space, drainage of pleural effusion, and pleural biopsies^[9]. Flexible pleuroscopy was effectively utilized to treat pleural illnesses under local anesthesia. The gadget is simple to use and has a larger endoscopic field of view. Thus, visualization of the lesion site and biopsy from a correct position becomes feasible, which is not achievable with thoracentesis^[10]. Pleuroscopy is regarded as a relatively safe technique with a high degree of diagnostic accuracy. Pleuroscopy is comparable to chest tube insertion in technique and is thus simpler to master than flexible bronchoscopy if competence in chest tube insertion has previously been acquired^[11]. It has the benefit of Video Assisted Thoraoscopic Surgery (VATS) in that it does not need general anesthesia or single lung ventilation. Pleuroscopy is similar to chest tube insertion and may be performed with local anaesthetic utilizing a single point of entry. It is safe when conducted by skilled personnel, and we expect that with fast increasing technology, better anesthetic procedures, and technology, pleuroscopy will eventually replace traditional biopsy methods^[12,13].

Objective: The purpose of this research is to determine the diagnostic accuracy and problems associated with flexible pleuroscopy.

Materials and Methods

Study type and location: This prospective study was conducted at tertiary hospital in Bangladesh.

Time and duration: The duration of this study was one year (January 2020 to December 2020).

Sample size: Total 60 patients with exudative pleural effusion was selected as sample diagnosed by chest x-ray, CT scan of chest and pleural fluid study (Protein, sugar, LDH) in whom diagnosis couldn't be confirmed were consider for this study.

Flexible pleuroscopy was performed aseptically under local anaesthetic in the 5th or 6th intercostal gaps in the mid-axillary line, and many (5-6) parietal pleura samples were collected in questionable locations. A 28FR chest drain was inserted at the pleuroscope entry site. Histopathology was performed, and the patient was monitored for complications. The next day, a chest X-ray is acquired, and the drain is removed within 48 hours if the lung has expanded and the collection is modest.

Results

Table-01: Frequency table of socio demographic characteristics among the patients (N=60).

Socio demographic Variables		% (N = 60)
Age	Mean Age	46.7 years
	(Years)	(Range 22- 70 years)
Sex	Male	35 (58.83%)
	Female	25 (41.67%)
Side of effusion	Right	28 (46.67%)
	Left	29 (48.33%)
	Bilateral	03 (5%)

In table 1 shows that, the patients were on average 56.7 years old, with 58.83 percent male and 41.67 percent female. Nearly 46.67 percent of individuals acquired flexible pleural effusions and 48.33 percent developed left pleural effusions. Three individuals had bilateral illness.

Table-2: Distribution of Pleuroscopic fluid findings (N=60)

Pluroscopic fluid findings	Average Value	Percentage
Pleural fluid for sugar	6.6 mmol/L	24%
Pleural fluid for protein	4.2 g/dl	38%
ADA	46 U/L	38%

In table 2, shows that average value of pleural fluid for sugar is 6.6 mmol/L, protein is 4.2 g/dl and ADA is 46 U/L.

Each patient had a total of 5-6 biopsies performed, with the histology findings reported in Table 3. In all, 95.7% of patients had a conclusive diagnosis.

Only 8.7% of patients tested positive for malignant cells in a pleural fluid investigation, despite the fact that 60.8% of those tested had primary and secondary malignancies. Only 26.1% of patients were found to have TB, despite the fact that no tubercular organism could be found in either cytology or culture on any of them. Among the patients who underwent testing, 4.3% had empyema thoracis identified, and the same number of patients had normal pleura. Only two individuals (4.3 percent) had data that might be considered definitive.

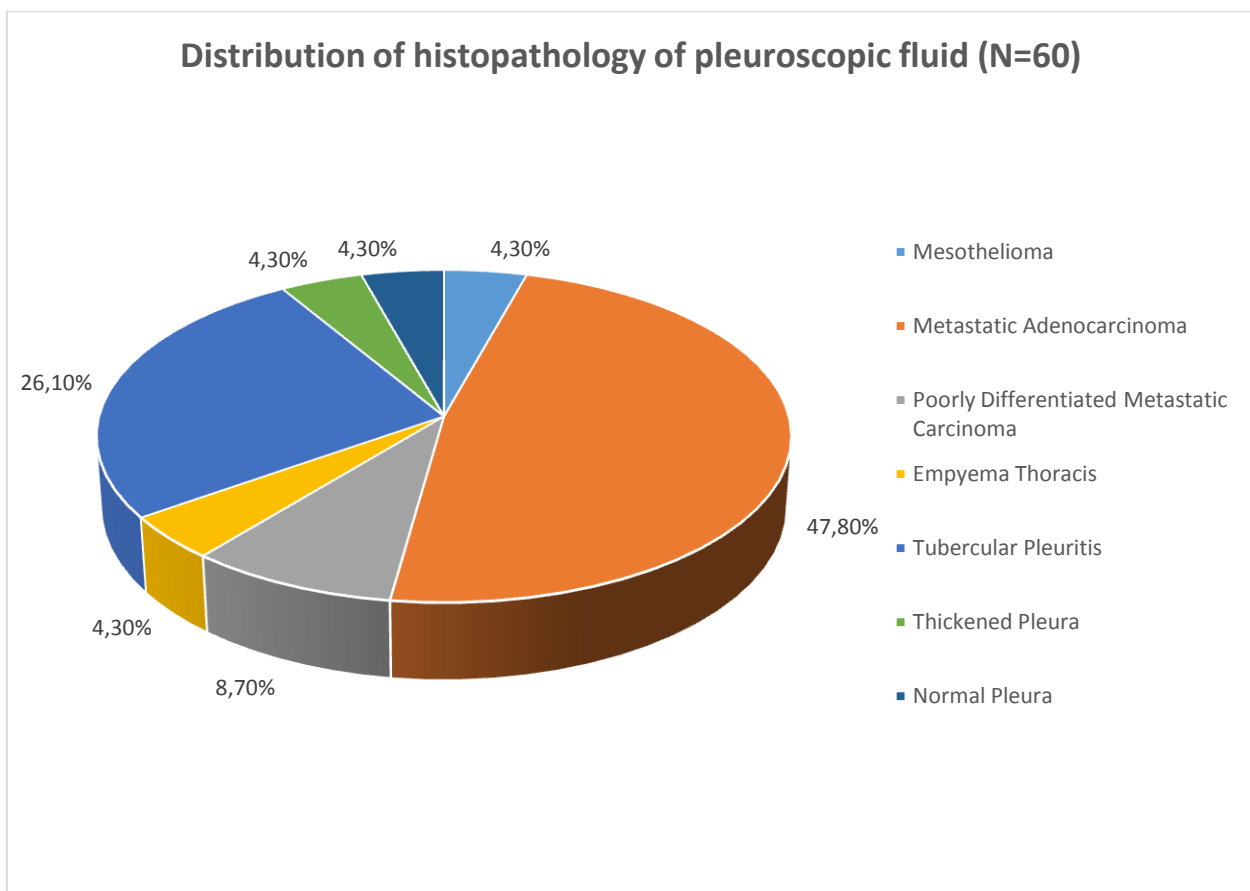


Figure: Pie chart of histopathology of pleuroscopic fluid

Discussion

Our thoracic surgery ward sees a lot of patients with pleural effusions. There are two options when it comes to pleural biopsy: the blind pleural biopsy or the Pleuroscopic biopsy. Patients who had been on anti-TB medications for more than three weeks with no clinical improvement were sent to our center, and thoracentesis and blind

closed-pleural biopsy give only 50-60% diagnostic accuracy for combined tuberculosis and malignancy^[7,9,14]. In this research, 60.8 percent of patients had malignancy, however only 8.7 percent had malignant cells detected in pleural fluid. Additionally, 26.1% of patients were diagnosed with tuberculosis, although none obtained confirmed evidence of tuberculosis in

pleural fluid studies. Previously, the use of fiberoptic bronchoscopes in the pleural area was documented. Despite the fact that it provided improved views of the apex and paravertebral gutters, it was difficult to manage and had a poor diagnostic yield^[9]. VATS is a superior option with high diagnostic accuracy, but it requires more skill and, in certain cases, numerous ports. Additionally, VATS requires general anaesthesia, which increases the risk of problems. In comparison, rigid pleuroscopy is performed under local anaesthetic and is a rather simple procedure technically. Pleuroscopy's principal use is to augment diagnostic skills when less invasive techniques fail^[13,15]. Flexible instruments have been critical to the technique's development^[16,17]. Pleuroscopy using flexible telescopes and trocars enables the parietal and visceral pleura to be seen clearly. However, while performing the treatment under local anaesthetic, the posterior and mediastinal parts of the hemithorax are not readily accessible with the single puncture approach. Pleuroscopy using flexible telescopes and trocars enables the parietal and visceral pleura to be seen well. However, while performing the treatment under local anaesthetic, it is difficult to reach the posterior and mediastinal parts of the hemithorax using the single puncture approach. This issue can be resolved by using single lung breathing and compressing the lung at the test location, however this will need general anaesthetic. As a result, it may be limited to patients in which stiff pleuroscopy fails to see aberrant pleura. Another option is flex-rigid pleuroscopy, which allows visualization of places that are not visible with rigid pleuroscopy.

Pleuroscopy has a low risk of complications. Only 6.4 percent had countable problems (4.3 percent developed subcutaneous emphysema and 2.1 percent experienced persistent air leak).

Conclusion

Thus, we may conclude that pleuroscopy is a very important method for diagnosing previously undiscovered exudative pleural effusions when

thoracentesis failed to provide an appropriate diagnosis. It is a straightforward and safe procedure that may be performed under local anaesthetic with a high degree of diagnostic accuracy and a low risk of complications. Additionally, this operation is less time consuming due to the use of local anaesthetic, and patient turnover is increased, which is beneficial in a nation like ours where patient burden is a major consideration.

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