



## Original Research Article

## Role of pleural biopsy by rigid thoracoscope in undiagnosed pleural effusions at a tertiary care center

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## ABSTRACT

**Introduction:** Undiagnosed pleural effusion constitutes nearly 25% of all exudative pleural effusion. Pleural biopsy is essential in this situation. In this study we assessed the diagnostic utility of rigid thoracoscopic pleural biopsy in undiagnosed pleural effusion.

**Materials and Methods:** This is a retrospective study done at tertiary care center. Data from June 2018 to May 2019 was analysed. All patients underwent the procedure with 30° rigid thoracoscope under local anaesthesia. Data was analyzed using MS Excel 2010.

**Results:** 25 patient's data was analyzed. Of these 19 were males and 6 were females. Mean age of study group was 54.8 years. In 19 patients diagnosis was confirmed. 11 were malignancies and 8 were tuberculosis. 6 patients had nonspecific chronic inflammation. No mortality related to procedure occurred.

**Conclusion:** Rigid thoracoscopy is a safe procedure for pleural biopsy. Thoracoscopic pleural biopsy not only confirms diagnosis but also avoids delay in diagnosis.

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### 1. Introduction

Pleural effusion is common in chest medicine practice. Some times after initial diagnostic workup definite cause of an exudative pleural effusion cannot be made, called as undiagnosed pleural effusion. This is nearly 25% of exudative pleural effusions. Pleural biopsy is essential in this situation to determine etiology. Pleural tissue can be obtained by different methods. Thoracoscopy is one of them. In Europe and USA thoracoscopic pleural biopsy is a common practice. In developing countries like India some clinicians empirically treat these patients with anti-Tuberculosis drugs without further evaluation. This is not recommended as malignancy is also a possibility and diagnosis is delayed. In this study we assessed the diagnostic utility of rigid thoracoscopic pleural biopsy in undiagnosed pleural effusion.

### 2. Materials and Methods

This is a retrospective study done at Respiratory medicine department, Narayana medical college, Nellore. We have compiled data of all patients who underwent diagnostic rigid thoracoscopy from June 2018 to May 2019. We excluded patients with parapneumonic pleural effusion, patients who were treated with empirical ATT, malignant cytology positive in pleural fluid. All patients underwent rigid thoracoscopy under local anaesthesia. 30° rigid thoracoscope (Karl-storz, Germany) of diameter 5 mm was used. All patients were placed in lateral decubitus position with involved side up and stretching the hand above the head. Site of entry was decided using a 10 ml syringe with needle between 4<sup>th</sup> to 7<sup>th</sup> intercostal spaces in mid axillary line. After infiltrating with 10-15 ml of 2% lignocaine, 1-2 cm incision parallel to ribs was given. Using blunt dissection, pleural cavity was entered. Trocar with cannula was inserted through the entry site. Keeping cannula in position, trocar was removed and thoracoscope was inserted. Instruments used for thoracoscope were shown in

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Figure 1. Pleural cavity was visualized to the possible extent and biopsy was taken from suspected/ abnormal areas. 4-5 samples taken for histopathological examination. Figure 2 showing pleural metastasis from Osteosarcoma. After the procedure, intercostal tube was placed and fixed properly. Once drain became < 100 ml for 3 consecutive days, intercostal tube was removed. For malignancy confirmed patients, intercostal tube was removed after pleurodesis with doxycycline. They were discharged subsequently. Histopathology reports were collected and documented. Data was analyzed using MS excel 2010.

### 3. Results

Total number of patients included in this study was 30. 5 patients were excluded as their data was incomplete. Remaining 25 patient's data was analyzed. Of these 19 were males and 6 were females. All patients had pleural fluid lymphocytosis ranging from 70 to 100%. Mean age of study group was 54.8 years. 11 patients were  $\leq$  50 years of age and 14 were > 50 years of age. Out 6 females, 5 turned out to be malignant and 1 was TB. In 19 patients diagnosis was achieved. 11 were malignancies and 8 were tuberculosis. 6 patients had nonspecific chronic inflammation. Of malignancies, 9 were metastatic adenocarcinoma, 1 was squamous cell carcinoma and 1 was osteosarcoma. Out 6 females, 5 turned out to be malignant. Most common complication following procedure was pain, 4 patients had surgical emphysema, No mortality related to procedure. But 2 patients expired due to advanced malignancy. Mean duration of intercostal tube drainage was 7 days. Pleurodesis with 1 gram doxycycline was done in 11 patients with malignancy. Patients underwent intercostal tube removal once the lung expanded and drain becomes < 100 ml for 3 consecutive days.



Fig. 1: Thoracoscopic instruments used at our institute

### 4. Discussion

The most frequent indication for diagnostic thoracoscopy is undiagnosed exudative pleural effusion.<sup>1</sup> In rigid thoracoscopy good amount of pleural tissue under direct vision can be obtained. Pleural biopsy reveals diagnosis in



Fig. 2: A case of osteosarcoma with pleural metastases

majority of the cases. In previous studies this diagnostic yield of thoracoscopic pleural biopsy ranged from 69 to 95%. Refer to Table 1. In present study also diagnostic yield was 76%. In previous studies nearly 50% of undiagnosed pleural effusions turned out to be malignant in origin. In few studies it was nearly 70%.<sup>2-4</sup> But in present study it is around 44%. This is similar to studies by Mohamed et al<sup>5</sup> and SJ Kim et al.<sup>6</sup> In our study metastatic adenocarcinoma is the most common cell type. This is similar to studies by.<sup>2,4</sup> In a study by L.A. Helala et al<sup>3</sup> malignant mesothelioma was most common followed by metastatic adenocarcinoma. TB was diagnosed in only 8 (32%) patients in our study. This is relatively high when compared to previous studies in which it was ranging from < 1% in studies by A. Agarwal et al<sup>4</sup> and SJ Kim et al<sup>6</sup> to 22.5% in a study done by L. A. Helala et al.<sup>3</sup> In 24% (6) patients even after thoracoscopic pleural biopsy diagnosis was not confirmed. This is similar to other studies by Yousef et al,<sup>2</sup> A. Agarwal et al,<sup>4</sup> A. Sh. Mohamed et al and SJ Kim et al.<sup>6</sup> But in a study by L. A. Helala et al<sup>3</sup> it was only 5%. Complications related to rigid thoracoscopy are relatively less. In this study group 3 patients complained of severe pain during procedure which subsided with analgesics, this was also mentioned in studies by Yousef et al<sup>2</sup> and L. A. Helala et al.<sup>3</sup> Post thoracoscopy 4 patients developed surgical emphysema in our study group. This is similar to other studies by Yousef et al,<sup>2</sup> L. A. Helala et al,<sup>3</sup> A. Agarwal et al<sup>4</sup> and Dhooria S. et al.<sup>7</sup> Following the procedure 2 patients developed fever. This complication was reported also by Dhooria S. et al.<sup>7</sup> Empyema was reported in studies by A. Agarwal et al,<sup>4</sup> SJ Kim et al<sup>6</sup> and Dhooria S. et al.<sup>7</sup> Re expansion pulmonary edema was reported by SJ Kim et al<sup>6</sup> and Dhooria S. et al<sup>7</sup> prolonged air leak and wound infection were reported by Yousef et al<sup>2</sup> and Dhooria S. et al.<sup>7</sup> No procedure related deaths in all the previous studies. This was also supported by present study. But 2 patients died of advanced malignancy in our study. Similar deaths were reported due to advanced malignancy in a study by SJ Kim et al.<sup>6</sup> On average total duration of hospital stay was <10 days. In

**Table 1:** Diagnostic yield of various studies of thoracoscopy

S. No.	Study done by	Type of thoracoscope	Sample size	Diagnosis (%)	Malignancy (%)
1	A. Sh. Mohamed et al <sup>5</sup>	rigid	20	17 (85)	9(45)
2	Yousef et al <sup>2</sup>	Rigid	36	29 (80.6)	25(69.4)
3	L.A. Helala et al <sup>3</sup>	Semirigid	40	38(95)	28(70)
4	SJ Kim et al <sup>6</sup>	Rigid or semirigid	26	19(73)	12(46)
5	A. Agarwal et al <sup>4</sup>	Rigid	19	13(69)	13(69)
6	Present study	Rigid	25	19(76)	11(44)

previous studies this ranged from 6 days in study by SJ Kim et al<sup>6</sup> to 14.5 days in a study by A. Agarwal et al.<sup>4</sup> In view of these observations rigid thoracoscopy is a relatively safe procedure for pleural biopsy. In developing countries like India where empirical treatment for Tuberculosis is common particularly in undiagnosed pleural effusion, this is a good option. This not only helps in diagnosis but also prevents unnecessary treatment with anti TB drugs.

## 5. Conclusion

Undiagnosed pleural effusion is relatively common in practice. In majority of these cases we can clinch diagnosis by pleural biopsy. Malignancy is most common in undiagnosed pleural effusion. Rigid thoracoscopy under local anaesthesia is a safe procedure for pleural biopsy. This provides good amount of pleural tissue from abnormal areas of pleura under direct vision. Doing early thorascopic pleural biopsy not only confirms diagnosis but also avoids delay in diagnosis.

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## 7. Conflict of interest

None.

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