INTRODUCTION

Medical thoracoscopy is a minimally invasive procedure that enables a pulmonologist to directly visualize the pleural space and take samples from pathological sites (1, 2). Compared to video-assisted thoracoscopic surgery (VATS), which is performed under general anesthesia with double-lumen tracheal intubation, medical thoracoscopy is immensely advantageous since it can be performed with local anesthesia and conscious sedation (3). Several studies show medical thoracoscopy has increased diagnostic rates in cases where thoracentesis and blind pleural biopsy were not diagnostic (4). In our study, we evaluated the diagnostic value and safety of medical thoracoscopy in patients with exudative pleural effusion where clinical, radiologic, and cytological finding were inconclusive.

METHODS

Thirty-seven patients who had undergone medical thoracoscopy due to exudative pleural effusion in our clinic from March 2011 to August 2014 were studied retrospectively. These patients had a failed diagnosis by classical methods, including thoracentesis and closed pleural biopsy, before medical thoracoscopy. Medical thoracoscopy was performed by a rigid thoracoscope (Karl Storz, Germany). In all, 500 cc of fluid was drained from the pleural cavity and the same of volume air was administered instead to create an iatrogenic pneumothorax prior to the procedure. The patients were positioned...
on their unaffected side. We administered 15-20 mL of 1% lidocaine to the dermis, subdermis, intercostal muscles, and parietal pleura as a local anesthetic and a trocar was placed through a 1-1.5 cm incision. Short-acting benzodiazepine (midazolam) for premedication and low-dose propofol, short-acting hypnotic agent, and/or opioids (pentanyl or remiphenanyl) for anesthesia was used. The drug dose was adjusted to have a RAMSEY sedation scale of 2-3. The obtained specimens were inspected in our pathology department.

This retrospective study was conducted in our hospital. Because of this is a retrospective study, informed written consent was not obtained, but informed consent was received from all of the patients before the procedures. This study protocol was approved by the institutional ethics committee.

RESULTS

Of the 37 patients, 26 were male, 11 were female, and the median age was 50.94 ± 15.38. Fourteen had right-sided pleural effusion. Sixteen had a history of blind pleural biopsy either in our clinic or another medical center; their pathology results were as follows: 9 chronic nonspecific pleuritis (Figure 1); 3 sparse atypical cells, suspicious for malignancy; 1 atypical mesothelial cell proliferation; 1 atypical cell proliferation in fibrohyalinized tissue; and 2 had insufficient material. The most common thoracoscopic finding was diffuse or patchy nodular lesions on the parietal pleura. Tumoral lesions protruding into the pleural space, originating from parietal pleura, pleural thickening, pleural hyperemia, and pleural fibrin webs, were observed in decreasing order of frequency. Medical thoracoscopy was diagnostic in 36 of the patients (97.3%). The distribution of patients according to diagnosis is summarized in Table 1.

A patient who was diagnosed as lymphocytic pleuritis, but thoracoscopically considered as malignant, underwent decortications and the final diagnosis was biphasic malignant pleural mesothelioma. Of the 9 (24.3%) patients diagnosed as nonspecific pleuritis, 1 underwent decortication and the final diagnosis was consistent with fibrinous pleuritis characterized by widespread fibrosis. The other 8 patients did not develop malignancy in their 2 year follow-up.

Diagnoses of the patients who had to undergo medical thoracoscopy because they were undiagnosed by blind pleural biopsy are summarized in Table 2. Two cases referred to our clinic with suspicion of pleural malignancy were diagnosed as chronic nonspecific pleuritis; the thoracoscopic appearance of pleura was also supportive of this diagnosis.

Talc pleurodesis was performed in 1 patient with small cell lung carcinoma metastasis, 1 patient with malignant pleural mesothelioma, 2 patients with clear cell carcinoma, 2 patients with non-small cell lung carcinoma, and 1 patient with chronic necrotizing granulomatosis.

During post-operative follow-ups, the complication rate was 19%. Four patients had subcutaneous emphysema, 3 patients had to undergo prolonged chest tube drainage due to expansion failure. One of these patients developed hemothorax that required transfusion but was controlled spontaneously. However, the patient died on the 34th day of admission due to respiratory failure. The median post-operative hospital stay was 5 days (minimum-maximum: 1-34).

DISCUSSION

In our study, medical thoracoscopy is seen as a useful diagnostic method with high diagnostic yields (97.3%), low complication rates (19%), and short hospital stays (5 days) in the management of exudative pleural effusion.

75% of all patients with pleural effusion were diagnosed with analysis of the pleural fluid obtained by thoracentesis (5). In cases where thoracentesis fails, blind pleural biopsy or imaging-assisted pleural biopsies are required. Medical thoracoscopy has become a popular alternative method since blind pleural biopsy has low diagnosis rates and surgical pleural biopsy requires general anesthesia, single-lung ventilation, and longer hospital stays (5). Several studies comparing medical thoracoscopy to pleural fluid cytology and/or blind pleural biopsy report a 93% diagnostic rate with rigid thoracoscopy (6, 7). Medical thoracoscopy also has the advantage of enabling the clinician to take several biopsies from the diaphragm and visceral pleura (8). Direct visualization of the pleura during the procedure helps the clinicians form an early opinion and a better chance at patient management (9).

Our study had a high diagnosis rate of 97.3%. Two of our patients were referred to our clinic because blind pleural biopsy findings were atypical of glandular cells. Final diagnosis was nonspecific pleuritis,
Studies show that medical thoracoscopy has a significantly lower systemic complication and mortality rate compared to surgical thoracoscopy and thoracotomy (9, 10). Subcutaneous emphysema, localized infection of the incision site, hypotension, fever, atrial fibrillation during the procedure are minor; empyema, hemorrhage, tumor seeding in port site, bronchopleural fistula, pneumonia, prolonged air-leak and re-expansion pulmonary edema are the major complications reported from various studies (11). The complication rates in our study were similar to the literature; the post-operative hospitalization period was shorter in our study (Table 3) (4, 8, 12-15). The most common complication was subcutaneous emphysema; however, these patients had similar hospitalization days compared to the rest of the patients. One patient who had pleural metastatic larynx carcinoma developed hemothorax that required transfusion. Although hemorrhage was controlled spontaneously, the patient died on the 34th day of admission due to respiratory failure.

A 9% to 50% of patients undergoing medical thoracoscopy due to pleural effusion were diagnosed with nonspecific pleuritis (16, 17). Two pathways are suggested in the management of these patients: “wait and see” or “decide based on the patient.” Deciding based on the patient involves the clinician’s visual assessment of the pleura thoracoscopically. If there is a suspicion of malignancy, re-thoracoscopy or surgery is recommended. If the lesions are considered benign, the patient should be monitored; however, criteria for the follow-up period or methods are yet to be defined (18). In our study, the rate of nonspecific pleuritis was 24.3%. Two patients were undiagnosed, but were highly suspicious for malignancy. Of these two patients, one was diagnosed as nonspecific pleuritis after decortication whereas the other was diagnosed as mesothelioma after surgery. The other patients diagnosed as nonspecific pleuritis were thoracoscopically considered as benign so they were monitored. After considering these findings, the “decide based on the patient” is regarded as the more suitable approach.

In diseases where local tumoral invasion is common in biopsy sites, and more often than not radiotherapy is required for these sites, such as malignant mesothelioma, it is crucial to minimize the number of diagnostic and therapeutic procedures. Medical thoracoscopy enables talc pleurodesis in the same procedure where visual assessment is consistent with malignancy (19). In our study, talc pleurodesis was performed on seven patients due to visual assessment of malignant disease. However, one of these patients was later diagnosed as necrotizing granulomatous inflammation. The reason for this situation is merely because this was our first medical thoracoscopy patient.

CONCLUSION
We would like to state that medical thoracoscopy should be considered in patients with exudative pleural effusion who cannot be diagnosed by thoracentesis and closed pleural biopsy. This enables the clinician to sample the pleura while seeing the pleural cavity. It has a high diagnosis but low morbidity and mortality rates, short hospital stays and no requirement for ventilation.
Peer-review: Externally peer-reviewed.


Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES
5. Skalski JH, Astoul PJ, Maldonado F. Medical thoracoscopy. Semin Respir Crit Care Med 2014; 35: 732-43. [CrossRef]