International Journal of Advances in Medicine
Jindal S et al. Int J Adv Med. 2015 Feb;2(1):30-33
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: 10.5455/2349-3933.ijam20150207

Research Article

Medical thoracoscopy: a retrospective analysis in a tertiary care centre

Savita Jindal*, Chirag A. Gangajalia, Pujan Parikh, V. G. Vinod, Nalin T. Shah, Kusum V. Shah

Department of Pulmonary Medicine, Civil Hospital, B.J.M.C, Ahmedabad-380016, Gujarat, India

Received: 6 December 2014
Accepted: 24 December 2014

***Correspondence:**
Dr. Savita Jindal,
E-mail: drsavy05@gmail.com

ABSTRACT

Background: Medical thoracoscopy is a minimally invasive procedure to visualize the entire pleural surface and perform limited diagnostic and therapeutic procedures. One of the main indications for medical thoracoscopy is to obtain a diagnosis in an exudative pleural effusion when other, simpler methods non-diagnostic. Medical thoracoscopy can also be used for therapeutic procedures. The present study is an effort to analyse our experience of medical thoracoscopy in patient of undiagnosed pleural effusion.
Methods: 25 patients of pleural effusion in which diagnosis was not made by routine pleural fluid examination (biochemical/microbiological/cytological evaluation) were subjected to video thoracoscopy and biopsy, pleural fluid taken for pathological examination and therapeutic interventions such as adhesiolysis and pleurodesis were done. Intercostal drain kept.
Results: Overall yield in the present study is 92% (23 out of 25). Majority of patients had malignant effusions (19 patients - 76%), of which 8 had metastatic adenocarcinoma and 7 had malignant mesothelioma. 2 patients (8%) were diagnosed to have tuberculous pleurisy. Present study had no incidence of thoracoscopic complications.
Conclusions: We recommend that thoracoscopy shall be the Investigation of choice of undiagnosed pleural effusion as it has good yield with minimal complications.

Keywords: Medical thoracoscopy, Exudative pleural effusion, Tuberculosis, Pleural metastasis, Mesothelioma

INTRODUCTION

Interventional pulmonology is a relatively new field of medicine with increasing repertoire of which the oldest arsenal is the thoracoscopy that was described first by Jacobaeus in 1910 using a cystoscope mainly for lysing pleural adhesions back then. But only in recent past it gained pace in its usage and has now become indispensable for not only diagnostic and certain therapeutic procedures of pleura by "medical thoracoscopy" or "pleuroscopy" but also for the management of various pleural, pulmonary, mediastinal pathologies in the form of VATS (video assisted thoracoscopic surgery); former is done under conscious sedation as an OPD procedure while the latter under general anesthesia with single lung ventilation in an indoor facility.[1]

Medical thoracoscopy is a minimally invasive procedure most commonly done with a single port that allows to visualize the entire pleural surface and perform limited diagnostic and therapeutic procedures. One of the main indications for medical thoracoscopy is to obtain a diagnosis in an exudative pleural effusion when other, simpler methods (pleural fluid biochemical, microbiological and cytological analysis) are non-diagnostic. Medical thoracoscopy can also be used for therapeutic procedures, such as adhesiolysis and evacuation of pleural fluid in patients with empyema,

pleurodesis in patients with malignant pleural effusion and spontaneous pneumothorax.

The present study analyses our experience of medical thoracoscopy in patients with undiagnosed pleural effusion.

METHODS

It is a retrospective study done in the department of pulmonary medicine, B.J.M.C Ahmedabad, between November 2012 and March 2014. Undiagnosed pleural effusion is defined as failure to achieve a diagnosis by initial pleural fluid analysis including biochemical analysis, adenosine deaminase levels, culture and sensitivity, gram and ZN stain and atleast 3 pleural fluid analyses negative for malignant cells. The patients included in the study were subjected to detailed history and clinical examination, chest X-ray, computed tomography of the chest and also blood investigations including coagulation profile, platelet count, HIV and HbsAg status. Patients who had crowding of ribs, bleeding diathesis (INR >1.2, platelet count <60000/mm^3, creatinine >3 mg/dl), pulmonary arterial hypertension, severe uncorrectable hypoxemia despite oxygen therapy, unstable cardiovascular status, refractory cough were excluded from the study.

Patients were made to fast for 4-6 hours from the early hours of the day of procedure. After getting an informed consent, peripheral venous access obtained and patient was positioned in lateral decubitus position with the diseased side up with that side's arm above the head as it would widen the intercostal space and helps in insertion of trocar and also improves the working field. Skin over the chest wall cleansed with 4% povidone iodine and then draped. Patients were sedated with IV midazolam (1 ml diluted to 5 ml in NS).

The routine for our medical thoracoscopy (with semirigid pleuroscope) is with a single port the entry point of which is usually in the mid-axillary line in the 6^{th} 0r 7^{th} intercostals space which is adequately anaesthetized with 20 ml of 2% lignocaine before making an incision of about 2 cm long along the line of intercostals space using sterile 11 size surgical blade. After blunt dissection of subcutaneous tissue and the intercostal muscles with curved artery forceps, a cannula of 10 mm diameter with blunt trocar is inserted into the pleural cavity. The trocar was then removed and the rigid video thoracoscope (olympus) is inserted. Pleural fluid was suctioned to enable clear visualization of entire pleural surface. Thoracoscope was maneuvered to see visceral, costal, diaphragmatic surface and the costophrenic recess.

Biopsy site is selected and the biopsy forceps introduced through the working channel of the thoracoscope and the pleural tissue sample is biopsied under vision. After adequate biopsy samples (minimum 10) were taken, scope and cannula were removed and intercostals drainage tube of 28 to 32 Ft size is inserted through the same incision, connected to the ICD bag and skin suture taken. Patient was advised not to take anything orally for 1 hour post procedure and a chest x ray was ordered after 12 hours. Once the lung had expanded and drain output had decreased to less 50 ml for 3 consecutive days, chest drain was removed.

RESULTS

In the present study, 25 patients (80% male and 20% female; mean age 54.69 years) with undiagnosed pleural effusion were subjected to thoracoscopy for diagnostic purposes.

Of the 25 patients with undiagnosed pleural effusion, the initial clinical diagnosis was malignant pleural effusion in 20 (80%) patients, TB in 2 (8%) patients, Churg-Strauss syndrome in 1 (4%) patient. 2 (8%) patients had no clinical diagnosis despite pleural fluid and radiological investigations.

Thoracoscopic pleural biopsy made diagnosis in 23 of the 25 patients (92%). Final diagnosis of pleural malignancy was made in 19 patients, TB in 2 patients, empyema in 1 patient and Churg-Strauss syndrome in 1 patient.

Table 1: Results of thoracoscopic biopsy.

Clinical diagnosis	Thoracoscopic pleural biopsy	Final diagnosis on thoracoscopic pleural biopsy
Malignant pleural effusion (n=17)	17/17 (100%)	Metastatic adenocarcinoma - 8
		Malignant mesothelioma - 7
		Spindle cell tumor - 1
		Poorly differentiated metastatic tumor - 1
Tuberculosis (n=5)	4/5 (80%)	Tuberculosis - 2
		Empyema - 1
		Squamous cell carcinoma - 1
		Non diagnostic - 1
No clinical diagnosis (n=2)	1/2 (50%)	Lymphoma - 1
Churg-Strauss syndrome (n=1)	1/1 (100%)	Churg-Strauss syndrome - 1

Of the 19 patients with proven pleural malignancy, 7 had mesothelioma and the remaining had metastatic pleural malignancy. 8 had metastatic adenocarcinoma, 1 patient each had spindle cell tumor, squamous cell carcinoma, lymphoma and poorly differentiated metastatic pleural malignancy.

In 2 patients, thoracoscopic pleural biopsy showed granulomatous inflammation consistent with TB. 1 patient each got neutrophilic inflammation and

eosinophilic infiltration in pleural biopsies suggesting empyema and Churg-Strauss syndrome respectively.

In 2 out of 25 (8%) patients with pleural effusion, thoracoscopic pleural biopsy did not reveal any specific diagnosis.

No post-thoracoscopy complications encountered in the present study group.

DISCUSSION

In the present study, the diagnostic yield of the thoracoscopic biopsy is 92% (23/25) patients. Similar experience with medical thoracoscopy has been made in various studies: Lee et al. 96% (n=51%),[2] Tscheikuna et al. 95% (n=34),[3] Kendall et al. 83% (n=48),[4] V. K. Mootha et al. 74.3% (n=35).[5]

Majority of the undiagnosed pleural effusion in the present study found out to be malignant 76% (19/25) which is similar to the experience of various centers like Tscheikuna et al. 70%, Francois Xavier et al. 53.7%,[6] V. K. Mootha et al. 45.7% showing majority of the yield to be malignant.

Pleural metastasis (8/19 = 42.1%) is more common than mesothelioma (7/19 = 36.8%) as the etiology of the malignant effusion in our study which is in concordance with the study of V. K. Mootha et al. who had pleural metastasis as the more commoner etiology of malignant effusion (16/17 = 94.1%) than mesothelioma (1/17 = 5.9%). Similar scenario was noted in B. Thangakunam[7] et al. who had 6/18 (33.3%) adenocarcinoma compared to 1/18 (5.55%) mesothelioma.

In a minority of patients (2/25 = 8%), TB was found to be the cause of undiagnosed effusion. Similar incidences of TB were made by V. K. Mootha et al. (8/35 = 22.9%), B. Thangakunam et al. (3/18 = 16.67%).

Thoracoscopic pleural biopsy is considered gold standard in diagnosis of malignant pleural effusion and TB pleural effusion. Diagnostic yield of thoracoscopic pleural biopsy can be as high as 95% in malignant pleural effusions and 99% in TB pleural effusions which is superior to that of pleural fluid analysis and closed pleural biopsy. These findings and various studies including the present study suggest that thoracoscopic pleural biopsy should be considered in all patients with pleural effusions who remain undiagnosed after initial pleural fluid analysis.

We had no complication in the present study. The literature describes a variety of complications whose rates are very minimal and are easily manageable: subcutaneous emphysema (0.6%-4.9%), air leak (0.5%-8.1%), empyema (0.5%-2.7%), hemorrhage (0.3%-0.4%), shock (0.2%), chest wall seeding by malignancy (0.5%-4.0%).

Table 2: Demographic characteristics of 25 patients of the present study compared with that of another study by V. K. Mootha et al.

Demographic characteristic	Present study	Mootha VK et al.
Age (years)	54.69 (16)	48.68 (14.0)
Male:Female	20:5	25:10
Initial clinical diagnosis		
Malignant pleural effusion	17	26
TB	5	3
No diagnosis	2	5
Churg-Strauss syndrome	1	1
Pleural effusion		
TLC (/mm^3)	714 (764)	1,525 (1,795)
Differential count	80% Lymphocytic 16% Neutrophilic 4% Eosinophilic	50% Lymphocytic 50% Neutrophilic
Protein (g/dL)	4.3 (1.26)	4.89 (1.21)
Sugar (mg/dL)	70.72 (46.33)	72.22 (38.3)
AFB	0%	0%
ADA (I/L)	27.07 (38)	39.1 (19.5)
Malignant cells	0	0

The results are expressed as mean (SD) or %.

AFB - Acid fast bacilli; ADA - Adenosine deaminase; TLC - Total leucocyte count; TB - Tuberculosis; CT - Computed tomography

CONCLUSIONS

The results of this study suggest that medical thoracoscopy should be considered in patients with undiagnosed pleural effusions, particularly those lymphocytic exudative effusions where TB and malignant pleural effusion are clinical possibilities and initial pleural fluid analysis is inconclusive.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Fishman AP, Elias Jack A. Interventional pulmonology. In: Fishman AP, Elias Jack A, eds. Fishman's Pulmonary Diseases and Disorders. 5th ed. New York: McGraw-Hill, Health Professions Division; 1997.
2. Lee P, Colt HG. Rigid and semirigid pleuroscopy: the future is bright. Respirology. 2005 Sep;10(4):418-25.
3. Tscheikuna J, Silairatana S, Sangkeaw S, Nana A. Outcome of medical thoracoscopy. J Med Assoc Thai. 2009;92(Suppl 2):S19-23.

4. Kendall SW, Bryan AJ, Large SR, Wells FC. Pleural effusions: is thoracoscopy a reliable investigation? A retrospective review. Respir Med. 1992;86:437-40.
5. Mootha VK, Agarwal R, Singh N. Medical thoracoscopy for undiagnosed pleural effusions: experience from a tertiary care hospital in North India. Indian J Chest Dis Allied Sci. 2011;53:21-4.
6. Francois-Xavier Blanc, Kinan Atassi, Jean Bignon, Bruno Housset. Diagnostic value of medical thoracoscopy in pleural disease: a 6 year retrospective study. Chest. 2002;121:1677-83.
7. Thangakunam B, Christopher DJ, James P, Gupta R. Semirigid thoracoscopy: initial experience from a tertiary care hospital. Indian J Chest Dis Allied Sci. 2010;52:25-7.

DOI: 10.5455/2349-3933.ijam20150207
Cite this article as: Jindal S, Gangajalia CA, Parikh P, Vinod VG, Shah NT, Shah KV. Medical thoracoscopy: a retrospective analysis in a tertiary care centre. Int J Adv Med 2015;2:30-3.