Medical Thoracoscopy: Our Experience With 155 Patients

D Stav

Citation

D Stav. *Medical Thoracoscopy: Our Experience With 155 Patients*. The Internet Journal of Pulmonary Medicine. 2002 Volume 3 Number 2.

Abstract

Medical thoracoscopy is a procedure used by interventional pulmonologists for investigation and treatment of pleural and peripheral lung disease. It is usually carried out under local anesthesia and sedation and performed in a bronchoscopy suite.

Methods

Thoracoscopies were performed in the bronchoscopy suite, under local anesthesia and sedation with midazolam. A rigid 7 mm thoracoscope connected to a video system was used.

Results

Thoracoscopy was carried out on 155 patients between April, 1996, and March, 2003. Mean age of the patients was 56 years (range 36 to 82) and 26 of them were female. In 106 patients (68%) it was done for diagnostic purposes and in 41 (26%) for pleurodesis by talc insufflation. Of the 106 diagnostic patients 100 were investigated for pleural abnormality and 6 for peripheral lung disease. Of the 41 patients who underwent pleurodesis the procedure was successful in 38 (93%). Among the 8 patients who had empyema only 5 gained from the procedure.

Conclusion

Medical thoracoscopy is a rapid, safe and efficient procedure for both diagnosis of pleural diseases and therapeutic pleurodesis.

INTRODUCTION

Medical thoracoscopy (pleuroscopy) was described for the first time by the pulmonologist Jacobous ([1]). He used it to sever pleural adhesions in patients with tuberculosis. The procedure was carried out under local anesthesia using primitive instruments and lighting. With the advent of anti-tuberculosis drugs thoracoscopy was abandoned for several decades.

The revival of thoracoscopy was made possible by advances in endoscopy technology particularly video assisted thoracoscopy. Medical thoracoscopy differs from video-assisted thoracic surgery, (VATS) in that local anesthesia and sedation are used instead of general anesthesia and the procedure can be performed in an ambulatory care setting ([2],[3]). Although medical thoracoscopy is primarily used for the diagnosis and management of pleural disorders, it can also be used to perform lung biopsy ([4]) and to manage spontaneous pneumothorax ([5]). This technique has been used at Asaf Harofe Medical Center since 1996. In this report we present our experience with medical thoracosocopy between April, 1996 and the end of March, 2003.

MATERIALS AND METHODS

Medical thoracoscopy was performed by placing the patient in the lateral decubitus position with the arms placed over the head in order to increase the size of the intercostal spaces. After local anesthesia (intercostal block) with 2% lidocaine and sedation with midazolan drip, a small caliber trocar (14F) was introduced into the intercostal space after incising the chest wall in order to produce a pneumothorax. A larger flexible trocar (10mm) was then introduced after enlarging the channel. A rigid thoracoscope 7 mm diameter (Richard Wolf, Germany) was inserted into the pleural cavity after increasing the pneumothorax by insufflating air with a 60 ml syringe. The thoracoscope was connected to a video camera and viewed on a computer screen. When biopsy, lysing of adhesion or electrocoagulation or cutting

were carried out a second smaller (5 mm) incision was made to enable insertion of a second instrument (usually a biopsy forceps).

Pleurodesis was achieved via thoracoscopy by insufflating talc into the pleural space. (Poudrage) For malignant pleural effusions the average quantity of talc used was 7 grams and for pneumothorax 1.5 grams. The procedure was considered successful if no more than an estimated 100 ml of fluid accumulated following the talc poudrage.

RESULTS

Thoracoscopy was performed on 155 patients, from April 1996 to the end of March, 2003. Mean age of the patients was 56 years (range 36 to 82) and 26 of them were female. Thoracoscopy was done on 106 patients (68%) for diagnostic purposes and on 41 (26%) for pleurodesis. Diagnostic thoracoscopy for pleural abnormality was carried out only after pleural fluid examinations and in many cases additional closed pleural biopsy were been non-diagnostic. As shown in table 1, 94% of diagnostic procedures were performed for investigation of pleural abnormalities and the remaining 6% for peripheral lung disease. In nine (9.0%) of the patients undergoing the procedure for diagnostic purposes no diagnosis obtained. In three of these the procedure was not successful due to pleural adhesions. In subsequent exploratory thoracotomy the diagnostic was made in five. The detailed diagnostic diseases distribution are shown in table 2. In cases with a diagnosis of normal pleura, the pleural effusion was most likely secondary to heart failure, liver and/or renal diseases, or of unknown etiology.

Figure 1

Table 1: Diagnostic thoracoscopy

	Diagnostic	Non-diagnostic
Pleural	91 (91%)	9 (9%)
Lung	5 (83%)	1 (17%)

(%) of total pleural or lung.

Figure 2

Table 2: Diagnosis made by thoracoscopy

	Pleural (91)	Lung (5)
Metastatic cancer	29 (32%)	
Mesothelioma	3 (3%)	
Lung cancer		3 (50%)
Tuberculosis	3 (3%)	
Chronic pleuritis	35 (38%)	
Normal pleura	21 (23%)	
Interstitial fibrosis		2 (33%)

(%) of total pleural or lung thoracoscopies

In 41 patients the procedure was carried out in order to produce pleural adhesion (pleurodesis). As shown in table 3., the success rate was 92% for treating chronic and recurrent pleural effusions (32 malignant, 5 heart failure), and 100% (4 cases) for treating recurrent pneumothorax. In the 3 cases where empyema was the indication for thoracoscopy the procedure was unsuccessful and open thoracotomy was required.

Figure 3

Table 3: Treatment thoracoscopy

Pleurodesis (41)			Empyema (8)
Pleural effusion		Pneumothorax	
Malignant	Non-malignant		
30 (69%)	4 (10%)	4 (10%)	5 (63%)
2 failed	1 failed	No failure	3 failed

(%) of treated.

Concerning complications, no patient required emergency thoracotomy although two patients were operated on within three days of the procedure due to prolonged bleeding. One patient experienced transitory respiratory arrest during induction of sedation. Prolonged air-leak was observed in 2 patients who underwent thoracoscopic lung biopsy. Subcutaneous emphysema developed in 36 patients but none required treatment and none suffered symptoms related to it. No death nor any infectious complications occurred as a result of the procedure.

DISCUSSION

The diagnosis of pleural disease is often problematic. Even after thoracocentesis and closed pleural biopsy have been carried out in addition to other studies relevant to the clinical circumstances, 21% to 27% of patients remain without a definitive diagnosis ([6,7,8]). The diagnostic yield of thoracoscopy is between 90 and 100%, in contrast to 44% for closed pleural biopsy and 62% for fluid cytology.

If the patient has malignancy and cytology performed on

thoracocentesis fluid is negative, thoracoscopy is clearly indicated because it will establish the diagnosis in > 90% of cases. In malignant pleural effusion treatment includes complete evacuation of pleural fluid, maximization of lung expandability by removing adhesions, and talc poudrage pleurodesis (also known as talc insufflation). This results in short and long-term success rates of > 90% ([9])

In the case of recurrent pleural effusion of benign etiology (heart failure, cardiac surgery, nephrotic syndrome, connective tissue diseases, and other inflammatory disorders) thoracoscopic pleurodesis is indicated when the recurrent effusion causes symptoms and is not controlled by repeated large-volume thoracocentesis ([10],[11]).

When persistant or recurrent pneumothorax is the problem thoracoscopy provides an excellent alternative to repeated chest tube drainage ([12]). In addition thoracoscopy makes possible definitive treatment of small blebs (< 2 cm) by electrocautery. Larger bullae are removed by VATS or open thoracotomy. With or without treatment of the blebs pleurodesis is achieved in these cases by talc insufflation. The dose required is about 20% of that needed for malignant pleural effusion.

In the case of empyema and complicated para-pneumonic fluid thoracoscopic intervention is usually required, after failure of chest tube drainage and fibrinolytic treatment. ([13]). In our series we had little success with such cases mainly due to thick fibrotic pleural bands. Because of the threat of major bleeding in this situation open thoracotomy is the preferred procedure. Since these fibrotic bands develop later in the course of such cases thoracoscopic intervention should be considered when chest tube drainage is unsatisfactory, usually not later than 3 to 5 days after the empyema appears.

The frequency of procedure-related complications is an important consideration. Of 102 patients undergoing thoracoscopy under local anesthesia, hemodynamic compromise or persistent air leak requiring thoracotomy was reported in 1.9% and minor complications were reported in 7.5% ([14]). The mortality rate associated with thoracoscopy ranges from 0.01 to 0.24% ([15],[16]). These reported results are consistent with our experience as described above.

CONCLUSION

The experience presented in this report demonstrates that medical thoracoscopy is a safe and efficient way for diagnosing pleural
abnormalities and to treat chronic recurrent pleural effusion, and recurrent pneumothorax. The rate of success in diagnosing pleural disease was high and talc poudrage proved to be an excellent method for pleurodesis.

CORRESPONDENCE TO

Dr. David Stav, Pulmonary Institute, Assaf Harofeh Medical center, Zrifin 70300, Israel . Tel. (972) 89779024, Fax. (972) 89779821 dstav@asaf.health.gov.il

References

1. Mares DC, Mahur PN. Medical Thoracoscopy: the pulmonologist's perspective. Seminar Respir Crit Care Med. 1977;18:603-15.
2. Colt HG, Thoracoscopy: window to the pleural space. Chest 1999; 116:1409-15.
3. Mahur PN, Astoul P, Bpoutin C. Medical thoracoscopy: technical details. Clin Chest Med 1995 ;16:479-85.
4. Mahuur PN, LoddenkemperR. Medical thoracoscopy: role in pleural and lung disease. Clin Chest Med 1995; 16:487-96.
5. Boutin C, Astoul P, Rey F, Maur PN. Thoracoscopy in the diagnosis and treatment of spontaneous pneumothorax. Clin Chest Med 1995;16:497-03.
6. Gunnels JJ. erplexing pleural effusion. Chest. 1978;74:390-93.
7. Poe RH, IsraelRH, Utell MJ, Hall WJ, Greenblat DW, Kallay M. Sensitivity,
8. Arch Inern
9. 1984; 144:325-8.
10. Menzies R., Charbonneau M. Thoracoscopy for the diagnosis of pleural disease. An Internal Med 1991 114: 271-276.
11. Colt HG. Thoracoscopic management of malignant pleural effusions. Clin Chest Med 1995;16:505-18.
12. Aelony Y., King R., and Boutin C., Thoracoscopic talc poudrage for chronic recurrent pleural effusion. An Intern Med. 1991; 115: 778-782.
13. Milanez de Campos JR., Vargas FS., Werbe EC., Cardoso P., Teixiera LR., Jatene FB., and Light RW., Thoracoscopy talc poudrage. Chest 2001;119:801-806.
14. Panacek EA., and Sahn SA. Management of spontaneous pneumothorax. An American college of chest physician Delphi consensus statement. Chest 2001;119:590-602.
15. Karmy -Jones R, Sorenson V, Horst HM et al. Rigid thoracosocopy debridement and continous pleural irrigation in the management of empyema. Chest 1997.
16. Boutin C, Villat JR, cargnino P, Farisse P, Choux R. La thracoscopie en 1980: revue general. Poumon Coeur 1981;37:9-11.
17. Viskum k, Enk B. Complications of thoracoscopy. Poumon Coeur 1981;37:25-2.
18. Colt HG, Thoracoscopy, window to the pleural space. Chest 1999; 116:1409-15.

Author Information

David Stav, MD
Pulmonary Institute, Assaf Harofeh Medical Center, Tel Aviv University