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Thoracoscopic Reoperation after Open Surgery

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ABSTRACT

Introduction : Video-assisted thoracoscopic surgery (VATS) is often avoided if an open thoractomy has previously been performed in the ipsilateral thoracic cavity. We reviewed our experience of performing VATS on the same pleural space in 9 patients who had previously undergone standard thoracotomy.

Methods : We reviewed patients who had undergone VATS on chests previously operated on in our hospital from November 2009 through December 2013.

Results : A total of 693 patients underwent pulmonary resections with VATS. Of these patients, 9 patients underwent 10 ipsilateral thoracoscopic operations on chests previously operated on with standard thoracotomy. Pulmonary adhesions to the chest wall were noted in all patients. Adhesiolysis through VATS was safely performed in all patients. The VATS was converted to thoracotomy in only 1 case.

Discussion : Although our cases were too few for definitive conclusions to be drawn, our experiences show that previous ipsilateral chest surgery, even standard thoracotomy, is not a contraindication for subsequent VATS. The surgeon's experience and the nature of the surgical procedure are important factors in deciding whether VATS should be performed on chests previously operated on. Such procedure requires a great deal of experience with VATS and should be performed only in selected institutions. (Jikeikai Med J 2014 ; 61 : 17-20)

Key words : thoracoscopic surgery, reoperation, adhesiolysis

INTRODUCTION

Video-assisted thoracoscopic surgery (VATS) represents a less-invasive approach to the surgical management of a wide variety of diseases[1]. The use of VATS for the treatment of pulmonary and mediastinal diseases has increased in many institutions. However, the use of VATS for patients who have previously undergone surgery in the ipsilateral thoracic cavity is a concern. Separation of dense pleural symphyses is difficult and can lead to bleeding and lung damage. As a result, many surgeons avoid performing VATS in such patients. There have been few reports of ispilateral thoracoscopic surgery after standard thoracotomy. We reviewed our experiences of performing VATS in the ipsilateral pleural space in 9 patients who had previously undergone standard thoracotomy.

MATERIAL and METHODS

We reviewed patients who underwent ipsilateral VATS after a previous thoractomy in our hospital from November 2009 through December 2013. All patients underwent a

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standardized preoperative workup, including pulmonary function testing, blood gas analysis, chest radiography, and high-resolution computed tomography (CT). All surgical procedures were performed with VATS under general anesthesia and one-lung ventilation with the patient in the full lateral decubitus position. The first port was inserted on the basis of the chest CT findings. The intercostal space used for the previous thoracotomy was deliberately avoided because adhesions were likely present underneath. A 30-degree ridged 10-mm thoracoscope was used for all operations. In the presence of adhesions, a pleural space was created by gentle blunt-finger dissection before the port and the thoracoscope were inserted. The other 3 or 4 ports were similarly created under direct thoracoscopic vision.

RESULTS

During the study period, 693 patients underwent pulmonary resection with VATS. Ten thoracoscopic operations (9 patients, Table 1) were performed on chests previously operated on. All patients had previously undergone standard ispilateral thoracotomy. The previous operations were for esophageal cancer in 5 patients, for pulmonary metastasis in 2 patients, and for tuberculosis and pneumothorax in 1 patient each. The VATS procedures consisted of 4 pulmonary lobectomies and 5 pulmonary wedge resections. Previous thoracotomy procedures and VATS procedures were tabulated (Table 1).

Pulmonary adhesions to the chest wall were noted in all patients and ranged from minimal adhesions through fibrinous adhesions to strong, dense fibrous adhesions. Adhesiolysis through VATS was safely performed in all patients. The mean volume of intraoperative blood loss in all patients was 248 ± 148 ml. In only 1 patient was VATS converted to thoracotomy ; the patient had undergone right standard thoracotomy and esophagectomy for esophageal cancer 3 years earlier. A pulmonary nodule was found in the right lower lobe 15 months later. The second surgery was a wedge resection of the right lower lobe performed

Table 1. Patient characteristics and operative procedures

Patient	Age (yr)	Sex	Previous indication	Previous operation (thoracotomy)	Interval between operations (mo)	Second or subsequent indication	Second or subsequent operation	Duration of thoracic drainage (days)	Intraoperative blood loss (ml)
1	75	M	Esophageal cancer	Esophagectomy	123	Pulmonary metastasis (esophageal cancer)	Pulmonary lower lobectomy	8	190
2	65	M	Esophageal cancer	Esophagectomy	2	Organizing pneumonia	Pulmonary wedge resection	4	220
3	51	M	Esophageal cancer	Esophagectomy	42	Lung cancer	Pulmonary upper lobectomy	7	250
4	64	M	Tuberculoma	Pulmonary wedge resection	78	Lung cancer	Pulmonary lower lobectomy	9	200
5	70	M	Esophageal cancer	Esophagectomy	16	Pulmonary metastasis (esophageal cancer)	Pulmonary wedge resection	5	400
6	72	M	Pulmonary metastasis (esophageal cancer)	Pulmonary wedge resection	21	Pulmonary metastasis (esophageal cancer)	Pulmonary wedge resection *	6	270
7	80	M	Pulmonary metastasis (rectal cancer)	Pulmonary wedge resection	36	Pulmonary metastasis (rectal cancer)	Pulmonary upper lobectomy	7	600
8	62	M	Pulmonary metastasis (rectal cancer)	Pulmonary lobectomy	23	Pulmonary metastasis (rectal cancer)	Completion puneumonectomy	1	150
9	40	F	Lung cancer	Pulmonary lobectomy	52	Lung cancer	Pulmonary wedge resection	5	200
10	36	M	Pneumothorax	Pulmonary wedge resection	228	Pneumothorax	Pulmonary wedge resection	2	0

*, second operation (VATS)

through VATS. Furthermore, 2 years later a CT scan of the chest showed a growing nodule in the right lower lobe. A third wedge resection of the right lower lobe through VATS was attempted. After this pulmonary wedge resection, massive air leakage occurred from a lung injury at the pleural symphysis. The procedure was converted from VATS to thoracotomy to repair the damaged lung and pleura. After surgery, air continued to leak through the chest tube. Endobronchial Watanabe spigots, which are used for bronchial embolization, were placed in the segmental bronchus of the right upper lobe. The chest tube was removed on postoperative day 6. This case was the only one with postoperative complications. The amount of intraoperative bleeding was slightly greater than usual, but no patients required blood transfusion. The mean duration of chest tube use was 5.5 days.

Discussion

Pleural adhesions after standard thoracotomy are generally believed to be more dense. Many surgeons believe that previous lung surgery is a contraindication for VATS because the separation of dense pleural symphyses is difficult and can lead to bleeding and lung damage[2]. For this reason, most surgeons avoid performing a second procedure with VATS in the same lung[3]. Although some pleural adhesions were present in all patients of our study, only 1 of the 10 VATS procedure could not be completed as planned. No complications were observed after VATS procedures, except for the case in which VATS was converted to thoracotomy. Although our cases were too few for definitive conclusions to be drawn, our experiences show that previous ipsilateral chest surgery, even a standard thoracotomy procedure, is not a contraindication to VATS. The experience of the surgeon and the nature of the surgical procedure are important factors in deciding whether VATS should be performed in a chest previously operated on. Such procedures require a great deal of experience with VATS and should be performed only in selected institutions.

Yim et al. have reported on 23 patients who had previously undergone open procedures and subsequently underwent ipsilateral VATS procedures for various chest diseases[1]. Pleural adhesions were observed in all cases. In 2 patients, the procedures were converted to thoracotomy because of pleural adhesions. In all other patients, VATS was successfully completed. Akiba et al. have reported on 10 patients who underwent a second VATS procedure for recurrent primary spontaneous pneumothorax after a first VATS procedure[4]. Ohno et al. have reported 8 VATS procedures and 14 thoracotomies for primary spontaneous pneumothorax in patients previously operated on[5].

Adhesiolysis of the chest wall with VATS is safer than with thoracotomy[4]. Thoracoscopic exploration of a chest previously operated on is generally safe if great care is paid to the details of adhesiolysis to avoid bleeding and damage to the lung[3]. Once a clear space is created to connect the thoracoscope and instruments ports, adhesiolysis can proceed in the usual manner. With VATS, adhesions can be clearly visualized in a chest previously operated on and can be separated directly, making the procedure minimally invasive[4]. VATS is less invasive than standard thoracotomy and, therefore, is suggested to be associated with less postoperative pain, shorter hospitalization, and a quicker return to preoperative activities[6].

In 1 patient of the present study, a second VATS procedure, which was the third procedure in this patient, was converted to thoracotomy because of massive air leakage from a lung injury at the pleural symphysis. The pleural adhesions of this patient were extensive and dense. The dense adhesions encountered at the third operation are believed to have been caused by fibrin sealant and a synthetic absorbable polyglycolic acid sheet used to cover the staple lines at the previous VATS procedure for metastasectomy. This case was exceptional in that 2 previous operations had been performed, unlike other cases in this study in which 1 previous operation had been performed.

Conclusion

In conclusion, Although our cases were too few for definitive conclusions to be drawn, our experiences show that previously ipsilateral chest surgery, even standard thoracotomy, is not a contraindication for subsequent VATS. The surgeon's experience and the nature of the surgical procedure are important factors in deciding whether VATS should be performed on chests previously operated on. Such procedure requires a great deal of experience with VATS and should be performed only in selected institutions.

Authors have no conflict of interest.

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