



Return to work after surgical treatment for malignant pleural mesothelioma: report of a case

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Received: 30 September 2018 / Accepted: 5 January 2019 / Published online: 12 January 2019
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Abstract

We report the case of a 56-year-old woman who underwent pleural biopsy to identify the cause of the right pleural effusion. The pathological diagnosis was epithelial malignant pleural mesothelioma. The patient worked as a junior high school teacher and strongly hoped for continuing work. Thus, we performed pleurectomy/decortication (P/D) as a curative surgery. The operative findings showed pleural thickening that in the lower lobe of the lung. Thus, peeling of the lower lobe was performed. Pleural biopsy was only performed on the upper and middle lobes. As a result, the operation was limited P/D. The pathological findings showed a small number of mesothelioma cells in the upper and middle lobes. The patient received four courses of cisplatin plus pemetrexed systemic chemotherapy after surgery. Continuous maintenance chemotherapy using pemetrexed has been performed until the time of writing. At present, she has continued her work for 6 years after the operation and has extended her retirement age without recurrence.

Keywords Malignant pleural mesothelioma · Pleurectomy/decortication · Incomplete resection · Maintenance chemotherapy · Long-term survival

Abbreviations

MPM	Malignant pleural mesothelioma
EPP	Extrapleural pneumonectomy
P/D	Pleurectomy/decortication
CT	Computed tomography
IASLC	International association for the study of lung cancer

Introduction

Malignant pleural mesothelioma (MPM) is generally associated with a poor prognosis; long-term disease-free survival is rare, even in the early-stage setting [1]. There have been a number of discussions on the techniques of curative surgery for MPM. In view of the fact that the postoperative results

of extrapleural pneumonectomy (EPP) are never satisfactory and the preservation of the pulmonary function, the number of institutions selecting pleurectomy/decortication (P/D) as a curative surgery for MPM has increased in recent years. In surgery for MPM, neither EPP nor P/D can secure a sufficient margin; thus, it is considered R1 surgery [2]. We herein report a case in which long-term survival was achieved by a patient with early-stage MPM. The patient underwent P/D for macroscopic complete resection; however, a microscopic tumor remnant was observed.

Case

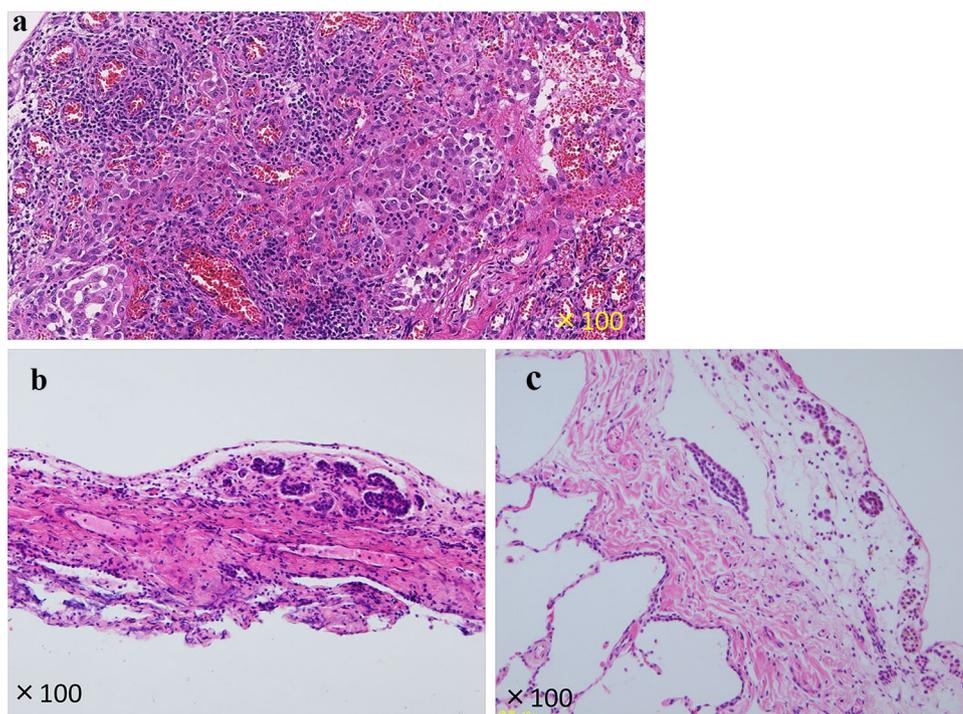
The patient was a 56-year-old woman without asbestos exposure who complained of right chest pain. She worked as a junior high school teacher. She underwent pleural biopsy using video-assisted thoracic surgery (VATS) to identify the cause of the right pleural effusion. The pathological diagnosis was epithelial malignant pleural mesothelioma (Fig. 1a). Chest computed tomography (CT) showed a pleural thickening in the lower lobe of the lung. No lymph node metastasis or distant metastasis was observed on the image. The stage of MPM, which was performed according

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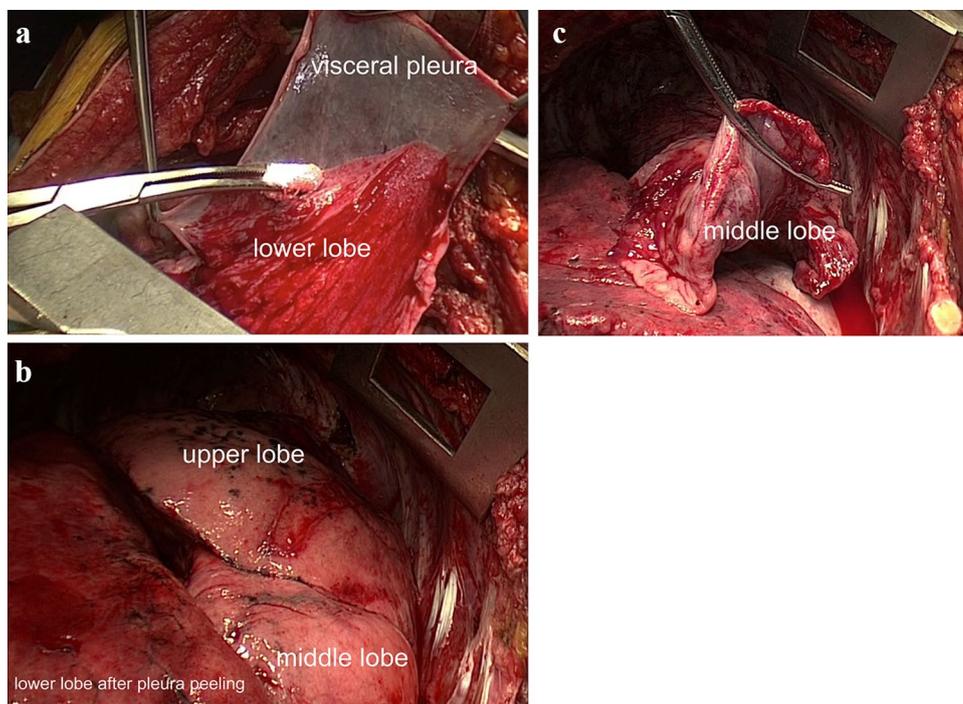
Fig. 1 Pathological findings. **a** On the background of haemorrhage and thickened collagen fibers, atypical mesothelial cells proliferated in trabecular, nest-like, papillary and invaded. It was a finding suggestive of epithelial malignant pleural mesothelioma. **b** Mesothelioma cells with mild atypical formed small aggregates in the background of fibrosis and mild inflammation and proliferated in a tubular structure. **c** Visceral pleura of the upper and middle lobes also showed a small number of mesothelioma cells



to the International Association for the Study of Lung Cancer (IASLC) 8th edition TNM classification of malignant tumors, was cT1N0M0 stage I. We recommended surgical treatment as the first choice for early MPM. We offered EPP or P/D as surgical treatment. The patient strongly hoped for the preservation of her pulmonary function, as she wished to continue her work. Returning to work was her first priority.

Thus, we performed P/D as a curative surgical technique after open thoracotomy. The surgical findings revealed a very thin, like a normal pleura (Fig. 2a), with thickening localized in the lower lobe of the lung. The pleura of the upper and middle lobes were macroscopically normal (Fig. 2b). Thus, peeling was performed on the lower lobe. Pleural biopsy specimens were only obtained from the upper

Fig. 2 Operative findings. **a** Visceral pleura of the lower lobe was very thin, like a normal pleura. **b** Peeling of the visceral pleura of the lower lobe was possible; however, the pleura of the upper middle lobe was normal. **c** Peeling of the visceral pleura of the upper middle lobe was impossible and only biopsy was performed



and middle lobes (Fig. 2c). As a result, peeling of the visceral pleura of the lower lobe was possible; however, the examination of the upper middle lobe pleura revealed normal findings (Fig. 2b). Thus, peeling of the visceral pleura was impossible and only biopsy was performed (Fig. 2c). As a result, it was a limited P/D operation. The operation time was 8 h and 22 min, and the amount of bleeding was 1320 cc. The postoperative course was uneventful.

A pathological examination revealed epithelial-type malignant pleural mesothelioma (Fig. 1b). However, the visceral pleura of the upper and middle lobes also showed a small number of mesothelioma cells (Fig. 1c), suggesting the presence of a microscopic tumor remnant. The patient received 4 courses of cisplatin (75 mg/m²) and pemetrexed (500 mg/m²) on day 1 every 3 weeks. Since then, maintenance chemotherapy using pemetrexed has been continuously carried out, and is currently ongoing. The patient has continued her work for 6 years after the operation and extended her retirement age without recurrence.

Discussion

MPM is a malignant tumor with a very poor prognosis; its treatment, including the necessity of surgery, has been discussed [3]. The IASLC's data showed that MPM patients who underwent surgery with curative intent had better survival in comparison with patients who received palliative surgery [4]. However, there is no evidence yet as to whether EPP or P/D should be selected [5, 6]. Considering the preservation of the pulmonary function, postoperative quality of life (QOL), and postoperative short-term recurrence, many institutions choose to perform P/D if possible. In the present case, the limited P/D achieved macroscopic complete resection in a patient with early MPM; however, a microscopic tumor remnant was confirmed. From the point that the patient did not want to receive EPP, the visceral pleura of the upper and middle lobes were macroscopically normal, and could not be peeled off, we did biopsy of the upper middle lobe only. In addition, if we added upper and middle lobectomy for complete microscopic resection, we could not control the air leakage in the lower lobe. As the patient has been recurrence-free for more than 5 years after surgery, macroscopic resection followed by combination treatment with di- or tri-modality is important for achieving a good result in MPM. Rather than sticking to complete microscopic resection, it is important for to achieve macroscopic resection of the tumor, and surgery should be promptly followed by multimodal treatment. Recently, the application of P/D in the treatment of MPM, which does not destroy the thoracic cavity, but resects it *en bloc* [7] has also been reported, and surgery is expected to play a role in the treatment of MPM.

Multiple reports have suggested the effectiveness of maintenance chemotherapy with pemetrexed in the treatment MPM [8, 9]. Pemetrexed might have been effective in the present case. In consideration of the side effects, pemetrexed was administered for 1 month. The effects of maintenance chemotherapy using pemetrexed should be prospectively investigated in the future. Furthermore, recently, Nivolumab has been approved for MPM and its effect is expected in progressive/recurrent cases. Combination therapy of Nivolumab and Pemetrexed is also in progress as a clinical trial, and further improvement of MPM prognosis is expected [10].

Conclusion

This treatment resulted in a good outcome. This is a rare report of an MPM patient who could return to work for 6 years after surgery without recurrence. It might be important to consider the return to work, which not only maintains the income of the patient but also has the socioeconomic benefit of saving manpower.

Acknowledgements We thank Dr. Atsuji Matsuyama for helpful assistance in pathological diagnosis.

Funding None.

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