



# Extended pleurectomy decortication for thymoma with pleural dissemination

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## Abstract

Complete resection is the mainstay of treatment for thymoma. Even for advanced-stage thymoma with pleural dissemination, complete resection with extrapleural pneumonectomy may provide a favorable prognosis. Pleurectomy decortication, a lung-sparing surgery, has been preferably employed in recent years as an alternative surgical procedure for malignant pleural mesothelioma. However, little has been reported about pleurectomy decortication for other malignant tumors with pleural dissemination. Here, we present the first case of thymoma with pleural dissemination for which complete *en bloc* resection was achieved with extended pleurectomy decortication.

**Keywords** Thymoma · Pleural dissemination · Pleurectomy decortication

## Introduction

Surgery is the most effective treatment of choice for the early stage thymoma. Even for advanced-stage thymoma with pleural dissemination (Masaoka-Koga stage IVa), complete resection with extrapleural pneumonectomy (EPP) may provide a favorable prognosis [1]. Pleurectomy decortication (P/D) is a lung-sparing surgery to remove entire pleura, which has been preferably employed in the recent years as an alternative of EPP to achieve complete resection for malignant pleural mesothelioma (MPM) owing to lower morbidity and mortality [2]. Here, we present the first case of thymoma with pleural dissemination which was completely resected with extended P/D.

## Case report

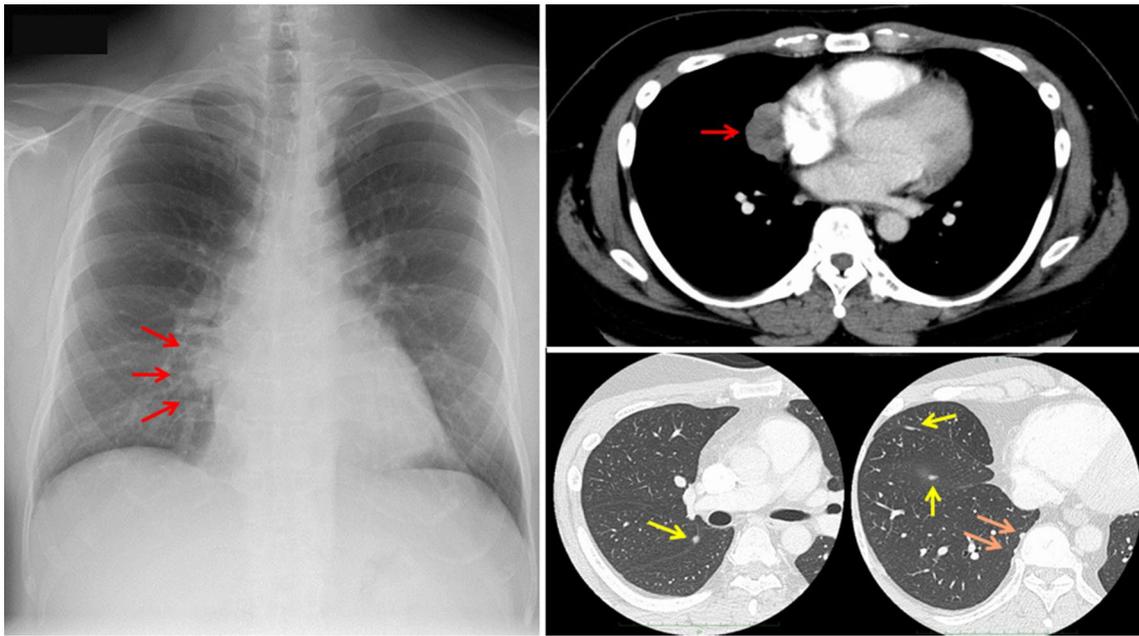
A 30-year-old Japanese male was referred for further examination and treatment of a right middle mediastinal mass with multiple nodules in the ipsilateral pleural cavity indicating disseminated tumors (Fig. 1). Thoracoscopic biopsy was

performed (Fig. 2), and the pathological diagnosis of type B1 thymoma with pleural dissemination was confirmed. Whole-body CT revealed no nodal metastasis or distant metastasis, and surgery to remove all tumors with P/D was planned. Pre-operative pulmonary function test indicated a mild restrictive pulmonary dysfunction [forced vital capacity (FVC) and predicted FVC, 3.27L and 71%; expiratory volume in 1 s (FEV1) and FEV1/FVC, 2.76L and 84%]. The ethical committee of the Hospital of the University of Occupational and Environmental Health, Japan approved the surgical procedure (No. 2018-14).

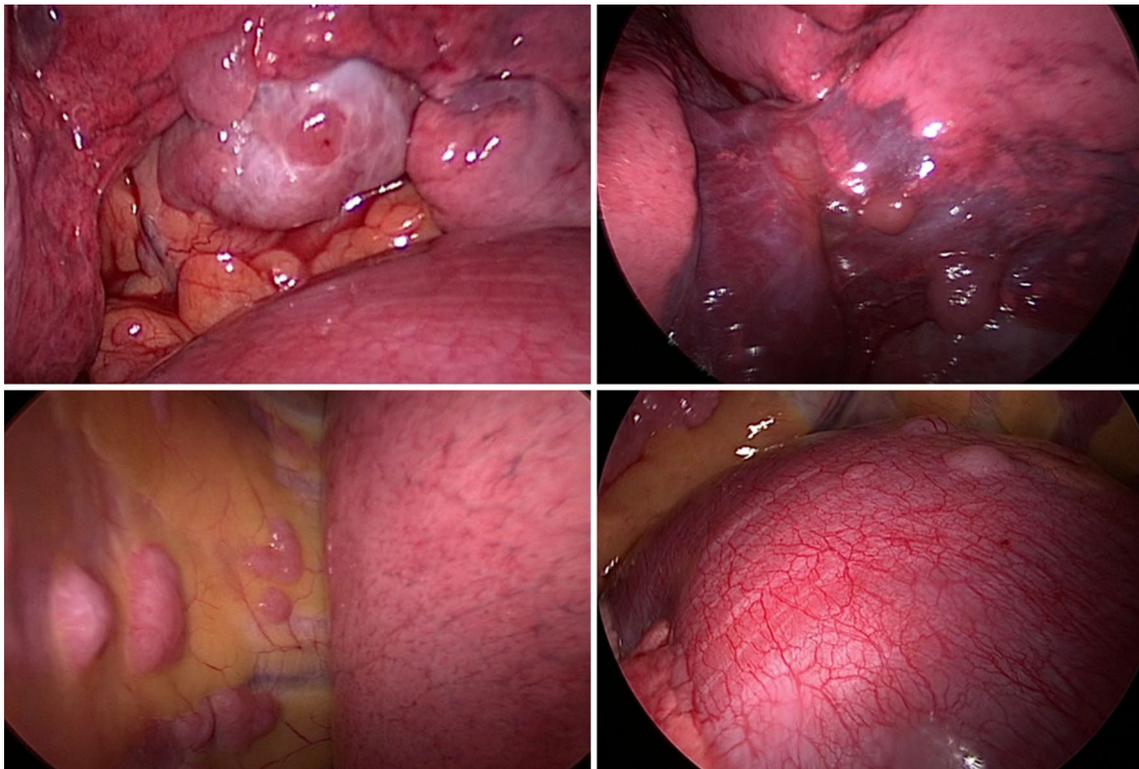
A right posterolateral thoracotomy was performed, and extrapleural dissection of the parietal pleura was done. The primary tumor with involved part of the pericardium, phrenic nerve, and diaphragm was dissected. Visceral pleural dissection was performed in a non-incisional manner as described previously [3]. Briefly, the pleural reflection at the hilum was first grasped, and the lung parenchyma was denuded by blunt traction dissection using fingers covered with dry gauze. After the dissection plane between the visceral pleura and the underlying lung parenchyma was created with elevating the edge of the pleural reflection, lung decortication was performed by pushing out the lung parenchyma with the aid of traction using gauze-covered fingers. The involved parts of lung parenchyma were dissected with stapling, and *en bloc* complete resection of the entire pleura and involved organs (diaphragm, pericardium, lung parenchyma, and phrenic nerve) along with the thymus involving

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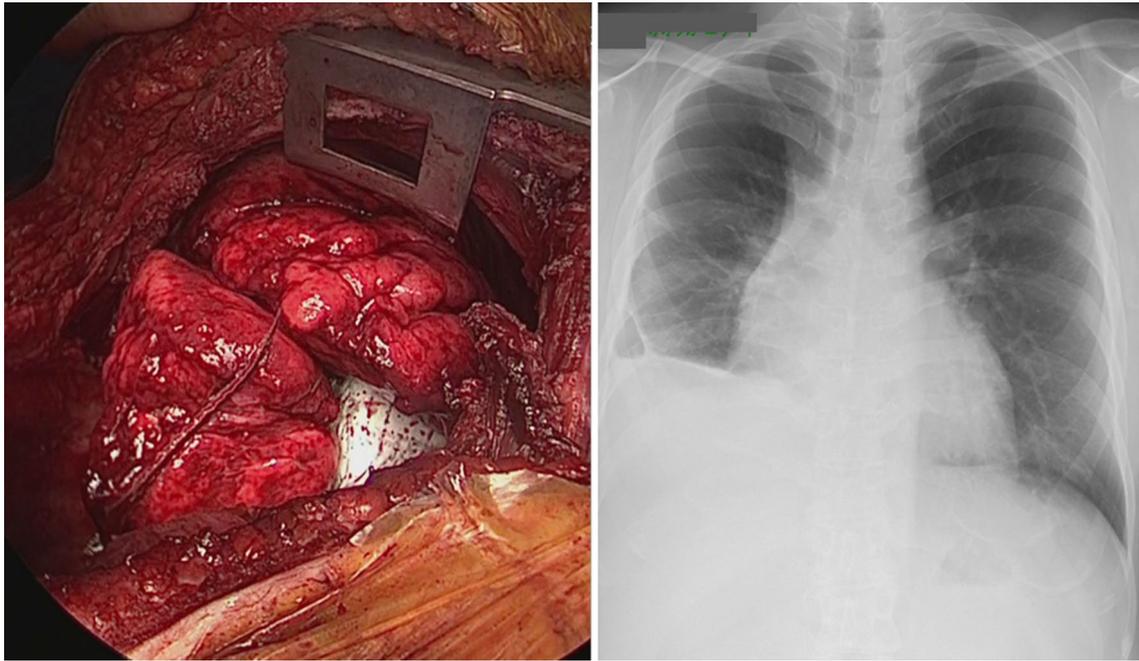
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**Fig. 1** Chest roentgenogram showed a mass on the right heart border (left). Computed tomography showed a lobulated solid tumor in the right middle mediastinum (right upper), and also revealed multiple nodules on the right parietal and inter-lobar and pleurae (right lower)



**Fig. 2** Intraoperative findings at thoracoscopic biopsy showing a mediastinal tumor (left upper) with disseminated pleural tumors on the lung (right upper), chest wall (left lower), and diaphragm (right lower)



**Fig. 3** Operative image after completion of extended pleurectomy decortication (left) and postoperative chest roentgenogram (right)

thymoma was achieved. The decorticated ipsilateral lung was fully expanded (Fig. 3). Pathological sections revealed tumor invasion to some parts of the lung parenchyma and diaphragm.

The postoperative course was uneventful. The patient received no subsequent treatment after surgery, and is alive without tumor recurrence at 1 year after surgery.

## Discussion

Advanced-stage thymoma cases with pleural dissemination account for only 6.8% of all thymoma cases. The optimal treatment remains un-established partly due to its rarity, but surgery may be the mainstay of treatment [4, 5]. Among a variety of surgical procedures including local pleurectomy, either EPP or P/D is theoretically the way to achieve complete resection for pleural dissemination. EPP, the most aggressive procedure, can be indicated only selected cases, as is associated with high morbidity and mortality as well as low quality of life after surgery [1, 4]. P/D can be an alternative surgical procedure to achieve complete resection not only for MPM but also for other malignant tumors with pleural dissemination. However, little has been reported about P/D for thymoma with pleural dissemination. In a retrospective study conducted by the ESTS Thymic Working Group, 107 cases operated for primary thymic tumors with pleural dissemination were reviewed. Surgical procedures were EPP in 32 cases, total pleurectomy (TP) in 13 cases, and local

pleurectomy in 32 cases. Only one case of P/D was included in TP cases, but no further information such as histologic type (thymoma or not), extent of resection (extended P/D or not), and curability of operation (complete resection or not) was indicated [5]. Accordingly, here is the first confirmed case of thymoma with pleural dissemination for which complete resection was achieved with extended P/D.

For advanced-stage thymoma cases, multimodality treatment is usually performed [1, 4, 5]. However, no induction or adjuvant treatment was performed in the present case, not only because the efficacy of multimodality treatment has not been established, but also because complete *en bloc* resection was achieved. No tumor recurrence was documented at 1 year after surgery, but a longer postoperative follow-up is no doubt required to evaluate the survival benefit of extended P/D.

## Conclusion

Extended P/D may be one of the alternatives in the treatment of thymoma with pleural dissemination.

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## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interests.

## References

1. Wright CD. Extended resections for thymic malignancies. *J Thorac Oncol.* 2010;5:344–7.
2. Rice D, Rusch V, Pass H, Asamura H, Nakano T, Edwards J, et al. Recommendations for uniform definitions of surgical techniques for malignant pleural mesothelioma. *J Thorac Oncol.* 2011;6:1304–12.
3. Tanaka F, Imanishi N, Takenaka M, Taira A. Non-incisional pleurectomy-decortication for malignant pleural mesothelioma. *Surg Today.* 2018;48:656–8.
4. Okuda K, Yano M, Yoshino I, Okumura M, Higashiyama M, Suzuki K, et al. Thymoma patients with pleural dissemination: nationwide retrospective study of 136 cases in Japan. *Ann Thorac Surg.* 2014;97:1743–9.
5. Moser B, Fadel E, Fabre D, Keshavjee S, de Perrot M, Thomas P, et al. Surgical therapy of thymic tumours with pleural involvement: an ESTS thymic working project. *Eur J Cardiothorac Surg.* 2017;52:346–55.