



Surgical options for treatment of metastatic pleural disease: extended abstract

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Introduction

Resection of a thymic epithelial tumor with pleural metastasis is encountered in two situations, one is during a surgery for a primary stage IV tumor and the other during resection of a recurrent tumor. Various surgical procedures are used, from a simple pleurectomy to combined resection, as well as more invasive types such as extrapleural pneumonectomy (EPP). This is a review of surgical treatment options in association with other treatment modalities for thymic epithelial tumors with pleural metastases.

Surgical treatment options and outcomes

In most advanced thymoma cases, surgical treatment is adopted as a part of a multimodality treatment strategy. At our institution, the most often employed surgical technique for a highly advanced thymoma with pleural metastasis is a two-staged approach composed of a median sternotomy and posterior thoracotomy. An extended thymectomy through a median sternotomy is performed to remove the primary tumor along with as many pleural metastases as possible. The next step is a posterolateral thoracotomy with a resection of pleural metastases in the posterior thorax.

When the primary tumor shows extensive invasion of the pulmonary hilum and involves the pulmonary vessels, a pneumonectomy is required for complete resection. In such cases, an EPP procedure might be an option. Fabre *et al.* retrospectively reviewed their experiences with EPP performed for 17 thymoma patients and reported that 10-year survival was 30% (1). Wright *et al.* reported a similar outcome after an EPP (2). Those along with

the report presented by Ishikawa *et al.* (3) suggested indications for an EPP for highly selected cases as well as the importance of multimodal treatment, though also emphasized a high rate of postoperative morbidity and the significance of complete resection. In author's personal opinion, EPP could be chosen only in the conditions that require a pneumonectomy for complete resection of the primary tumor.

A Japanese group reported results of a pleurectomy decortication procedure for stage IVA thymoma cases (4). That procedure was developed as an alternative to EPP as a treatment for malignant pleural mesothelioma and has recently become more prevalent. Preservation of lung parenchyma is thought to result in better quality of life for the patient and provide more opportunities for chemotherapy and radiotherapy. Reports of long-term outcomes of this novel strategy are necessary.

Several groups of surgeons have treated pleural metastases of thymoma with surgical resection in a combination with an intraoperative hyperthermic chemotherapy. Aprile *et al.* reported 27 cases, and indicated significant improvement in the local disease-free survival as compared to surgical treatment alone (5). Findings of a meta-analysis suggested the possibility of longer overall survival by use of debulking surgery as compared with a surgical biopsy (6), a notion that has been generally accepted by many clinicians because of the slow growing nature of a thymoma. Furthermore, by reducing the target lesion, other treatment options might become more effective.

A Japan Lung Cancer Society committee formed to establish guidelines for the treatment of thymic epithelial tumors examined clinical questions regarding treatment for

a stage IVA tumor and concluded (7):

- (I) Multimodal treatment is strongly recommended.
- (II) Surgical treatment is weakly recommended.
- (III) Reduction surgery is weakly recommended.

A retrospective analysis of a database created by the Japanese Association for Research of the Thymus (JART) showed significantly better overall survival for patients with pleural metastases when macroscopic complete resection was achieved (8). In addition, overall survival was significantly higher when there were 10 or fewer pleural metastatic lesions. Presumably, the group with 11 or more included those with numerous metastases, for which complete resection cannot be achieved. Nevertheless, an important finding was that patients with incomplete resection still achieved an overall survival over 10 years in nearly 50% of cases, demonstrating the clinical significance of reduction surgery for thymoma with pleural metastases.

Characteristics of pleural metastases and indications for surgery

It is important to take into account the characteristics of pleural metastases before performing treatment for an affected case. The metastatic lesions vary in size, number, degree of invasion of thoracic structures, and pathology of the primary tumor. A case with a few small lesions has a good chance of cure by surgery alone, whereas a more advanced condition seems difficult to be treated only by surgery and it likely requires a multimodal strategy. When resecting the diaphragm, spreading of neoplastic cells into the peritoneal cavity should be avoided. It is recommended that the chosen treatment strategy should be determined based on the metastases characteristics. A common system to describe the size, number, location and grading of invasion of the pleural metastases is required for further investigation.

Surgical treatment for recurrence in pleura

The JART database includes details of 420 patients with tumor recurrence, of whom 162 underwent re-resection. In the surgical treatment group, 75% were thymoma cases, and more than half of the resected lesions were metastases to the pleura or pericardium. Complete resection of the thymoma resulted in a 10-year survival noted for 75% of cases (9). All types of metastases were included in that group and long-term survival was not limited only to pleural metastases cases, but a good outcome following resection of

pleural metastases is expected when a surgical operation is feasible.

Conclusions

The effectiveness of surgical treatment alone for thymoma pleural metastases is limited to highly selected cases, for example, those with a small number of lesions. Surgery should be generally considered as one of the most effective method and part of multimodal treatment. A variety of conditions are found in cases of thymic epithelial tumors with pleural metastases and use of a surgical procedure should be determined depending on the condition of the metastatic lesions.

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