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Salvage debulking surgery and hyperthermic intrathoracic chemotherapy for massive recurrent mesothelioma in the mediastinum

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Abstract

Mediastinal malignant pleural mesothelioma with signs of tamponade is rare. Indication for reoperation for recurrent malignant pleural mesothelioma is a controversial but viable option in selected patients. We report a case of a 68-year-old man presenting with epithelioid malignant pleural mesothelioma who underwent a total of three debulking surgeries (pleurectomy/decortication) combined with hyperthermic intrathoracic chemotherapy. Five years after the first procedure, a third urgent operation was performed for recurrence of a large mediastinal mesothelioma causing acute symptoms of pericardial constriction and tamponade. The patient was alive for eight years since the first treatment and 36 months after the second reoperation.

Keywords: Mesothelioma • Debulking surgery • Hyperthermic intrathoracic chemotherapy • Pleurectomy • Decortication

CASE REPORT

A 68-year-old Caucasian man, ex-smoker, with history of ischaemic heart disease, was diagnosed with left epithelioid malignant pleural mesothelioma (MPM) in March 2013. He underwent four cycles of platinum-based chemotherapy followed by restaging and then surgery under the form of minimally invasive pleurectomy/decortication combined with hyperthermic intrathoracic chemotherapy (HITHOC). Postoperative radiotherapy was also administered. At a follow-up computed tomography (CT) scan in 2016, isolated diaphragmatic recurrence was found and surgery in combination with HITHOC was performed. In September 2018, he presented to the emergency department with hypotension and signs of cardiac tamponade. The CT scan, as shown in Fig. 1, demonstrated a large 25-cm mass in the anterior mediastinum compressing and displacing the heart posteriorly. Positron emission tomography CT scan was performed and an increased uptake was demonstrated in the mediastinum and left chest. Ultrasound-guided biopsy confirmed the presence of epithelioid mesothelial malignancy. After multidisciplinary discussion, the patient underwent antero-lateral left thoracotomy, debulking surgery (Fig. 1b) and HITHOC. HITHOC was performed with a

temperature of 42.5°C and intrapleural cisplatin perfusion at the dose of 120 mg/m² for 60 minutes. Following three days of care in the intensive care unit, the patient was discharged on day 12 postoperatively with a Heimlich valve for persistent air leak. The valve was removed two weeks later. The patient underwent further adjuvant chemo-radiotherapy and survived for eight years since the first operation and 36 months since the second reoperation before he passed away.

DISCUSSION

Reoperation for recurrent MPM is rarely reported as only a small proportion of patients are candidates for a second surgery due to metastatic spread or poor performance status [1–3]. MPM presenting with signs of pericardial constriction or tamponade is distinctly uncommon in the medical literature [4]. Okamoto *et al.* [5] described two patients who underwent second surgery for recurrence in the posterior mediastinum after extrapleural pneumonectomy, and patients were alive at 44.6 and 22.1 months, respectively. Due to the aggressive nature and unfavourable long-term survival of MPM, we only opted to perform debulking

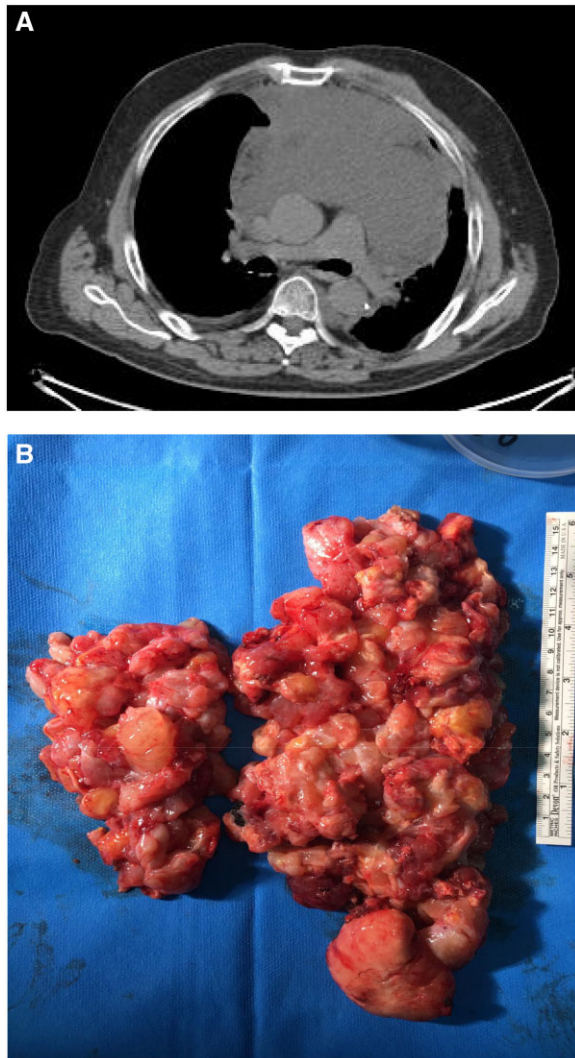


Figure 1: (A) Axial computed tomography scan showing a large mass invading the mediastinum causing cardiac tamponade. The mass was mediastinal recurrence of previously resected left malignant pleural mesothelioma. (B) Macroscopic view of the specimen removed. Histopathology analysis revealed cellular morphologies consistent with epithelioid mesothelioma subtype.

surgery and HITHOC for the patient owing to his critical clinical presentation and the absence of distant metastasis, otherwise a more conservative approach may be preferable.

Positron emission tomography CT scan at that time demonstrated that the disease was confined to the chest with no distant metastases. Usually the margins of tumour can be difficult to distinguish and complete removal and debulking of tumour in the mediastinum can be technically challenging due to the involvement of surrounding anatomical vascular structures. Henceforth, the benefits and risks of such undertaking should be clearly explained to the patient and family members prior to surgery. Due to tumour involvement in the mediastinum and left hilar cavity, we commenced the procedure with antero-lateral thoracotomy first to allow for extension to hemi-clamshell incision if required. With digital palpation and manipulation, it was possible

to free and dissect the tumour from the posterior wall of the sternum. As we gained good control of the pericardium and left hilum, we felt that the mediastinal debulking surgery can be performed without sternotomy to reduce postoperative morbidity risks.

We meticulously removed approximately 80–90% of the mass safely (Fig. 1b), which allowed the heart to beat without constriction, prolonging the survival of the patient.

To the best of our knowledge, this is the first case report which described a patient who presented with recurrence of malignant mesothelioma involving the mediastinum in later stages. He underwent three successful debulking surgeries and HITHOC. We have demonstrated that reoperation for debulking surgery and HITHOC for recurrent massive mediastinal MPM is occasionally feasible in selected patients with encouraging outcomes. This may be considered as an option for symptomatic patients who are critically unwell and has no features of distant metastasis. Moreover, this case observation could be seen as the foundation for future case series.

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