

# Chondrosarcoma of the Rib Mimicking Malignant Pleural Mesothelioma

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## Key Words

Chondrosarcoma · Malignant pleural mesothelioma · Rib tumor · Chest wall tumor · Chest wall reconstruction

## Abstract

A 62-year-old man with a history of long-term asbestos exposure was found to have a chest wall tumor invading the sixth rib on chest computed tomography. The computed tomography also revealed multiple plaques in the pleura. Malignant pleural mesothelioma was suspected, and thoracoscopic surgery was performed. Thoracoscopy revealed that the tumor location was extrapleural. Thus, excisional biopsy was performed. The tumor was histologically diagnosed as chondrosarcoma. Additional wide resection of the chest wall, including the fifth, sixth, and seventh ribs, was performed. Chest wall reconstruction was performed with a polypropylene mesh.

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## Introduction

Primary chest wall chondrosarcoma is a relatively rare malignant tumor [1–3]. When a patient with a history of long-term asbestos exposure has a pleural tumor with multiple plaques on chest computed tomography (CT), malignant pleural mesothelioma is usually suspected. We report a case of chondrosarcoma of the rib mimicking malignant pleural mesothelioma.

## Case Report

A 62-year-old man with a history of long-term asbestos exposure as a construction worker was found to have a chest wall tumor on chest CT and referred to our hospital. He was asymptomatic, and the tumor was not palpable. Chest CT showed a pleural tumor invading the sixth rib and multiple pleural plaques (fig. 1). Malignant pleural mesothelioma was suspected, and thoracoscopic surgery was performed for definitive diagnosis. Intraoperative findings revealed that the tumor was extrapleural. Thus, thoracoscopic excisional biopsy was performed (fig. 2). The tumor was histologically diagnosed as chondrosarcoma. Additional wide resection of the chest wall was performed, that is, en bloc resection, including the fifth, sixth, and seventh ribs, with a 5-cm safety margin from the tumor along the sixth rib. The chest wall defect was 25 × 10 cm in size, and chest wall reconstruction was performed with a polypropylene mesh. The resected specimen was 25 × 10 × 5 cm in size (fig. 3a). Microscopic examination revealed a lobulated growth pattern of cartilaginous cells of histological grade 1 (fig. 3b). Although the margins are free of tumor cells, the tumor widely spread into the sixth rib, to 17 cm long. The patient had a good postoperative course without any complications.

## Discussion

Chest wall chondrosarcoma is relatively rare [1–3]. To the best of our knowledge, this is the first reported case of chondrosarcoma of the rib mimicking malignant pleural mesothelioma. Two cases of extraskeletal mesenchymal chondrosarcoma mimicking malignant pleural mesothelioma have been reported [4, 5]. Goetz et al. [4] reported a case of myxoid chondrosarcoma with a history of asbestos exposure. In our case, the patient had a history of long-term asbestos exposure and multiple pleural plaques on chest CT. Correct diagnosis of chondrosarcoma of the rib is usually difficult. Hence, our case was preoperatively misdiagnosed as malignant pleural mesothelioma. Fine-needle aspiration cytology (FNAC) is a diagnostic option. However, diagnosing chondrosarcoma with FNAC only is difficult [6]. Additionally, diagnosis of malignant pleural mesothelioma by using FNAC is insufficient because it cannot differentiate malignant pleural mesothelioma from adenocarcinoma. Therefore, surgical biopsy remains the standard criterion for definitive diagnosis [7].

Chondrosarcoma is relatively radio insensitive, and no effective chemotherapy has been established so far. Thus, complete surgical resection is the only curative option for chondrosarcoma [1, 2]. Widhe et al. [1] reported that local recurrence rate was highly dependent on surgical margins. Therefore, wide resection with adequate safety margin is recommended. In our case, the tumor appeared as small as 3 cm on chest CT, but the tumor cells widely spread into the sixth rib, to 17 cm long. Because it is difficult to diagnose the free margin of the rib in intraoperative frozen sections, preoperative planning for wide resection of the chest wall is important. Chest wall reconstruction is recommended when at least three ribs are resected or when the resected size of the chest wall defect is more than 10 cm in order to avoid pulmonary complications [8].

## Conclusion

We present a case of chondrosarcoma of the rib mimicking malignant pleural mesothelioma. Our case suggests that it is difficult to diagnose chondrosarcoma in preoperative imaging diagnosis, and wide resection is necessary for curative treatment.

### Statement of Ethics

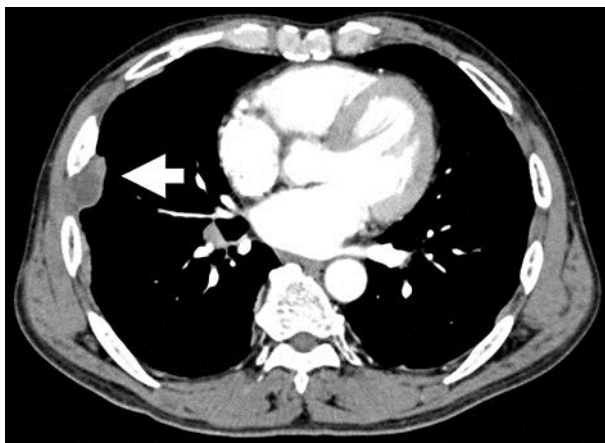
The authors have no ethical conflicts to disclose.

### Disclosure Statement

The authors have no conflicts of interest to declare.

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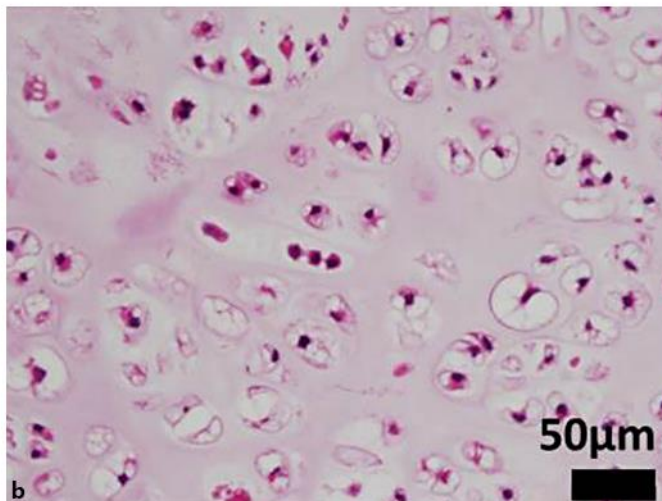
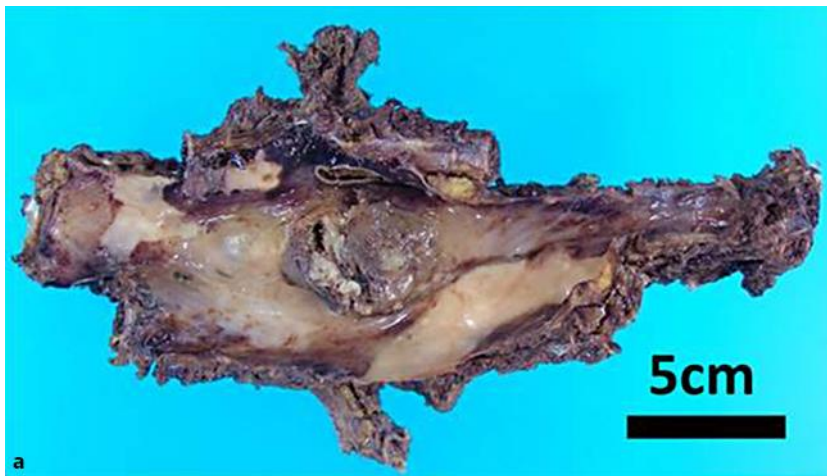
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**Fig. 1.** CT image of the chest revealing a mass arising from the right chest wall (arrow).



**Fig. 2.** Intraoperative findings showing multiple plaques and the extrapleural tumor.



**Fig. 3. a** The resected specimen, 25 × 10 × 5 cm in size. **b** Microscopic examination result showing a lobulated growth pattern of cartilaginous cells of histological grade 1.