

Thoracic wall reconstruction after chondrosarcoma resection. A case report

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Case Report

PLASTIC SURGERY

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Abstract: Sarcomas are a group of neoplasms derived from mesenchymal tissue and represent less than 1% of malignant tumors.

Initially they are asymptomatic. Pain and tumor growth can be manifestations of malignant transformation. Surgery is the primary surgical treatment.

We present the case of a 47-year-old patient with a low-grade sarcoma of the rib cage, treated with surgery and complementary radiotherapy. Currently 3 years after surgical treatment, the patient is disease free.

Primary tumors of the rib cage are classified according to the tissue from which they originate, whether they derive from soft tissues or skeletal lesions. Sarcomas of the rib cage account for 20% of all soft tissue sarcomas.

Sarcomas of the rib cage are rare tumors that present with a painless clinical behavior; clinical changes such as increased pain and tumor growth can be manifestations of malignant transformation.

Key words: Sarcoma, chondrosarcoma, thoracic wall reconstruction.

Introduction

Sarcomas are a group of neoplasms derived from mesenchymal tissue and represent less than 1% of malignant tumors. Sarcomas of the rib cage account for 20% of all soft tissue sarcomas (1). Chondrosarcoma is the most common malignant bone tumor of the chest wall, usually as a malignant degeneration of chondroma or osteochondroma.

Chondrosarcoma can be primary or secondary depending on its pre-existing origin. (2) Secondary chondrosarcoma is one that originates from a benign precursor. The risk of malignant transformation is less than 1%. (3)

They are more frequent in males. The symptoms are variable, initially it has a slow growth, tend to be asymptomatic and cause pain when they reach a variable size, clinical changes such as increased pain and tumor growth can be manifestations of malignant transformation. From the histopathological point of view, the majority of secondary chondrosarcomas are low-grade lesions. (2) Surgery is the primary treatment, an adequate surgical margin for high-grade tumors of 4 cm is accepted, for low-grade and intermediate tumors, a margin of 1 to 2 cm is sufficient. (4)

We present the case of a 47-year-old patient with a low-grade sarcoma of the rib cage, treated with surgery and complementary radiotherapy. Currently 3 years after surgery, the patient is disease free.

Case report

Forty seven-year-old female. Past medical history of hyperthyroidism in treatment with propranolol and Thiamazole. She refers to the appearance of a mass in the left thoracic wall at the submammary level 18 months prior to surgical treatment which gradually grew causing moderate to intense pain over the last 6 months with a predominance on palpation and physical activity with occasional mild dyspnea. Study protocol was carried out. Ultrasonography: Tracing in the left rib cage at the level of the 9th intercostal space and midclavicular line, showed a solid tumor with an irregular border measuring 7x4.x cm and extending into the intercostal space at its depth. Chest tomography reported a tumor of the costal arches with heterogeneous soft tissue attenuation coefficient affecting the anterior mediastinum and lymph nodes in the aforementioned topographies. PET CT scan reported hypermetabolism in a solid, heterogeneous tumor mass dependent on the anterior wall in the left hemithorax with intrathoracic protrusion through the 5th intercostal space, contacting part of the pericardium and anterosuperior part of the diaphragm. Intraoperative tumor of approximately 7x4x4 cm that compromised 3 rib arches (6th, 7th, and 8th), a wide resection was performed, placement of PTFE Dual mesh in the site of loss of continuity of the thoracic wall, placement of a titanium bar for thoracic stability and latissimus dorsi flap placement for



Figure 1. Pathology specimen of resected chondrosarcoma.

coverage. Histopathological report: Chondrosarcoma, histological grade I, lesion-free margins. Radiotherapy (Treatment with linear accelerator with 3D conformal technique) 33 Fx and 66 Gy. The postsurgical evolution was uneventful. The patient was discharged home on the 5th day. Subsequently, he presented seroma as a complication, resolving adequately after medical treatment. Currently the patient presents with an uneventful recovery three years after the surgical procedure, with no evidence of oncological disease.

Discussion

Primary tumors of the rib cage are classified according to the tissue from which they originate, whether they derive from soft tissues or skeletal lesions. (5) Sarcomas of the rib cage account for 20% of all soft tissue sarcomas (1). Chest radiography is the primary imaging study to evaluate rib cage tumors, which helps us detect and locate the lesion as well as determine cortical invasion. Computed tomography is more sensitive to appreciate the lesions, in addition to helping us to characterize and define the extent of the tumor. (6). The treatment of sarcomas of the rib cage is multimodal, the primary treatment of choice continues to be surgical resection with negative margins; followed by adjuvant radiation therapy and chemotherapy in locally advanced or metastatic tumors. In a review by Salas et al. (7) carried out in 22 institutions over a period of 27 years, they found 372 patients with sarcomas of the trunk; of these, 283 (82.5%) were located in the thorax. The primary objectives of the review were the assessment of overall survival, metastasis-free survival, and local recurrence-free survival. The primary treatment was surgical resection with negative margins in 272 cases (79.3%). One hundred and forty eight (43.1%) of the patients received postoperative radiotherapy and only 7 cases (2%) required it preoperatively in order to

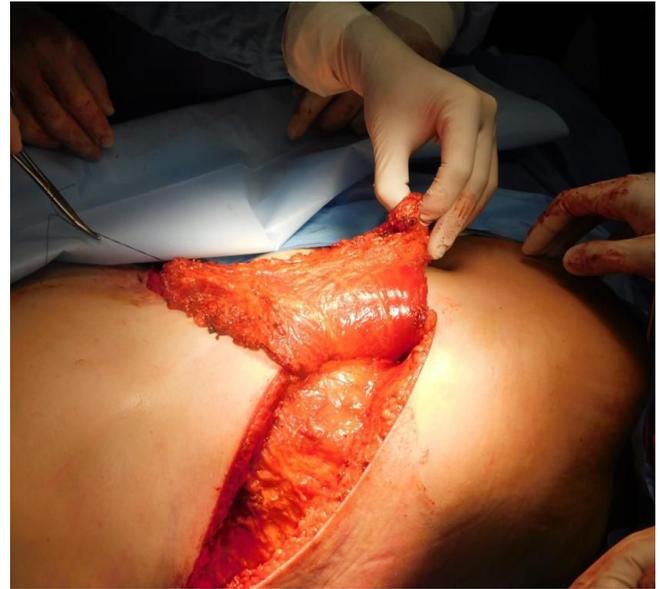


Figure 2. Intraoperative picture of pedicled latissimus dorsi flap.

reduce tumor volume. Twenty-three (6.7%) of the patients received neoadjuvant chemotherapy and 62 (18%) received it complementary to surgery; 17 patients (5%) received management with pre- and postoperative chemotherapy; palliative chemotherapy was used in 21 cases (6%). The local recurrence rate was 24.2% (83 patients) and the distant recurrence rate was 26.2% (90 patients). Global survival at 5 years was 60.4% and at 10 years, 53.7%. The 5-year local recurrence-free survival was 58.4% and 66.4% at 10 years. Finally, the 5-year metastasis-free survival was 68.9% and 66.4% at 10 years. The mortality associated with the tumor was 30.6%. Although Ochsner's experience (134 cases without mortality) should not be forgotten, which allows him to affirm that the chest wall supports large resections with little impact on ventilatory function, it seems beyond doubt that there are areas that have been defined as critical: Anterior wall of the chest, scapular and low intercostal areas in which the loss of substance is worse tolerated and therefore, it is necessary to be more demanding in parietal stability (8). Over time, numerous procedures have been devised with the purpose of correcting or reducing the effects of the absence of the rigid chest wall, especially when the size of the defect is important. If the defect is small and, therefore, the respiratory mechanics disorder is not important, enough periosteal flaps, ribs (9-12), myoplasties with pectoralis major and latissimus dorsi (14), but in the major defects, the case we represent is necessary to use some type of prosthesis. Every implanted prosthesis must have some requirements: 1) the prosthesis must not favor infection; 2) it needs to be physiochemically inert; 3) must not provoke a foreign body reaction; 4) should not cause slow wound healing (13).



Figure 3. Left thoracic wall post operative picture.

Conclusion

Sarcomas of the rib cage are rare tumors that present with a painless clinical behavior; clinical changes such as increased pain and tumor growth can be manifestations of malignant transformation. The diagnosis is based on imaging studies and histopathology studies, which the histological grade will give us the guideline to determine the size of the tumor resection. The primary treatment of choice is wide resection, which allows us local control and greater disease-free survival. There are several reconstruction options, in this case we perform chest wall reconstruction with Dual mesh PTFE mesh, titanium bar and latissimus dorsi flap.

Conflicts of interests

There was no conflict of interest during the study.

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