



Chondrosarcoma of the scapula secondary to radiodermatitis

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ABSTRACT

INTRODUCTION: The scapula is one of the most common locations for chondrosarcomas. They may have a primary or secondary origin, and they can be due to a degeneration of benign lesions or be secondary to radiotherapy. The surgical treatment presents good survival rates, if safety margins are preserved.

PRESENTATION OF CASE: We present the case of a chondrosarcoma of the scapula secondary to a radiodermatitis that required a modified total scapulectomy with a latissimus dorsi flap.

DISCUSSION AND CONCLUSION: Operations that respect or try to preserve the function of the upper limb must be taken into consideration in tumors of the pectoral girdle.

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1. Introduction

Chondrosarcoma is the second most common sarcoma of bone. It usually appears on the pelvis, the sternum, the ribs and the scapula. Its prognosis depends largely on the histological degree and the spreading of the tumor. Chondrosarcomas located on the scapula present better survival rates, because they are more superficial and there are no vital organs near it, which makes a surgical approach easier to take.¹

Chondrosarcoma of the scapula may have a primary or secondary origin, either due to irradiation or to the degeneration of a benign tumor of cartilaginous origin.^{2,3} The treatment is surgical resection with wide margins. Radiation and chemotherapy are not effective and can be used for palliation or for surgically inaccessible lesions.

When a complete surgical resection is possible, one of the main goals is to preserve an adequate function for basic activities in daily life. Different surgical approaches with their respective reconstructions have been developed in order to preserve the function of the limb and prevent its amputation.⁴

2. Presentation of case

A 77-year-old man with a personal history of excision of a dermal lesion on the area of the right scapula 20 years ago,

compatible with a low-grade fibrosarcoma. He had also received adjuvant radiotherapy for it.

The patient was transferred to our service because he presented a large tumor on the area of the right shoulder, over the grafts that had been previously applied.

In the exploration, the patient presented a large polypoid tumor of 4 cm × 3 cm, soft and adhered to deep layers of the skin, with an erythema on the surrounding skin and a radiodermatitis all over the right scapular area. The patient did not present alterations on the shoulder range of motion (Fig. 1).



Fig. 1. Tumor on the right shoulder.

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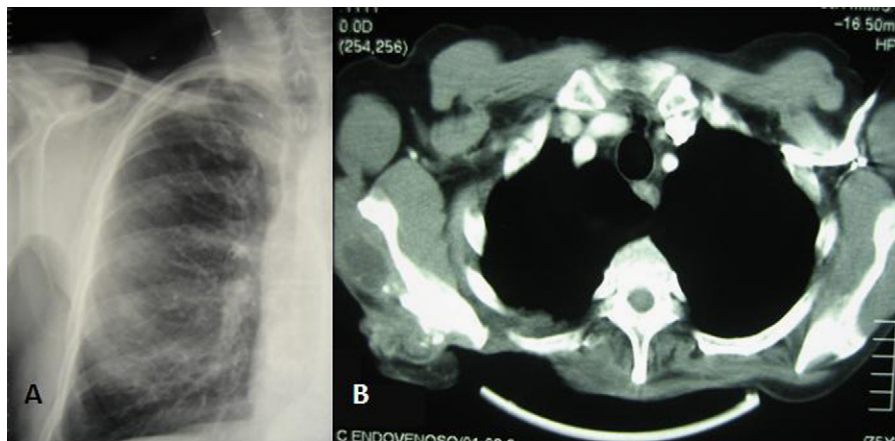


Fig. 2. (A) Simple X-ray of the right shoulder. (B) CT scan that shows a tumor of chondral origin connected to the scapula.



Fig. 3. Closing of the wound with a latissimus dorsi flap. The poor quality of the skin of the operated area can be seen.



Fig. 4. Operated element right scapula.

The imaging studies revealed irregularities on the posterior edge of the paravertebral muscles at the T12 level, with soft tissue density and an approximate size of 2 cm × 1 cm (Fig. 2).

The anatomopathological study pointed to a malignant tumor compatible with chondrosarcoma. The extension study was negative for distant metastasis.

The patient was operated and a total scapulectomy was performed. A small portion of the acromion was left intact, so that the deltoid muscle could be reinserted. The proximal end of the humerus and the clavicle were preserved, but the supraspinatus, infraspinatus and teres muscles were resected, with the subsequent loss of abduction and rotating capacity. The subscapularis muscle was removed so that adequate safety margins could be applied. The remaining muscles that are inserted into the scapula were sutured together and adhered to the ribcage. The costal wall did not present infiltration, and it did not need to be removed. During the closing of the wound, a latissimus dorsi flap graft was required due to the poor quality of the skin (Fig. 3).

The final anatomopathological result was a 9 cm × 8 cm × 7 cm grade II (out of III) chondrosarcoma, moderately differentiated, with negative surgical margins (Figs. 4 and 5). The patient did not develop local recurrence and remained continuously free of disease after 5 years of follow-up (Fig. 6). He preserves a shoulder abduction of 30°, obtained by the deltoid muscle. Full elbow flexion–extension and forearm supination, allow the patient to perform some basic activities of daily living such as eating or washing, although some other tasks like donning a shirt or combing one’s hair become hard to carry out.

3. Discussion

Chondrosarcoma is a malignant tumor of the connective tissue. It is characterized by the formation of a cartilaginous matter. It generally affects flat bones of the shoulder girdle and the pelvic girdle.

It can have a primary or secondary origin. Secondary chondrosarcomas represent 20% of all chondrosarcomas, and they appear due to degeneration of an earlier benign cartilaginous lesion or to irradiation of the bone, as in our case.^{2,3}

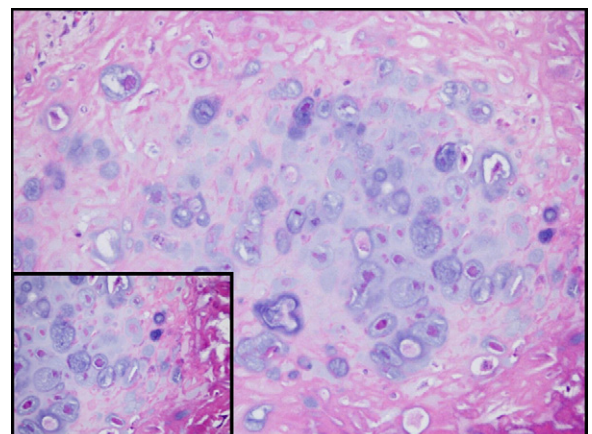


Fig. 5. Histological picture with hematoxylin–eosin staining (×20 and ×40).

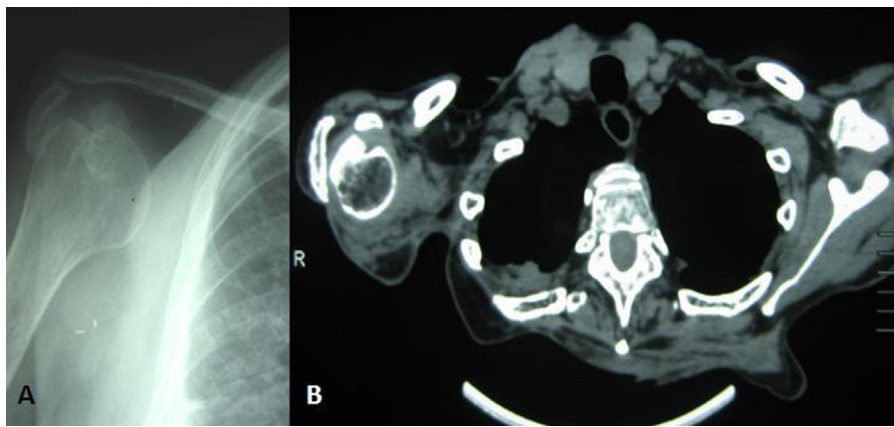


Fig. 6. (A) Simple X-ray that shows the scapulectomy and the humeral suspension. (B) CT scan that shows the scapulectomy and the lack of reappearance after 5 years.

The main treatment is the surgical resection of the tumor with a subtotal or total scapulectomy, depending on the size of the tumor.¹ The radiotherapy and chemotherapy do not provide better survival rates than surgery as a single treatment.⁵ For this reason, the surgical planning becomes greatly important and adequate safety margins are needed, which can hinder in some cases the function of the affected limb.

Between 1908 and 1913, Tikhoff and Bauman treated three cases by interscapulothoracic resection or triple-bone resection, which meant the partial resection of the scapula, the clavicle and the proximal end of the humerus in cases of tumors of the scapular girdle. This technique was described in 1928 as the Tikhoff-Linberg technique, which tried to avoid having to disarticulate or amputate the upper limb.⁵ From that moment on, the use of surgery that preserves the basic function of the upper limb and the non-affected articulations, such as the hand and the elbow, become as important as those approaches that try to preserve part of the shoulder articulation, always with an adequate oncological resection.^{4,6–8} The biggest challenge for this kind of surgery, together with wide safety margin resection, is the reconstruction of the substantial defects that appear. In the first place, surgeons may consider the suspension of the limb without reconstruction, but nowadays there are tumor prostheses for the proximal third of the humerus, prostheses of the scapula or plastic reconstructions with bank grafts for the articular part. One of the most important points in the preservation of the functionality is the reconstruction of the rotatory muscles of the shoulder, which is not always achieved but should nonetheless be kept in mind.^{4,6–8}

We believe that it is important to highlight the difficulties found when closing the wound. This is particularly relevant in tumors secondary to irradiation, because they present a precarious state of the skin, which in many cases require rotation flaps or free flaps.⁹

Around 95% of the cases of low- and high-degree sarcomas of the scapular girdle may be treated with these functional surgical techniques that prevent amputation, and the orthopedic surgeon should be familiar with them.⁴

4. Conclusion

We present a case in which the approach was not obvious, due to the existence of previous surgeries, the size of the tumor, the poor quality of the soft tissues and the skin. We performed a surgical

treatment with total scapulectomy that showed good functional and emotional results, as well as a good survival rate.

Conflicts of interest statement

None.

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None.

Ethical approval statement

Written consent obtained.

Authors' contributions

David Pescador involved in the data collections, data analysis and writing. Juan Blanco and Marcelo Jiménez contributed for the data collections, data analysis, writing and follow-up. Carolina Corchado participated in the data collections, data analysis, writing and traduction. Gonzalo Varela involved in the data collections, data analysis, writing and surgery; and German Borobio involved in the data collections and data analysis.

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