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(CASE REPORT)

COSTAL CHONDROSARCOMA MIMICKING BREAST CANCER: A RARE CASE REPORT AND REVIEW OF THE LITERATURE

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ABSTRACT

Costal chondrosarcoma is the most common primary malignant tumor of the ribs. Its course is generally indolent, but its potential for local extension can be considerable. Involvement of breast tissue, which is exceptional in the literature, is an unusual clinical presentation that can easily mimic a primary breast tumor and thus make the diagnosis difficult. A rigorous radiological and pathological approach is therefore essential to guide management.

The diagnosis of costal chondrosarcoma relies on a combination of clinical, radiological, and histopathological findings.

Clinically, the lesion often presents as a firm, minimally painful chest wall mass that may extend toward the breast tissue, where it simulates a breast tumor. The diagnosis can only be established after excluding metaplastic carcinoma and malignant phyllodes tumor, through multiple samplings looking for evidence of in situ or invasive carcinoma.

We report a case of costal chondrosarcoma mimicking breast cancer in a 48-year-old woman with no significant medical history, who presented with a right breast mass. The clinical appearance suggested a breast sarcoma, and histopathological examination was consistent with a grade II chondrosarcoma. Breast ultrasound and thoraco-abdomino-pelvic computed tomography (CT) were performed to assess the locoregional and distant extent of the tumor. We highlight the diagnostic difficulties encountered with the pathological samples and discuss the differential diagnoses.

Keywords: Chondrosarcoma; Chest wall tumor; Breast mass; Mastectomy; Computed tomography; Case report

1 INTRODUCTION

Chondrosarcomas are malignant tumors of cartilaginous origin, accounting for approximately 25% of primary bone sarcomas, which makes them the second most common primary malignant bone tumor after osteosarcoma (1). Their location in the chest wall is relatively rare: primary chest wall tumors account for only 5% to 10% of all thoracic tumors.

Costal chondrosarcoma is characterized by slow but infiltrative growth, with significant destructive potential. Extension into adjacent soft tissues is possible, but breast involvement is exceptional, reported in fewer than 1% of described

cases of costal chondrosarcoma. This atypical clinical presentation may simulate a primary breast tumor, making the diagnosis difficult and potentially leading to diagnostic or therapeutic errors.

In this context, imaging plays an essential role in identifying the parietal origin of the mass, whereas diagnostic confirmation relies on pathological examination. Through this case report, we discuss the diagnostic, radiological, and therapeutic features of a costal chondrosarcoma with breast extension, an extremely rare entity.

Owing to their rarity, the published literature is limited to small retrospective case series and case reports. It is essential to recognize them as a distinct entity

2 CASE REPORT

We report the case of Mrs. M.B., a 48-year-old woman with no significant medical history and no family history of breast cancer, who presented for management of a right breast mass that had been evolving for one year, with a marked increase in size over the previous five months. On physical examination, the patient was conscious, with a WHO performance status of 0. Breast examination revealed a hard, firm mass, tender on palpation, occupying the entire right breast and measuring 20 × 23 cm, with a smooth, shiny surface, and fixed to the chest wall (Figure 1), with no obvious axillary lymphadenopathy. The left breast was bra cup size A, with no palpable nodule and no inflammatory signs.

Breast ultrasound showed a voluminous solid tumor mass in the right breast involving the entire breast, with lobulated margins and heterogeneous echotexture, massively necrotic and hypervascular, infiltrating the subcutaneous fat and invading the chest wall, classified ACR 5. In the contralateral breast, an 8-mm ACR 2 lesion was seen. There was no lymphadenopathy bilaterally.

Thoraco-abdomino-pelvic CT revealed a large, ill-defined tumor process in the right anterior chest, with markedly heterogeneous enhancement, measuring approximately 150 × 140 × 216 mm. The tumor infiltrated the ipsilateral pectoralis muscles posteriorly and lysed the anterior arch of the 4th and 5th ribs, with lamellar periosteal reaction. It had a second, intrathoracic component in contact with the lung. It was associated with a massive right pleural effusion causing mass effect on the mediastinum, with no locoregional lymphadenopathy and no distant metastasis (Figure 2).

A biopsy of the breast mass initially suggested a sarcomatous tumor proliferation composed of small stellate cells arranged in sheets on a myxoid or bluish background reminiscent of chondroid matrix. Mitoses were rare, with a few necrotic foci. There were no signs of glandular organization, and no breast parenchyma was identified. Immunohistochemistry showed S100 protein expression, confirming a sarcomatous origin, and heterogeneous SATB2 positivity, supporting the diagnosis of sarcoma (grade II chondrosarcoma). In addition, the absence of nuclear SOX10 expression, the absence of epithelial membrane antigen expression, and moderate cytoplasmic D2-40 positivity reinforced the diagnosis.

Cytology of the pleural fluid showed an inflammatory fluid with no evidence of malignancy.

18F-FDG imaging showed a hypermetabolic mass extensively invading the right chest wall with lysis of the 4th and 5th ribs, infiltrating the skin of the breast anteriorly and compressing the right lung, with no other suspicious active focus.

The patient subsequently underwent, at another institution, wide radical surgery consisting of mastectomy with chest wall reconstruction using a titanium prosthesis to maintain the rigidity of the right chest wall and the lower part of the sternum (Figure 3). The postoperative course was favorable and uncomplicated, with no local complications. The patient had a good functional and aesthetic recovery, with no immediate or delayed complications.

Because of insufficient surgical margins, adjuvant radiotherapy was indicated to reduce the risk of local recurrence; treatment ended on 31 May 2025.

The patient is under regular follow-up, including clinical examination and chest CT every 3 to 4 months for the first two years, then every 6 months up to five years, and annually thereafter. The aim of this close follow-up is early detection of local or metastatic recurrence. To date, the course remains favorable, with no sign of recurrence.



Figure 1: Clinical image showing a voluminous mass occupying the entire right breast, measuring 20 × 23 cm.

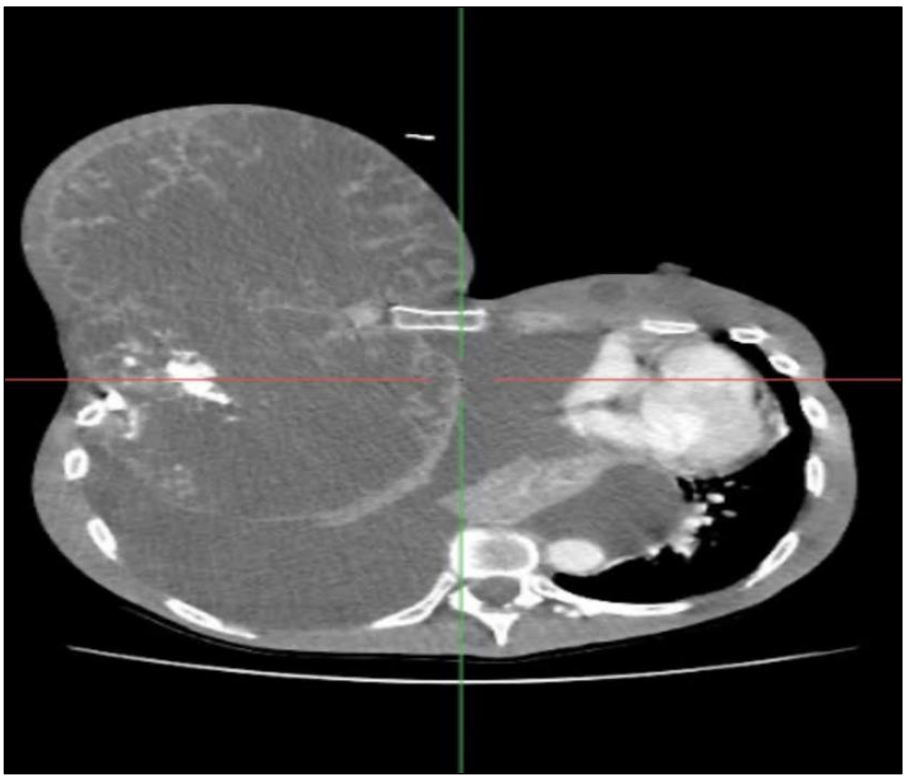


Figure 2: Axial CT image showing a voluminous soft-tissue mass centered on the anterior chest wall, extending into the various quadrants of the right breast, with intrathoracic extension.

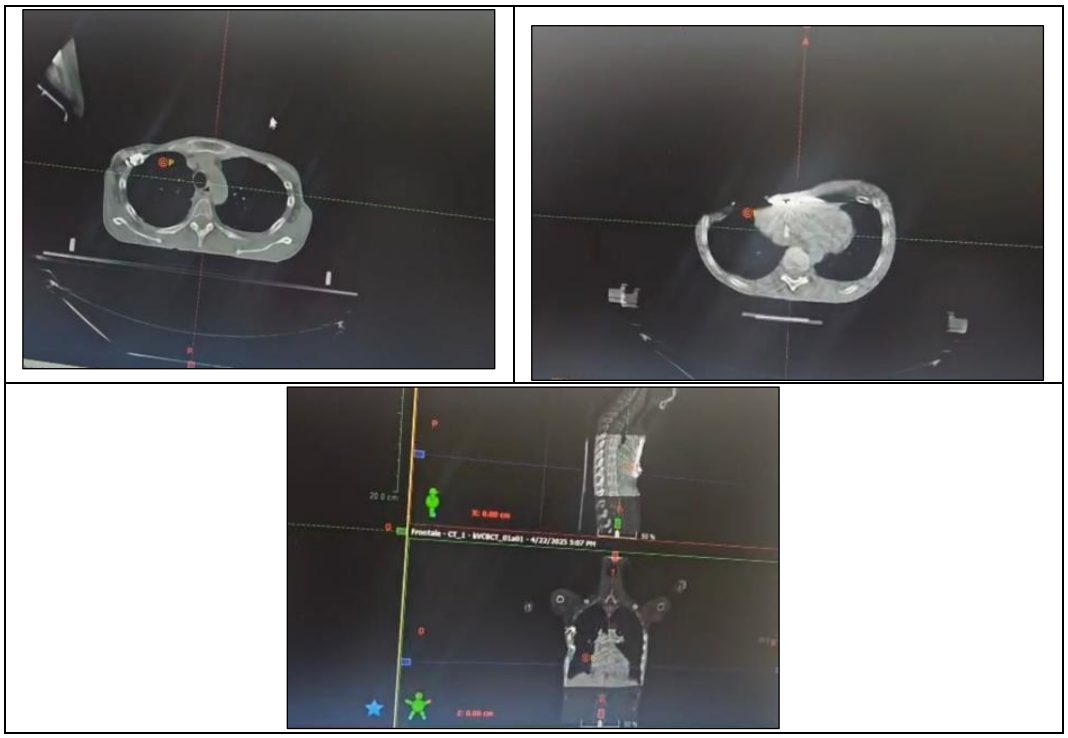


Figure 3: Various post-treatment CT images obtained after excision of the mass and placement of a metallic (titanium) chest wall prosthesis.

3 DISCUSSION

Chondrosarcoma is a rare tumor of bone and soft tissue (1,2). However, it is the most c ommon primary malignant tumor of the chest wall, and it is generally associated with better long-term survival than other types of thoracic sarcomas (3,4). Nevertheless, several authors report that chest wall chondrosarcoma may have an unfavorable prognosis because of distant metastases, particularly in high-grade forms or in cases of insufficient surgical margins.

It is characterized by slow but locally aggressive growth, with a potential risk of invasion of adjacent soft tissues. Extension to the breast, as observed in our case, remains exceptional and is rarely reported in the literature (5).

Clinically, costal chondrosarcoma can present in a particularly misleading way. When it extends into breast tissue, the mass becomes difficult to distinguish from a primary breast tumor. The lesion usually presents as a firm, painless swelling fixed to deep structures, which spontaneously suggests a malignant breast disease. This clinical similarity explains why several patients are first evaluated in a breast clinic, thus delaying identification of the true chest wall origin of the tumor (7).

Imaging therefore plays a decisive role in avoiding this diagnostic confusion. Chest CT is the key examination, not only to show the costal origin of the mass but also to reveal its internal characteristics. “Popcorn” calcifications, widely described in cartilaginous tumors, are particularly suggestive of chondrosarcoma (5,6). CT also allows assessment of chest wall involvement, rib erosion or destruction, and extension into the soft tissues and the breast. In our patient, a biopsy of the breast mass was performed to diagnose a breast tumor, but CT guided the diagnosis toward a primary chest wall tumor, which required a different therapeutic strategy.

MRI is an essential complement to the work-up, particularly for soft tissue assessment, owing to its excellent tissue contrast. It defines the locoregional extension of the tumor and its relationship with the pectoralis muscle, breast tissue, and thoracic cage, and it allows better evaluation of the degree of infiltration, which is essential for planning surgery.

In atypical situations, combining CT and MRI findings makes it possible to redirect the diagnosis toward a disease of chest wall origin, which is crucial to avoid inadequate initial management.

Diagnostic confirmation of costal chondrosarcoma relies exclusively on histopathological examination. It identifies the malignant cartilaginous nature of the tumor and determines its histological grade, a key element in prognostic assessment (8). Indeed, histological grade is one of the main predictors of local recurrence and distant metastasis, particularly to the lungs, which are the most frequent metastatic site in patients with chondrosarcoma (9).

Histological examination shows a proliferation of atypical cartilaginous cells, with variations according to grade:

- Low-grade chondrosarcomas show low cellularity, a well-preserved lobular architecture, and moderate nuclear atypia.
- High-grade chondrosarcomas show increased cellularity, marked nuclear atypia, and a significantly higher risk of recurrence and metastasis (10).

Thus, histopathology not only guides the definitive diagnosis but also determines treatment planning, in particular the need for wide surgical excision and intensified postoperative surveillance.

Treatment of costal chondrosarcoma is essentially based on wide surgical resection, including the tumor, the involved portion of the rib, and the surrounding soft tissues, with clear surgical margins, a major criterion for ensuring good local control and limiting the risk of recurrence (11). Unlike other sarcomas, chondrosarcoma is characterized by low sensitivity to radiotherapy and chemotherapy, which limits the use of these modalities to unresectable tumors, local recurrences, or palliative settings (12,13).

Several studies have shown that surgery is the main determinant of survival. Negative surgical margins and complete excision provide long-term survival superior to that observed in other thoracic sarcomas. Surgery is also the main means of preventing secondary metastases, since high-grade chondrosarcomas carry a high risk of pulmonary dissemination in the absence of complete excision (14).

Management therefore relies on a multidisciplinary approach combining accurate diagnosis, a complete extension work-up, and appropriate surgical planning, often in collaboration with thoracic and reconstructive surgery teams.

The prognosis of costal chondrosarcoma depends mainly on histological grade, tumor size, local extension, and completeness of surgical resection. Low-grade tumors have a low recurrence rate and limited metastatic risk, whereas high-grade tumors are associated with more frequent local recurrence and pulmonary metastases (15). Complete resection with negative margins (R0) is the key factor for local control and survival. Positive margins significantly increase the risk of recurrence (16).

Recent series report a 5-year overall survival of 70% to 75% after complete excision, with disease-free survival being slightly lower (17).

Follow-up after resection of a costal chondrosarcoma relies on regular clinical and radiological examinations, mainly chest CT, to detect local recurrence and pulmonary metastases. The frequency of examinations depends on histological grade and completeness of resection. Because of the risk of late recurrence, follow-up should be prolonged for at least 10 years, or even for life in high-risk patients.

4 CONCLUSION

Costal chondrosarcoma is a rare tumor of the chest wall whose extension into the breast can mimic a breast tumor, making clinical diagnosis sometimes misleading. Confirmation relies on histopathology, which determines the grade, the main prognostic factor. Wide surgical resection with clear margins remains the standard treatment, as radiotherapy and chemotherapy have limited efficacy. Prognosis depends essentially on histological grade, tumor size, and completeness of excision, while prolonged follow-up is essential for early detection of local recurrence and pulmonary metastases.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

REFERENCES

[1] Le HV, Wadhwa R, Theodore P and Mummaneni P. Excision of thoracicchondrosarcoma: case report and review of literature. Cureus 2016; 8: e708.

[2] Mosier SM, Patel T, Strenge K and Mosier AD. Chondrosarcoma in childhood: the radiologic and clinicalconundrum. J Radiol Case Rep 2012; 6-12: 32–42.

[3] Bishop MW, Somerville JM, Bahrami A, et al. Mesenchymalchondrosarcoma in children and youngadults: a single institution retrospectivereview. Sarcoma 2015; 2015: 608279.

[4] Nimonkar P, Bhola N, Jadhav A, et al. Myxoidchondrosarcoma of maxilla in a pediatric patient: a rare case report. Case RepOncol Med 2016; 2016: 5419737.

[5] Murphey MD et al. Imaging of primary chondrosarcoma. Radiographics. 2003.

[6] Truong MT et al. Primary chest wall tumors: radiologic–pathologic correlation. Radiographics. 2009.

[7] Jarroug, Achraf & Bouzida, Mounia & Hamid, Asmouki & Msougar, Yassine & Soummani, Abderraouf. (2023). CHONDROSARCOME COSTAL REVELE PAR UNE TUMEUR DU SEIN : A PROPOS DUN CAS ET REVUE DE LA LITTERATURE. International Journal of Advanced Research. 11. 773-777. 10.21474/IJAR01/16931.

[8] Evans HL, Ayala AG, Romsdahl MM. Prognostic factors in chondrosarcoma of bone: a clinicopathologic analysis of 60 cases.

[9] Wang Z, Chen X, Huang X, et al. Predictors of the survival of patients with chondrosarcoma of bone and metastatic disease at diagnosis. J Cancer. 2019;10(11):2457–2463.

[10] Fiore M, Ghert M, Dijkstra P, et al. Prognostic Factors for Survival in Patients With High grade Chondrosarcoma. Clin Orthop Relat Res. 2022.

[11] Nicolosi N, Stojadinovic A, Brennan MF. Chondrosarcoma of the chest wall: analysis of factors affecting outcome. Ann Thorac Surg. 1998

[12] Chondrosarcoma Resistance to Radiation Therapy: Origins and Potential Therapeutic Solutions" , PMCID: PMC10093143 PMID: 37046623

[13] Li, KHC, Gulia, A., Duffaud, F. et al. Faire progresser la thérapie systémique dans le chondrosarcome : de nouveaux horizons. Oncol Ther 13 , 1–9 (2025). https://doi.org/10.1007/s40487-024-00317-z

[14] Dunkman AJ, et al. Chest wall chondrosarcoma management. Am J Surg. 2011.

[15] Wang Z, Chen X, Huang X, et al. Predictors of survival of patients with chondrosarcoma of bone and metastatic disease at diagnosis. J Cancer. 2019;10(11):2457 2463.

[16] Lenze U., Angelini A., Pohlig F., et al. Chondrosarcoma of the chest wall: a review of 53 cases from two institutions. Anticancer Res. 2020;40:1519 1526.

[17] Gwely NE, Mostafa A, Abdelmohty H, Hassan W. Chest Wall Chondrosarcoma: Highly Expectant Survival After Radical Resection and Optimal Reconstruction. ZUMJ. 2023;29(1.2):283 287.