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Case Report

Pectoralis major muscle sarcoma masquerading breast lesion: A rare case report with review of literature ☆,☆☆

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ABSTRACT

Pectoralis major muscle sarcomas are extremely rare and can mimic breast lesion clinically. We report a case of poorly differentiated sarcoma of the pectoralis major muscle in a 63-year-old woman of south east Asian ethnicity presenting with a progressively increasing right breast lump. Mammography, ultrasonography (US), contrast-enhanced computed tomography, and biopsy were done to make the final diagnosis. Complete surgical excision was planned but deferred due to pulmonary metastasis, and the patient was treated with palliative chemotherapy. Clinical examination may be confusing but radiological and pathological investigations provide detailed information about the location and the extent of the disease and a definitive tissue diagnosis can only be made on histopathology which will be helpful in preoperative planning and further treatment of the patient.

Introduction

Soft tissue sarcomas are rare and can occur anywhere in the body but pectoralis major muscle sarcomas are extremely rare and very few cases have been reported. Patients presenting with large ill-defined masses in the retromammary tissue can confuse the surgeon even after a good clinical examination. Mammography along with correlative ultrasound and cross-sectional imaging determines the precise anatomic location and the extent of the lesion. Definitive diagnosis can only be confirmed through histopathology.

Abbreviations: US, ultrasonography; CECT, contrast-enhanced computed tomography; DM, digital mammography; DBT, digital breast tomosynthesis; CC, craniocaudal; MLO, mediolateral oblique.

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Case presentation

Clinical presentation

A 63-year-old female patient presented with a complaint of a painless lump in her right breast for 2-3 years progressively increasing in size. There was no history of nipple discharge, breast trauma, or breast surgery. She had no known personnel or family history of breast or ovarian malignancy. She was a known hypertensive taking medication on and off. There was no history of any other comorbidities.

Physical examination

A hard lump measuring 8 × 6 cm, fixed to the chest wall but not fixed to the skin was palpable in the upper inner quadrant of the right breast. The overlying skin was normal. There was no evidence of nipple retraction or nipple discharge. Palpable lymph nodes were present in the right axilla. The left breast and the left axilla were unremarkable. The clinical impression of a breast mass fixed to the underlying muscles was given and further imaging investigations were advised. The patient was restricted in strenuous activity but was ambulatory and able to carry out work of a light or sedentary nature, for example, light house work, office work- ECOG grade 1.

Imaging findings

On 2D mammography, an irregular-shaped high-density mass with circumscribed margin was seen in the upper inner quadrant of the right breast in the deep retromammary region. On digital breast tomosynthesis (DBT), the mass appeared to be contiguous with the underlying pectoralis muscle. The mass was partially visualized on both the CC and the MLO views measuring, approximately 10.1 × 7.2 × 8.4 cm. No calcifications and fat component were seen within the mass (Fig. 1).

On correlative ultrasound, a large oval-shaped hypoechoic mass with microlobulated margins was seen in the upper inner quadrant of the right breast contiguous with the underlying pectoralis muscles. On color Doppler interrogation, internal vascularity was seen in the mass. Another similar lesion was also seen in the upper outer quadrant of the right breast measuring approximately 4.6 × 2.7 cm in the interpectoral region (Fig. 2). This lesion was not visible on mammography.

The right axilla showed a single lymph node with a central hilum and mildly increased cortical thickness measuring approximately 1.8 × 0.8 cm with cortical thickness of 0.4 cm, suggestive of a reactive lymph node.

The left breast and the left axillae were unremarkable.

Chest CT showed a large heterogeneously enhancing soft tissue mass measuring approximately 11.8 × 7.9 cm originating from the right pectoralis major muscle infiltrating the breast parenchyma in the upper inner quadrant of the right breast. Underlying bone and adjoining costochondral junction were normal. Another similar lesion measuring approximately 4.2 × 3.0 cm was also seen in the interpectoral region (Fig. 3).

Ultrasound-guided core biopsy was done using a 14-gauge Bard breast biopsy needle.

The histopathology report showed features of poorly differentiated sarcoma and the tumor cells on immunohistochemistry were diffusely positive for vimentin and negative for ER, PR, CD34, and EMA.

Therapeutic intervention

Complete surgical excision was planned; however, the patient did not come for follow-up for 3 months due to personal concerns. After 3 months when the patient returned, a metastatic workup was done, and a repeat chest CT showed a few nodules in the lower lobe of the left lung in a random distribution, which were interpreted as metastasis. Thus, surgery was deferred and patient was treated with chemotherapy.

Discussion

Soft tissue sarcomas are a group of mesenchymal malignant tumors. The most common site of soft tissue sarcomas is the extremities however they can occur anywhere in the body [1]. Soft tissue sarcomas occur in all age groups and are more common in males than females in both adults and children, accounting for about 1.5% of all malignant tumors in adults [2]. Lesions in the pectoralis major muscle, including sarcomas, are extremely rare, with only a few case reports in the literature [3].

Clinically these lesions present as painless progressively enlarging masses, mimicking breast lesions and causing confusion to the examining surgeon, as in our case. Different histological subtypes of soft tissue sarcomas share radiological features and can be indistinguishable but the precise location and the extent can be determined with imaging for presurgical planning and a definitive diagnosis can be only be made on histopathology.

The reported literature includes very few cases of sarcomas of the pectoralis major muscle. To our knowledge, ours is the first case of poorly differentiated sarcoma of the pectoralis major muscle infiltrating the breast parenchyma.

Liu et al reported a case of breast mass due to alveolar soft part sarcoma of the pectoralis major muscle in a 20-year-old female. Ultrasound of lesion showed a heterogeneously hypoechoic lesion contiguous with the pectoralis muscle and the patient underwent wide local excision of the lesion [4].

Czarny et al. reported case of a 44-year- old, construction worker presenting with pain and swelling in the right chest wall which was seen in the right pectoralis muscles on contrast-enhanced computed tomography and diagnosed as high-grade sarcoma with rhabdoid features on histopathology. The patient was put on palliative chemotherapy and radiotherapy, as the patient was diagnosed with metastatic disease involving the lungs [5].

Salemis et al. described a case of 44-year- female with a rapidly growing left breast mass which was later diagnosed as Intramuscular atypical lipomatous tumor/well-differentiated liposarcoma of the pectoralis major muscle. The patient underwent complete excision and was treated with adjuvant radiotherapy [6].

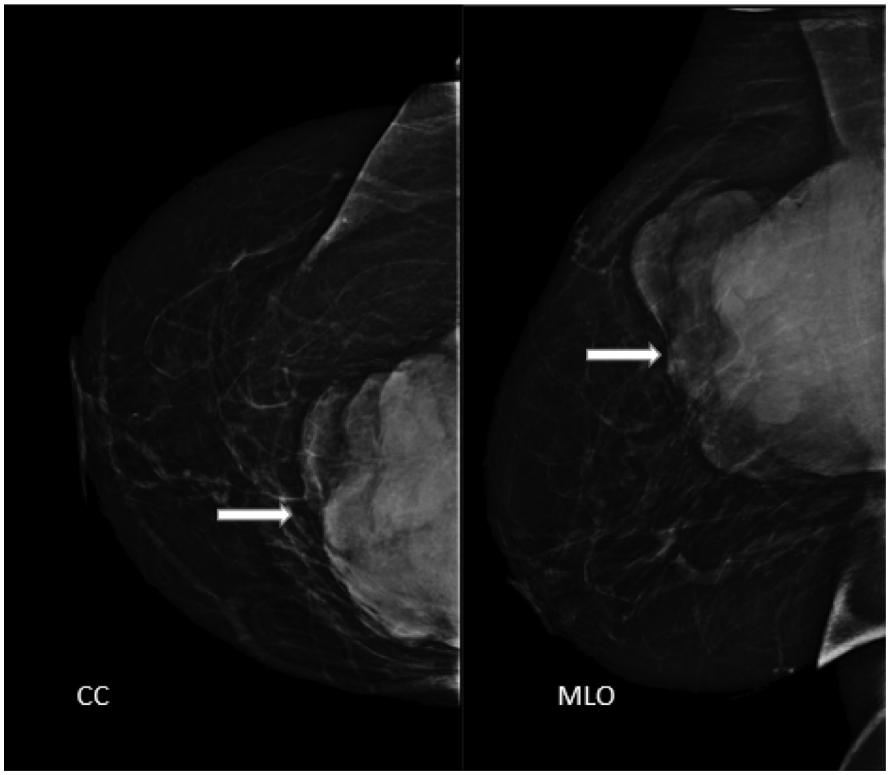

Fig. 1 – Digital mammography (CC and MLO views) showed an irregular, high-density mass (arrows) with circumscribed margins in the upper inner quadrant of the right breast in the deep retromammary region, contiguous with the underlying pectoralis major muscle.

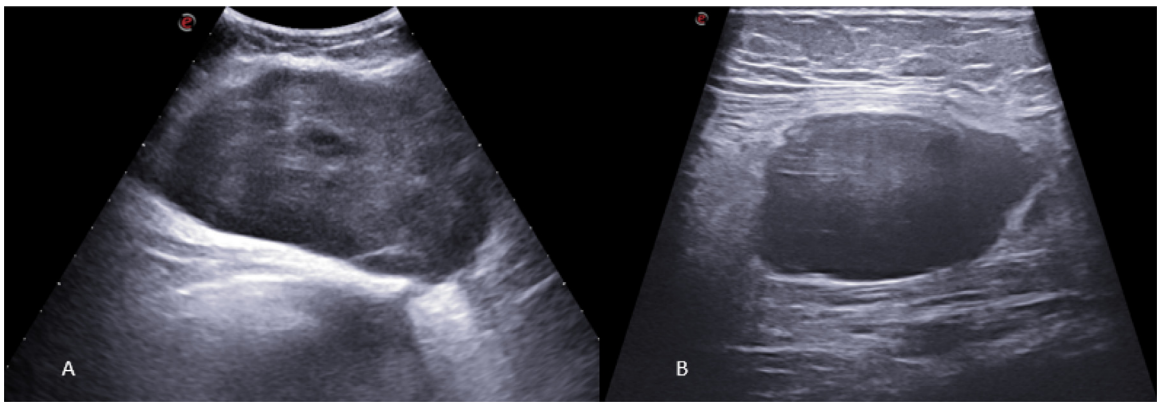

Fig. 2 – Ultrasound showed a large oval hypoechoic mass with microlobulated margins in the upper inner quadrant of the right breast, contiguous with the underlying pectoralis muscles (A). Another similar-appearing mass was seen in the upper outer quadrant of the right breast in the interpectoral region (B).

Sezer et al. reported a case of a high-grade pleomorphic liposarcoma of pectoralis major muscle in a 70-year-old elderly male who presented with painless left breast mass which on mammography appeared as encapsulated high-density mass in the left pectoralis major muscle. Chest CT confirmed its intrapectoral location. Their patient underwent complete resection with partial pectoral major muscle resection [3].

Soft tissue sarcoma disseminates by hematogenous route with the lungs being the most common site of metastasis. Sarcoma shows an infiltrative growth pattern and after surgical treatment recurrence is common. Mortality is usually due to distant metastases but morbidity due to local recurrence may lead to mutilating operations [1].

Wide local excision of the tumor is first-line therapy and offers the best prognosis in the absence of metastasis. However, in cases with large or highly invasive tumors, with narrow (1 cm) margins, or with positive margins with residual disease radiotherapy should be considered. In case of a large tumor

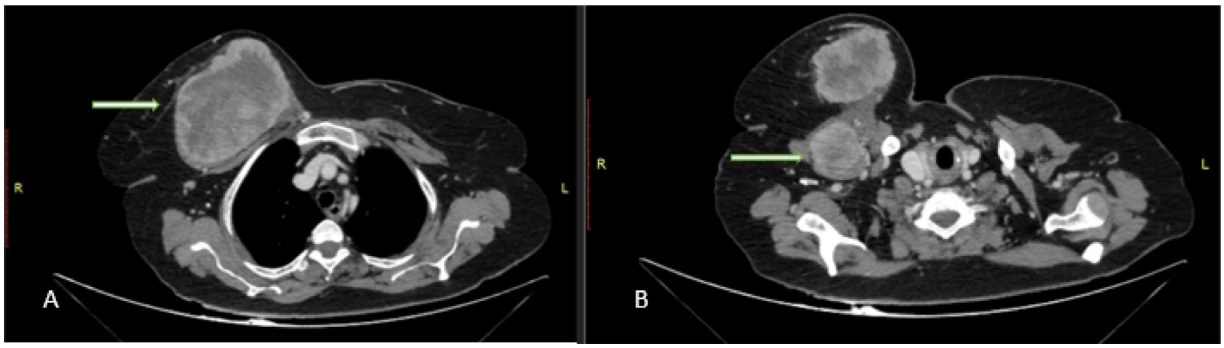

Fig. 3 – Chest CT showed a large, heterogeneously enhancing soft tissue mass (arrow), originating from the right pectoralis major muscle, infiltrating the breast parenchyma in the upper inner quadrant (A). A second similar-appearing mass was seen in the right interpectoral region (arrows) (B).

burden or location near important neurovascular structures, neoadjuvant chemotherapy can be considered to improve resectability [5].

Conclusion

Soft tissue sarcomas are rare and their location in the pectoralis major muscle is exceedingly rare and can clinically masquerade breast lesions. Definitive diagnosis is possible only on histopathology with the precise location and extent determined by cross-sectional imaging. Complete wide local excision is the first-line treatment; however, radiotherapy and chemotherapy are selected on case-to-case basis. Breast radiologists and clinicians should be aware of this rare entity for appropriate patient management.

Author contributions

Dr. Anamika Kumar conceptualized, collected radiological images and written the case report. Dr. Pranjali Joshi did literature review and helped in data collection. Dr. Satish Chaitanya K and Dr. Ananya Deori clinically examined the patient, advised radiological investigation and helped in drafting the paper. Dr. Bhagyashree Singh did histopathology reporting, made pathological diagnosis and helped in data collection. Dr. Prateek Sharda and Dr. Bina Ravi did surgical assessment, advised metastatic workup and reviewed the article. Dr. Anjum Syed helped in image interpretation, guided, reviewed and supervised writing the entire case report.

Data availability statement

All data generated or analyzed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Patient consent

I state that written informed consent was obtained from the patient for publication of the details of their medical case and accompanying images. The patient was informed that no personal details will be revealed in the publishing of this case.

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