CASE REPORT
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Breast Schwannoma: a rare case report of a benign neoplasm in the upper outer quadrant of the right breast

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ABSTRACT

Mammary schwannoma is a rare benign neoplasm that originates from the Schwann cells of peripheral nerves, representing a small fraction of breast masses. This case report describes a patient with a painless nodule in the upper lateral quadrant of the right breast. She underwent surgical excision of the lesion, which was sent for histopathological analysis. The examination revealed a fusocellular mesenchymal neoplasm with areas of metaplastic bone tissue, suggesting the need for further diagnostic workup with immunohistochemistry. The result confirmed a mammary schwannoma through the expression of S100 protein, characteristic of this type of tumor. This case highlights the rarity of mammary schwannomas, a benign neoplasm underreported in medical literature, and emphasizes the importance of careful differential diagnosis, as clinical and imaging findings can mimic more common conditions.

KEYWORDS: breast; schwannoma; S100 proteins; nodule.

INTRODUCTION

Breast schwannoma is a rare benign neoplasm originating from the Schwann cells of peripheral nerves. Accounting for only a small fraction of breast masses, these tumors are typically slow-growing and asymptomatic. They are often incidentally detected during imaging studies or biopsies performed to investigate suspicious breast nodules. Despite their rarity, accurate identification is essential, as treatment generally involves surgical excision, with a favorable prognosis in most cases[1,2]. The objective of the present case report is to describe the case of a 42-year-old female patient diagnosed with breast schwannoma located in the upper outer quadrant of the right breast. This report aims to detail the clinical, radiological, and histopathological characteristics of the lesion, as well as the therapeutic approach employed, contributing to the medical literature on this rare condition.

CASE REPORT

We present the case of a 42-year-old Caucasian female, a cook by profession, who noticed the gradual growth of a painless nodule in the upper outer quadrant of her right breast. The nodule was first observed about 5 months prior to consultation. The patient reported no associated pain or discomfort. She denied any history of trauma to the breast, as well as a family history of breast cancer or other malignancies. Upon physical examination, the nodule was palpable and firm, with no signs of skin changes or nipple retraction. The patient had no other significant medical history and was otherwise in good health.

Examinations were ordered, and the results were as follows: A breast ultrasound of the upper outer quadrant revealed a heterogeneous hypoechoic nodule with an oval shape, regular borders, and undefined limits, measuring approximately 5.3×2.9 cm (Figure 1). The lesion was of an indeterminate nature, and a pathological lymph node was considered a differential diagnosis. A chest computed tomography scan showed no particular abnormalities. Subsequently, a fine-needle aspiration was performed for cytological examination of the nodule. The pathological result showed the presence of rare atypical cells, which raised suspicion for a benign but unusual lesion, necessitating further investigation. Given the clinical and imaging findings, a surgical excision of the nodule was recommended for definitive diagnosis.

The patient was taken to surgery following oncological principles for breast surgery. The procedure was thoroughly discussed with her, emphasizing that, initially, only the lesion would be excised and sent for analysis without axillary intervention. Preoperative antibiotic prophylaxis was administered. Under general anesthesia, an arc-shaped incision was made in the upper outer quadrant of the breast, following the natural curvature of the superior breast

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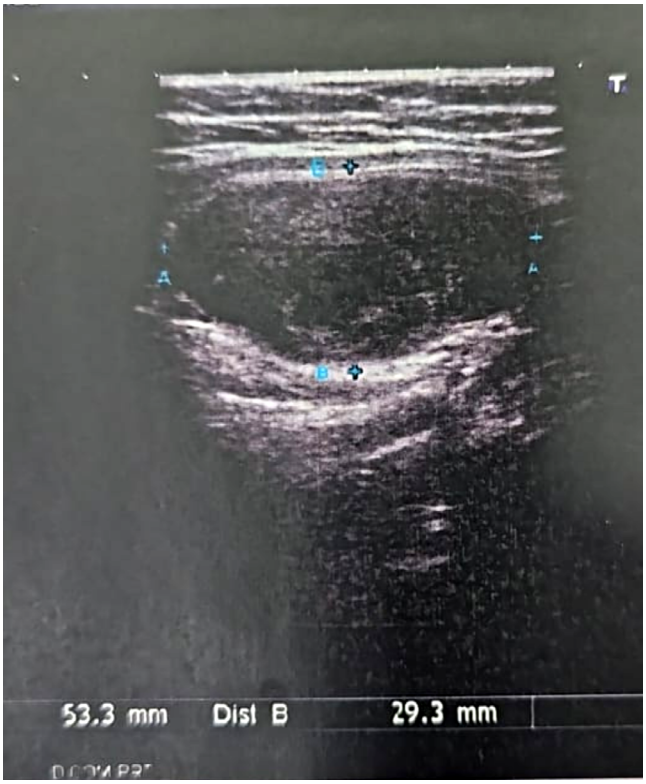

Figure 1. Ultrasonography of the breasts in the upper lateral quadrant identifies a heterogeneous hypoechoic nodule with an oval shape, regular borders, and undefined margins, measuring approximately 5.3 × 2.9 cm of indeterminate nature. Among the differential diagnoses, the possibility of a pathological lymph node should be considered.

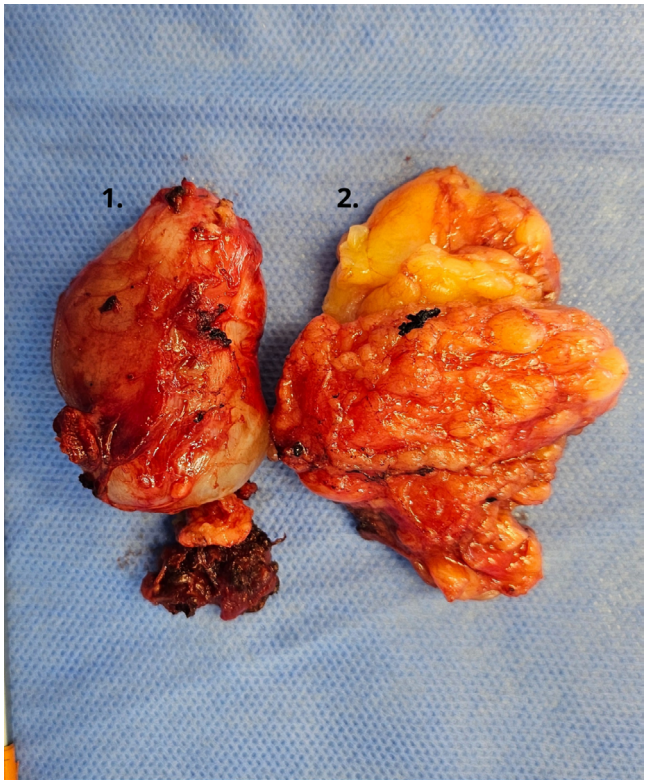

Figure 2. Surgical specimen (1) mammary schwannoma (2) margin enlargement around the lesion.

contour. The lesion was excised with safety margins, adhering to surgical best practices (Figure 2). The procedure lasted approximately one and a half hours and was uneventful, with no intraoperative complications reported. Postoperatively, the patient was hospitalized for 36 h for observation. She was discharged in stable condition, with a follow-up appointment scheduled for 7 days later.

At the postoperative follow-up, the patient presented the pathological report of the excised lesion. The macroscopic examination described an irregular, grayish-brown tissue mass measuring 5.0×3.0×3.0 cm. Upon sectioning, the lesion displayed a brownish and elastic appearance, with a whitish calcified area measuring 1.5×1.0×0.8 cm. Histological analysis revealed a spindle-cell mesenchymal neoplasm with areas of metaplastic bone tissue and exudative foci. The pathologist raised the hypothesis of an inflammatory myofibroblastic tumor but emphasized that immunohistochemistry would be essential for a more accurate characterization of the lesion. Based on this recommendation, further diagnostic steps were planned to clarify the lesion's nature

Immunohistochemical analysis was performed to complement the diagnosis, and the findings were as follows: The immunohistochemical panel, in conjunction with the morphological aspects, was consistent with a schwannoma presenting symplastic alterations. The lesion exhibited strong immunoexpression of the S100 protein, with no significant expression of other markers.

Based on the immunohistochemical findings, the diagnosis of breast schwannoma was confirmed. The patient was counseled about the benign nature of the pathology and reassured regarding its excellent prognosis. Follow-up care was planned according to the general risk guidelines for breast pathologies in the population, given the absence of associated malignant potential.

DISCUSSION

Breast schwannoma is a rare, benign neoplasm originating from Schwann cells of peripheral nerves. It typically affects individuals aged 40 years and older, with an average presentation around 48 years. While these tumors can occur at any age, they are less commonly diagnosed in younger individuals. Schwannomas are generally solitary, slow-growing, and asymptomatic, often discovered incidentally during imaging or surgical procedures. Histologically, they display well-encapsulated structures with characteristic Antoni A and B areas, and immunohistochemical staining, particularly for S100 protein, is critical for diagnosis[3]. The case presented here involves a 42-year-old patient, slightly younger than the average age of presentation, aligning with the described characteristics of slow growth and benign behavior. The lesion's localization in the upper lateral quadrant and its well-demarcated features are consistent with documented

findings, emphasizing the importance of distinguishing such tumors from other spindle cell lesions of the breast[3].

Schwannomas are challenging to diagnose due to their rarity and overlapping imaging characteristics with other benign and malignant breast lesions. Ultrasonography often reveals hypoechoic, well-circumscribed, or lobulated masses, but these findings are not specific. For more detailed evaluation, advanced imaging modalities such as multiparametric ultrasound and magnetic resonance imaging can be instrumental, especially when determining lesion margins and internal composition. However, definitive diagnosis usually requires histopathological analysis and immunohistochemistry, with S100 protein positivity being a hallmark finding, as seen in this case. The cytological findings of rare atypical cells in the initial biopsy were consistent with the need for further immunohistochemical confirmation to exclude malignancy and identify the tumor subtype precisely[4-6].

The treatment of mammary schwannoma, like other schwannomas, is predominantly surgical, focusing on the complete removal of the lesion to minimize the risk of recurrence. Surgery typically involves resection with safety margins, especially in cases with suspected malignancy or uncertain preoperative diagnosis. Techniques such as extracapsular dissection are frequently employed to preserve the function of adjacent tissues, particularly in sensitive areas, and have demonstrated high efficacy in recent studies[7-9].

Clinical treatments, such as chemotherapy or radiotherapy, are rarely necessary, as most schwannomas are benign. However, in rare instances of malignant variants or schwannomas associated with genetic syndromes, such as neurofibromatosis type 2, adjuvant therapies may be considered[7-9].

In the presented case, the surgical approach adhered to the best practices outlined in the literature, involving lesion resection followed by histopathological and immunohistochemical analysis for diagnostic confirmation. The absence of axillary involvement and benign progression reinforced the appropriateness of the chosen management. Comparatively, this case highlights the critical role of surgery as the definitive treatment for mammary schwannomas while emphasizing the importance of careful differential diagnosis.

CONCLUSIONS

Mammary schwannoma is an exceptionally rare neoplasm, representing only a small fraction of benign breast tumors. This rarity contributes to the limited medical literature on the condition, making its diagnosis and management a challenge. The case presented highlights the importance of careful differential diagnosis and appropriate surgical management, as its clinical and imaging features may mimic those of more common breast conditions.

Moreover, the scarcity of recent studies on mammary schwannoma underscores the need for greater attention to these cases to enhance understanding of the disease, particularly regarding its histopathological patterns and diagnostic criteria. This calls for new multicenter studies and additional case reports to expand clinical and scientific knowledge of this rare condition, ultimately aiding in the development of more comprehensive management and follow-up guidelines.

AUTHORS' CONTRIBUITION

LBS: Writing – review & editing. RSV: Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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