Breast schwannoma

ClinicalPractice

Abstract

Schwannoma is a benign tumor originating from Schwann cells, which envelop peripheral nerves. Typically solitary, this tumor develops slowly over time. Schwannoma symptoms vary based on tumor size and location but may encompass pain, tingling, muscle weakness, or sensory loss. Diagnosis is typically confirmed through medical imaging, such as MRI or CT scans. Treatment often involves surgical intervention for tumor removal, although periodic monitoring may be recommended in some instances. We present a case of a 26-year-old patient diagnosed with a breast schwannoma during an evaluation for a breast nodule.

Keywords: Schwannoma • nodule • breast • mammography • histopathology

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Introduction

Formerly known as neurinoma or neurilemmoma, schwannoma is a benign neurogenic tumor arising from the proliferation of Schwann sheath cells [1]. Initially described in 1910, this tumor can affect any peripheral or central nerve, with the exception of the olfactory and optic nerves, which lack this sheath [2]. However, mammary localization is exceedingly rare. It was first reported in 1973 by Collins et al. [3]. Herein, we present a case of a mammary schwannoma mimicking a breast adenofibroma.

Patient and Observation

A 26-year-old patient presented to our department with a self-detected lump in her left breast. The patient had no notable personal or family medical history, including no family history of benign or malignant breast conditions, nor any other gynecological cancers. Breast examination revealed a well-defined, painless, firm, mobile nodule measuring 1 cm, located at the junction of the upper quadrants of the left breast. No signs of inflammation or nipple discharge were observed, and lymph nodes were non-palpable. The contralateral breast examination was unremarkable. Mammography exhibited a well-defined, homogeneous, oval opacity with sharp and regular margins, measuring 15 mm in its greatest axis at the upper quadrant of the left breast, with no microcalcifications or associated lymphadenopathy. Ultrasound revealed a hypoechoic, homogeneous, well-defined mass with regular margins and no posterior acoustic enhancement. These radiological features were consistent with a diagnosis of adenofibroma. However, the initial microbiopsy was inconclusive, prompting a surgical excision.

Macroscopically, the excised specimen was an oval-shaped, soft mass measuring 15 mm in its greatest axis, well-circumscribed, and beige in appearance upon sectioning. Histological examination revealed a well-demarcated benign tumor proliferation, encapsulated by a thin layer. This proliferation consisted of Schwann cells, which appeared spindle-shaped with faintly eosinophilic, poorly visible cytoplasm. The nuclei were slender and regular in appearance, with no mitotic activity observed. These cells were arranged in short or intertwined bundles, displaying nuclear palisading, Verocay hyaline nodules, and coiling formations **(FIGURE 1)**. The diagnosis established was a left breast schwannoma.

Discussion

Schwannoma arises from the proliferation of Schwann sheath nerve cells. It predominantly affects cranial, spinal, or peripheral nerves, especially sensory branches. Peripheral locations are often observed in the head, neck, and flexor surfaces of the extremities. The most commonly reported central lesion is the vestibular branch of the eighth cranial nerve [4]. Mammary localization is exceedingly rare and even

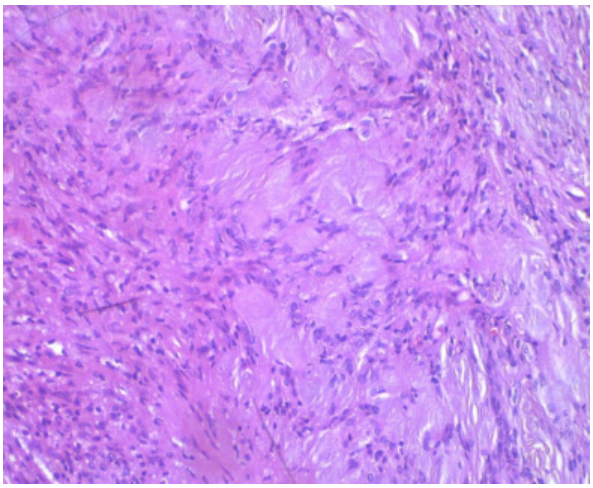

FIGURE 1: Macroscopic Appearance of Schwannoma.

exceptional, comprising 2-3% of all occurrences and merely 0.2% of breast tumors [5]. To date, fewer than 40 cases of mammary schwannomas have been published in the literature, with only 5 documented in Tunisia. The literature indicates a broad age range of occurrence, spanning from 18 to 83 years, with an average age of 48 years [6]. Our patient was 26 years old. Schwannoma affects both sexes equally [7]. The size of a schwannoma varies, ranging from millimeter-sized lesions to palpable masses. According to published series, schwannoma sizes range from 0.7 cm to 22 cm, with an average of 3.74 cm [6,8]. In two-thirds of cases, this tumor appears on the right breast, affecting all quadrants of the breast equally, without a preference for the supero-external quadrant as seen in malignant tumors [9]. In our case, the tumor measured 16 mm and was palpable in the upper quadrant.

In some instances, schwannoma may be associated with a genetic familial syndrome. Notable syndromes described in the literature include neurofibromatosis type 2 (3%), schwannomatosis, and Carney's complex. However, 90% of schwannomas occur sporadically in isolation, as in our patient's case [10, 11].

Clinical signs remain nonspecific. In the series by Dus Gupta, discovery circumstances included a mobile firm nodule in eleven cases, a nipple lesion in one case, and mastodynia in another case [6].

Radiologically, breast schwannoma is classified as a BI-RADS 4A lesion, indicating low malignancy suspicion and necessitating a biopsy. Definitive diagnosis always relies on histology [12]. Mammography often reveals a well-defined, homogeneous, and round opacity.

Breast ultrasound describes this lesion as a hypoechoic, homogeneous mass with a "target" or "bull's-eye" appearance and clear posterior acoustic enhancement [13, 14]. The use of MRI remains exceptional. Salano et al. described a fortuitously discovered schwannoma through MRI as a rounded benign circumscribed lesion with a high ADC of 1.9 cm^2/s [15].

PET scan results in high FDG accumulation in schwannoma. According to Wang et al., FDG hypermetabolism was significantly correlated with schwannoma location, degree of enhancement, and presence of lymphatic tissue [16].

The rarity of this tumor makes diagnosis via fine-needle aspiration cytology possible but challenging, often confused with phyllodes tumors. In fact, the presence of spindle cells in cytology may suggest various other benign and malignant differential diagnoses: fibroadenomas, mesenchymal neoplasms, phyllodes tumors, or even epithelial breast cancers [17, 18].

Macroscopically, schwannoma manifests as a nodular mass with smooth contours, encapsulated, yellowish in color, and eccentrically developing along a visible nerve pathway, visible in 50% of cases at the tumor periphery. The specimen may sometimes contain cystic, hemorrhagic, or calcified areas. Histologically, schwannoma results from benign tumor proliferation of Schwann cells. These cells appear spindle-shaped, with eosinophilic cytoplasm and tapering oval nuclei. Architecturally, two zones are distinguished: Antoni A, where cells arrange into compact bundles, and Antoni B, where bundles are looser. In Antoni A, palisade-like nuclei arrangement can create swirling fibrillar spaces called "Verocay nodules." In the Antoni B region, inflammatory exudate, edematous changes, and blood extravasation are observed. Schwannoma is a highly vascularized tumor.

Electron microscopy reveals the distinctive features of Schwann cells, characterized by convoluted cellular extensions without pinocytosis vesicles and surrounded by a continuous basal membrane.

The presence of dystrophy or glandular structures complicates diagnosis, highlighting the importance of immunohistochemical examination. Schwann cells intensely express S100 protein and occasionally glial fibrillary acidic protein (GFAP) [19, 20].

Similar to other schwannoma locations, treatment is exclusively surgical. Wide extracapsular excision of the tumor is recommended. Generally, prognosis is favorable, with no reported recurrences in the literature [21].

Conclusion

Mammary schwannoma is a rare benign tumor. Preoperative diagnosis remains challenging, often mimicking other tumor types, exacerbated by nonspecific imaging findings. Diagnosis is histological, and treatment is exclusively surgical, relying on wide excision.

Competing Interests

The authors declare no conflicts of interest

Authors' Contributions

Mhelheli Riadh, Hafsi Montacer: Data acquisition and interpretation, article writing

Ben Moumen Olfa, Gomri Emna, Hachicha Sarra: Article writing

Ragmoun Houssem: Supervision, critical revision, and correction of the article

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