CASE REPORT

A case of schwannoma in breast: A rare site

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Abstract

Schwannomas are slow growing, benign tumors that develop from Schwann cells of peripheral nerve sheath. Breast schwannomas are exceedingly rare, comprising only 2.6% of all schwannomas. This report describes the case of a woman aged 22, who developed a firm, mobile lump in the right breast, initially diagnosed as fibroadenoma. After excision, histopathology study revealed a well-encapsulated, pale white tumor, microscopically portraying interlacing fascicles of spindle-shaped cells, characteristic Verocay bodies and S100 protein immunopositivity, confirming the diagnosis of schwannoma. This case emphasizes the necessity of factoring breast schwannoma in the diagnostic possibilities of palpable breast masses and the necessity of histopathological confirmation following imaging studies.

Keywords: Breast, Palpable mass, Schwannoma

Introduction

Schwannoma, also known as lemmocytoma, neurinoma or neurilemmoma are usually slow growing benign tumors that emerge from sheath of peripheral nerve [1]. They can emanate from various nerves in the body, but the head, neck, and limbs are where they are most frequently found [2]. Breast schwannomas are incredibly uncommon, making up only 2.6% of all schwannomas, despite the fact that schwannomas can develop in any organ [3]. We detail a case of schwannoma that arose in a 22-year-old woman's right breast.

Case Report

A 22-year old healthy female reported having a lump for five months in her right breast. According to the patient, it was initially small and painless and gradually increased in size. Upon examination, the right breast revealed an oval, moveable nodule with a distinct border, estimated to be 2 by 2 cm in the upper lateral quadrant. A clinical diagnosis of fibroadenoma was made. Ultrasonography revealed a well-defined hypoechoic lesion measuring 1.5×1.3 cm at the same location and an ultrasound diagnosis of likely fibroadenoma was made. She underwent an excisional biopsy, and tissue was sent for histopathology study.

On macroscopy (Figure 1), the nodule measured 1.5×1×0.8 cm with smooth well-encapsulated pale white external appearance. Cut section showed a homogenous pale white solid appearance without slit like spaces. Microscopically (Figure 2) it was an encapsulated tumor tissue comprised of interlacing fascicles of spindle cells arranged in, hypercellular (Antoni A) and hypocellular (Antoni B) areas. Individual cells were spindle shaped having round to oval nucleus, moderate eosinophilic cytoplasm. Few cells were showing clear to vacuolated cytoplasm. Also seen were peripheral palisading of nucleus suggestive of Verocay bodies and few cells showed buckled nucleus. Also noted mild lymphocytic infiltrate, congested

blood vessels and areas of hyalinization. No epithelial component was noted. A differential diagnosis of schwannoma / fibroma was given.

Immunohistochemistry (IHC) (Figure 3) confirmed the diagnosis of schwannoma by showing diffuse intense immunopositivity for S100 protein – a nerve sheath marker. The tumor was negative for markers desmin and smooth muscle actin, ruling out other soft tissue tumors.

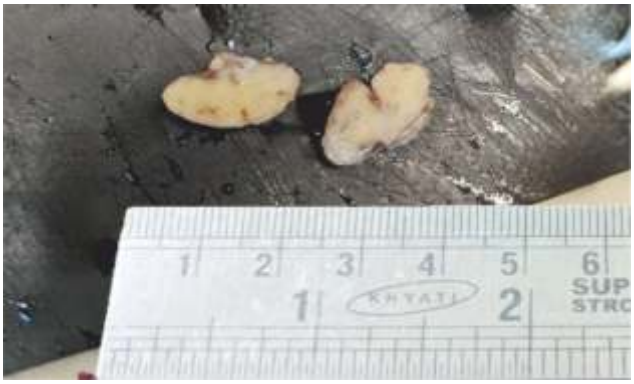

Figure 1: Gross image- A pale white circumscribed encapsulated globular tissue bit measuring 1.5×1×0.5 Cut section- Pale white, solid, homogenous

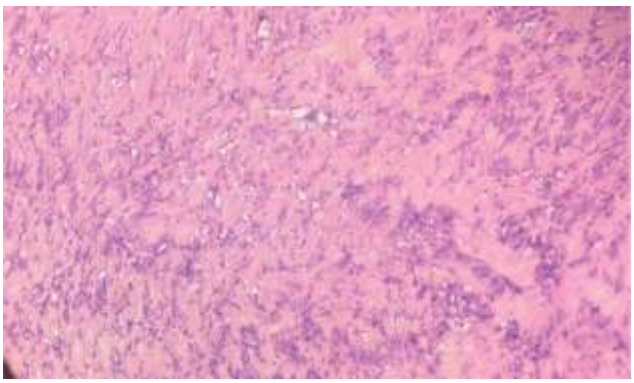

Figure 2: Microscopic image- 100×-H & E: Spindle cell tumor with palisaded arrangement of nuclei (Verocay bodies) typical of schwannoma. Cellular (Antoni A) areas alternate with looser myxoid (Antoni B) areas

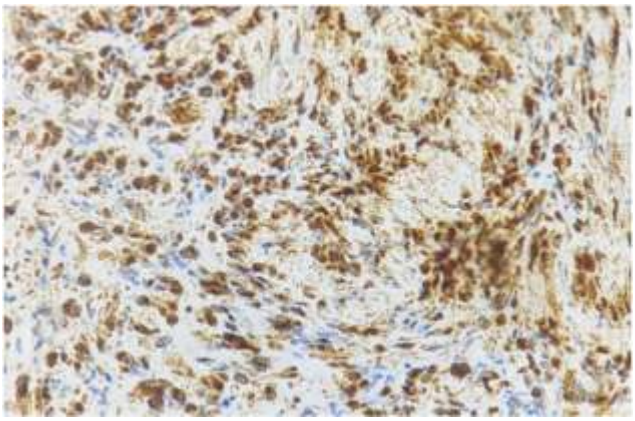

Figure 3: Microscopic image- 200×, - IHC marker- S100 showing diffuse intense cytoplasmic positivity

Discussion

The most common peripheral nerve tumors are schwannomas. Typically, they impact young individuals in their third decade of life. The Schwann cells that form the peripheral nerve's insulating myelin coating are the source of these slowly growing neoplasms. The majority of them are benign tumors that most frequently affect nerves in the head, neck, and extremities. The mediastinum, retroperitoneum, posterior spinal roots and flexor aspects of the limbs are where they are most often found [4]. Uncommonly it may occur in retromolar trigone, infratemporal fossa, parotid gland, maxillary sinus, false vocal cord, external auditory canal, and frontal recess. Collins *et al.* described the first case of schwannoma at the breast location [4]. It is an unusual site that constitutes around 2-3% of all schwannomas, and 0.2% of all tumors of breast [1, 2]. These tumors can occur at all ages; however, they are generally found in those over 40. The size of the tumour is usually less than 5 cm, but it can range from a few millimetres to more than 20 cm [5].

Although 90% of schwannomas occur sporadically, only 3% occur in association with neurofibromatosis type II (NF II). The pathophysiology of these tumors is primarily driven by the loss of merlin function, which can occur due to mutation of the NF-2 gene on chromosome 22 or indirectly through the inactivation of the merlin (schwannomin), a tumor-suppressor gene. In the present case, there were no signs of genetic disorders such as schwannomatosis or NF [6].

As in our case, in ultrasonography, schwannomas are typically encapsulated well defined hypoechoic lesions without calcification. However, the diagnostic modality of choice for these lesions is magnetic resonance imaging [2]. Characteristic degenerative features such cystic development, calcification, hemorrhage, and hyalinization are brought on by the tumor's persistent progression. On mammography, it appears as equally dense round to oval circumscribed nodule without microcalcifications [5]. Additionally, it has been noted that in certain instances, a schwannoma manifests as a poorly defined growth.

A few studies have reported on the diagnosis made with fine-needle aspiration cytology (FNAC) [5, 7]. In our instance, FNAC was not carried out. In FNAC smear, Bellezza *et al.* discovered many clusters of elongated, spindle-shaped cells with nuclei grouped in parallel strands and palisades, and poorly defined cytoplasmic boundaries [5]. Despite this, slide interpretation is quite difficult due to the rarity of the tumour and low cellularity in the aspirate sample.

Histological analysis as in our instance, shows a proliferation of spindle cells grouped in sections that are loose (Antoni B tissue) and dense (Antoni A tissue). There is not much mitotic activity. The size and shape of the nuclei are slightly variable. Visible areas exhibit nuclear palisading (Verocay bodies). The traits matched those of earlier cases that were documented [1, 2, 8, 9].

Schwannomas in the breast are often misdiagnosed as fibroadenomas, phyllodes tumours, mesenchymal neoplasms such as fibrosarcoma, malignant fibrous histiocytoma, leiomyosarcoma, synovial sarcoma, dermatofibrosarcoma protuberans or even malignancies of the breast epithelium [6].

On IHC, schwannomas show diffuse cytoplasmic immunopositivity for S-100 protein and SOX10. GFAP and CD34 shows variable immunoreactivity. S100 protein is often used for confirmation of schwannoma [10].

Conclusion

Despite being uncommon benign neoplasms, breast schwannomas can be challenging to diagnose clinically and radiologically apart from other mammary nodules. Both on clinical examination and imaging, schwannomas may mimic a malignant tumor. To prevent making an incorrect diagnosis based solely on morphological traits, we advise doctors to make the diagnosis of schwannoma only after doing a histological examination. However, there is more specific IHC that can help with a challenging diagnosis. The only effective treatment for breast schwannoma is surgical removal with a good prognosis.

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How to cite this article:
Jawalkar S, Patil V, Raj SS. A case of schwannoma in breast: A rare site. *J Krishna Inst Med Sci Univ* 2024; 13(4):185-188.

Submitted: *23-July-2024* ***Accepted:*** *20-Sep-2024* ***Published:*** *01-October-2024*