Case Report

A Case of Schwannoma of the Breast

Tsuyoshi Maezawa¹⁾, Akira Komatsu¹⁾, Kazuhiko Asanuma¹⁾, Tsuyoshi Notake²⁾,
Yasuo Koike¹⁾ and Shinichi Tsuchiya³⁾

Departments of Breast and Thyroid Surgery¹⁾ and Surgery²⁾, Maezawa Hospital

³⁾Division of Pathology, Iida Hospital

Abstract

We report a rare case of schwannoma of the breast that occurred in a 79-year-old woman who did not have von Recklinghausen's disease. The patient complained of a growing mass and pain in her left breast for more than 6 years. An elastic-hard, smooth, movable tumor measuring 2.5cm × 2.3cm was palpable in the lower inner quadrant of the left breast. Mammography showed a high-density oval lesion with a smooth outline in the lower inner area of the left breast. Ultrasonography of the breast revealed a hypo echogenic, heterogeneous well-defined mass, which led to suspicion of a fibroadenoma or phyllodes tumor. An excisional biopsy was performed, and microscopic examination revealed interlacing bundles of spindle-shaped cells and nuclear palisading. Immunohistochemical staining showed that the tumor cells were diffusely positive for S-100 protein. These findings were compatible with schwannoma. If a tumor has a clear boundary, the possibility of a schwannoma should be kept in mind when making the preoperative diagnosis.

Key words: mammary gland, schwannoma, neurilemmoma

Introduction

Schwannomas are classified among the soft tumors under non-epithelial tumors¹⁾, and their occurrence in the breast region is very rare. We report a case

Fig. 1 Ultrasonography findings in the breast. A well demarcated oval-shaped mass measuring 2.5×2.3×1.8cm was observed in the left B. The interior of the image was heterogeneously hypoechoic. Posterior echo intensity was enhanced (+). Color Doppler revealed blood flow in part of the mass.

of schwannoma arising in the breast together with a discussion based on the literature.

Case Report

Patient: A 79-year-old woman.

History of the present illness: The patient first noticed a mass in her left breast around 2005, and she underwent a thorough examination at another hospital, but it was decided to monitor her course, but the patient herself neglected it. Around December 2010, the patient began to experience persistent pain, and because the tumor had grown larger than before, in February 2011 she was examined at a local hospital. She was then referred to the surgery department of our hospital for the purpose of a thorough examination and treatment.

Present illness: An elastic, somewhat hard, oval,

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Correspondence to: Tsuyoshi Maezawa
Department of Breast and Thyroid Surgery, Maezawa Hospital, 11-5, Uwabuminami Komagane-shi, Nagano 399-4114, Japan

Fig. 2 Mammography findings.

The mass was observed as a well demarcated, high-density, homogeneous image (CC image).

Fig. 3 Plain chest CT scan findings.

A well demarcated mass is seen in region B of the breast.

Fig. 4 Surgical specimen.

The tumor measured 3.3 cm × 2.5 cm. Its surface was covered by a thin capsule, and its cut surface was yellow and solid.

mobile, benign mass measuring approximately 3cm was palpated in region B (lower inner quadrant) of the patient's left breast. Palpation revealed that it was accompanied by tenderness. No abnormal findings were detected in her skin.

Hematological examination findings: There were no abnormal findings in any of the routine biochemical tests, including for tumor markers (CEA, CA15-3, BCA225, and NCC-ST439).

Ultrasonography findings: A clearly demarcated oval-shaped mass measuring 2.5cm × 2.3cm was observed in region B of the left breast. The interior was heterogeneous and hypoechoic, and posterior echo intensity was enhanced. Color Doppler revealed blood flow in part of it (Fig. 1).

Mammography findings: A well demarcated, high-density, homogeneous mass shadow was depicted (Fig. 2).

Chest CT findings (plain): A well demarcated 2-cm tumor was observed region B of the left breast (Fig. 3).

Fine-needle aspiration (FNA) biopsy findings: A protein-like substance and erythrocytes were observed, but it was impossible to collect an epithelial component, and cytology did not lead to a definitive diagnosis. Fibroadenoma, carcinoma in fibroadenoma, a phyllodes tumor in an elderly person, etc., were considered possible preoperative diagnoses, and the tumor was excised under local anesthesia.

Surgical findings: The tumor was located in adipose tissue. When it was moved during the tumor excision maneuvers, the patient experienced pain, and after it was excised the pain resolved.

Findings in the surgical specimen: The mass measured 3.3cm × 2.5cm, and its surface was covered by a thin capsule. The cut surface was yellow

Fig. 5 Histopathological findings.

- a) It was an encapsulated tumorous lesion, and growth of spindle-shaped cells accompanied by palisading was observed. H.E. $\times 200$
 b) S-11 protein staining was intensely positive. S-100 immunostain $\times 200$

a|b

and solid (Fig. 4).

Histopathological findings: It was an encapsulated tumorous lesion, and spindle cell proliferation with palisading was observed. Immunostaining revealed that the tumor cells were diffusely strongly positive for S-100 protein. Based on these findings a diagnosis of benign schwannoma arising in the breast region was made (Fig. 5).

Discussion

Schwannomas are benign tumors that originate in the Schwann cells that form the myelin sheaths of peripheral nerves, and their most common sites of occurrence are the neck, mediastinum, spinal nerve roots, and cerebellopontine angle. The incidence of schwannomas in males and females is almost the same, and they are more common in adults. Schwannomas rarely arise in the breast. It has been reported that schwannomas of the breast account for approximately 2-3% of all schwannomas, and that 0.2% of all breast tumors are schwannomas²⁾. A disease that should be ruled out in describing this case is von Recklinghausen's disease³⁾, an autosomal dominant hereditary disease in which schwannomas are observed along the course of subcutaneous peripheral nerves. Melanin pigment deposition is seen in the skin, and coffee-color macules called café-au-lait spots develop throughout the body. Since none of the above findings was present in our patient, there was no family history, and no clear evidence of tumors was observed in the brain or spinal cord system on the diagnostic images, it was possible to rule out von Recklinghausen's dis-

ease.

Schwannoma of the breast was first reported by Collins et al.⁴⁾, and as far as we were able to determine in a search of the literature, there have been very few cases of schwannoma developing in the breast region in Japan, with only 10 cases, including our own, ever having been reported in the country^{2,5-9)}. Ages have ranged from 18 to 82 years (mean: 54.4 years), and the most common site of origin has been the upper outer quadrant. There have been 3 cases, including our own, in the lower inner quadrant. There have been many reports of a preoperative diagnosis of fibroadenoma based on a combination of diagnostic imaging, etc., being made in many cases. The case reported by Tohnosu et al. has been the only case in which it was possible to make a definitive diagnosis of schwannoma preoperatively⁵⁾, and they reported that the diagnostic method was FNA biopsy and that diagnosis was possible because the cells contained a large amount of cytoplasm and exhibited a palisading pattern. Tetsuhara et al.¹⁰⁾ describe Antoni A schwannomas as characterized by tumor cells that are spindle-shaped, exhibit little atypia, grow in a fascicular manner, mainly course in an intricate manner, and exhibit a whorled pattern, and by nuclei that exhibit palisading in a horizontal row. Also, patterns in which fibril-like cytoplasm is interposed between palisade arrays are called Verocay bodies, and are said to be one of the characteristics of schwannomas. In Antoni B schwannomas a pattern in which a sheet-like layer spreads out like the spokes of wheel at the margin of cell aggregates is observed, and it ap-

pears to be a cell pattern that suggests its presence.

Because it was also impossible to make a diagnosis preoperatively in our own case, the mass was excised for the purpose of making a definitive diagnosis.

When examined by diagnostic imaging, schwannomas are often depicted by mammography as a well demarcated homogeneously dense mass, but it would be hard to describe that as the characteristic picture of schwannomas. In ultrasonography examinations schwannomas are depicted as well demarcated masses, but sometimes the internal echo is homogenous and at other times it is heterogeneous. The difference is said to be related to the fact that in Antoni A schwannomas spindle-shaped cells grow in palisade-like arrangements, whereas cells are sparse in Antoni B schwannomas. In Antoni A the interior appears homogeneously hypoechoic because of the palisade arrangement, which is its histological characteristic, and the tumors tend to be diagnosed as adenofibroma, solid ductal carcinoma, etc. In mixtures of Antoni A and Antoni B the internal echo is often depicted as heterogeneous due to various types of degeneration, including cysts and vascular lesions, and it becomes even more difficult to make the differential diagnosis from a phyllodes tumor and breast cancer (solid ductal carcinoma, intracystic carcinoma, etc).

It is recommended that a needle biopsy or Mammotome® biopsy be performed to make a definitive diagnosis, or that an excisional biopsy be performed for the purpose of treatment.

Immunohistochemically, schwannomas stain diffusely and intensely positive for S-100 protein, and staining is useful for making the diagnosis. It is also useful for making the differential diagnosis from fibroadenoma, phyllodes tumor, and carcinoma of the breast.

If the tumor is histopathologically diagnosed benign as with in our own case, we think that treatment can consist of total excision of the tumor. However, malignant schwannoma of the breast 5 cases have been in the English literature was able

to search¹¹⁻¹⁵⁾, they have selected the radical excision. Because of the high risk of local recurrence recommend total mastectomy. The main site of distant metastasis is the lung, followed by the liver and bone.

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