Clinical Case Report

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Ultrasonographic manifestations of a rare granular cell tumor of the accessory breast

A case report

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Abstract

Rationale: The ultrasound manifestations of granular cell tumor (GCT) is a consequence of the histopathological characteristic of the tumor and can be distinguished from breast cancer.

Patient concerns: A GCT is a rare, benign, hyperplasia-based lesion. Approximately 1% to 2% of GCTs are malignant. About 5% to15% of the cases occur in the breast, and it is relatively rare in the axillary accessory breast. There are no effective preventive measures for GCTs, early detection combined with a thorough and wide complete resection of the tumor remains the best treatment for a favorable outcome.

Diagnoses: A 45-year-old female patient with an axillary mass of more than 3 months duration was examined through physical examination, color Doppler ultrasound and postoperative pathology.

Interventions: A provisional diagnosis of left axillary lymph node enlargement was made and necessary investigations were advised.

Outcomes: A differential diagnosis of accessory breast in the left arm pit, possibly malignant, or a solid mass in the left arm pit secondary to chronic inflammation. Postoperative pathology: GCT of axillary accessory breast, with tumor-free margins. Immunohistochemical staining showed strong S-100 positivity, CD68 positivity, and negative periodic acid-Schiff staining.

Lessons: The ultrasound examination can detect GCT mass in the breast/accessory breast and is not easy to misdiagnosis.

Abbreviations: CDFI = color Doppler flow imaging, GCT = granular cell tumor.

Keywords: accessory breast, blood flow signals, granulosa cell tumor, low and homogeneous internal echo, ultrasound

1. Introduction

A granular cell tumor (GCT) is a rare, benign, hyperplasia-based lesion. The disease was first reported in 1926 by Abrkossoff, which was thought as a myogenic tumor.[1] In recent years, immunohistochemistry has confirmed that GCTs belong to nerve tissue-derived soft tissue tumors. Current opinion regards GCTs to originate from the Schwann cells of nerve sheath.

2. Case report

A 45-year-old female patient was admitted to our hospital with "an axillary mass of more than 3 months duration." Physical examination of the lump in the left armpit was found to be about 2 cm in diameter, hard on palpation, with undefined borders, poor mobility, and mild tenderness. A provisional diagnosis of left axillary lymph node enlargement was made and necessary investigations were advised.

Color Doppler ultrasound revealed echo of a mammary gland-like structure visible on the left armpit with a size of about 18 mm × 13 mm hypoechoic group in its center with blurred boundaries, a homogeneous internal echo, and a significantly attenuated rear echo (Fig. 1). In addition, color Doppler flow

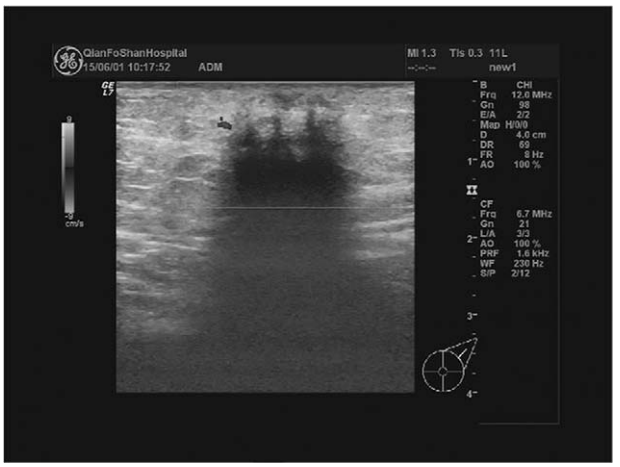

Figure 1. Ultrasound demonstrated a 18 mm×13 mm mass, hypoechoic group in its center with blurred boundaries, a homogeneous internal echo, and a significantly attenuated rear echo.

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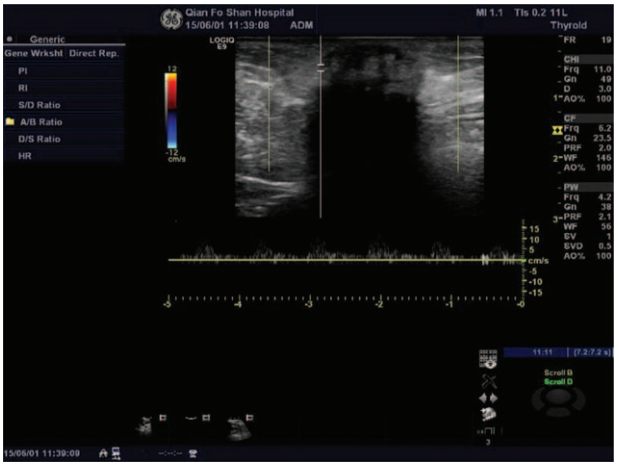

Figure 2. CDFI showing arterial blood flow signals at the edge of the hypoechoic group. CDFI = color Doppler flow imaging, GCT = granular cell tumor.

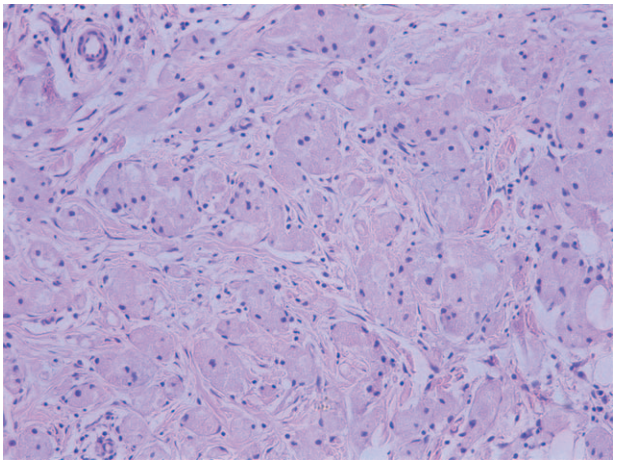

Figure 4. Polygonal cell nests divided by fibrous tissue typical for GCT. GCT = granular cell tumor.

imaging (CDFI) showed a small number of arterial blood flow signals at the edge of the hypoechoic group (Fig. 2). Ultrasound report suggested a differential diagnosis of accessory breast in the left arm pit, possibly malignant, or a solid mass in the left arm pit secondary to chronic inflammation. Surgical excision of the mass was advised, and a wide left axillary mass resection was performed. Intraoperatively, an axillary mass of $3.5 \times 3 \times 2.5$ cm was resected with an uneven surface interspersed with fat. The cross section showed the mass itself was $2 \times 2 \times 1.5$ cm, grayish white and of a hard texture (Fig. 3). Rapid frozen section pathology confirmed a hyperplastic fibrous tissue (axillary mass) with visible granulocyte-like cells and chronic inflammatory cell infiltration, which were consistent with GCT that needed further paraffin routine investigation. Postoperative pathology reported GCT of axillary accessory breast (Fig. 4), with tumor-free margins. Immunohistochemical staining showed strong S-100 positivity, CD68 positivity, and negative periodic acid-Schiff staining. The study was approved by the Institute Research Ethic Committee of Shandong Provincial Qianfoshan hospital.

Figure 3. Gross pathology of the left armpit mass.

3. Discussion

A GCT usually occurs in adults (male-to-female ratio of 1:3); about 90% cases appear as single tumors, which could occur in different parts of the body that contain nerve tissue. Approximately 1% to 2% of GCTs are malignant,[2] showing rapid growth of the nodules and frequent ulcers, with a wide range of adjacent tissue involvement and lymph node metastasis. About 5% to15% of the cases occur in the breast, and it is relatively rare in the axillary accessory breast. As there are no effective preventive measures for GCTs, early detection combined with a thorough and wide complete resection of the tumor remains the best treatment for a favorable outcome.

The clinical symptoms and ultrasound images of breast GCTs lack specificity and can easily be confused with accessory breast/breast malignant tumors.[3] Ultrasound images of GCTs show irregular low echo mass with blurred edges and can be misdiagnosed as a malignancy. A GCT contains a large number of slender fiber separations and significant attenuation of the rear echo, which is similar to accessory breast/breast cancer, making it is difficult to differentiate between the 2 conditions. However, an experienced doctor can still make out the differences in the ultrasound after careful analysis.

The ultrasound manifestations of GCT is a consequence of the histopathological characteristic of the tumor and can be distinguished from breast cancer by the following aspects: (1) A GCT displays a combination of infiltrative growth of the tumor tissue and normal tissue that constitutes a complex high-impedance interface on imaging producing irregular and nonencapsulated edges with increased and blurred peripheral echoes. This is similar to the ultrasonogram in breast cancer, but a GCT will not exhibit edema in the edges of the tumor in the ultrasound, and (2) the cell morphology of GCT is consistent with an intensive and even arrangement, which shows very low and homogeneous internal echo in the ultrasound.[4] In contrast, the cell size, shape, and rapid growth rate of breast cancer is inconsistent, and will often show areas of liquefaction necrosis and microcalcifications.

It may be added that because of the internal and rear echo attenuation in GCTs, the CDFI cannot probe within the tumor and blood flow signals. The internal blood flow signals appearing

on CDFI need to be further evaluated. Current ultrasound literature results show that there are only a small amount of blood flow signals on the edge of the tumor.

In summary, the ultrasound examination can detect GCT mass in the breast/accessory breast and is not easy to misdiagnosis. Simultaneously by understanding its pathological basis of the characteristics, being familiar with its ultrasound performance, and careful analysis, is relatively effective identification of GCT tumor and breast/accessory breast Ca.

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