Mammography, Ultrasonography and Sonoelastography Findings of Granular Cell Tumor in Accessory Axillary Breast

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ABSTRACT

The main objective of breast imaging is to detect and differentiate benign lesions from malignant ones with higher accuracy rates. Recent studies have reported that sonoelastography (SE) is helpful for distinguishing benign and malignant solid breast masses and shows higher specificity than B-mode ultrasound (US) alone. Granular cell tumors are rare stromal tumors. While mammographically, they appear to be indistinctly marginated asymmetric density, sonographically the lesion generally shows acoustic shadowing and an irregular shape. In our case, in addition to mammography and US findings, we evaluated SE findings as well. The elasticity value and elasticity ratio showed similarity with malignant masses; therefore, we conclude that SE has no additional contribution to diagnosis of these lesions.

Keywords: Elastography, sonoelastography, granular cell tumor

INTRODUCTION

Granular cell tumor was first defined as "myoblastic myoma" by Abrikosoff in 1926 (1). It is called granular cell tumor because tumor cells include eosinophilic granules and that it originates from Schwann cells and not muscle cells. Approximately 5%–6% of all granular cell tumors develop in the breast (2, 3). Of these, 99% are benign. However, they are first evaluated as malignant masses because the imaging findings indicate malignant lesions.

CASE PRESENTATION

A 45-year-old female patient, who had no complaints or remarkable physical examination findings, was referred to the breast imaging unit for routine annual mammography screening. It was learned that she had two children and that she breastfed them for a short time (6 months on average). She had no familial history of breast cancer. Her mammograms revealed increased density in the right axillary region, which was mildly asymmetric, compared with the left region, but no apparent mass formation was detected. In the spot compression view of this area, the asymmetric density was not observed. Ultrasonography (US) (Logiq E9; General Electric Healthcare, United States) examination that was performed on the same day demonstrated a hypoechoic 7×5.5 mm irregular-margined mass having an intense posterior shade and a thick hyperechogenic halo surrounding it in the right axillary breast tissue (Figure 1). Immediately after the B-mode examination, sonoelastography (SE) was performed with the same probe (15 MHz). By holding the probe vertically to the chest wall, compression and decompression were performed with mild pressures. The obtained SE images were recorded in the digital media as a color map. According to the elastography software, the color red shows soft tissues, the color green shows moderately stiff tissues, and the color blue shows stiff tissues (4). In our case, because the mass was coded blue in the SE images, it was evaluated to be stiff. The region of interest (ROI) tool, which was to be measured, was inserted in the mass and in the neighboring fat tissue, and the elasticity value and rate were determined. After the analysis of the images, the elasticity value of the mass was measured to be 5.7, the elasticity value of the neighboring fat tissue to be 1.4, and the elasticity ratio of the mass to the neighboring fat tissue to be 7 on an average (Figure 2). Because the SE characteristics of the mass met the criteria of malignancy, it was evaluated as BI-RADS 4b, and histopathological verification was recommended.

Before biopsy, the patient was informed about the procedure, and her informed consent was obtained. A tissue sample was taken from the lesion with fully automatic 14-gauge-thick needle (Bard Biopsy Systems, Tempe, AZ). The mass, which was reported as a granular cell tumor according to the biopsy results, was excised through open surgery after obtaining consent from the patient, and the diagnosis was confirmed after excision (Figure 3).

DISCUSSION

Granular cell tumors are stromal tumors derived from Schwann cells. They are more frequently observed in women aged be-

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tween 30 and 50 years. They peak in the fourth decade. They can also be encountered in men and in postmenopausal women (5).

Granular cell tumors generally emerge as a palpable, painless, and stiff mass or as a mass with an irregular margin on mammographs. Because the cutaneous sensory branches of the supraclavicular nerve are included in the upper inner quadrant of the breast, they are mostly observed in this region (6).

Granular cell tumors consist of a combination of fusiform cells, which include eosinophilic granules, as a bundle. There is an intense fibrous tissue among fusiform cells. Tumor cells infiltrate the neighboring tissues and involve the ducts and lobules (5). Granular cell tumors in the breast are not premalignant, and they do not cause a relatively increased risk of breast cancer (5).

In mammography, similar to breast cancer, they can be viewed as masses with unclear margins or with spicular extensions. Microcalcification does not accompany. In US, they are generally seen as elliptical masses with irregular margins. Because tumors have an intense fibrous structure, they absorb sound waves and cause an intense posterior shade. Moreover, an anisotropic effect is observed. Because of the internal fibrillary structure of these tumors, when sound waves arrive at these fibrils at a 90° angle of incidence, the lesion appears isoechoic or hyperechoic. When the waves arrive at an oblique angle, the lesion is observed as hypoechoic. Granular cell tumor is the only lesion in which anisotropy emerges in the breast on US (5). However, because the size of lesion was smaller than 1 cm in our case, its anisotropy feature could not be exactly evaluated probably due to its small size.

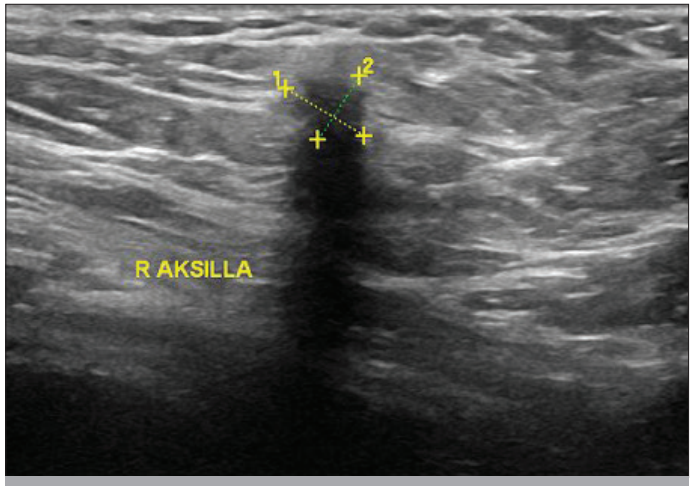

Figure 1. Ultrasonography image of the hypoechoic solid mass with intense posterior shade in the right axillary region of the accessory breast tissue.

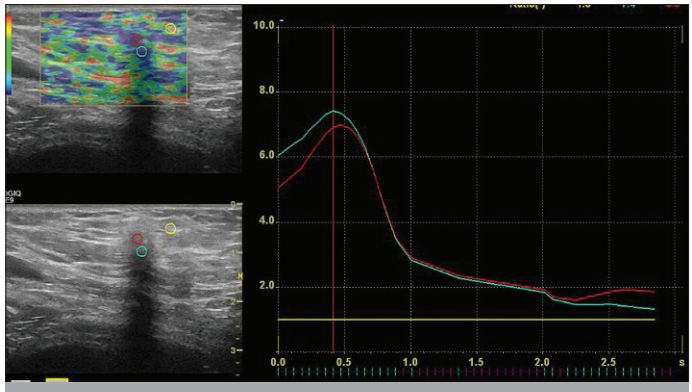

Figure 2. In the elastography examination performed with the probe compression technique, the mass/fat tissue ratio was found to be 7 on an average.

SE is an US technique developed based on the principle that malignant tissues are felt as stiff masses with palpation but benign lesions are felt as soft masses. Its main principle is based on the fact that stiff tissues in the breast change place less frequently compared with soft tissues with the compression of sound waves. There are two main methods for obtaining SE images: *strain* and *shear wave*. In our case, we obtained SE images by performing compression for about 3 seconds with a probe, which is the *strain* elastography method. The stiffness of tissue is predicted by determining its rate of changing place through compression, and this helps to diagnose breast cancer. Although it differs depending on the devices, bluish tones encode stiff tissues and reddish tones encode soft tissues in the device that is used. The ROI tool, which will be measured, is inserted in the mass and in the neighboring fat tissue, and elasticity rates are determined. In previous studies, elasticity scores have been reported to be 4.2 on average for malignant masses and 2.1 on average for benign masses (7, 8). As observed in case reports describing SE features of a granular cell tumor in the literature (9), elasticity values were found to be high in favor of a stiff (malignant) mass in our case. In other words, the elasticity rate of the mass was 7 in our case, which was consistent with that of a malignant mass. The reason for the high elasticity value similar to that of malignant masses is explained by the content of intense fibrous tissue in the lesion.

CONCLUSION

SE is an easily applied technique that has been frequently used in recent years and is considered to contribute to the differentiation of benign and malignant tumors. The mammography and US findings of granular cell tumors, which rarely develop in the breast, mimic those of malignant masses. In our case, SE values

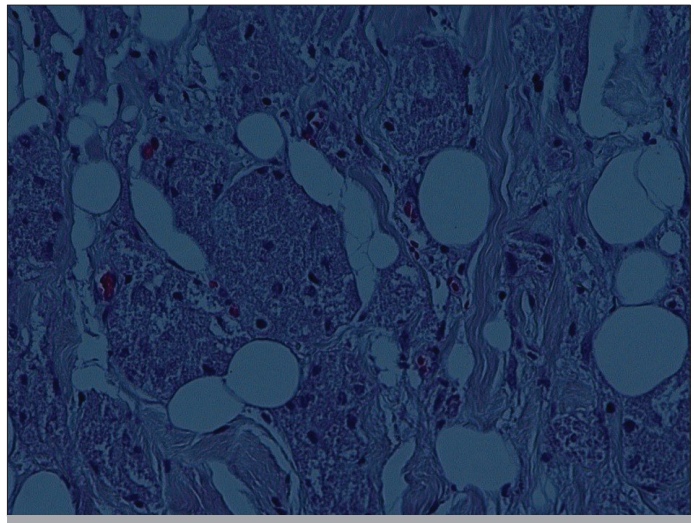

Figure 3. Pathological findings (H&E 20×). Cells with small ovoid nucleus and large granular cytoplasm are observed in the accessory breast tissue.

also mimicked those of a malignant mass. As this and similar cases emerge, whether or not SE, which has come into use in the breast, will display significant difference in the evaluation of masses will be determined better.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

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