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Giant juvenile fibroadenoma in a 14-year old Chinese female: A case report

Wang J *et al*. GJF: A case report

Abstract

BACKGROUND

A giant juvenile fibroadenoma (GJF) is a rare, benign breast tumor that affects females < 18 years of age. GJFs are generally suspected based on a palpable mass. GJFs influence breast shape and mammary gland development *via* the pressure effect from their enormous size.

CASE SUMMARY

Herein we report a case involving a 14-year-old Chinese female with a GJF in the left breast. GJF is a rare, benign breast tumor that usually occurs between 9 and 18 years of age and accounts for 0.5%-4.0% of all fibroadenomas. In severe cases, breast deformation may occur. This disease is rarely reported in Chinese people and has a high clinical misdiagnosis rate due to the absence of specific imaging features. On 25 July 2022 a patient with a GJF was admitted to the First Affiliated Hospital of Dali University. The preoperative clinical examination and conventional ultrasound diagnosis needed further clarification. The mass was shown to be an atypical lobulated mass during the operation and confirmed to be a GJF based on pathologic examination.

CONCLUSION

GJF is also a rare, benign breast tumor in Chinese women. Evaluation of such masses consists of a physical examination, radiography, ultrasonography, computer tomography, and magnetic resonance imaging. GJFs are confirmed by histopathologic examination. Mastectomy is not selected when the patient benefits from a complete resection of the mass with breast reconstruction and an uneventful recovery.

Key Words: Giant juvenile fibroadenoma; Fibroadenoma; Breast tumor; Ultrasonography; Case report

Wang J, Zhang DD, Cheng JM, Chen HY, Yang RJ. Giant juvenile fibroadenoma in a 14-year old Chinese female: A case report. *World J Clin Cases* 2023; In press

Core Tip: Giant juvenile fibroadenoma (GJF) is a rare benign breast tumor below 18 years of age and can be suspected mainly through palpable masses in clinical practice. Breast ultrasonography shows left masses > 5 cm with benign features (Breast Imaging Reporting and Data System score 3) through the preferred examination for breast imaging in this GJF case. The breast mass of GJF patients in this report showed a lobulated shape and many lobular ducts. Therefore, it is necessary to differentiate GJF from phosphotyrosine binding by histopathology. Clinicians should be aware of this diagnosis for a better approach and early conservative treatment instead of blindly performing mastectomy.

INTRODUCTION

A fibroadenoma (FA) is characterized by aberrant proliferation of epithelial and mesenchymal elements, and is the most common benign lesion of the breast in females < 30 years of age[1]. FAs are mostly solitary and can be unilateral or bilateral, with 10%-20% occurring in multiple fashions[1] and divided into adult- and juvenile-types[1,2]. A giant fibroadenoma (GFA) is a specific type of FA that weighs > 500 g, measures > 50 mm in diameter, or is disproportionally large compared with the rest of the breast[2]. The exact etiology of GFA is unknown[2]; however, unopposed estrogen stimulation, increased estrogen receptor sensitivity, or diminished estrogen antagonist sensitivity are thought to be the chief causative factors[1]. FAs are commonly detected incidentally during routine physical examination, ultrasound, magnetic resonance imaging (MRI), and computed tomography (CT), and are diagnosed based on pathologic evaluation. Gene detection and artificial intelligence have been shown to have high prediction accuracy, sensitivity, and specificity in the differential diagnosis of large breast masses[3,4].

CASE PRESENTATION

Chief complaints

On 25 July 2022, a 14-year-old girl was hospitalized in the Department of Thyroid and Breast Surgery of The First Affiliated Hospital of Dali University (China), for evaluation of a giant left breast mass, which had been developing for nearly 6 mo without an apparent cause. Indeed, the mass had enlarged from the initial size of a mung bean to the current size of a hen's egg.

History of present illness

The patient had normal menstruation in the past. She denied any family history of breast masses.

History of past illness

The patient had no history of any other illness.

Personal and family history

The patient denied any history of chest disease, irradiation or estrogen supplementation. There was no family history of breast or ovarian cancer.

Physical examination

The physical examination revealed a 100.0 mm × 40.0 mm mass on the left breast with an unclear border, tough texture, poor mobility, and tenderness. There was no skin erythema, surgical scars, or nipple depression involving the affected breast. The right breast and both axillae were normal. In addition, there were no abnormalities on the biological examination.

Laboratory examinations

There were no abnormalities on routine blood testing, blood biochemistry, blood coagulation function, or routine stool and urine testing.

Imaging examinations

Breast ultrasonography (BUSG) (Toshiba Aplio 500© with a 7.5-MHz probe) of the patient's left breast showed a large hypoechoic solid lesion (110.4 mm × 41.6 mm in size), which had an oval shape, clear boundaries, horizontal growth, and even distribution. A few irregular liquid dark areas were noted in the breast mass without obvious calcifications and no enlarged lymph nodes in the bilateral axillae (Figure 1A). A color Doppler examination revealed few punctate flow signals at the edge of the breast mass (Figure 1B). The lesion was classified as Breast Imaging Reporting and Data System (BI-RADS) category 3.

FINAL DIAGNOSIS

A tru-cut biopsy of frozen sections was reported as a juvenile fibroadenoma (JFA), which was characterized by small oval gland ducts and interstitial collagen fibers (Figure 2).

TREATMENT

On 27 July 2022, the patient successfully underwent a simple surgical excision under general anesthesia. The excised lump was smooth, mobile, lobulated, and 100 mm × 90 mm × 50 mm in size (Figure 2). Because she benefited from a complete resection of the mass with breast reconstruction and recovered uneventfully, a mastectomy was not indicated.

OUTCOME AND FOLLOW-UP

The breast development of the patient was restored to normal. Three months after surgery, her routine outpatient follow-up BUSG evaluation was normal.

DISCUSSION

FAs are the most common benign tumors in adolescent women. FAs commonly present in late adolescence and comprise 91% of all histologically-evaluated solid breast masses among patients < 19 years of age based on a radiologic study[8]. Among women with FAs, only 15% have 2-4 masses in one breast, and only 11% have bilateral masses[9]. According to the size and histologic features, adolescent breast masses usually include six types: Simple, complex, multiple, giant, juvenile FAs, and phosphotyrosine binding[7,10,11]. While simple FAs of the breast are the most common lesion, giant juvenile fibroadenomas (GJFs) are a very rare variant with an incidence of 0.5%-2.0%, representing 7%-8% of all FA subtypes, and the most common cause of unilateral gigantomastia in young female patients[7]. In fact, GFAs in patients between 10 and 18 years of age are defined as JFAs, eventually becoming GFAs due to rapid growth[12].

Fibroepithelial breast tumors are biphasic neoplasms formed by an organoid pattern of ductal structures with a striking stromal appearance composed of extensive vascular proliferation, including common FAs and rare phyllodes tumors[13,14]. The FA stroma is usually of low cellularity, with myxoid, fibroblastic, or hyalinized appearances, displaying an interlacing fascicular arrangement of fibroblasts and myofibroblasts with a peri-canalicular pattern[8]. The epithelial proliferation may disclose gynecomastia features with fine filigree-like narrow micropapillary epithelial protrusions[8]. Phyllodes tumors, neoplasms with the potential for recurrence, show an exaggerated intracanalicular growth pattern with broad stromal fronded architecture and stromal hypercellularity[13]. Although the breast mass of the patient in this report had a lobulated shape and a large number of lobular ducts, the histopathologic report was not a phyllodes tumor, thus more longitudinal follow-up is required.

Imaging plays an important role in diagnosing and differentiating GJFs, and a histopathologic exam is used to define the diagnosis further. In a retrospective analysis of 52 articles (n = 153 patients), most patients (86%) presented with a single breast mass[15]. Imaging modalities included BUSG in 72.5% of the patients and mammography (MMG) in 26.1% of the patients[15]. A tissue diagnosis was obtained using a core-needle biopsy in 18.3% of the patients, fine-needle aspiration (FNA) in

25.5% of the patients, and excisional biopsy in 11.1% of the patients[15]. BUSG and MMG are two basic techniques for routine imaging in diagnosing breast diseases, such as FAs, phyllodes tumors, hamartomas, cysts, hematomas, abscesses, and carcinomas, which are difficult to distinguish clinically based on interview, clinical manifestations, and physical examination. The accuracy of MMG is reduced because of the high density of glandular tissue in adolescent breasts[16], thus MMG is not recommended[7]. If it is not feasible to establish the diagnosis of a JFA clinically, further studies are necessary (BUSG and FNA)[16]. BUSG is the main diagnostic examination in children and adolescents associated with a breast MRI[7]. The 7.5-MHz probe used in this study is commonly recommended in classic textbooks. Sonographic imaging of the breasts with a 7.5-MHz probe achieved a sensitivity of 83% and an net present value of 84%. The same concept applies to Doppler scanning[17]. A high-frequency (20-30 MHz) probe was used in a targeted manner to image breasts in prospective studies. High-quality scans were obtained with optimal spatial resolution and anatomic detail[17]. The typical appearance of a GJF on BUSG is the presence of well-circumscribed round or oval-shaped masses, sometimes lobulated, with a parallel orientation, fairly uniform hypoechoic or anechoic areas with low-level internal echoes, and sometimes with a posterior acoustic enhancement[7]. A GJF on Doppler evaluation can be avascular or show some central vascularity[7]. The diagnosis and treatment of GJFs are heterogeneous. The most common diagnostic modalities include a core needle or excisional biopsy, and the mainstay of treatment is complete excision with an emphasis on preserving the developing breast parenchyma and nipple-areolar complex[15]. Women with BI-RADS category 3 or less breast lesions have a low risk of malignancy, in which case an FNA would reduce the excisional biopsy rate[18]. In the treatment of our patient, although the mass was removed directly without an FNA, it was confirmed by BUSG and verified by pathologic evaluation.

CONCLUSION

GJFs are benign tumors that can influence breast shape and mammary gland development through a pressure effect due to the enormous size of the mass. GJFs usually require surgical resection of the mass to offer a complete cure and acceptable cosmetic results. In this case report, the breast ultrasound provided a preoperative diagnostic basis for surgical treatment, while the postoperative histopathologic diagnosis avoided an unnecessary mastectomy.

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