Print ISSN: 2321-6379
Online ISSN: 2321-595X

Case Report

Giant Complex Fibroadenoma Mimicking Breast Carcinoma: A Clinical Deception

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Abstract

Fibroadenoma (FA) is a benign, solid breast tumor commonly found in young women. When a FA presents with additional features such as cysts larger than 3 mm, epithelial calcifications, sclerosing adenosis, or papillary apocrine metaplasia, it is classified as a complex FA. Giant FAs, defined as those exceeding 5 cm in size or weighing over 500 g, are rare and often associated with hormonal changes like pregnancy or lactation due to their hormone-sensitive nature. This report presents a case of an 18-year-old woman with a large bilateral breast masses that initially appeared to be breast carcinoma both clinically and on gross examination. The sizable mass, with its characteristics suggesting malignancy, was further evaluated through microscopic analysis. The histopathological examination revealed it to be a giant complex FA. The tumor exhibited all typical features of a complex FA, including large cysts, epithelial calcifications, and sclerosing adenosis, confirming the benign nature of the mass. This case highlights the challenge of distinguishing giant complex FAs from malignant breast conditions, emphasizing the need for comprehensive clinical, radiological, and pathological evaluation to ensure accurate diagnosis and appropriate management.

Key words: Breast carcinoma, Breast fibroadenoma, Breast, Complex fibroadenoma, Giant fibroadenoma

INTRODUCTION

Fibroadenomas (FAs) are the most common benign breast tumors, particularly prevalent in women under 30 years of age. They are solid, non-cancerous growths made up of both glandular and stromal (connective) tissue. These tumors typically present as painless, movable lumps within the breast, and their size may fluctuate with the menstrual cycle. The etiology of FAs is not entirely understood, but hormonal influences, particularly estrogen, are thought to play a significant role in their development. FAs are generally diagnosed through a combination of physical examination, imaging techniques such as ultrasound or mammography, and sometimes biopsy to confirm their benign nature.[1]

Complex FAs are a variant of FAs, distinguished by the presence of additional histological features such as sclerosing adenosis, epithelial calcifications, or cystic changes. These features are typically identified through microscopic examination of the excised tissue. Although both FAs and complex FAs are benign, complex FAs are associated with a slightly higher risk of subsequent breast cancer compared to simple FAs. This increased risk is relatively modest but underscores the importance of careful monitoring and, in some cases, surgical removal, especially in women with other risk factors for breast cancer.[2]

The management of FAs and complex FAs largely depends on factors such as the size of the tumor, symptoms, patient age, and individual risk factors for breast cancer. Many FAs may not require treatment and can be monitored over time, while others, particularly complex FAs, might necessitate surgical excision to rule out malignancy and alleviate patient concern.[3]

CASE PRESENTATION

An 18-year-old female presents with 2-year history of painless lumps in both breasts. The left breast lump, initially 2 × 1 cm, progressed to 6 × 5 cm, while a simultaneous right breast lump grew to 13 × 10 cm (Figure 1). The patient

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IJSS
www.ijss-sn.com

Month of Submission : 09-2024
Month of Peer Review : 10-2024
Month of Acceptance : 11-2024
Month of Publishing : 11-2024

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has no associated systemic symptoms, such as fever, nipple discharge, weight loss, or loss of appetite. Past medical history is unremarkable, except for excision and biopsy of bilateral breast lumps 2-years-ago reports were not available. On examination, both breasts are asymmetrical with palpable, non-fixed, non-fluctuant lumps. The left breast lump is 8 × 8 cm, and the right is 13 × 10 cm, with hyperpigmentation and crusting noted.

Axillary lymphadenopathy was not noted; however, another 3x3cms solitary swelling was noted in the left axilla. Firm in consistency and freely mobile to The axillary swelling was firm in consistency and freely mobile. Tru-cut biopsy showed tiny tissue bits, depicting adenosis, fibro-adipose tissue. Tru-cut biopsy showed to The tru- cut biopsy of the breast lumps showed tiny tissue bits, depicting adenosis, fibro-adipose tissue. Furthermore, noted were tiny foci of spindle cells arranged loosely amidst parenchyma. No evidence of atypia is evident on the sections.

Complete surgical excision of both breast lumps and left axillary swelling was done and sent for histopathological examination (Figure 2).

Lumpectomy of the right breast revealed a 13 × 11.5 × 7 cm globular mass with multiple grey-white nodules, the largest being 4 × 2.5 × 2 cm. The left breast specimen measured 13 × 11.5 × 11 cm with similar grey-white lesions. A left axillary specimen showed multiple grey-white nodules, the largest being 2.5 × 2 × 1 cm (Figures 3 and 4).

Figure 1: Pre-operative of the large lesions involving both breasts

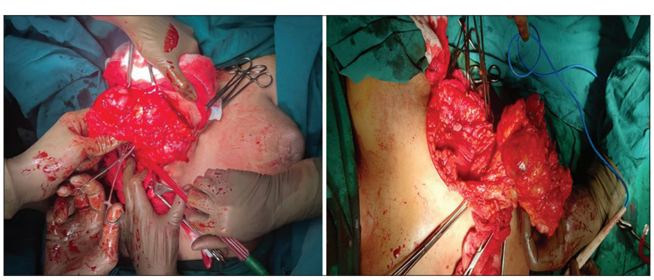

Figure 2: Intraoperative image of the right breast

Microscopic examination revealed multiple fibroepithelial lesions with ductal cells in canalicular and peri-canalicular patterns, surrounded by sclerosed stroma. Some ducts exhibited epithelial hyperplasia without atypia, and apocrine metaplasia was noted. The features suggest complex FA of bilateral breasts and the left accessory breast, with no evidence of malignancy (Figures 5 and 6).

The initial differential diagnosis included mucinous carcinoma or malignant phyllodes tumor. However, histopathological analysis revealed a proliferation of epithelial and stromal components, with some cystic ductal dilatation and areas of apocrine changes. In addition, certain sections exhibited sclerosing adenosis, microcalcification foci, and stromal hyalinization, along with apocrine metaplasia. At places, stromal cellular hyperplasia along with a few entrapped

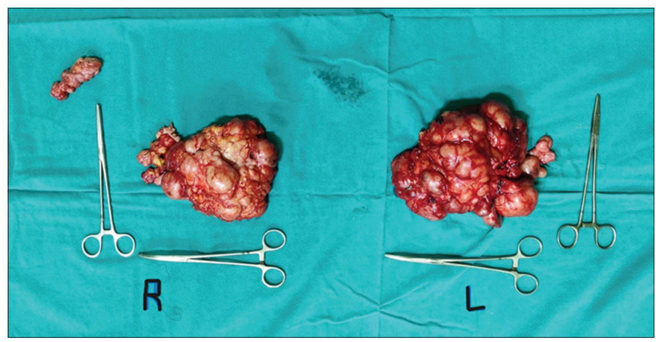

Figure 3: Gross specimen of right and left breast after excision: Large, bosselated mass with the presence of multiple nodules on the external surface

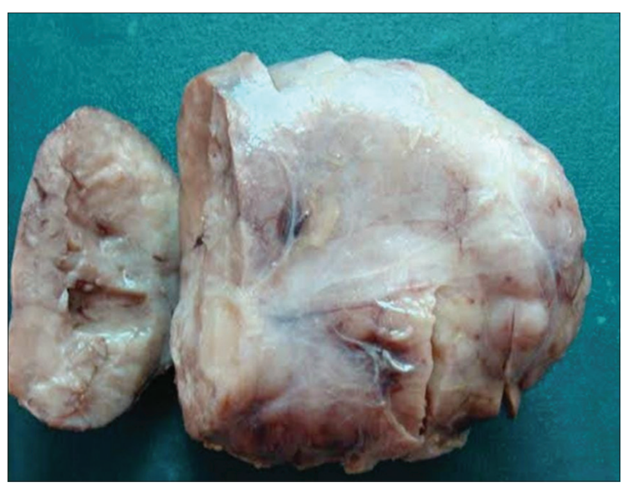

Figure 4: Gross specimen of right breast: Globular tissue mass measuring 13 × 11.5 × 7 cm. E/S: is nodular and minimal fat attached. On the serial section, noted multiple grey-white lesion larger measuring 4 × 2.5 cm and smaller 1 × 1 cm

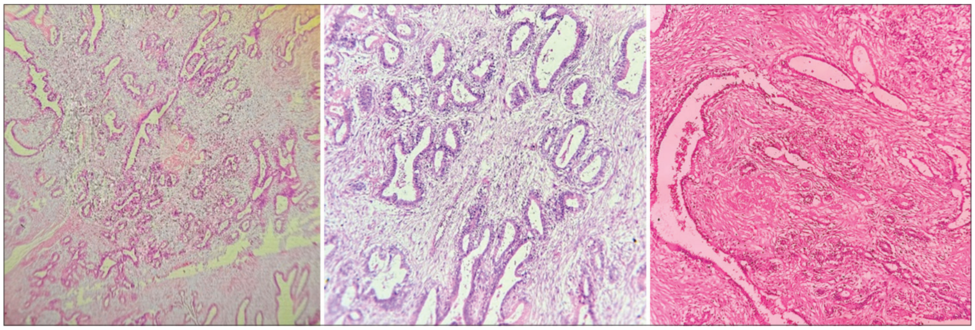

Figure 5: Section studied from multiple lesions is composed of ductal cells arranged in peri canalicular pattern. They are lined by two-layered epithelium. (i) ×4 hematoxylin and eosin (H&E) (II) ×10 H&E. (III) Increased in number of ducts noted surrounded by sclerosed stroma. At place, stromal cellular hyperplasia along with a few entrapped ducts and myxoid area noted (×40 H&E)

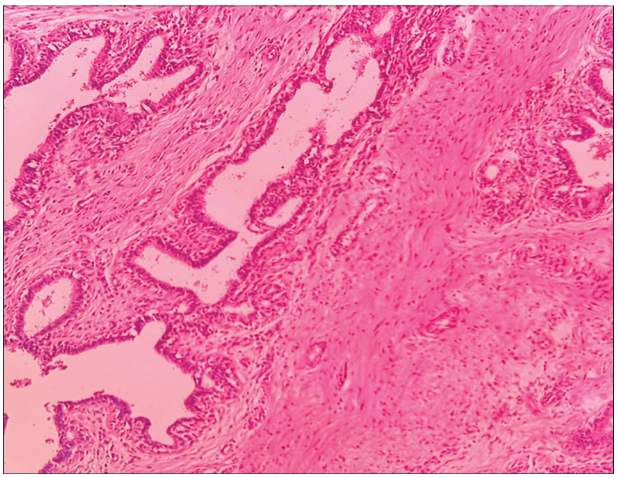

Figure 6: Some of the ducts show epithelial hyperplasia with no evidence of atypia. Apocrine metaplasia noted in a few ducts. The lesion is circumscribed and surrounded with a wide area of sclerosis (×10 hematoxylin and eosin)

Figure 7: Post-operative image after excision of breast lumps

ducts and myxoid areas noted. Some of the ducts show epithelial hyperplasia. No atypia or dysplasia was detected across multiple levels. Given the tumor's size and complex characteristics, a final diagnosis of giant complex FA was made. The patient's 12-month follow-up showed no recurrence, and the outcome remained uneventful (Figure 7).

DISCUSSION

Complex FAs are a variant of the common FA, which is the most frequent benign breast tumor occurring primarily in women of reproductive age. While simple FAs are well-circumscribed, rubbery, and mobile masses that are easily diagnosed clinically and radiologically, complex FAs present a more nuanced challenge due to their histological complexities and slightly increased risk of associated breast cancer.

Histopathological Features

Complex FAs are distinguished from simple FAs by the presence of additional histological features. These may include sclerosing adenosis, epithelial calcifications, apocrine metaplasia, cystic changes, and stromal hyalinization. These features contribute to the "complex" designation and often require a more thorough examination under the microscope to differentiate from other breast lesions, including malignant ones. For instance, the presence of calcifications within the lesion can sometimes mimic the appearance of ductal carcinoma *in situ* on imaging, necessitating careful pathological analysis to avoid misdiagnosis.[4]

In complex FAs, the epithelial component may show various changes, such as apocrine metaplasia, where the cells acquire features similar to those of apocrine sweat glands. In addition, cystic dilatation of ducts and the presence of sclerosing adenosis (a condition characterized by the proliferation of small ductal structures within a fibrous stroma) is commonly observed.[5] Despite these changes, the overall architecture of the FA remains benign, with no evidence of cellular atypia or dysplasia, which are key markers of malignant potential.

Clinical Significance and Management

The presence of complex features in a FA slightly increases the risk of subsequent breast cancer, though this risk remains relatively low. According to studies, women with complex FAs have a 1.5–2 times higher risk of developing breast cancer compared to those with simple FAs.[6] However, this risk is significantly lower than that associated with other high-risk lesions such as atypical hyperplasia.

Given the low but increased risk of breast cancer, management of complex FAs can vary. In younger women, especially those under 30, where the risk of breast cancer is generally low, the approach may be conservative, involving regular follow-up with clinical and imaging examinations. Surgical excision may be considered in cases where the lesion is large, symptomatic, or has features that overlap with malignancy on imaging.[7] In ddition, patient anxiety, family history of breast cancer, and the presence of other risk factors might influence the decision to excise the lesion.

For older women or those with a family history of breast cancer, the threshold for excision may be lower. This is because the overlapping features of complex FAs with malignant lesions on imaging studies can sometimes make it difficult to confidently exclude malignancy without histopathological examination.[8]

Prognosis and Follow-Up

The prognosis for women with complex FAs is generally excellent. The recurrence rate after excision is low, and the lesions do not metastasize. However, the identification of complex features warrants more vigilant follow-up due to the slightly increased risk of breast cancer. Regular clinical breast exams and mammography or ultrasound, depending on the patient's age and risk factors, are recommended.

In cases where surgical excision is performed, the histopathological analysis usually confirms the benign nature of the lesion, providing reassurance to both the patient and the clinician. Long-term follow-up data suggest that most women with complex FAs do not develop breast cancer, and those who do typically have a favorable outcome due to early detection and treatment. In the present case, the tumor was surgically managed due to its larger size.

CONCLUSION

Complex FAs, while benign, represent a unique subset of FAs with distinct histopathological features and a slightly elevated risk of breast cancer. Understanding these nuances is crucial for appropriate management and patient counseling. The decision to monitor or excise these lesions should be individualized, taking into account the patient's age, clinical presentation, imaging findings, and personal and family history of breast cancer.

Thorough clinical assessments, imaging studies, and a complete diagnostic workup are crucial for the timely and conservative management of breast conditions. For patients with giant FAs, ongoing radiological monitoring is essential to detect any additional lesions that may develop. The current case stands out due to its unusually large size and the presence of all four characteristic features associated with complex FAs.

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How to cite this article: Naidu PG, Suhas N, Reddy GR, Gollamudi S. Giant Complex Fibroadenoma Mimicking Breast Carcinoma: A Clinical Deception. Int J Sci Stud 2024;12(8):1-4.

Source of Support: Nil, **Conflicts of Interest:** None declared.