Case Report

Ductal carcinoma in situ arising from fibroadenoma; a rare case with review of literature

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ARTICLE INFO

Keywords:
Fibroadenoma
Benign tumors
DCIS
Breast cancer

ABSTRACT

Introduction: Fibroadenoma (FA) is a common benign breast mass representing a group of hyperplastic breast lobules due to the deviation of normal development. This study aims to present a rare case of ductal carcinoma in situ (DCIS) associated with fibroadenoma.

Case report: A 49-year-old married female presents with a right breast mass for five years. Core needle biopsy diagnosed the specimen as cellular complex fibroadenoma. A breast-lumpectomy and the histopathological examination of the surgical specimen confirmed ductal carcinoma in-situ.

Discussion: Malignant changes within fibroadenomas typically happen at an older age, with the age of detection in the fifth decade. Complex fibroadenomas are more related to malignant transformation. Old age and strong family history are risk factors for malignant transformation of fibroadenomas.

Conclusion: Fibroadenomas are common benign tumors. They can rarely be associated with DCIS. Therefore, the risk of malignancy should always be kept in mind.

1. Introduction

Fibroadenoma (FA) is a common benign breast mass representing a group of hyperplastic breast lobules due to the deviation of normal development [1]. It is usually found as a single mass in the breast during the early reproductive years of a women’s life [2]. Although it can occur at any age, the peak incidence is the second and third decades of life [3]. It is thought to be stimulated by many factors such as estrogen, progesterone, pregnancy, and lactation, and become atrophied during menopause [4]. It is a biphasic tumor comprised of stromal and epithelial elements [4]. The incidence ranges from 7% to 13% in the general population, and up to 20% present with bilateral and multiple masses [5]. The size of FA is directly proportional to the estrogen level, which may decrease in size or degenerate when estrogen effect decreases, particularly during the late fourth decade [6]. Cancer-associated fibroadenoma is extremely rare and found incidentally during pathological examination [7].

This report aims to present a rare case of ductal carcinoma in situ (DCIS) associated with FAs. SCARE guidelines were used with a brief literature review for the report preparation [8].

2. Case report

Patient Information: A 49-year-old married female presents with a right breast mass for five years. Her past medical history is notable for hypertension, for which she takes medication. Her family history is negative for breast cancer. Previously she underwent surgical resection of a mass in the same breast. The histopathological examination proved the resected mass to be a fibroadenoma.

Diagnostic Assessment: Focused physical examination of the right breast demonstrated a firm, smooth, ill non mobile mass. Mammography showed a lobulated well defined mass. Ultrasound of the breast showed a subareolar mass of (64*21mm) toward the 3 o’clock and 3mm away from the nipple with normal left breast. Magnetic resonance imaging (MRI) showed an oval-shaped mass of (55*35mm) at the subareolar region and toward 3 o’clock, 18mm away from the nipple and 28mm away from the chest wall. Core needle biopsy (FNA) diagnosed the specimen as cellular complex fibroadenoma.
**Theorapeutic Intervention:** We resected the lump surgically and sent it for histopathological examination. The result confirmed ductal carcinoma in-situ (DCIS) confined within a fibroadenoma with clean surgical margin.

**Follow-up and Outcome:** We sent the patient to the oncologist, and they put her on Tamoxifen. During the postoperative follow-up, the patient seemed to be doing well and tolerating the medication fairly.

3. Discussion

It is uncertain whether FA increases the likelihood of breast cancer development [9]. Dupont et al. reported that the risk of developing invasive breast cancer (IBC) is about 2.17 times greater among patients with FA in comparison to non-fibroadenoma patients [10]. The incidence of carcinoma arising within FA is 0.02% [11]. Approximately two-thirds of carcinomas within FAs are lobular, and the remaining one-third are ductal or mixed [12]. Malignant changes within FAs typically occur at an older age, with the age of detection in the fifth decade [9,13]. Complex FAs have a higher tendency for malignant transformation than non-complex FAs [14]. As reported by Dupont et al. the risk is 3.10 times greater in patients with complex FAs than in non-complex ones, at about 1.89 times [10]. Other studies linked the presence of carcinoma to the degree of proliferation of the epithelium within the FA rather than the presence of fibroadenoma by itself [14]. Old age and strong family history are risk factors for the malignant transformation of FAs [15]. One of the significant indicators of malignant transformation in FAs is the increase in the size and thickness of the mass with advancing age [6]. Radiological studies may show suspicious findings indicating the presence of carcinoma arising from FAs [7]. Malignant changes can’t be diagnosed preoperatively and need surgical intervention for diagnosis [16]. Sonographic examination of carcinomas arising from FAs appears irregular with irregular borders. They have extensive hypoechoic shadowing with an echogenic halo and distort the surrounding tissue [7]. Ultrasound is superior for measuring the size of the tumor as it offers high-resolution imaging [6]. Mammography may demonstrate indistinct borders and microcalcifications, but it is hard to diagnose FAs harboring carcinoma using mammography alone [17]. The presence of microcalcifications on mammography is an excellent indicator of the malignant transformation of the tumor [11]. However, Ooe et al. reported a case of DCIS arising within a FA with a well-circumscribed, polygonal, and relatively iso-dense mass without the presence of microcalcifications [4]. The case reported by Luci et al. on mammography appeared as a partially well-circumscribed, single lesion with variable density [12]. However, on mammography, the lesion in the current study appeared as a lobulated and obscured mass with equal density. Through dynamic MRI, malignant changes can be differentiated from pure FAs through differences in vascularity [7]. FAs typically show on MRI a round, oval-shaped mass with a smooth margin and demonstrate a persistent enhancement until the late phase [15]. However, the dynamic MRI commonly shows a rapid enhancement with variation in delayed enhancement when carcinoma is present [15]. In the current case, mammography observed a lobulated, obscured mass with equal density. MRI showed an oval-shaped mass.

Due to the rare status of the condition and its diagnosis being an incidental one, there isn’t an exact management guidelines, and the treatment follows the malignant components of the FAs [3]. If the surgical margin is free of cancer, lumpectomy may be sufficient [7]. Management depends on the stage and the degree of metastasis (local or distant). If it is small, conservative management is sufficient in the form of lumpectomy or wide local excision with axillary lymph node dissection in the presence of local metastasis (N1) [17]. We treated our case with a breast lumpectomy. Prognosis depends on the grade and stage at diagnosis [4]. FAs can be diagnosed early through clinical presentations and screening programs, which results in early detection of any malignant transformation and a good prognosis [4]. However, studies show that 10% of patients presented with carcinoma in situ within an FA had recurrences or metastasis [17].

Although FAs are a common subtype of benign tumors, they rarely can be associated with DCIS. Therefore, the risk of malignancy should always be suspected. When malignant, the radiological features, management, and prognosis differ.

**Ethical approval**

The manuscript approved by ethical committee of Kacien organization.

**Sources of funding**

None is found.

**Author contribution**

Abdulwahid M. Salih: major contribution of the idea, literature review, final approval of the manuscript. Zuhair D. Hammood: Surgeon performing the operation, final approval of the manuscript. Fahmi H. Kakamad: literature review, writing the manuscript, final approval of the manuscript.

**Consent**

Written informed consent was obtained from the patients the patient’s family for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

**Guarantor**

Fahmi Hussein Kakamad is Guarantor of this submission.

**Provenance and peer review**

Not commissioned, externally peer-reviewed.

**Declaration of competing interest**

None to be declared.

**Appendix A. Supplementary data**

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jamsu.2022.103449.

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