Case Report

Mucinous Subtype of Invasive Ductal Carcinoma Arising Within a Fibroadenoma

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Abstract

Fibroadenoma is a common benign tumor observed during the second and third decades of life. Malignancy transformation in the epithelial component of a fibroadenoma is rare and can occur 20 years after its diagnosis. Mammographic findings in this phenomenon include indistinct margins and microcalcifications. Here we present a 58-year-old woman with a mobile, lateral upper quadrant mass that was rather firm when palpated. The mammography showed a lobulated mass without calcification suggestive of a benign process, most probably fibroadenoma. However the excisional biopsy contained both an intracanalicular fibroadenoma and invasive ductal carcinoma with mucinous components.

Keywords: Breast, fibroadenoma, invasive ductal carcinoma, mucinous subtype, pathology

Cite the article as: Monsefi N, Nikpour H, Safavi M, Lashkarizadeh MR, Dabiri S. Mucinous Subtype of Invasive Ductal Carcinoma Arising Within a Fibroadenoma. *Arch Iran Med*. 2013; **16(6):** 366 – 368.

Introduction

Fibroadenoma is a common tumor prevalent in the second and third decades of life however it may occur at any age.[1] Despite its benign nature the increased risk for breast cancer following a fibroadenoma diagnosis has been reported in several studies.[2]

breast fibroadenoma is a biphasic tumor composed of epithelial and stromal components.[3] Malignant transformation of the fibroadenoma occurs in just 0.1% of cases. Its malignancy usually originates from the epithelial component, most of which are in situ. On the other hand, sarcomatous transformation of a fibroadenoma is an even rarer phenomenon as there is only one possible report in the literature.[4]

Case Report

The patient was a 58-year-old woman who discovered a mobile, rather firm mass in the lateral outer quadrant of her right breast during breast self-examination. Her mammography showed a lobulated mass in the same quadrant. The mass had a well-circumscribed border and no calcifications, which was suggestive of a benign process - most likely a fibroadenoma (Figure 1). The patient underwent surgery with the diagnosis of fibroadenoma. The mass was resected with a safe surgical margin of 1 cm.

Gross appearance of the specimen revealed a rather well demarcated grayish creamy mass with firm consistency and a focal gelatinous area surrounded by breast fatty tissue, which was 4 cm in greatest diameter (Figure 2).

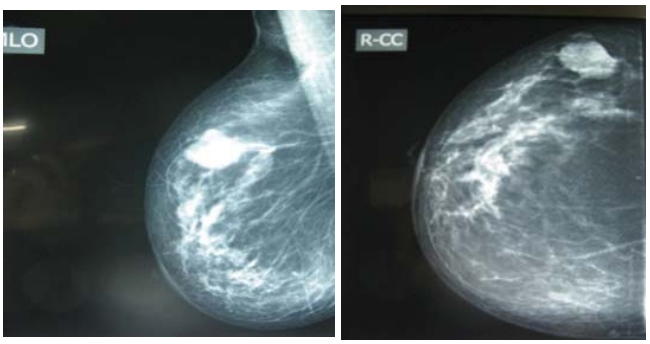

Figure 1. Mammography mediolateral and craniocaudal views that show a lobulated noncalcified mass.

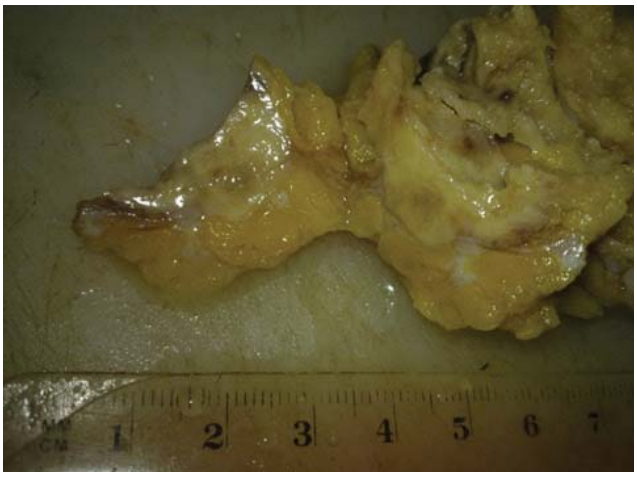

Figure 2. Gross appearance of the specimen showed an oval grey creamy firm mass with focal gelatinous area.

The microscopic findings were remarkable for a neoplastic growth composed of malignant epithelial cells with sparse gland formation. Also present were mucin lakes in which tumor cells floated. An intracanicular growth pattern type was observed in the

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Accepted for publication: 13 December 2012

fibroadenoma. Foci of necrosis were also evident in the stroma of the fibroadenoma and tumor (Figures 3 and 4).

Alcian blue staining showed mucin lakes with floating tumor nests (Figure 5). Immunohistochemistry studies were negative for estrogen receptor (ER), progesterone receptor (PR) and HER 2 neu, however neuron-specific enolase was positive in the tumor cells which favored the mucinous subtype of invasive ductal carcinoma (Figure 6).

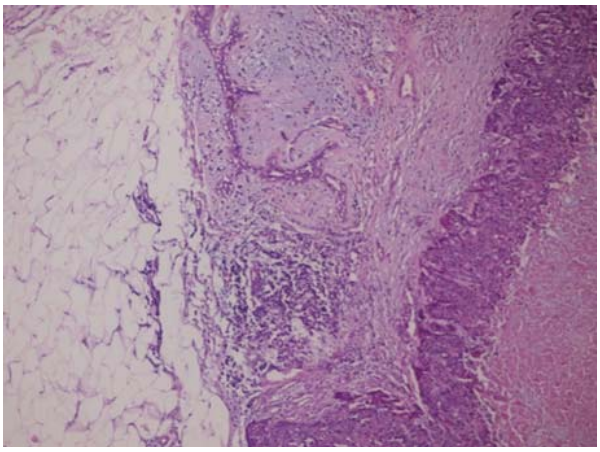

Figure 3. Invasive ductal carcinoma and fibroadenoma in the same section of the specimen (40×).

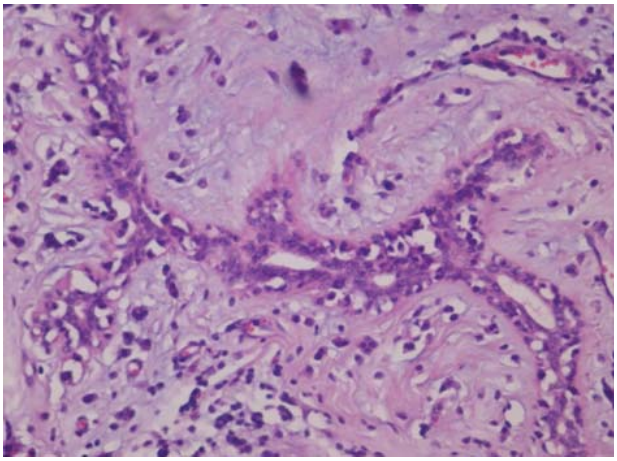

Figure 4. High power view of intracanalicular growth pattern of the fibroadenoma (400×).

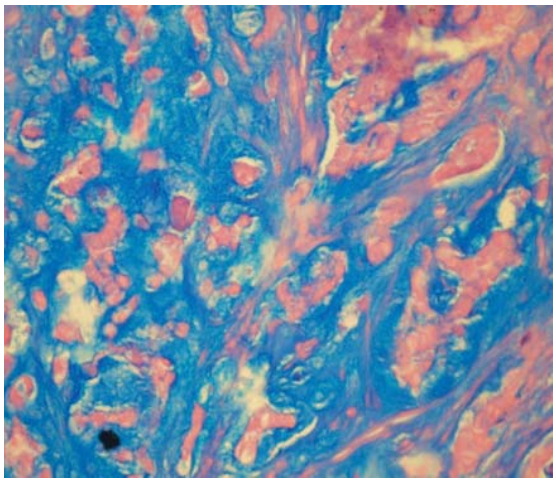

Figure 5. Alcian blue staining remarkable for mucin lakes (400×).

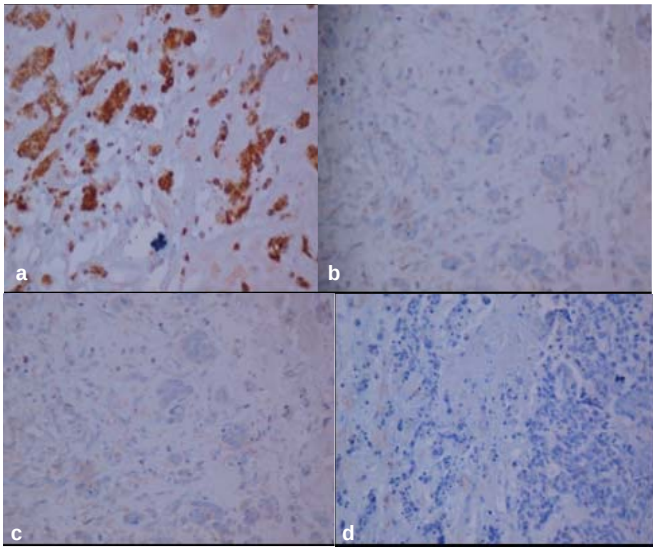

Figure 6. a) Positive neuron-specific enolase (NSE); **b)** Negative estrogen receptor (ER); **c)** Negative progesterone receptor (PR); **d)** Negative HER 2neu.

Discussion

Carcinoma formation in a fibroadenoma is a rare phenomenon with a peak incidence at the age of 42.2 years. This is approximately 20 years after the peak incidence of fibroadenoma.[5] This may prompt clinicians to choose a proper follow up policy for prolonged untreated fibroadenoma and set exact criteria for malignancy transformation by clinical, radiological and pathological investigations.

In the comprehensive review by McDivitt et al., 50% of 26 carcinomas that arose from fibroadenoma were *in situ* lobular carcinoma, 11% were invasive lobular, 22% were *in situ* ductal carcinoma and the remainder were invasive ductal carcinoma.[6] However, in a more recent study by Diaz et al. on 105 malignant cases, there were equal numbers of LCIS (lobular carcinoma *in situ*) and DCIS (ductal carcinoma *in situ*) attributed to fibroadenomas which contrasted previous findings.[7] To the best of our knowledge the only mucinous carcinoma in the context of fibroadenoma has been reported just once by Charfi et al. in a 36-year-old woman.[8] Similar to the presented case, invasive ductal carcinoma of the mucinous subtype is a very rare malignancy arising from fibroadenoma.

Mammographic findings which may distinguish a carcinoma arising in a fibroadenoma from a benign fibroadenoma include indistinct margins and clustered microcalcifications.[9,10] Interestingly however, in the current case, the mammographic changes were similar to a benign fibroadenoma.

Management of fibroadenoma depends on the patient's age, long-standing increased risk of breast cancer and malignancy transformation of epithelial and stromal components. Numerous authors have suggested a conservative treatment for fibroadenoma in patients younger than a certain age. The age threshold for conservative treatment varies among studies and is reported to be 25, 35, and 45 years of age.[11–13] The presence of hyperplasia in adjacent tissue, complexity of the fibroadenoma and positive family history of breast cancer increase the long-standing risk of invasive breast cancer.[2,14] Since approximately half of the fibroadenomas exhibit complexity or hyperplasia in adjacent tissue, it would be logical to excise all fibroadenomas in order to estimate the risk of malignancy.[15] Ultimately, malignant changes in the epithelium or stroma

of the fibroadenoma mandate surgical treatment of breast cancer as in the otherwise normal breast[5,16] and therapy should be the same as carcinomas independent from fibroadenomas.[17] As malignancy transformation of a fibroadenoma occurs in patients older than 40 years, therefore removal of fibroadenomas in women older than 35 years can prevent possible epithelial progression to malignancy.

When malignancy is confirmed in the context of a fibroadenoma, a random biopsy of the contralateral breast in addition to an ipsilateral mastectomy is advised[6] as carcinoma develops in the contralateral breast in 20% of these cases.[18]

In conclusion, although the occurrence of a carcinoma in a fibroadenoma is very low, we should consider all fibroadenoma-like lesions at-risk of malignancy transformation, particularly in women older than the age of 35. Thus surgical removal of fibroadenomas in older women despite benign radiologic findings seems logical.

References

1. Foster ME, Garrahan N, Williams S. Fibroadenoma of the breast. *J R Coll Surg Edinb*. 1988; **33:** 16 – 19.
2. Dupont WD, Page DL, Part FF, Vnencak-Jones CL, Plummer Jr WD, Rados MS, et al. Long-term risk of breast cancer in women with fibroadenoma. *N Engl J Med*. 1994; **331:** 10 – 15.
3. Azzopardi JG, Ahmed, Mills RR. Problems in breast pathology. In: Benigton JC, ed. *Major Problems in Pathology*. Edinburgh: WB Saunders Company Ltd; 1979: 325 – 328.
4. Rosai J. *Rosai and Ackerman's Surgical Pathology*. 10th ed. Vol. 2. Edinburgh; New York: Mosby; 2011: 1668.
5. Pick PW, Iossifides IA. Occurrence of breast carcinoma within a fibroadenoma. A review. *Arch Pathol Lab Med*. 1984; **108:** 590 – 596.
6. McDivtt RW, Stewart FW, Farrow JH. Breast carcinoma arising in solitary fibroadenomas. *Surg Gynaecol Obstet*. 1965; **125:** 572 – 576.
7. Diaz NM, Palmer JO, McDivitt RW. Carcinoma arising within fibroadenomas of the breast; a clinicopathologic study of 105patients. *AM J Clin Pathol*. 1991; **95:** 614 – 622.
8. Charfi L, Mrad K, Sellami R, Driss M, Sassi S, Abbes I, et al. Invasive mucinous carcinoma arising within breast fibroadenoma. *Pathologica*. 2008; **100:** 199 – 201.
9. Baker KS, Maonsees BS, Diaz NM, Destouet JM, McDivitt RW. Carcinoma within fibroadenomas: mammographic features. *Radiology*. 1990; **176**: 371 – 374.
10. Deschenes L, Jacob S, Fabia J, Christen A. Beware of breast carcinomasin middle aged women. *Can J Surg*. 1985; **28:** 372 – 374.
11. Cant PJ, Madden MV, Close PM, Learmonth GM, Hacking EA, Dent D. Case for conservative management of fibro-adenomas of the breast. *Br J Surg*. 1987; **74:** 857 – 859.
12. Wilkinson S, Anderson TJ, Rifkind E, Chetty U. Forrest AFibroadenoma of the breast: a follow-up of conservative management. *Br J Surg*. 1989; **76:** 390 – 391.
13. Dixon JM, Dobie V, Lamd J, Walsh J, Chetty U. Assessment of the acceptability of conservative management of fibroadenoma of the breast. *Br J Surg*. 1996; **83:** 264 – 265.
14. Pharoah PDP, Day NE, Duffy S, Easton DF, Ponder BA. Family history and the risk of breast cancer: a systematic review and meta-analysis. *Int J Cancer*. 1997; **71:** 800 – 809.
15. Kuijper A, Mommers EC, van der Wall E, van Diest PJ. Histopathology of fibroadenoma of the breast. *Am J Clin Pathol*. 2001; **115:** 736 – 742.
16. Ozello L, Gump FE. The management of patients with carcinomas in fibroadenomatous tumors of the breast. *Surg Gynecol Obstet*. 1985; **160:** 99 – 104.
17. Stafyla V, Kotsifopoulos N, Grigoriades K, Kassaras G, Sakorafas GH. Lobular carcinoma in situ of the breast within a fibroadenoma. A case report. *Gynecol Oncol*. 2004; **94:** 572 – 574.
18. Goldman RL, Friedman NB. Carcinoma of the breast arising in fibroadenoma, with emphasis on lobular carcinoma. *Cancer*. 1969; **23:** 544 – 550.