

Breast Fibromatosis

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We report a case of fibromatosis of the breast in which both clinical and mammographic appearances were indicative of carcinoma. The patient was 46 years old Bahraini, obese woman who presented with a hard right breast mass. As fine needle aspiration (FNA) cytology did not reveal any malignant cells, a conservative local excision was performed. Fibromatosis should hence be considered in the differential diagnosis of patients presenting with hard breast lumps suspicious of malignancy. The differential diagnosis is discussed with review of the literature.

Key words: Fibromatosis, breast, pathology.

Bahrain Med Bull2005; 27(4):

INTRODUCTION

Fibromatosis of the breast is a rare lesion that may arise in the mammary gland or represent extension of a lesion arising deep in the aponeurosis of chest wall or shoulder girdle^{1,2}.

By definition, fibromatosis is non-encapsulated well-differentiated fibroblastic lesion composed of relatively uniform fibroblasts and collagen and forming a firm, solitary, or multinodular mass with an infiltrative growth pattern^{1,2}.

Mammary fibromatosis incidence is less than 0.2% of primary breast neoplasms^{1,3}.

We herein report a case of mammary fibromatosis, discuss the differential diagnosis and review the literature.

The Case

Forty-six year old Bahraini, obese lady presented with right breast lump of one month duration. The patient noticed the lump incidentally. It was localized at the upper inner quadrant of the breast, measuring 2x3 cm. The lump was associated with occasional mild pricking sensation.

Examination revealed large breasts. Examination of the right breast revealed a mass in the upper inner quadrant measuring 2x3 cm, hard in consistency, not mobile, non-

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tender and not attached to the skin. The nipple, areola and breast skin were normal. The left breast and both axillae were normal.

Bilateral mammogram revealed large mainly fatty breasts. An area of increased parenchymal density measuring 3x1.5 centimeters was seen in the medial aspect of the right breast in the oblique view. There was no microcalcifications or skin thickening. No focal abnormality was noted in the left breast. Lymph nodes in both axillae were of normal size.

Figure of Mammogram

FNAC of the mass revealed no malignant cells. Nevertheless, malignancy was still considered based on the clinical presentation and mammography. A negative FNAC report; however, lead to a breast conserving and wide local excision .

Pathology findings

An ill defined greyish white central lesion with few yellowish streaks measuring 2x1x1 centimeters was identified. Frozen section revealed a bland spindle cell lesion and no evidence of malignancy.

The specimen was then fixed in 10% buffered formalin, processed in the routine fashion, and embedded in paraffin. 5µm sections were cut and stained with haematoxylin and eosin.

Microscopically, the lesion was composed of monomorphic spindle cells in loose fascicles, arranged in a sweeping fashion. The edges were infiltrative, incorporating adjacent adipose tissue and breast lobules and extending as tongue-like projections. Occasional perivascular lymphoid cell infiltrate is noted. The vascular network is composed of opened up , round spaces. Keloid-like collagen is present in-between the fascicles. Low mitotic rate up to 2 mitoses per 10 high power fields was seen. Surrounding breast tissue showed features of fibrocystic change. Excision is complete.

(Fig.1-4)

Immunohistochemically, the spindle cells were positive for vimentin, focally positive for smooth muscle actin and negative for cytokeratin, estrogen and progesterone receptors. The histological features are compatible with fibromatosis .

DISCUSSION

It is important to recognize mammary fibromatosis as it presents a big dilemma for the clinician, because it mimics cancer clinically, radiologically and sometimes cytologically². Although the exact pathogenesis of mammary fibromatosis is not clear, at least 30% of patients recount history of significant trauma to the involved area^{2,4}. Antecedent trauma has been described at the site of fibromatosis in some patients and in association with saline-filled breast implants^{2,5-7}.

Few cases have been associated with Gardner's Syndrome; familial multicentric fibromatosis and familial adenomatous polyposis which suggests a genetic predisposition and probably alteration of the APC/ beta-catenin pathway^{1,2,4,5,8}. Cytogenetic studies have demonstrated trisomy 8 and 20 , and loss of chromosome 5q (including the locus of the APC gene) as the most characteristic genetic aberration⁵.

Despite the aforementioned, many cases appear to occur spontaneously⁴.

This case had neither a history of trauma or genetic disease.

Fibromatosis arising within the breast parenchyma appears to represent a separate entity from extramammary fibromatosis, whereas the latter arise from the muscular fascia or aponeurosis, mammary fibromatosis appear to originate from fibroblasts and myofibroblasts within the breast parenchyma⁹.

Patients with mammary fibromatosis almost always present with a painless palpable, firm or hard tumor that suggests carcinoma on clinical examination as the case with our patient. Skin dimpling and retraction are relatively common signs of breast fibromatosis that is likely to reinforce the clinical impression of carcinoma².

Mammography reveals a stellate tumor indistinguishable from carcinoma. The presence of mammographically detectable microcalcifications; however, favors the diagnosis of carcinoma since calcifications are unusual in mammary fibromatosis. Rarely, the tumor is non-plapable and detected initially by mammography².

Pre-operative diagnosis of fibromatosis by FNAC is rare. Nevertheless, fine needle aspiration cytology, although not entirely specific, may be a source of important information in patients with breast fibromatosis. In particular, it confidently allows the exclusion of breast cancer and other more common diseases and is useful in planning a surgical approach to the lesion^{7,10}.

Although fibromatosis may be suspected if a frozen section is performed, definitive diagnosis should await final paraffin sections in order to allow thorough study to exclude other neoplasms and metaplastic carcinoma. The specimen should be inked and margins generously sampled².

This case was subjected to wide local excision and frozen section examination despite a negative fine needle aspiration cytology report. This was based on the clinical and radiological suspicion, illustrating the importance of the triple approach (clinical, radiological and cytological input), in the management of breast disease^{10,11}. Histologically, fibromatosis is composed of uniform, spindle shaped fibroblasts forming sweeping or interlacing fascicles entrapping ducts and lobules with an infiltrative edge. The degree of cellularity varies, ranging from relatively cellular to predominantly collagenized lesions. Devouassoux-Shisheboran *et al* studied the morphofunctional features of 33 cases of fibromatosis and showed that the cellularity of the lesion varied with the patient's age⁹. Lesions in the younger patients (childbearing age) were significantly more cellular than those of the perimenopausal and postmenopausal groups, it displayed larger proportion of cells with mild atypia and were mitotically more active . Compared to lesions in the childbearing group,

lesions in the perimenopausal and postmenopausal patients were significantly more fibrous and presented with prominent inflammatory cells.

Histologically, fibromatosis should be differentiated from nodular fasciitis, fibrosarcoma, spindle cell carcinoma low grade fibromatosis-like variant) and infiltrating myoepithelioma.

Nodular fasciitis is usually favored if there is clinical history of a rapidly growing mass over a short period of time. Microscopically, the lesion is fairly well circumscribed. It consists of plump active fibroblasts and myofibroblasts arranged in short, loose and irregular bundles. The background matrix is usually myxoid and there is often an impression of maturation towards the periphery of individual nodules. Inflammatory cells are usually evenly distributed throughout the lesion as compared with fibromatosis which is usually perivascular. In this case, the lesion had irregular infiltrative edges, the stroma was collagenized rather than myxoid and there was no evidence of maturation at the periphery. In nodular fasciitis the vessels are compressed and branching whereas fibromatosis usually has opened up vascular channels. In nodular fasciitis, the fibroblasts and myofibroblasts are characteristic in that they resemble cells in tissue culture, being usually stellate with basophilic finely vacuolated cytoplasm and microvesicular nuclei with prominent nucleoli. Mitotic figures may be seen and can be numerous. This is in contrast with fibromatosis, in which mitotic figures are rare^{1,2,7,12-15}.

Fibrosarcoma is generally highly cellular, exhibiting cytological atypia and pleomorphism, as well as numerous mitotic figures. The proliferating cells in fibrosarcoma form long fascicles, a herringbone pattern and focal necrosis¹²⁻¹⁴.

Spindle cell carcinomas generally have some recognizable carcinoma elements and are immunoreactive for epithelial markers like cytokeratin^{12-14,16}.

Myoepithelial lesions can mimic fibromatosis but are usually fairly well-circumscribed, composed of short bundles of spindle cells with scattered giant cells and mast cells in a perivascular location. In addition, they are usually positive for cytokeratin, desmin, actin, S100 protein and CD 34 in few cases.¹²⁻¹⁵

Immunohistochemically, fibromatosis exhibits positivity for smooth muscle actin and vimentin and negativity for cytokeratin, estrogen, progesterone and androgen receptors (ER, PR and AR)^{8,15,16}.

Numerous reports showed that even though extramammary fibromatosis usually exhibit positivity for ER and PR, mammary fibromatosis is consistently devoid of such receptors^{2,6,15}. Moreover, Devouassoux-Shisheboran et al have shown that cytoplasmic pS2 protein expression, which is induced by estrogen, is consistently negative in their series of 33 cases. Therefore, no benefit from anti-estrogen therapy would be expected in mammary fibromatosis. One caveat to this would be that tamoxifen has been shown to induce synthesis of transforming growth factor beta 1 by ER-negative fibroblasts, which may explain the effectiveness of tamoxifen on ER-negative fibromatosis⁹.

Because of the consistent absence of ER and PR receptors in mammary fibromatosis, a positive reaction for either receptor in a spindle cell neoplasm of the breast would help exclude fibromatosis from the differential diagnostic consideration for practical purposes. Along the same lines, since myofibroblastoma of the breast was found to express AR, AR positivity in a well delineated myofibroblastic proliferation of the breast would favor the diagnosis of myofibroblastoma over that of fibromatosis⁹.

This case shows positivity for smooth muscle actin and vimentin and negativity for cytokeratin and both estrogen and progesterone receptors, hence being consistent with the findings in the literature.

Total excision is recommended to minimize the risk of recurrence, since it is clear that some fibromatoses of the breast will recur if not totally excised^{1,2,7}.

Wide local excision is the recommended treatment, because of the stellate configurations and grossly inapparent extensions of most lesions. Negative margins are particularly important in fibromatosis as there are no other treatment modalities.³

Eric Wargotz *et al* studied 28 cases of breast fibromatosis and concluded that specific histological features, such as size, cellularity, atypia and mitotic figures, were not helpful in predicting recurrence^{1,3}.

None of the literature we reviewed reported any mammary fibromatosis metastasis or death of patients from their disease^{1,2}. However, malignant transformation of fibromatosis following radiation therapy was reported⁴. As breast fibromatosis do not demonstrate metastatic capabilities, axillary dissection is not performed⁴.

A literature review conducted by Trey Thomas *et al* suggests that patients should undergo quarterly clinical examination for a minimum of three years; as available literature suggests the majority of local recurrences manifest within this time frame⁴. There is no evidence that postoperative radiotherapy, chemotherapy or hormonal treatment is useful as an adjunct to surgery for primary treatment or to control recurrent disease².

This patient was followed in the out patient clinic for a period of two years and eight months with no sign of recurrence.

CONCLUSION

Mammary fibromatosis is a rare benign spindle cell lesion that mimics malignancy both clinically and radiologically due to its locally infiltrative growth pattern. Awareness of such lesions by radiologists, surgeons and pathologists is therefore of paramount importance to guard against an unnecessarily drastic surgical approach; as a complete localized excision is all that is required.

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