



ORIGINAL RESEARCH PAPER

Radiology

MALE BREAST LESIONS : CLINICAL, RADIOLOGICAL AND PATHOLOGICAL CORRELATION

KEY WORDS: Image guided FNAC, male breast, gynecomastia

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ABSTRACT

Background: Breast lesions in males are overall less as compared to females with the incidence of 1.4-7.3% and carcinomas <1% in males. Despite the emerging role of core needle biopsy, Image guided FNAC continues to be an effective tool in the initial evaluation of breast masses in males.

Aim of the study: To evaluate the role of image guided FNAC in the preliminary diagnosis of male breast lesions as a minimally invasive technique especially in areas with limited diagnostic facility.

Materials and Methods: A total of 182 cases of male breast lesions were analyzed at Patna Medical College from June 2013 to 2018. This is a prospective study with complete clinical evaluation, imaging and cytopathological correlation. FNACs are performed by the Cytopathologist and simultaneous collection of cell block.

Results: The age range was 6-80 years. Out of 182 cases, 176 cases were benign and 6 cases were malignant. Of the 176 benign cases, 156 cases were gynecomastia, 14 cases were benign breast aspirate, 3 cases of breast abscess, 2 cases of lipoma, 1 epidermal inclusion cyst and 6 cases of infiltrating ductal carcinoma. Histopathological correlation was available only in 22 cases.

Conclusion: Image guided FNAC is still a quick, effective and minimally invasive technique for initial evaluation of breast lesion in males. Cell block further reduces the need for core biopsy as immunohistochemistry and molecular tests can be effectively done for definite diagnosis.

INTRODUCTION

Over the last 2 decades, the rate of male breast complaints increased from 0.8% to 2.4%, while 1% of all breast cancers occur in men. The female to-male breast cancer ratio is 70-100:1. The mean age at the time of diagnosis in men is 67 years, which is about 5 to 10 years higher than that of women. Usually, male breast cancer (MBC) is detected in more advanced stages because of delayed diagnosis, compared with that of the women and about 50% of men have axillary nodal metastasis at the time of diagnosis therefore, early detection of MBC could improve the survival rate and prognosis of the disease.^{1,2}

MATERIALS AND METHODS

A total of 182 cases of male breast lesions were analyzed at Patna Medical College from June 2013 to 2018. This is a prospective study with complete clinical evaluation, imaging

and cytopathological correlation. FNACs are performed by the Cytopathologist and simultaneous collection of cell block. FNAC Aspirates were performed using 23 gauge needle and 5 ml syringe. Air dried smears routinely stained with Giemsa stain and examined under microscope. Histopathologic diagnosis was obtained wherever available and correlated with cytological and imaging findings.

RESULTS

The age range was 6-80 years. Out of 182 cases, 176 cases were benign and 6 cases were malignant. Of the 176 benign cases, 156 cases were gynecomastia, 14 cases were benign breast aspirate, 3 cases of breast abscess, 2 cases of lipoma, 1 epidermal inclusion cyst and 6 cases of infiltrating ductal carcinoma. Histopathological correlation was available only in 22 cases.

Table 1 Case distribution with clinical, pathological and histopathological correlation(n=182)

Type of Lesion	No. of cases	Clinical Presentation	Imaging	Cytology	Histopathology
Gynaecomastia	156	U/L breast swelling (128) B/L (28)	Hypochoeic mass	Clusters of benign ductal epithelial cells	Benign ducts embedded in stroma surrounded by mature adipose tissue
Benign Breast aspirate	14	U/L Painless breast swelling	Ill defined hypochoeic lesion	Clusters and scattered benign ductal epithelial cells	NA
Breast Abscess	3	Painful breast lesion with fever	hypochoeic to anechoic lesion with irregular margin and peripheral vascularisation	Pus aspirated with smear showing sheets of polymorphs	Not done
Lipoma	2	Painless swelling	homogenous mass slight hyperechogenic with respect to surrounding fat	Mature fibroadipose tissue fragments	Partially encapsulated fibroadipose tissue
Epidermal Inclusion cyst	1	Painless nodular swelling	Round well circumscribed nodule in breast parenchyma	anucleated squames and mature squamous epithelial cells	Benign cyst filled with keratin flakes
Ductal Carcinoma	6	Variable nipple retraction to cauliflower growth	Irregular hyperechoic mass	Discohesive neoplastic cells	Hyperchromatic, high N:C ratio and prominent nucleoli

Majority lesions are benign and amongst them gynecomastia is the most common lesion. Most benign lesions presented with diffuse irregular mass beneath nipple. Significant history of alcohol and anabolic steroid intake was documented. In the majority of cases, the aspirated smears were moderately cellular to hypocellular. The cell population was composed of tightly cohesive groups of epithelial cells, often admixed with sparse single stromal cells "bipolar nuclei, myoepithelial cells, and fragments of cellular fibrous stroma. Tissue sections showed the usual histologic features of gynecomastia characterized by fibromyxoid or collagenous stroma and duct hyperplasia. (Figure 1A, B, C & D)



Figure 1A Unilateral enlargement of left breast

Figure 1B USG shows diffuse glandular gynecomastia in which glandular tissue is diffusely distributed within adipose tissue in a pattern resembling female breast
 Figure 1C Smears with cohesive monolayered sheets of benign ductal epithelial cells admixed with myoepithelial cells (Giemsa 40x)

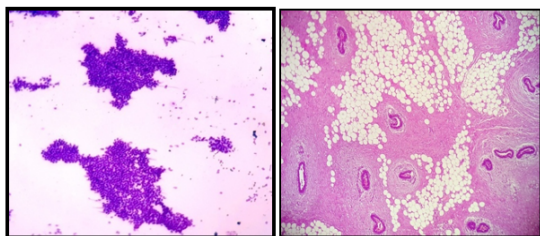


Figure 1D Benign ducts embedded in stroma

Breast abscess is a localized infection secondary to ductal ectasia, chronic obstruction, and inflammation. Common clinical features include pain, nipple swelling, and nipple discharge. Staphylococcus aureus and Staphylococcus epidermidis are the most common causative organisms. USG guided FNAC yielded pus aspirate with smears revealing features of acute suppurative inflammation. (Figure 2A & 2B)

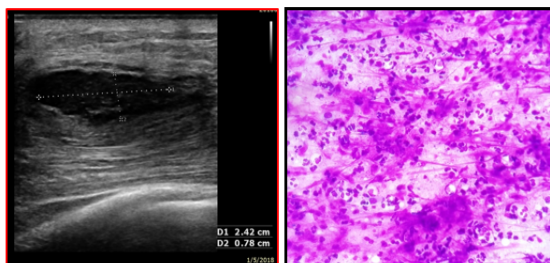


Figure 2A USG shows hypoechoic to anechoic lesion with irregular margin and peripheral vascularisation

Figure 2B FNAC yielded pus with smear showing sheets of polymorphs

Lipomas are uncommon lesions in male breast. Patient was a 6 year old child with painless enlargement of right breast and clinical possibility of gynecomastia. Imaging revealed homogenous hyperechoic mass ruling out any cyst or abscess but confirmation was done on cytology with subsequent histopathology. (Figure 3A, B, C & D)

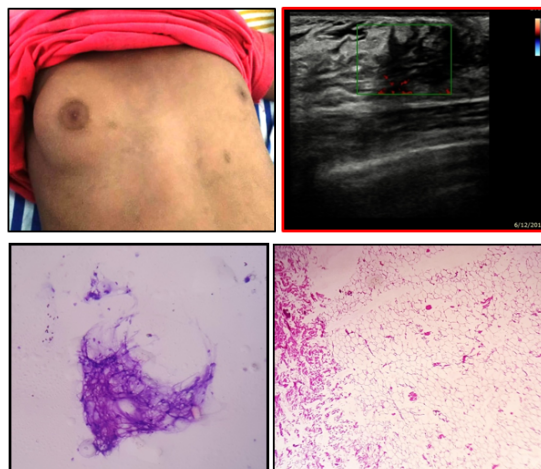


Figure 3A Unilateral enlargement of right breast Figure 3B USG reveals a homogenous mass slight hyperechoic with respect to surrounding fat Figure 3C FNAC revealed fibroadipose tissue fragments Figure 3D Biopsy revealed partially encapsulated fibroadipose

Breast cysts in males are rare and intraparenchymal epidermal inclusion cyst is extremely rare in males. Imaging findings are characteristic with a well circumscribed nodule and no demonstrable internal vascularisation on colour doppler. FNAC aspirate is foul smelling and dirty necrotic with smear revealing sheets of nucleated and anucleated squames. (Figure 4A & B)

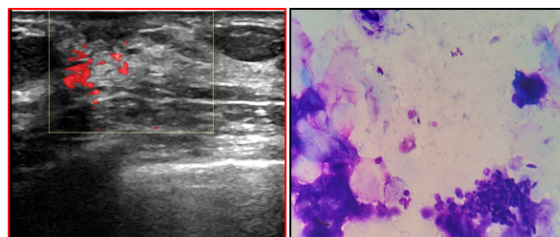
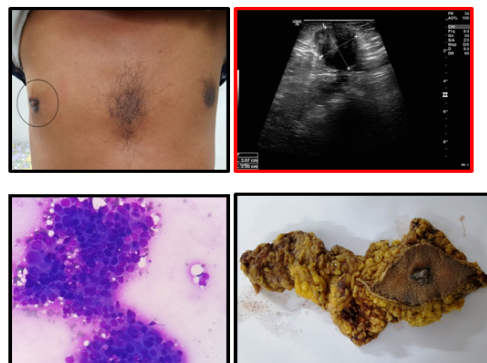


Figure 4A USG reveals round well circumscribed nodule in breast parenchyma

Figure 4B FNAC smear shows anucleated squames and mature squamous epithelial cells

Male breast cancer mostly occurs in a sub-areolar region, but it is usually eccentric to the nipple. The shapes of the lesions may be round, oval, or irregular. The mass border is circumscribed, indistinct, or mostly speculated and microlobulated. The typical form of them in the mammogram is a high-density circumscribed irregularly shaped mass. Calcifications are rare and tend to be fewer in number, coarser, and less frequently rodshaped. FNAC aspirate is hemorrhagic fleshy with smears revealing sheets of neoplastic discohesive clusters and confirmed on histopathology. (Figure 5A, B, C & D)



**Figure5A Breast nodule with nipple retraction Figure5B
USG reveals irregular hyperechoic mass Figure5C
Smear shows discohesive cluster of atypical cell Figure
5D Radical Mastectomy with inverted nipple**

DISCUSSION

Gynecomastia, the most common abnormality of the male breast, is caused by benign proliferation of ductal and stromal tissue elements, resulting in breast symptoms and imaging findings that may be unilateral or bilateral. Patients typically present with unilateral or less commonly bilateral breast pain, a breast mass or masses, or breast enlargement. The three characteristic patterns of gynecomastia seen at mammography are nodular, dendritic, and diffuse glandular. The nodular and dendritic forms correspond to the florid and fibrous stages of proliferation, respectively, whereas the diffuse glandular type corresponds to epithelial proliferation and is often linked to the use of exogenous hormones. The ultrasound examination reveals a subareolar hypoechoic mass, which may have typical nodular features and a long axis that is parallel to the skin (nodular gynecomastia), or it may be triangular with extensions that radiate into the subareolar fat (dendritic gynecomastia), or it may resemble a female breast (diffuse gynecomastia). The color-Doppler evaluation reveals moderate, harmonious intralesional vascularisation. Gynaecomastia is a benign enlargement of male breast caused by hormonal imbalance due to estrogen excess. It can be physiological presenting in neonatal period, puberty or in elderly. Pathological gynaecomastia occurs due to systemic diseases like hepatic diseases, renal diseases, thyrotoxicosis, starvation etc. Various drugs like anabolic steroids, androgen, digoxin, ketoconazole, cyproterone also lead to male breast enlargement. It occurs in wide age range of 15 – 90 years. In our study, gynaecomastia has come out as commonest benign lesion. The most common differential diagnosis is pseudogynecomastia. It involves breast enlargement (usually bilateral) caused by an excess of adipose tissue, which is not necessarily associated with constitutional obesity or with alterations of the breast parenchyma, whose volume is normal. Ultrasonography reveals the presence of lobular areas of adipose tissue that are homogeneously hypoechoic and separated from one another by thin hyperechoic bands of fibrous tissue.^{2,3}

Breast abscess are rare in males. Risk factors include smoking, diabetes and obesity. Smoking predisposes anaerobic and aerobic infection. At mammography, a subareolar abscess usually appears as an ill-defined subareolar mass with surrounding trabecular thickening. Doppler imaging often shows accentuation of peripheral vascularity, with sparse to absent internal flow. However, occasionally abscesses may have accentuated internal flow, making the diagnosis of infection less certain and therefore requiring fine needle aspiration cytology and further evaluation of the aspirated material.⁴

Lipoma is a benign tumor composed of mature fat cells and typically manifests clinically as a soft, nontender, palpable mass. At mammography, it has a characteristic appearance of a well-encapsulated, radiolucent, fat-density lesion, which corresponds to a mildly hyperechoic, relatively avascular, oval mass. However, lipomas may also be hypoechoic or isoechoic relative to subcutaneous fat. Lipomas do not require surgical excision unless they are cosmetically unacceptable.⁵

A sebaceous cyst is a benign intradermal lesion secondary to an obstructed sebaceous gland. It is typically smaller than an epidermal inclusion cyst; however, these two entities are often indistinguishable at imaging. It appears as a round or oval, well-circumscribed, hypoechoic mass in the subcutaneous tissue immediately adjacent to the skin. Although there should be no demonstrable internal blood flow at color Doppler imaging, there may be significant surrounding hyperemia if the cyst is inflamed. Do not biopsy the lesion when the imaging findings are characteristic, owing to an increased

risk of inflammatory response in the surrounding breast tissue with possible abscess development if the cyst ruptures.⁶

Breast malignancies are relatively rare in males. The commonly occur as localized, painful masses and are usually found at the subareolar level or in the upper outer quadrant of the breast. Compared with gynecomastia, these lesions are often eccentric with respect to the nipple. The mass may be attached to the skin or the pectoral muscle. Other clinical presentations include nipple retraction and bloody discharge from the nipple. Several risk factors have been identified for male breast cancer including age, family history (BRCA2), exposure to radiation, cryptorchidism, testicular injury, Klinefelter syndrome, liver dysfunction, and chest trauma. The most common forms are invasive ductal carcinoma (85% of cases), papillary carcinoma (5%), and lymphoma. On ultrasound, invasive ductal carcinoma appears as a solid mass, which is usually hypoechoic. Less frequently it may appear as a complex cyst or as an area of distortion. In all cases, it has irregular margins and more or less intense posterior attenuation. Some lesions are hypervascular. Papillary carcinoma appear as solid or complex cystic masses with thick walls that contain both solid and cystic components. As for primary lymphoma of the breast, it may appear as a solid, roundish, hypoechoic mass with irregular or microlobulated margins. These tumors are usually hypervascular.^{7,8,9}

Ultrasonography is more important in the diagnosis of true gynecomastia, which has a clinical presentation very similar to that of other nodular diseases. Ultrasonography, together with history, physical examination and image guided FNAC can provide a preliminary diagnosis for further evaluation. Image guided core biopsies would be reserved for definite diagnostic purposes only especially in cases of male breast lesions

REFERENCES

- 1) Yitta S., Cl Singer, Toth H.B., Mercado C.L. Image presentation. Sonographic appearances of benign and malignant male breast disease with mammographic and pathologic correlation. J Ultrasound Med. 2010;29:931-947.
- 2) Appelbaum A.H., Evans G.F., Levy K.R., Amir Khan R.H., Schumpert T.D. Mammographic appearances of male breast disease. Radiographics. 1999;19:559-568.
- 3) Johnson R.E., Murad M.H. Gynecomastia: pathophysiology, evaluation and management. Mayo Clin Proc. 2009;84:1010-1015.
- 4) Sinha RK, Sinha MK, Gaurav K, Kumar A. Idiopathic bilateral male breast abscess. BMJ Case Rep 2014;2014. pii:bcr2013202169.
- 5) Olivier Groh and Klaas in't Hof. Giant lipoma of the male breast: case report and review of literature. Eur J Plast Surg. 2012 May; 35(5):407-409.
- 6) Meeta Singh, Barkha Maheshwari, Nita Khurana, and Shyama Jain, Epidermal inclusion cyst in breast: Is it so rare? J Cytol. 2012 Jul-Sep; 29(3):169-172.
- 7) Hoda RS, Arpin Iii RN, Gottumukkala RV, Hughes KS, Ly A, Brachtel EF. Diagnostic Value of Fine-Needle Aspiration in Male Breast Lesions. Acta Cytol. 2019 Mar 22; 1-9.
- 8) Yang W.T., Whitman G.J., Yuen E.H., Tse G.M., Stelling C.B. Sonographic features of primary breast cancer in men. AJR Am J Roentgenol. 2001;176:413-416.
- 9) Chen L., Chantra P.K., Larsen L.H., Barton P., Rohitpakarn M., Zhu E.Q. Imaging characteristics of malignant lesions of the male breast. Radiographics. 2006;26:993-1006.