Case Report:

Granulomatous mastitis or carcinoma: Clinical and radiological diagnostic dilemma

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Abstract:
Granulomatous mastitis is a rare entity with clinical and radiological features similar to carcinoma. Treatment of carcinoma and granulomatous mastitis are completely different. We analyzed retrospectively clinical, radiological and pathological findings in 4 cases of granulomatous mastitis from January 2014 to January 2015 in Medical College, Kolkata. Granulomatous mastitis clinically and radiologically mimics carcinoma. But mainstay in diagnosis of granulomatous mastitis is fine needle aspiration and biopsy. Fine needle aspiration is rapid method but less reliable than biopsy. Therefore biopsy is a confirmatory investigation to rule out carcinoma in case of granulomatous mastitis.

Introduction
Granulomatous mastitis (GM) is an uncommon breast lesion that was first described by Kessler and Woolloch in 1972. This disease usually affects women of child-bearing age or those with a history of oral contraceptive use. Clinically and radiologically the condition may closely mimic carcinoma or breast abscess. But with the help of cyto-morphological and histo-pathological appearance, we can recognise the true nature of the disease. Hence, it may prevent misinterpretation as a carcinoma often associated with disastrous consequences or unnecessary surgery.

Case reports

Case 1
A 25 year old female presented in surgery OPD with a history of fever and pain in the breast for last 2 weeks. History of lactation present since 1 year. There was no family history of breast carcinoma. Oral contraceptive intake history was negative. Clinically patient had 3.5 cm lump on left upper outer quadrant. The lump was mobile, firm to hard in consistency. FNAC of the lump was performed. Smears prepared from FNAC showed epithelioid cell granulomas with chronic inflammatory cells in background. Ziehl Neelsen stain was performed but was negative.

Case 2
A 30 year old female presented in obstetric OPD with a painful breast swelling. She was 20 weeks pregnant. She had a history of oral contraceptive intake but no family history of breast cancer. It was her first pregnancy. On examination she had a 2.5 cm well defined lump on the right upper outer quadrant of breast. The lump was painful, mobile and firm in consistency. FNAC and trucut biopsy of the swelling was done. FNAC smears showed non-necrotizing granulomas and lymphocytes against haemorrhagic background. Ziehl Neelsen stained smears were negative for acid fast bacilli. Sections from trucut
biopsy showed foreign body giant cells, epitheliod cell granuloma and lymphocytes in background.

**Case 3**
A 32 year female presented with painful breast swelling in surgery OPD. She had a history of oral contraceptive intake for last 1 year. Family history of breast carcinoma was positive. Younger child was on breast feeding. On examination there was a well defined lump having diameter 1.5 cm present in a sub-areolar region. Lump was painful, mobile and firm in consistency. FNAC and trucut biopsy was performed. FNAC smears showed epithelioid granuloma cell granulomas with neutrophils in background. In this case also acid fast bacilli was negative on Ziehl Neelsen staining. Trucut biopsy sections showed lobulocentric granulomatous inflammation.

**Case 4**
26 year old female presented with fever and breast lump for last 15 days. Swelling was reddish in colour, painful and firm in consistency, clinically diagnosis of breast abscess was made. Family history of breast carcinoma was positive. Her mother died due to carcinoma breast, 3 years back. Oral contraceptive intake history was present. On examination, there was a diffuse swelling located in right upper outer quadrant of the breast having diameter of 3 cm. FNAC was performed and smears from FNAC showed granuloma formation with a clusters of epithelioid cells and lympho-plasmcytic cells in background. On Ziehl Neelsen staining of FNAC smears, no acid fast bacilli was found.

**Discussion**
GM is an uncommon breast lesion that is well known for its worrisome clinical presentations as a breast lump, particularly in younger women. Affected women are nearly always parous and usually present in their early thirties. On the whole, unilateral involvement of the breasts is typical, although bilateral disease had been described. Cigarette smoking and oral contraceptive intake have been associated with GM. But these factors are not conclusively demonstrated as risk factors.

Hyperprolactinemia potentially play a role in the development of GM by causing overstimulation of the breast parenchyma as well as changes similar to the lactation period.

Granulomatous mastitis cytologically consists of epitheliod cell granuloma with inflammatory cells present in background. Histologically, it is characterized by the presence of non-necrotizing granulomas, usually admixed with inflammatory cells originating in the breast lobules. The differential diagnosis includes infectious organisms, bacteria (culture), mycobacteria (AFB stain and necrotizing necrosis) and fungus (GMS stain), sarcoidosis (“naked” granulomas, i.e., lacking lymphocytic inflammation), traumatic fat necrosis (foamy macrophages and nonlobular), ruptured cyst (nonlobular), duct ectasia (periductal fibrosis), plasma cell mastitis (nongranulomatous), Wegener’s granulomatosis (vasculitis), carcinoma(keratin immunohistochemistry), and foreign body reaction (polarizable material).

Fletcher and colleagues suggested that the initial event was damage to ductular epithelium by infection, trauma or chemically induced inflammation, which allowed luminal secretion to escape into the lobular connective tissue, where it stimulated a granulomatous response and further damaged the lobular structures.

In our study, all the patients were females. All the cases in our study were in reproductive age groups, this finding is similar to other studies like Altintoprak.
et al\textsuperscript{9}, Larsen et al\textsuperscript{10}. Case 3 and case 4 had a family history of breast carcinoma. In three cases (case 2, case 3 and case 4) out of four there were history of oral contraceptive intake. It may suggest a role oral contraceptive in granulomatous mastitis. In other studies of Khaffaf et al\textsuperscript{6}, Imoto et al\textsuperscript{7}, Altintoprak et al\textsuperscript{8}, role of oral contraceptives had been considered. Out of four cases two gave a history of breast feeding (Case 1 and Case 3) and two cases had a history of fever with abscess (Case 1 and Case 4). Out of four patients, two patients had lesion on the right side of the breast, one had on left side and one was in subareolar region. The size of the lesions ranged from 1.5 cm to 3.5 cm with a mean of 2.6 cm. In mammography and sonography nodular opacities and hypoechoic nodules are found.

**Conclusion**

There is an overlapping between radiological findings of granulomatous mastitis and carcinoma of breast. After radiology, fine needle aspiration is the investigation of choice for these kind of lesions. Fine needle aspiration removes dilemma between carcinoma and granulomatous mastitis in most cases. For further confirmation histopathology of the lesion can also be performed.

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**Figure 1:** Fine needle aspiration of granulomatous mastitis showing epithelioid histiocytes (Hematoxylin & Eosin, 100X)

**Figure 2:** Fine needle aspiration of granulomatous mastitis showing epithelioid histiocytes and lymphoplasmocytic cells in background (Hematoxylin & Eosin, 400X)
Figure 3: Photomicrograph of tissue specimen shows lobulocentric granulomatous inflammation and presence of giant cells (H and E, 100x).

Figure 4: Photomicrograph of tissue specimen shows granulomatous and lymphocytic inflammation (Hematoxylin & Eosin, 400x).

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