

Clinicopathological study of male breast lesion: An experience in a regional cancer center, Odisha

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ABSTRACT

Background: Breast cancer in males is relatively uncommon, accounting for <1% of all breast cancers. Due to rarity of this disease; screening, diagnosis, and further management is a big challenge. **Objectives:** To analyze the role of fine needle aspiration cytology (FNAC) in the diagnosis of male breast lesion and to know the prevalence of male breast lesion and male breast cancer (MBC) with their clinicopathological characteristics in the Acharya Harihar Regional Cancer Centre, Cuttack, Odisha, India. **Materials and Methods:** A retrospective study was conducted for a period of 7 years from January 2010 to December 2016 on male patients who presented with breast lump. **Results:** A total 158 male patients were encountered out of which 27 (17.8%) were malignant and 131 (82.9%) were benign. Among malignant lesion, only invasive ductal carcinoma (IDC)-NOS types were encountered whereas in benign lesion, gynecomastia were predominant 115 (72.78%). Overall prevalence of male breast lesion was 2.5% whereas MBC was 1.34%. The mean age of the malignant cases was 56 years with age ranged between 32 and 82 years. In FNAC, there were no false positive cases in this series giving a specificity of 100%, sensitivity of 87 % and overall diagnostic accuracy of 94.93%. In histology, Stage III was maximum (14, 51.85%), followed by Stage IV (7, 25.92%) and Stage II (1, 2.7%). **Conclusion:** MBC is relatively lower than female breast cancer, but the incidence is still increasing with late presentation. FNAC is very reliable with high sensitivity and specificity for early and presumptive diagnosis.

KEY WORDS: Male Breast Cancer; Fine Needle Aspiration Cytology; Gynecomastia

INTRODUCTION

Breast cancer in men is relatively uncommon, accounting for <1% of all breast cancers and <1.5% of all malignancy in men.^[1] The incidence of male breast cancer (MBC) is much higher in North America and Europe as compared with other Asian countries.^[2] In India, although this condition has been a rare entity, accounting for only 0.7% of all

male cancers but it seems to be substantially increasing.^[3] A recently published report covering more than 40 years of data indicated that males with breast cancer were at increased risk of death and disease recurrence compared to their female counterparts.^[3]

The epidemiologic literature on female breast cancer are extensive, but little is known about the etiology of MBC. Some predisposing factors such as inherited mutations in BRCA gene, Klinefelter syndrome, estrogen or testosterone use, orchitis/epididymitis, obesity, benign breast conditions (breast trauma, breast cyst, and nipple discharge), and drinking alcohol are suggested, but it has not been established properly. Whether gynecomastia is a risk factor for MBC is unclear, but some authors have reported its association with breast cancer in men.^[4]

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Although screening, early and presumptive diagnosis with proper management improves the outcome but male patients often presented in advance stage resulting in higher morbidity and mortality. It's probably due to lack of awareness, unestablished early screening method and paucity of research on this topic.^[5] The study has shown, fine needle aspiration cytology FNAC has been proved as a reliable, safe, cost-effective, early, and presumptive screening method in female breast lesion but the diagnosis of male breast lesion by this method is not yet well experienced yet.^[6]

Hence, we aimed to analyze the role of FNAC in the diagnosis of male breast lesion and to know the prevalence of male breast lesion and MBC with their clinicopathological characteristics in the Acharya Harihar Regional Cancer Centre, Cuttack, Odisha, India.

MATERIALS AND METHODS

A retrospective study was conducted for a period of 7 years from January 2009 to December 2016. During this study period hospital based data were analyzed from the register of all male patients who presented with breast lump in surgical oncology outpatient department (OPD) and then undergone FNAC at cytology OPD of Acharya Harihar Regional Cancer Centre, Cuttack. Data were also analyzed on the prevalence of the male breast lesion and male breast cancer with their clinicopathological parameters during this study.

Cytodiagnosis was correlated with histology, in available cases, which were advised for biopsy for further evaluation. The sensitivity, specificity, and overall diagnostic accuracy of the FNAC were also evaluated.

RESULTS

A total 158 male patients were encountered in this study series. This comprised 27 (17.08%) breast cancers cases, out of which all were invasive ductal carcinoma (IDC)-NOS type. Among benign breast diseases, most of the patients 115 (72.78%) were diagnosed of gynecomastia followed by 4 (2.53%) fibroadenoma, 10 (6.32%) inflammation/mastitis, and 2 (1.26%) epidermal cyst (Figures 1a-d). The prevalence of male breast lump accounted 2.5% of all breast lump cases, and MBC accounted 1.34% of all breast cancer cases in our institute for duration of 7 years from January 2009 to December 2016 (Table 1).

Overall age of the patients was ranged from 15 to 87 years, while, the mean ages of the malignant cases were 56 with age ranged between 36 and 82 years (Table 2).

Symptoms included self-detected lump in 146 (92.4%) patients followed by nipple retraction in 5 (3.16%), ulceration in

11 (6.96%), nipple discharge in 37 (23.41%), and fixity in 34 (21.51%) cases (Figure 2). Location of tumor in all quadrant (upper inner quadrant, upper outer quadrant, lower inner quadrant & lower outer quadrant) was 101 (63.92%) followed by retroareolar region, i.e., 57 (36.7%). Clinically, 155 (98.10%) patients were presented unilateral breast mass lesion, and 3 (1.89) were bilateral breast mass lesion (Table 3).

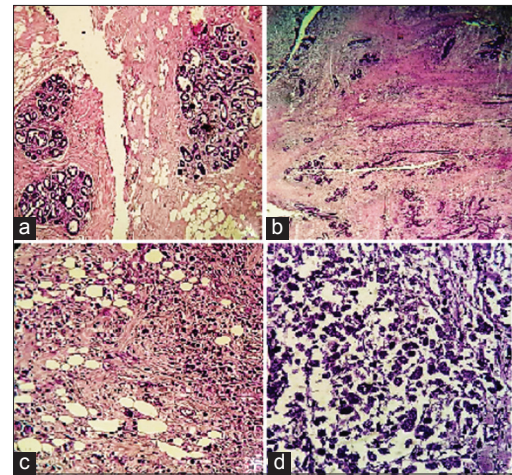


Figure 1: (a) Gynecomastia ×10 H and E, (b) fibroadenoma ×40 H and E, (c) invasive ductal carcinoma-NOS ×100 H and E and (d) invasive ductal carcinoma-NOS ×400 H and E



Figure 2: Patient presenting breast lump with nipple retraction (left side)

Table 1: Types of diagnosis

Diagnosis	N=158 (%)
Benign disease	
Gynecomastia	115 (72.78)
Fibroadenoma	4 (2.53)
Inflammatory smear	10 (6.32)
Epidermal cyst	2 (1.26)
Malignant	
IDC	27 (17.08)

IDC: Invasive ductal carcinoma

Table 2: Age incidence of male breast lesion

Age group	N=158 (%)	Malignant (N=27) (%)	Benign (N=131) (%)
0-10	-	-	-
11-20	11 (6.96)	-	11 (8.39)
21-30	30 (18.9)	-	30 (22.90)
31-40	27 (17)	2 (7.40)	25 (19.08)
41-50	29 (18.35)	4 (14.81)	25 (19.08)
51-60	44 (27.84)	13 (48.14)	31 (23.66)
61-70	8 (8.06)	6 (22.22)	2 (1.52)
71-80	6 (3.79)	1	5 (3.81)
>80	3 (1.89)	1	2 (1.52)

On cytology out of total 158 cases, 128 patients were diagnosed from benign lesion whereas 22 were reported as malignant (22 ductal carcinoma). Only eight cases were reported as suspicious lesion on cytosmear. Out of above cytodiagnosis cases, only 55 cases underwent biopsy, i.e., (33 lumpectomy, 9 simple mastectomy, and 13 modified radical mastectomy) for further evaluation and management. In 47/55 cases the diagnosis was same on both cytology and histology, but 8 suspicious cytosmear cases turned out to be ductal carcinoma in 5 cases, gynecomastia in 3 cases on histology. Hence, 5 cases were false negative. There were no false positive in this series giving a specificity of 100%, sensitivity of 87% and overall diagnostic accuracy of 94.93%.

Among histological diagnosis, Stage III was most common (14, 51.85%), followed by Stage IV (7, 25.92%), and Stage II (1, 2.7%). Grade II was maximum 14 (51.85%). Lymph node involvement was observed in 19 (70.37%) cases and lymphovascular invasion in 16 (59.25%) cases (Table 3).

DISCUSSION

The British physician John of Arderne is reported to be the first to discover MBC in the 14th century.^[7] As in women, the incidence of MBC has increased, approximately about 26% over the past 25 years.^[8,9] Due to the incidence of MBC is rising there has been an increasing interest in this disease worldwide.^[10]

In India, data on MBC patients have been a rarity.^[11] However; the studies of MBC available from India have variably reported the incidence. Chikaraddi *et al.*^[2] have reported an incidence rate of 0.4 % of all breast cancer. A study conducted by Rai *et al.*,^[12] from North India, revealed the incidence of MBC as 0.5% while Shah *et al.*^[13] have reported a relatively high incidence of 4.1% from Kashmir. In our study, the prevalence of MBC in this study was 1.34%, among all MBC cases and 2.50%, among all breast lesion which is similar to the study conducted by Sundriyal *et al.*^[14] and Mitra *et al.*^[15]

The prevalence of MBC increases with age. Age frequency distribution for males is unimodal with a peak incidence

in the late sixth and early seventh decade. By comparison, females have bimodal age frequency distribution with early onset incidence at 50 and late at 70 years. The average age of diagnosis in males is 60 years, which is 10 years older than that noticed in female patients with the disease.^[16] In our study series, the mean age of MBC was 56 with age ranged between 32 and 82 years which is similar to the other Indian study, but the mean age of presentation in the western population is reported as 71.^[2] The youngest case of carcinoma of the male breast has been reported in a 6-year-old male child by Hartman and Magrish.^[17]

A painless lump beneath the areola, usually discovered by the patient himself is the most common presenting symptoms in the male breast carcinoma.^[18] The typical clinical presentation of breast cancer in 75-95% of men with hard eccentric non-tender mass.^[19] In our study, presenting symptoms included self-detected followed by nipple retraction in 7 (25.92%), ulceration in 19 (12.2%), nipple discharge in 17 (10.75%), and fixity in 15 (9.49%) cases. Tumor was localized in the central retroareolar region is highest, i.e., 16 (59.25%) in comparison to another quadrant 11 (40.74%) which is similar to another study which shown 43.4% of cases, tumor was localized in the central retroareolar region, followed by upper outer quadrant in 32%.^[20] In women, the most frequent location is the upper outer quadrant of the breast. These gender differences in tumor location are likely related to the relatively rudimentary nature of the male breast.^[9] It is usually presents in unilateral, and rarely involves both breasts.^[21] In India, It is usually unilateral.^[2] Nipple involvement is rare, and there is a slight left-sided predilection with a left to right ratio of 1.07:1.^[20] In our series 26 (98.10%) patients were presented unilateral breast mass lesion, and 1 (1.89%) was bilateral breast mass lesion. Left-sided involvement was observed in 14 (51.85%) cases whereas bilateral involvement was seen in one case. This finding is consistent with the study conducted by Elhaj *et al.*^[22]

FNAC is a very sensitive and specific diagnostic tool for the assessment of breast masses in male patients. The routine use of FNAC and immediate screening of unstained slides for the presence of adequate material would greatly reduce the number of unnecessary biopsies and frozen sections for histopathology evaluation, especially in the case of gynecomastia. Hence, a study has strongly recommended the use of FNAC as the first-line investigation in the clinical evaluation of male breast lumps.^[6] Studies also shown that use of FNA can allow diagnosis to be made with a sufficient degree of confidence which can spare the patient an invasive surgical procedure.^[23] In our series, the total number of patients who underwent FNAC for the assessment of a breast lump was 6319 over a 7 years period with males constituting 2.50%. Study conducted by MacIntosh *et al.*,^[24] male constituting (3.2%). However, Westend and Jobse^[25] and Wauters *et al.*,^[26] had very few cases such as 1.5% and

Table 3: Clinical characteristics of breast lesions

Characteristics	Total no. (%) (n=158)	Malignant no. (%) (n=27)	Benign no. (%) (n=131)
Clinical presentation			
Self-detected lump	146 (92.4)	27 (100)	119 (90.83)
Nipple retraction	5 (3.16)	3 (11.11)	2 (1.52)
Nipple ulceration	11 (6.96)	7 (25.92)	4 (3.05)
Nipple discharge	37 (23.41)	19 (70.37)	18 (13.74)
Fixity	34 (21.51)	24 (88.88)	10 (7.63)
Side of tumor			
Left side	87 (51.26)	14 (51.85)	73 (55.72)
Right side	68 (41.13)	12 (44.44)	56 (40.45)
Both side	3 (3.79)	1 (3.70)	2 (3.81)
Surgical procedure			
Lumpectomy	42 (26.58)	14 (51.85)	28 (21.37)
Modified radical mastectomy		22 (81.48)	-
Lymphovascular invasion		16 (59.25)	-
Lymph node involvement		19 (70.37)	-
TNM stage I			
II		14 (51.85)	-
III		7 (25.92)	-
IV		1	-
Grade I			
II		6 (22.22)	-
III		14 (51.85)	-
		2 (7.40)	-

1.7%, respectively. In a large study (614 cases of males with breast lesions) conducted by Johns Hopkins Institute USA showed a sensitivity of 95.3%, specificity of 100% and diagnostic accuracy of 98% for FNAC.^[27] In our study, FNAC showed a sensitivity of 87%, specificity of 100% and diagnostic accuracy of 94.93% which is similar to the previous study.^[24-27]

In this study, we had 55 (34.81%) cases with histologic follow-up which is lower than the study conducted by Westend and Jobse^[25] (47%) and Wauters et al.,^[26] (58%) reported and higher than MacIntosh et al.,^[24] (17%) (Table 4). Infiltrating ductal carcinoma is the most frequent invasive carcinoma in men, accounting for 70 - 95% of MBC and lobular carcinoma is rare (around 1% of all cases) due to lack of terminal lobules in the male breast.^[4] However, literature has shown that exposure to estrogen can cause terminal lobules to develop carcinoma in the male breast.^[28]

In our study series, infiltrating ductal carcinoma-NOS type was the only malignant type. The same histological type was also found to common by others such as Fentiman et al.,^[9] in 2006, and Chikaraddi et al.,^[2] in 2012.

The tumor biology of MBC is not significantly different from that of females; however, limited public awareness and

absence of adequate screening for MBC result in delayed diagnosis and poor outcomes.^[4] The diagnostic evaluation and staging system used for MBC are the same as for female breast cancer, but MBC exhibits more frequent lymph node involvement, more frequent lymphovascular invasion and advanced stages than in females.^[14,22,29] It probably due to paucity of breast tissue in males.^[30] In this study, 1 (2.7%) had Stage II, 14 (51.85%) had Stage III, and 7 (25.92%) had Stage IV, which is similar with the previous study conducted by Chikaraddi et al.^[2] Men with lymph node involvement have a 50% higher risk of death than those without lymph node involvement.^[8]

This could be explained by the lack of a screening program (unlike for women), smaller breast tissue, unawareness of patients, and lack of expectation among treating physicians; furthermore, the stigma of cancer in general, and breast cancer (a disease of woman) in particular, make men seek medical advice later.^[7]

CONCLUSION

The incidence of MBC is increasing, so awareness and screening can detect the lesion early and prevent late detection of disease in advance stage as tumor stage is most important for survival. FNAC is very reliable in early and

Table 4: This study in comparison with another study

Result	Westend and Jobse ^[25]	MacIntosh et al. ^[24]	Wauters et al. ^[26]	Pailoor et al. ^[6]	Present study
Year	2002	2008	2009	2015	2017
Number of male FNAC (%)	153 (1.5)	138 (3.2)	147 (1.7)		158 (2.5)
Number of biopsy (%)	72 (47)	23 (17)	85 (58)	19 (50)	55 (34.81)
Number of malignant cases (%)	15 (9.8)	11 (7.9)	15 (10.2)	4 (10.5)	27 (17.08)
Number of unsatisfactory cases (%)	18 (11.7)	46 (33.3)	45 (30.6)	1 (2.6)	8 (5.06)
Sensitivity %	100	95.5	100	100	87
Specificity %	89	100	90.2	100	100

FNAC: Fine needle aspiration cytology

presumptive diagnosis with high sensitivity, specificity, and diagnostic accuracy. It should be used as a first line of investigation in the evaluation of male breast lesions. The main limitation of our study being a retrospective nature with a lack of information on epidemiological data. Hence, multi-institutional prospective study regarding awareness, screening, epidemiology, and further management is needed for better understand of this rare disease in our region.

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