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Original Article

Surgery Section

Pattern of Various Male Breast Diseases in a Tertiary Care Centre of Aurangabad District, Maharashtra, India- A Prospective Interventional Study

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ABSTRACT

Introduction: A small percentage of men are affected by breast diseases and awareness of male breast disease is less and presentation is often delayed due to embarrassment. The most common presentation is gynaecomastia, where cosmetic correction is sought. Over the last two decades the rate of male breast complaints increased from 0.8% to 2.4%, while 1% of all breast cancers occur in males.

Aim: To study the pattern of various male breast diseases in a tertiary care centre of Aurangabad District in Maharashtra, India.

Materials and Methods: This prospective clinical interventional study was carried out in 44 male patients above the age of 12 years coming with complaints related to breast to the Department of General Surgery of Government Medical College, Aurangabad from 1st August 2017 to 31st July 2019. Detailed history was taken and any underlying causative disease/risk factor or medication was noted. Thorough clinical examination and laboratory investigations were done. Ultrasonography (USG) of breast was done in all patients. Mammography was done in three patients who were having clinical suspicion of malignancy. Continuous variables were presented as mean, Standard Deviation (SD) or median if the data is unevenly distributed. Categorical variables are expressed as absolute numbers and percentages. Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 17.0.

Results: The youngest patient was 12 years old and eldest was 85 years old. In the present study, 39 benign and five malignant male breast diseases were diagnosed. Out of total, 33 had gynaecomastia, two had breast abscess, five infiltrating duct carcinoma and one each of mastitis, eczema of nipple, sebaceous cyst of areola and primary breast sarcoma. Out of 44 patients, 12 patients underwent surgery for benign and malignant breast diseases, 24 patients of gynaecomastia were managed by reassurance, five males with infiltrating ductal carcinoma were managed by Modified Radical Mastectomy (MRM) and three patients by medical therapy.

Conclusion: It was concluded that benign male breast diseases were more common and USG together with mammography should be used to differentiate characteristics of benign and malignant male breast lesions.

Keywords: Gynaecomastia, Mammography, Mastitis

INTRODUCTION

Breast diseases even though in small percentages, do affect men. Awareness of male breast disease, particularly among the general public, is low [1]. Men do however, possess a small amount of breast tissue, which makes them susceptible to breast disease [2]. Further, presentations are often late due to embarrassment [3]. The most common presentation of male patients with breast pathologies is gynaecomastia, where cosmetic correction is sought and the other benign diseases includes abscess, haematoma, lipoma, fat necrosis, ductal ectasia, intraductal papilloma etc [4].

Over the last two decades the rate of male breast complaints increased from 0.8% to 2.4%, while 1% of all breast cancer occur in males [5]. Major improvements have been achieved in the understanding of breast cancer and cure can be offered if the disease is diagnosed at an early stage. However, the disease is more often diagnosed at more advanced stages (3 or 4) in men in contrast to women. Its rarity among men as well as lack of awareness leads to its detection at later stages [2]. The prevalence of metastasis to the breast is generally 5-6 times less often in men as compared to women (approximately 0.5% to 6.6% of breast malignancies), which is accounted for by differences in hormonal and endothelial cell adhesion molecules, as well as in breast size and vascularity. The melanoma, lymphoma, prostate, lung and colon tumours are the most frequent primary tumours in men which metastasise to the breast [2]. Male breast carcinoma is a rare condition, accounting for less than 1% of all breast carcinomas [6].

Considering the data, since 0.1% of mortality among male oncologic conditions is attributed to male breast carcinoma, it is obvious that compared to females, among whom breast cancer is the first cause of oncologic death in most European and American countries, the disease is less studied, treated and followed in men [7]. The most important risk factors are represented by hormonal imbalance (caused by the metabolic syndrome even in young patients), hyperthyroidism, traumatic or infectious origin or antiandrogenic medication used for prostatic carcinoma, testicular disorders of development, and environmental conditions (professional or therapeutic exposure to radiation) [8,9].

There is a need for research on Male Breast Cancer (MBC), specifically concerning the psychosocial aspects of cancer care, since breast cancer is known as a typical woman's disease, most research to date has focused on Female Breast Cancer (FBC) [10]. Over the last few decades, survival of female breast cancer has improved substantially. This is likely due to a combined result of earlier detection and improvements in treatment. Given the scarcity of MBC, solid recent data on risk and outcome for male disease is lacking [11].

Earlier studies on MBC had certain limitations, like small sample sizes, short follow-up time, limiting their interpretability because of low incidence. Another issue was that the therapeutic strategies for MBC patients were commonly extrapolated from those used to treat postmenopausal FBC patients [4,5]. Earlier available information

has suggested that MBC has biological differences compared with FBC. Following factors are associated with MBC advanced stages namely, higher grades, higher prevalence of hormone receptor-positivity, and a worse prognosis [11]. It may be inappropriate to adopt the clinical applications of female-to-male extrapolation, since, studies have proposed that MBC patients are insensitive to adjuvant therapy, and an underutilisation of therapy in MBC patients compared with FBC patients [12,13]. Thus, the aim was to study the pattern of benign and malignant male breast diseases and its outcome in a tertiary care centre.

MATERIALS AND METHODS

The present prospective interventional study was carried out in 44 male patients visiting the Department of General Surgery of Government Medical College, Aurangabad district in Maharashtra, India with complaints such as breast pain, swelling in breast, nipple discharge and ulceration etc. from 1st August 2017 to 31st July 2019. Institutional Ethical Committee (IEC) clearance was taken vide no. Pharmac/IEC-GMCA/479/2017, dated: 23.10.2017 and informed consent was obtained.

The sample population of 44 patients comprised of all the patients meeting the inclusion criteria and attending the Outpatient Department (OPD) of General Surgery of Government Medical College, Aurangabad district during the study period. Patients below the age of 12 years and those patients not willing to get enrolled in the study were excluded from the study.

Procedure

Detailed history was taken and any underlying causative disease/risk factor or medication was noted. Thorough clinical examination was done, including general and systemic examination, breast, genitals, thyroid and any signs of liver cell failure were noted. Routine investigations like Complete Blood Count (CBC), liver function and Kidney Function Test (KFT) were done. Ultrasonography (USG) of the breast was done in all patients. Mammography was done in patients with clinical suspicion of malignancy, which was further analysed by Breast Imaging Reporting and Data System (BIRADS-IV) [13].

Management: Those males with malignant features on clinical as well as USG were subjected to both Fine Needle Aspiration Cytology (FNAC) and trucut biopsy. Incisional biopsy was done if there was ulceroproliferative growth arising from breast biopsy suggestive of primary breast sarcoma. The patients were followed-up on first week, after one month and after three months.

STATISTICAL ANALYSIS

The data were expressed as frequencies and percentages and tabulated. It was further analysed using the Statistical Package for the Social Sciences (SPSS) version 17.0. Continuous variables were presented as mean, SD or median if the data was unevenly distributed. Categorical variables were expressed as absolute numbers and percentages.

RESULTS

Amongst 44 males, the youngest patient was 12 years old and eldest patient was 85 years old. Maximum number of males 13 (29.54%) were in the age group of 12-20 years with the mean age of 37.86 years. Swelling was the most common presenting complaint 42 (95.45%) in males with breast disease followed by pain 26 (59.09%). There was right-sided male breast disease preponderance in 23 (52.27%) patients.

The [Table/Fig-1] shows that the aetiology for both benign and malignant breast disease was idiopathic in 30 (68.18%) patients and adolescent/physiologic in 10 (22.72%) patients and least 2 (4.54%) was seen in drug induced cases.

Aetiology	Number of patients (n)	Percentage (%)
Idiopathic	30	68.18
Adolescent/physiologic	10	22.72
Drug induced (e.g- ART)	2	4.54
Liver cell failure	2	4.54
Total	44	100

[Table/Fig-1]: Distribution of patients according to the aetiology.
ART: Antiretroviral therapy

The [Table/Fig-2] shows that the lump in the breast was the most marked clinical feature in majority 43 (97.72%) patients followed by tenderness in 23 (52.27%), nipple discharge in 2 (4.54%), and ulcer in 2 (4.54%).

Signs	Number of patients (n)	Percentage (%)
Lump	43	97.72
Tenderness	23	52.27
Nipple discharge	2	4.54
Ulcer	2	4.54
Warmth	1	2.27
Lymphadenopathy	3	6.81
Hepatomegaly	1	2.27
Atrophic testis	1	2.27

[Table/Fig-2]: Distribution of patients according to their presenting signs (N=44).

The [Table/Fig-3] shows that gynaecomastia was the most common 33 (75%) benign breast disease in males. Ultrasonography was suggestive of benign disease in 39 (88.6%) and malignant in 5 (11.36%). Mammography was done in three patients showing BIRADS-IV in one suggestive of malignant lesion and BIRADS-II in two patients suggesting benign lesion.

Diseases	Number of patients (n)	Percentage (%)
Gynaecomastia	33	75
Infiltrating duct carcinoma breast	5	11.36
Breast abscess	2	4.54
Eczema of nipple areola	1	2.27
Mastitis	1	2.27
Primary breast sarcoma	1	2.27
Sebaceous cyst of areola	1	2.27
Total	44	100

[Table/Fig-3]: Distribution of patients according to disease pattern in male breast.

The [Table/Fig-4] shows that out of the total 44 patients, 24 (54.54%) patients had gynaecomastia which was managed by reassurance and three patients by medical therapy. One patient of each forming breast abscess, mastitis and eczema with skin ulceration were managed by broad spectrum antibiotics. Among them, three males were given medical therapy with tamoxifen 20 mg once daily for three months, five males who underwent trucut biopsy had infiltrating ductal carcinoma and were managed by Modified Radical

Management	Number of patients N=44	Percentage (%)
Reassurance	24	54.54
Subcutaneous mastectomy	6	13.63
MRM	5	11.36
Medical therapy	3	6.81
Antibiotics	3	6.81
Palliative care	1	2.27
Incision and drainage	1	2.27
Excision	1	2.27

[Table/Fig-4]: Distribution of patients according to management of their breast diseases.

Mastectomy (MRM) followed by chemotherapy/hormonal therapy/ radiation therapy.

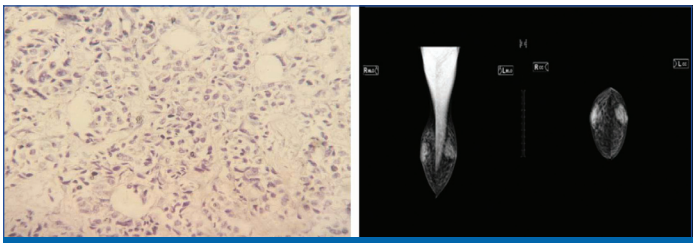
Total 12 male patients out of 44 underwent surgery for benign and malignant breast diseases and they were looked for postoperative complications like haematoma, seroma, skin edge necrosis, surgical site infection etc. Seroma was a common complication seen in four males who underwent MRM, flap necrosis was found in one MRM patient and one subcutaneous mastectomy.

The [Table/Fig-5] shows that gynaecomastia was the common histopathological finding, found in 6 (50%) patients. Infiltrating ductal carcinoma was observed in histopathology report of 5 (41.66%) patients who underwent MRM.

Report	Number of patients	Percentage (%)
Gynaecomastia	6	50
Infiltrating ductal carcinoma	5	41.66
Sebaceous cyst of areola	1	8.33
Total	12	100

[Table/Fig-5]: Distribution of patients according to the histopathology report.

Microscopic examination under 40x magnification of the haematoxylin and eosin (H&E) stained sections was done from all the nodules [Table/Fig-6] showed a well-circumscribed but unencapsulated tumour composed of interlacing fascicles of spindle shaped cells with prominent herring bone pattern. The tumour cells had scant cytoplasm and elongated nucleus with minimal atypia. Small foci of myxoid change were also noted. Underlying muscle was not involved by the tumour and lymph nodes were reactive. Infiltrating Ductal Carcinoma not otherwise specified (IDC nos) section showed tumour tissue arranged in sheets and in trabeculae. Tumour cells were pleomorphic with pleomorphic hyperchromatic nuclei and prominent nucleoli and mitosis was seen at necrosis site. Background showed inflammatory infiltrate admixed with Red Blood Corpuscles (RBC). Sections through the areola and nipple showed presence of tumour in subcutaneous tissue with thinning of overlying epidermis. P53 Immunohistochemistry (IHC) revealed negativity for cytokeratin, Epithelial Membrane Antigen (EMA), desmin, S-100, CD 10 (Calla) test and CD-34, Human Melanoma Black (HMB-45), Estrogen Receptor (ER) and Progesterone Receptor (PR); thus ruling out epithelial, muscular, neural differentiation of the tumour and showed positivity for vimentin in the tumour cells. [Table/Fig-7-9] shows radiographic and clinical images of gynaecomastia in male patients.



[Table/Fig-6]: Microscopic examination under 40x magnification haematoxylin and eosin (H&E) stained.
[Table/Fig-7]: Digital mammogram showing bilateral gynaecomastia. (Images from left to right)

[Table/Fig-8]: Bilateral gynaecomastia in middle aged male.
[Table/Fig-9]: Drug induced gynaecomastia in patient on ART. (Images from left to right)

DISCUSSION

In the present study, the youngest patient was 12 years old and eldest patient was 85 years old. Maximum males 13 (29.54%) were in the age group of 12-20 years with the mean age of 37.86 years, which is similar to the study by Carrascov RM et al., [6], in their retrospective study of 628 male breast patients, which found that their age ranged from 12-94 years and mean age was 52.3 years. The present study was also similar to the study by Jatav J et al., which found that the patients were 8 months to 91 years old (43.8±19.9), and the median age was 48 years [7]. In the present study, a lump in the breast was the most marked clinical feature in majority 43 (97.72%) patients followed by tenderness in 23 (52.27%), nipple discharge in 2 (4.54%), followed by ulcer in 2 (4.54%) patients.

Similarly, in a retrospective study by Yuan WH et al., that included 112 male patients with breast complaints who had preoperative breast USG and postoperative pathological diagnosis of the 125 breast masses, palpable tender lumps and bilateral synchronous masses were more likely to be benign than malignant (both, 100% vs 0%, p<0.05). Advanced age and bloody discharge from nipples were common in malignant lesions (p<0.05) [8]. Similarly Ramji AN, in his retrospective study of 21 male patients found swelling of breast 15 (71.42%), lump in 2 (9.52%), pain in 2 (9.52%) and ulcer over the breast in 1 (4.76%) [3]. In the present study, males presented with swelling 95.45%, pain 59.09%, nipple discharge 4.54%, fever 2.27%, and ulcer 2.27%. Our study results are similar to previous studies by Carrascov RM et al., [6] and Athwal RK et al., [14].

In the present study, males with unilateral breast diseases were 90.9% and bilateral were 9.09%. Of unilateral cases, right-side involvement was 52.2% and left-side was 38.6%. Our study findings are similar to the study findings by Jatav J et al., in a retrospective study of 112 male patients 104 (92.9%) had a unilateral breast lump (55 on right-side and 49 left-side) and 8 (7.1%) had bilateral breast lump [7]. Vela SA et al., in their retrospective study of 40 male patients, found 37% in left breast, 37% in the right breast and 26% bilateral [15].

In the present study, aetiology was idiopathic (68.18%), adolescent/ physiologic (22.72%), drug induced (4.54%) and systemic illness-liver cell failure cirrhosis (4.54%). Our study is similar to the study findings by Athwal RK et al. In their study of 53 male patients with breast diseases, 34 patients (82%) were idiopathic and 19 patients (18%) were taking medication {finasteride (n=9), ranitidine (n=4), corticosteroids (n=4) and potassium sparing diuretics (n=2)} that could have been a potential cause of the gynaecomastia [14]. A study by Hanavadi S et al., found that using tamoxifen was safe and effective in men with painful idiopathic or physiological gynaecomastia and to be considered before contemplating surgery [16]. In the present study, USG was suggestive of benign disease in 88.6% and malignant in 11.36%. Mammography was done in three males showing BIRADS-IV in one male suggestive of malignant lesion and BIRADS-II in two patients suggesting benign lesion. Similar findings were observed by Chen PH and Slanetz PJ, in their retrospective study of 327 male patients with 353 mammograms were further evaluated by USG and additional findings were analysed. Out of 14 biopsied patients, 12 (85.7%) were having BIRADS-IV and II (14.28%) patients having BIRADS-V. Among 10 patients of mammographic diagnosis of gynaecomastia 6 were of BIRADS-II and IV [17] Vela SA et al., found that most of the male patients were having BIRADS-II in 36 patients accounting for 90% of the population studied, 1 (2.5%) BIRADS-III, 2 (5%) BIRADS-IV and 1 (2.5%) BIRADS-V [15].

In the present study, those males with malignant features on clinical as well as USG were subjected to both FNAC and trucut biopsy. Out of six FNAC, three were suggestive of malignancy and three were

benign lesions. Out of six trucut biopsy, five had infiltrating ductal carcinoma and one was gynaecomastia. Incisional biopsy was done in one patient who had ulceroproliferative growth arising from left breast biopsy which was suggestive of primary breast sarcoma.

Ting AC et al., in their study of 68 male patients with idiopathic gynaecomastia 23 patients were treated with tamoxifen 18 (78.2%) had complete resolution which was similar to the present study [18]. Also, similar findings were noted by Hanavadi S et al., in their retrospective clinical study of 220 male patients 144 (65.4%) patients were managed by reassurance [16]. Also, similar findings were noted by Anjanappa HT and Arjun A, in their study of 25 males presenting with gynaecomastia. Reassurance was given in eight cases and excision surgery in the remaining 17 cases [19].

In the present study, 26 males with gynaecomastia were managed by reassurance as the cause was idiopathic and low grade, similar to Hanavadi S et al. Two males were dissatisfied with reassurance hence underwent subcutaneous mastectomy. Among them, three males with gynaecomastia were given medical therapy (tamoxifen), two of the three males showed regression in size and were relieved of pain [16]. Also, among the operated cases of gynaecomastia and male breast carcinoma, seroma was the most common complication which developed in 4 (33.33%) patients. Surgical site infection was seen in 3 (25%) and 2 (16.66%) patients had skin flap necrosis. Also, similar findings were noted by Arvind A et al., in their retrospective study of 53 male of gynaecomastia operated by different techniques, 22.6% patients had complications like seroma (2 patients), superficial wound dehiscence (2 patients) and major complications were haematoma requiring evacuation in theatre (2 patients) [20]. Also, similar findings were noted by Innocenti A et al., in their study of 312 patients who got operated for gynaecomastia, complications observed were 6 (1.9%) seroma, 3 (0.9%) haematoma and bleeding in 1 (0.32%) patient [21].

In the present study, 12 patients underwent surgical management. Histopathological reports of these patients were confirmed as gynaecomastia 6 (46.15%), infiltrating ductal carcinoma 5 (38.46%), sebaceous cyst of areola 1 (7.69%). The present study matches with all the above findings in terms of histopathological reports for gynaecomastia and infiltrating ductal carcinoma. Also, similar findings were noted by Yuan WH et al., in their retrospective study of 112 male (125 breasts) patients with breast complaints who had preoperative breast USG and postoperative pathological diagnosis. Benign masses were gynecomastia 53 (42.4%), pseudogynaecomastia 2 (1.6%), chronic inflammation 7 (5.6%), myofibroblastoma 2 (1.6%) and normal breast tissue 4 (3.2%). Malignant masses were Invasive ductal carcinoma 17 (13.6%), Ductal carcinoma in situ (DCIS) 1 (0.8%), Intraductal papilloma with DCIS 2 (1.6%), Invasive papillary carcinoma 1 (0.8%), Apocrine adenocarcinoma 1 (0.8%), Metastatic adenocarcinoma 1 (0.8%) [8].

In the present study 86.4% male breast disease were benign and 13.6% were malignant. Also, similar findings were noted by Yuan WH et al., who in their retrospective study of 112 male (125 breasts) patients with breast complaints who had preoperative breast USG and postoperative pathological diagnosis 80% masses were benign and 20% malignant [8]. Ramji AN found 19 (90.47%) as benign conditions and 2 (09.53%) as malignant out of 21 [3].

In the present study, the pattern of male breast diseases seen was gynaecomastia 33 (75%) as most common benign disease. Second most common male breast disease was carcinoma 5 (11.36%), breast abscess 2 (4.54%), 1 (2.27%) mastitis, 1 (2.27%) eczema of areola, 1 (2.27%) sebaceous cyst of areola and 1 (2.27%) sarcoma of breast. Similar findings were noted by Ramji AN, in his clinicopathological retrospective study of 21 male patients found the various male breast diseases as gynaecomastia 14 (66.66%), carcinoma 2 (9.52%), fibrocystic disease 1 (4.76%), abscess 1 (4.76%), sebaceous cyst 1 (4.76%), lipoma 1 (4.76%), and folliculitis 1 (4.76%) [3].

In the present study it was also found that the disease processes affecting the female breast can also manifest in the male breast, usually in the presence of endocrine disturbances beyond scope of the present study. Benign male breast diseases were more common than malignant diseases. Ultrasonography must be recognised as a powerful modality together with mammography to differentiate characteristics of benign and malignant male breast lesions. The most commonly encountered condition was gynaecomastia. Reassurance, medical and surgical corrections are various options available for the treatment of gynaecomastia and treatment should be tailored according to underlying condition and should be done at the earliest to avoid psychosocial stigma to the patient and help him lead a satisfied, embarrassment free functioning life.

Limitation(s)

Sample size was small and short duration of follow-up.

CONCLUSION(S)

In the present study, benign male breast diseases were more common than malignant diseases. Gynaecomastia was the most common disease affecting male breast followed by infiltrating ductal carcinoma. Other male breast diseases found were breast abscess, mastitis, eczema of nipple and areola, sebaceous cyst of areola and primary breast sarcoma. It can be concluded that disease processes affecting the female breast also manifest in the male breasts. Reassurance, medical and surgical corrections are various options available for the treatment of gynaecomastia.

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