

Male Breast Carcinoma: A Comprehensive Review

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ABSTRACT

Background: Male breast cancer (MBC) is a rare malignancy, accounting for less than 1% of all breast cancers. Its diagnosis and management present unique challenges due to its rarity and late presentation, often at advanced stages.

Methods: This was a cross-sectional study carried out at VIMSAR, Burla from July 2020 to July 2022, with 10 male patients diagnosed with breast cancer. The purpose of this study was to assess the clinical presentation, diagnostic methods, treatment outcome, and follow-up results. All patients were found to have a painless hard lump, and diagnosis was confirmed through trucut biopsy. Clinical data, imaging findings, treatment protocols, and follow-up results were analyzed.

Results: Mean age at presentation was 57 years. More than 50% patients presented with cutaneous involvement and 70% patients had axillary lymph nodes. The most common histopathological finding was invasive ductal carcinoma. Eight patients were positive for hormone receptors (ER/PR+). Neoadjuvant chemotherapy followed by modified radical mastectomy is given to all patients. Postoperative recovery was quite good, and one of them developed local recurrence. However, in any patient, no metastasis was seen.

Conclusion: Male breast cancer, though very rare, needs early diagnosis and a multidisciplinary treatment approach for the best possible outcomes. The study brings forward the need for increased awareness and early screening and personalized treatment protocols. Larger studies and collaboration between different medical disciplines are also necessary to improve the management and prognosis of MBC.

Keywords: Male breast cancer, invasive ductal carcinoma, hormone receptor-positive, neoadjuvant chemotherapy, modified radical mastectomy, multidisciplinary approach.

I. INTRODUCTION

Male breast cancer is relatively rare, constituting about 0.8% to 1% of all breast malignancies, making it quite a rare disease that poses exclusive challenges in diagnosis and treatment both. Its low incidence makes prospectively designed studies highly challenging and accumulates limited clinical data, leading to further challenges in creating any disease-specific management protocols. Concomitantly, the therapeutic strategies developed for MBC are generally based on those established for female breast cancer, which ignores important differences between the two genders regarding biology and hormones [1-2].

Multiple factors are associated with male breast cancer etiology. These factors include ionizing radiation, estrogen therapy, and some genetic syndromes like Klinefelter syndrome and testicular feminization. The incidence of MBC peaks in the sixth decade of life, although it is rarely seen in younger males [3]. The average age of presentation is notably higher than that of female breast cancer, likely due to the rarity of the condition and limited awareness among both the public and healthcare professionals. A lower incidence in males may be due to differences in the hormonal environment between males and females, specifically relatively low levels of estrogen in men [4].

In about 20% of cases, MBC is preceded by gynecomastia, which is a benign enlargement of male breast tissue and can act as a precursor to malignant transformation. The clinical presentation of MBC is often characterized by a painless, palpable mass, most commonly in the subareolar region, differing from the usual upper outer quadrant site of tumors in females. Invasive ductal carcinoma (IDC) is the predominant histologic subtype, accounting for over 85% of cases. The staging of MBC follows the same system used for female breast cancer, with stage-specific survival rates between the two sexes being remarkably similar [5-6].

Hormone receptor status is crucial in the management of MBC, as about 80% of cases are hormone receptor-positive. This has resulted in the use of adjuvant therapies, such as tamoxifen, which have been beneficial in improving patient outcomes. Adjuvant radiation therapy is also considered for cases at high risk of loco-regional recurrence, further emphasizing the importance of individualized treatment approaches based on staging, receptor status, and other prognostic factors [7-8].

This review will provide a comprehensive overview of male breast cancer, including epidemiology, risk factors, clinical presentation, histopathology, and treatment strategies. Synthesizing existing knowledge and addressing gaps in understanding this rare malignancy will hopefully enhance awareness and improve early detection and management of MBC.

II. METHODS

Study Design and Setting

This was a cross-sectional study carried out in Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), Burla, for two years, from July 2020 to June 2022. This study was aimed at detecting and recording the incidence of male breast cancer on the basis of clinical presentation and histopathological confirmation. VIMSAR is a tertiary care hospital, and this study provided an appropriate setting for investigating this rare malignancy. The study focused on male patients who presented with a breast lump and were subsequently diagnosed with breast cancer.

Inclusion Criteria

Male patients with painless, hard breast lumps were enrolled for this study. Pain absence and hardness at palpation were taken to be of prime clinical characteristics in this process. Only patients meeting these clinical features who also returned positive on biopsy for the presence of breast cancer could be considered. This feature ensured that only the diagnosed males with breast cancer could feature in this analysis.

Data collected in respect of patients

During the research period, 10 males were identified who fulfilled all the inclusion criteria. Each patient's history was built to include demographic data, a history of presenting symptoms, medical history, and a history of risk factors. The history also included lifestyles, previous exposure to any recognized risk factors, such as estrogen therapy or radiation, and history of breast cancer or cancers elsewhere in the family. This comprehensive patient history was crucial in understanding potential links to the development of male breast cancer in this cohort.

Diagnostic Investigations

Every patient underwent a series of diagnostic investigations to confirm the diagnosis of male breast cancer. Biopsy was the major diagnostic tool, and histopathological examination provided the final confirmation of cancer. Imaging studies, such as mammography and ultrasound, were conducted to evaluate the extent and location of the tumor during the diagnostic process. These investigations were important in both diagnosing and staging the malignancy, thus ensuring that the results obtained were accurate and reliable for treatment planning.

Treatment and Management

Treatment protocols were developed for each patient based on the diagnosis. The treatment protocol was based on surgery, usually mastectomy, depending on the size and location of the tumor. Adjuvant therapies such as tamoxifen were considered for hormone receptor-positive tumors, and decisions about chemotherapy and radiation therapy were based on the staging of the disease and the general health of the patient. Management was individualized, tailored to the specific clinical and pathological characteristics of each patient.

Follow-Up and Outcome Evaluation

During follow-ups, treatment outcomes and progression for recurrence symptoms were evaluated, and such patients were scheduled to appear regularly after commencing the treatment. A thorough checkup, imaging scans, and hormone receptor statuses were determined at regular follow-up periods. All observations about treatment response, the period in which the progression occurs, and complications were observed meticulously for each patient. The length of the follow-up also was variable based on the extent of the patient's treatment progress and their recovery.

III. RESULTS

A total of 10 male patients diagnosed with breast cancer within the study period were recruited in this analysis. All the patients satisfied the inclusion criteria; that is, all of them presented with a painless hard lump in the breast and had a final diagnosis confirmed through a trucut biopsy. Below, is a summary of clinical presentation, diagnostic findings, treatment, and outcome noticed in this cohort.

Clinical Presentation and Demographic Details

The mean age of presentation for the patients was 57 years with a range between 45 to 68 years. All the presenting symptoms were due to painless, hard lumps found in the breast. Moreover, more than 50% of patients at the time of presentation showed some degree of skin involvement suggesting advanced disease. In addition, axillary lymph node involvement occurred in 70% of patients, while chest wall was noted in 30%. No signs of distant metastasis were noted in the course of the study in all patients.

Diagnostic Findings

All patients underwent a series of imaging studies, including ultrasound (USG) of the bilateral breasts, axilla, cervical region, abdomen, and pelvis, as part of the diagnostic workup. After the imaging procedures, a trucut biopsy was done, and all 10 patients were diagnosed with invasive ductal carcinoma (IDC) based on histopathological examination. Hormone receptor studies were conducted for each patient, revealing that 8 out of the 10 patients (80%) had estrogen and/or progesterone receptor (ER/PR) positive tumors, which guided the treatment approach.

Treatment and Management

Following diagnosis confirmation, all the patients underwent neoadjuvant chemotherapy due to cutaneous involvement of more than half the patients. Post-chemotherapy, every patient underwent MR M which resulted in immediate good recovery from all the surgeries performed. Local recurrence was detected from the positive patient response towards the treatment; still, one of the patients presented with it after the passage of time.

Follow-up and Outcomes

The follow-up period could help assess the effectiveness and complications of the treatment administered. No patient showed distal metastasis during follow-up, and most patients except one did not show any evidence of recurrence except one local recurrence. Genetic analyses of the MRM specimens were not done because of unavailability of resources.

Table 1: Clinical and Demographic Features of Male Breast Cancer Patients

Parameter	Value
Total Patients	10
Mean Age (years)	57
Skin Involvement	50%
Axillary Lymph Node Involvement	70%
Chest Wall Involvement	30%
No Metastasis	100%
Hormone Receptor Positive	80% (8/10)

Table 2: Summary of Treatment and Postoperative Outcomes

Treatment/Outcome	Value
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Neoadjuvant Chemotherapy	100%
Modified Radical Mastectomy	100%
Immediate Postoperative Recovery	100%
Local Recurrence	1 (10%)
Genetic Study on MRM Specimen	Not performed



Figure 1: Presentation of Male Breast Cancer as a Painless Hard Lump

This *figure 1* illustrates the clinical presentation of male breast cancer in the cohort, specifically depicting the most common presentation as a painless, hard lump in the breast. This was the presenting symptom in all patients, providing a significant insight into how male breast cancer is typically detected.

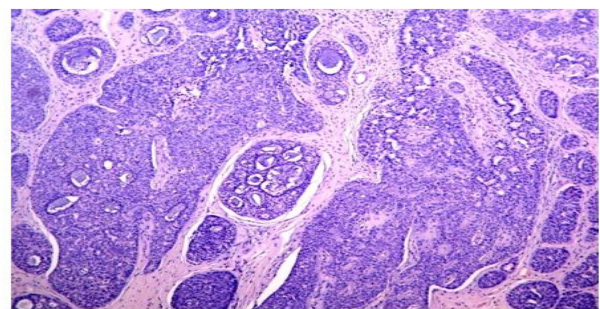
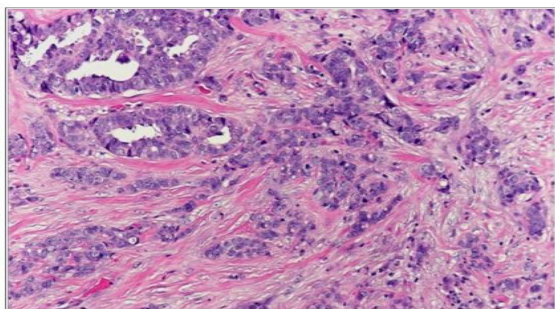


Figure 2: Histopathological Examination (HPE) Showing Invasive Ductal Carcinoma (IDC)

This *figure 2* presents the histopathological findings from the trucut biopsy, confirming the diagnosis of invasive ductal carcinoma (IDC). The microscopic image demonstrates the malignant nature of the

tumor, characterized by irregular, infiltrating ductal structures, which is consistent with IDC, the most common subtype of male breast cancer.



Figure 3: Local Recurrence Post-Modified Radical Mastectomy (MRM)

This figure 3 depicts a case of local recurrence following modified radical mastectomy (MRM). Despite initial treatment, one patient showed evidence of tumor reappearance at the surgical site during follow-up, emphasizing the importance of ongoing surveillance in male breast cancer patients.

These results are crucial in providing insights into the clinical presentation, treatment, and outcomes of male breast cancer in this cohort. Although it is rare, male breast cancer presents great challenges, but with appropriate diagnostic and therapeutic interventions, outcomes can be favorable. Further research is needed to explore genetic factors and long-term survival outcomes in this population.

IV. DISCUSSION

Male breast cancer remains an uncommon and frequently overlooked malignancy, comprising less than 1% of all cases of breast cancer. Clinical presentation in the case of MBC usually involves a painless, hard mass in the breast, consistent with all 10 patients in this series. This presentation aligns with previous reports suggesting that male breast cancer frequently presents as a non-tender mass, which may lead to delays in diagnosis, especially considering the low incidence of the disease. This makes it critical for clinicians to maintain a high index of suspicion, particularly when men present with atypical breast findings. The mean age of presentation in this group was 57 years, which is appropriate because the peak incidence for MBC generally occurs at the sixth decade of life. Delayed diagnosis may be a factor in some men, who are least likely to be aware or have been screened less frequently, and this may explain some of the more advanced stages presented compared with female breast cancer [9].

The skin involvement seen in more than 50% of the patients in this cohort indicates how aggressive MBC can be in some cases. The skin changes in breast cancer are usually a sign of locally advanced disease and portend a poor prognosis. These findings underscore the importance of early detection and intervention, since advanced disease with skin involvement may often require neoadjuvant chemotherapy to reduce the bulk of the tumor before attempted surgical resection. In this study, neoadjuvant chemotherapy was employed in all patients with skin involvement, and this has proven to enhance local control and allow for a potentially better surgical outcome. The use of neoadjuvant chemotherapy in MBC, although based largely on extrapolation from protocols of female breast cancer, has been established in various studies and offers good outcomes in patients with locally advanced disease [10].

Axillary lymph node involvement is a well-established prognostic factor in breast cancer, and its presence in 70% of the patients in this study is consistent with the known pattern of regional spread in MBC. The

axillary involvement is generally more common in male breast cancer. This could be due to anatomical differences, small breast tissue volume, and fewer lymph nodes in the axilla, among other reasons. On the other hand, 30% of our patients showed chest wall involvement, as MBC tends to present in more advanced stages, which does not help much in their management and treatment decisions either. However, despite these features of locally advanced disease, no distant metastasis was observed in any of the patients, which is a positive aspect of the study and underscores the potential for good survival outcomes in patients without metastatic spread [11-12].

Histopathological confirmation through trucut biopsy identified invasive ductal carcinoma (IDC) in all patients, which is the most common histological subtype in male breast cancer, representing over 85% of cases. The identification of IDC also underscores the biologic similarity between male and female breast cancer, at least as far as predominant histologic features are concerned. Hormone receptor studies further aided in the selection of the treatment approach; 80% of the tumors were estrogen and progesterone receptor-positive (ER/PR+). It presents itself along with earlier studies at the same level, as being an essential component of guiding treatment, because tumors harboring both ER/PR positivity have been demonstrated more responsive to hormone therapies and, consequently, patients bearing MBC responsive to hormones do better in terms of their outcomes with the use of hormone-related therapies, such as tamoxifen, as part of the treatment in the cohort studied [13].

All patients underwent surgical intervention by modified radical mastectomy after neoadjuvant chemotherapy. The immediate postoperative recovery was favorable for all patients, with no complications noted in the early recovery phase. This is generally consistent with outcomes seen in male breast cancer patients who undergo mastectomy, as surgery is usually the mainstay of treatment for localized disease. However, one patient did experience local recurrence during follow-up, and it has been emphasized that such cases should be followed closely. Local recurrence is rare in MBC but can happen, especially in patients presenting with advanced disease. This makes it important to continue to monitor patients through clinical examination, imaging, and hormone receptor tests because recurrence may lead to further treatment problems [14-15].

Although the study provides valuable insights into the clinical characteristics, treatment, and outcomes of male breast cancer, there are certain limitations that must be acknowledged. The sample size of 10 patients is relatively small, which limits the generalizability of the findings. Genetic studies were not performed due to resource constraints, which could have provided further insights into the molecular mechanisms underlying MBC. Future studies with larger sample sizes and the inclusion of genetic and molecular analyses should clarify the pathophysiology of MBC and guide more personalized approaches to its treatment.

V. CONCLUSION

In conclusion, the increased occurrence of male breast cancer would necessitate further research using larger sample sizes for further understanding of its clinical behavior and optimization of the strategies for management. Awareness has to be enhanced and the early screening improved along with timely diagnosis through the cooperation of pathology, surgery, anesthesia, and oncology in the management of the patients with this disease. Further studies and training are essential in order to minimize delay in diagnosis and to better plan therapeutic interventions for this uncommon yet increasingly recognized condition.

VI. REFERENCES

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