



Rare Case of Male Carcinoma Breast Presenting as Gynecomastia

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Abstract

We report a case of a 42-year-old male chef who presented with a four-month progressive history of left breast swelling accompanied by recent-onset nipple pain and sanguineous discharge. Clinical examination and ultrasonographic imaging suggested benign gynecomastia with duct ectasia. However, histopathological examination of the surgically excised specimen revealed an unexpected diagnosis of invasive ductal carcinoma, Nottingham Grade 1, measuring 1.1 centimetre with extensive intraductal component. Immunohistochemical analysis demonstrated oestrogen receptor and progesterone receptor positivity with human epidermal growth factor receptor 2 negativity, corresponding to pT1N0M0 stage disease. Positron emission tomography imaging excluded distant metastasis. The patient proceeded to modified radical mastectomy with planned adjuvant chemotherapy. This case highlights the critical diagnostic imperative of maintaining elevated clinical suspicion for malignancy in male patients presenting with nipple discharge or atypical breast findings, emphasizes the essential role of tissue diagnosis in establishing pathological certainty, and underscores the importance of multidisciplinary team approach in optimizing treatment outcomes in this rare malignancy.

Keywords: Male breast cancer, Invasive ductal carcinoma, Gynecomastia, Diagnostic challenge, Nipple discharge, Case report

Introduction

Male breast malignancy remains an uncommon disease entity, accounting for less than one percent of all breast cancer diagnoses globally [1]. Despite advances in cancer screening and diagnostic modalities, male breast cancer frequently presents at advanced disease stages, primarily due to diagnostic delays resulting from limited clinical awareness among both patients and healthcare practitioners [2]. The rarity of this condition contributes to diagnostic uncertainty and cognitive bias; wherein benign clinical presentations may mask underlying malignancy.

Gynecomastia, defined as pathological enlargement of breast glandular tissue in males, occurs with considerable prevalence across different age groups and has multiple recognized aetiological factors [3]. While gynecomastia is universally benign, its presentation occasionally coincides with or precedes detection of breast malignancy. The diagnostic challenge intensifies when clinical and imaging findings suggest benign pathology whilst harbouring occult malignancy.

This case exemplifies the diagnostic complexity inherent in distinguishing benign male breast disease from carcinoma. We present a clinical scenario wherein initial clinical and radiological assessment favored benign diagnosis, yet histopathological examination revealed invasive ductal carcinoma with aggressive potential. The case underscores essential principles in diagnostic approach to male breast pathology and highlights the irreplaceable value of tissue-based diagnosis in achieving diagnostic certainty.

Case Presentation

Patient presentation and history

A 42-year-old male professional chef attended the surgical outpatient clinic with chief complaints of left breast swelling for four months, associated with pain and nipple discharge for the preceding 15 days (Figure 1).

The patient reported initial observation of gradual, insidious left breast enlargement approximately four months prior to hospital presentation. The swelling remained relatively static during the initial three months, without associated discomfort or functional impairment. However,

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Figure 1: Pre operative image showing swelling in left breast with sanguinous discharge from the nipple.

approximately one month prior to presentation, the patient noticed accelerated increase in swelling size, prompting him to seek medical evaluation.

Associated symptoms included intermittent, sharp, pricking-type pain over the breast swelling for 15 days, exacerbated by strenuous occupational activities including heavy lifting and prolonged standing, with partial relief upon resting. The patient reported occurrence of spontaneous nipple discharge of mild volume, with reddish tinge suggestive of blood staining, occurring intermittently over the preceding 15 days. The discharge was non-purulent and without foul odour. The patient denied fever, weight loss, decreased appetite, or systemic symptoms suggestive of disseminated disease. Bowel and bladder habits remained normal.

Relevant medical history included diagnosis of Alcohol Dependence Syndrome approximately two months prior to this presentation, for which he had initiated counselling and supportive care. He denied previous medical diagnoses of hypertension, diabetes mellitus, asthma, tuberculosis, coronary artery disease, renal disease, cerebrovascular disease, or thyroid dysfunction.

Family history was notable for the absence of breast malignancy, testicular cancer, or thyroid cancer among family members. There was no documented familial pattern of other malignancies.

Clinical examination

General examination revealed an alert, oriented, afebrile patient with stable vital signs: arterial blood pressure 120/80 millimetres of mercury, heart rate 78 beats per minute, respiratory rate 16 breaths per minute, and peripheral oxygen saturation 100 percent on room air. Systemic examination of the cardiovascular system revealed normal heart sounds without murmurs. Respiratory examination demonstrated bilateral air entry without adventitious sounds. Abdominal examination documented soft, non-tender abdomen with normal bowel sounds. Neurological examination was unremarkable.

Local breast examination demonstrated mild enlargement of the left breast compared to the right side. A linear scar measuring approximately four by two centimetres was noted immediately superior to the left nipple-areolar complex, suggesting previous surgical intervention. The skin overlying the swelling appeared normal without evidence of dimpling, puckering, or prominent venous patterns. Visible spontaneous nipple discharge was observed from the left nipple.

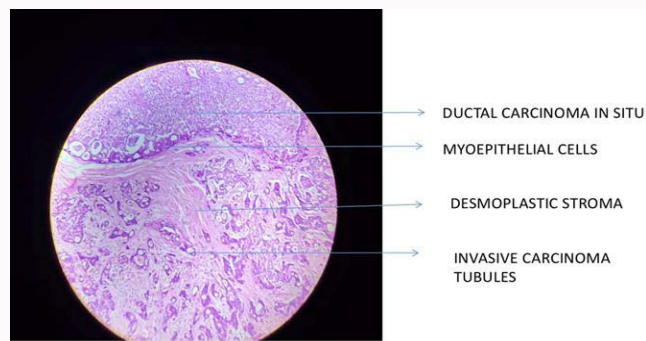


Figure 2: What was thought to be gynecomastia on a histological surprise it shows features of carcinoma.

On palpation, the breast swelling was confirmed, demonstrating soft consistency, tenderness to pressure, and mobility in all anatomical planes. Grade 1 gynecomastia was diagnosed clinically. Active sanguineous nipple discharge was expressible upon gentle breast compression. Examination of ipsilateral axilla revealed no palpable lymph nodes. Contralateral breast examination was unremarkable.

Investigations and imaging

Baseline haematological and biochemical investigations were performed and documented as within normal reference ranges.

Ultrasonographic assessment: Ultrasound imaging of the left breast and surrounding soft tissues revealed a well-defined hypoechoic region localized to the left areolar region. Doppler evaluation demonstrated absence of internal arterial flow or neo-vascularization. Focal asymmetry of fibroglandular tissue with prominent dilated ducts was identified in the inner upper and outer lower quadrants. The overall imaging impression suggested benign gynecomastia with ductal ectasia, without radiological evidence of malignant features. Based on clinical and imaging findings, the presumptive diagnosis was left-sided gynecomastia with associated duct ectasia.

Pre-operative assessment: The patient was deemed suitable for surgical intervention under general anaesthesia. American Society of Anaesthesiologists physical status classification was Grade 1, indicating excellent baseline health without systemic disease.

Surgical procedure and specimen: Under general anaesthesia with standard operative precautions, wide local excision of the left breast tissue was performed via submammary incision with patient in supine position. The surgical specimen was preserved in formalin and submitted for comprehensive histopathological analysis.

Histopathological findings

Histopathological examination of the wide local excision specimen from the left breast revealed an unexpected and significant finding: **invasive carcinoma of no special type (ductal type)** (Figure 2).

The tumour demonstrated the following characteristics according to the Nottingham Histological Grading System:

- Glandular and acinar differentiation: Grade 1 (well-formed tubules present)
- Nuclear pleomorphism: Grade 2 (moderate increase in nuclear size and irregularity)

- Mitotic count: Grade 1 (low mitotic activity)
- **Overall Histological Grade: Grade 1 (aggregate score 4)**

The largest invasive focus measured 1.1 centimetre in maximum dimension. Additional smaller invasive foci, each measuring less than 0.1 centimetre, were identified, indicating multifocal disease. Ductal carcinoma in situ was present with extensive intraductal component noted throughout the specimen.

Immunohistochemical receptor analysis:

Immunohistochemical staining for hormone receptors was performed:

- **Oestrogen receptor (ER):** Positive (extensive staining of malignant cells)
- **Progesterone receptor (PR):** Positive (moderate to strong staining)
- **Human epidermal growth factor receptor 2 (HER2/neu):** Negative (0-1+ staining, no gene amplification)

This receptor profile corresponds to the hormone receptor-positive, HER2-negative phenotype, equivalent to Luminal A-like subtype in molecular classification (Figure 3).

Pathological staging: Final pathological stage assigned: **pT1N0M0** (Stage 1) according to American Joint Committee on Cancer staging system.

Metastatic disease assessment: Positron emission tomography with integrated computed tomography of the thorax, abdomen, and pelvis was obtained to exclude distant metastatic disease. Imaging demonstrated no evidence of metabolically active lesions at distant sites, confirming M0 status (Figure 4).

Discussion

Epidemiological context

Male breast cancer represents an infrequently encountered malignancy, comprising less than one percent of all breast cancer diagnoses in the global population [1]. Nonetheless, the incidence has demonstrated gradual increase over recent decades, particularly in developed nations [2]. The median age of presentation typically ranges from 60 to 70 years, though presentation in younger age groups, as exemplified by this case, is documented within the literature [3].

The patient's age of 42 years represents a relatively younger demographic for male breast cancer presentation, though certainly within the reported range. The occupational history of chef, involving sustained heat exposure and potential endocrine disruptors,

may theoretically contribute to risk, though causality remains unestablished.

Aetiological considerations

The patient harboured a recent diagnosis of Alcohol Dependence Syndrome. Chronic alcohol consumption is recognized as an independent risk factor for male breast cancer through multiple proposed mechanisms: impaired hepatic metabolism resulting in oestrogen accumulation, malnutrition leading to micronutrient deficiencies, and direct gonadotoxic effects causing testosterone reduction [4]. The temporal proximity between ADS diagnosis and breast cancer presentation suggests either concurrent evolution of previously unrecognized disease or potential aetiological association. The altered hormonal milieu in alcohol-dependent individuals, with relative oestrogen predominance, may have contributed to both benign gynecomastia manifestation and concurrent malignant transformation.

The patient lacked documented classical risk factors including Klinefelter syndrome, obesity, hepatic cirrhosis, family history of breast cancer, or occupational exposure to carcinogenic substances. The ADS history appears to be the dominant identifiable risk factor in this presentation.

Diagnostic challenge and clinical bias

The clinical presentation in this patient initially mimicked uncomplicated benign gynecomastia, a diagnosis supported by conventional imaging findings. Gynecomastia substantially exceeds male breast cancer in population prevalence, establishing cognitive bias wherein benign diagnosis becomes preferred unless compelling evidence suggests otherwise [5]. This representativeness heuristic contributes to diagnostic anchoring, potentially delaying malignancy recognition.

However, several clinical features should have heightened suspicion for malignancy: spontaneous sanguineous nipple discharge, particularly when occurring unilaterally, warrants thorough investigation and often indicates underlying breast pathology including malignancy [6]. Rapid acceleration in swelling size over one month is atypical for uncomplicated gynecomastia and suggests more aggressive pathology. The presence of tenderness, while sometimes observed in inflammatory conditions, may also accompany malignancy.

The pre-existing scar superior to the nipple-areolar complex adds complexity to clinical interpretation. The clinical history provided no explanation for this scar, raising questions regarding previous surgical intervention, possible residual disease, or inadequate previous assessment. This anatomical finding merited closer investigation.

Imaging interpretation and diagnostic limitations

Ultrasonographic examination revealed findings consistent with benign gynecomastia: well-defined hypoechoic region, absence of internal vascularity, and prominence of dilated ducts. These characteristics typically suggest benign pathology. However, this case demonstrates a critical principle in breast radiology: benign imaging appearance cannot definitively exclude underlying malignancy [7]. Small invasive carcinomas, particularly low-grade tumours, may demonstrate unremarkable imaging characteristics.

Magnetic resonance imaging, offering superior soft tissue contrast resolution and dynamic enhancement patterns, might have provided additional diagnostic sensitivity, though its routine use in male breast

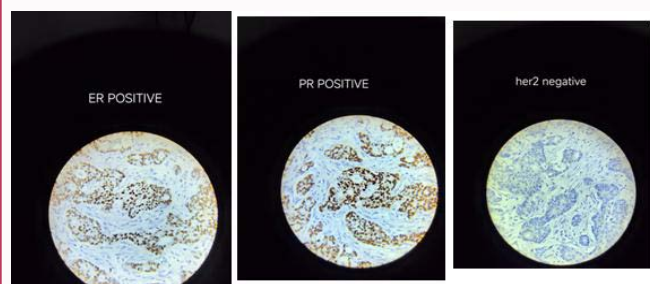


Figure 3: IHC was done and tumors was positive for ER, PR and Her2u negative.

assessment remains uncommon [8]. The reliance on ultrasonography alone, whilst practical and cost-effective, contributed to the benign diagnostic impression despite underlying malignancy.

This case underscores an essential principle: when clinical features raise concern for malignancy, tissue diagnosis through biopsy or excision remains the diagnostic gold standard, regardless of imaging reassurance.

Histopathological significance

The histopathological finding of invasive ductal carcinoma Grade 1 in a patient with clinically and radiologically benign-appearing disease represents a diagnostic surprise with important implications.

Grade 1 tumours characteristically demonstrate well-preserved glandular architecture with low mitotic activity, contributing to relatively favourable prognosis compared with higher-grade disease [9]. The size of 1.1 centimetre places the tumour in the T1 category (≤ 2 cm), corresponding to early-stage disease.

The presence of extensive intraductal component suggests a predominantly in-situ process with focal invasive elements, typical of ductal carcinoma. Multifocal invasive foci within the same lesion may indicate aggressive biological behaviour relative to unifocal presentation, potentially influencing local recurrence risk [10].

Receptor Status Implications:

The hormone receptor-positive, HER2-negative phenotype (ER+/PR+/HER2-) confers several clinical advantages:

1. **Endocrine sensitivity:** These tumours demonstrate responsiveness to hormonal manipulation via selective oestrogen receptor modulators (tamoxifen) or aromatase inhibitors.
2. **Chemotherapy response:** Hormone receptor-positive tumours frequently demonstrate chemosensitivity, particularly when combined with endocrine therapy.
3. **Prognostic implications:** This phenotype generally associates with more indolent course compared with triple-negative or HER2-positive disease.
4. **Treatment options:** Multimodal therapeutic approaches incorporating chemotherapy and long-term hormonal therapy offer substantial benefit.

Staging and prognostic assessment

The pT1N0M0 stage represents stage 1 disease (T1, N0, M0). This early-stage classification, combined with Grade 1 histology and hormone receptor positivity, generally predicts relatively favourable long-term outcomes. However, several factors warrant consideration:

1. **Multifocal disease:** The presence of multiple invasive foci may increase local recurrence risk.
2. **Extensive intraductal component:** EIC presence is associated with higher margin positivity and local recurrence in breast-conserving procedures, though this patient underwent total excision.
3. **Male breast cancer biology:** Male breast cancers demonstrate distinct biological behaviour compared with female counterparts, with generally more aggressive natural history despite comparable histological grade [11].

Five-year disease-free survival for stage 1 male breast cancer

ranges from 85-95%, depending on tumour characteristics and treatment completion [12].

Therapeutic approach and management rationale

The discovery of invasive carcinoma necessitated modification of treatment strategy from simple excision to more comprehensive surgical intervention.

Surgical strategy: Modified radical mastectomy (MRM) represents the standard surgical approach for male breast cancer, fundamentally differing from female breast conservation paradigms. This difference reflects anatomical considerations: males possess minimal breast tissue, and tumour proximity to nipple-areolar complex necessitates comprehensive tissue removal to achieve adequate margins [13]. The MRM permits systematic assessment of regional lymph nodes (axillary dissection), which was unattainable through simple lumpectomy.

The classical modified Stewart incision, preserving pectoralis major muscle whilst removing all breast tissue and axillary lymph nodes, remains standard in this patient population.

Systemic therapy: Adjuvant chemotherapy is indicated for stage 1 male breast cancer in selected cases based on tumour characteristics, patient factors, and prognostic assessment. Standard chemotherapy regimens for hormone receptor-positive breast cancer typically include anthracycline and cyclophosphamide-based protocols (e.g., AC-Paclitaxel or FEC regimens).

The hormone receptor-positive status qualifies the patient for long-term endocrine therapy. Tamoxifen, a selective oestrogen receptor modulator, remains the endocrine agent of choice in male breast cancer, offering both therapeutic benefit and protective effect against contralateral breast malignancy [14]. Alternative approaches using aromatase inhibitors require concurrent gonadal suppression (luteinizing hormone-releasing hormone agonists) to maintain efficacy in males, representing a more complex regimen (Figures 4 and 5).

Multidisciplinary approach: Optimal outcomes in male breast cancer necessitate coordinated input from surgical oncology, medical oncology, and radiotherapy specialties. This patient's management involved comprehensive discussion regarding surgical timing, chemotherapy initiation, endocrine therapy duration (typically 5-10 years), and surveillance protocols.

Learning implications and clinical significance

This case contributes several important lessons to clinical practice:

1. **Clinical suspicion imperative:** Nipple discharge in males, particularly spontaneous and sanguineous discharge, mandates investigation regardless of imaging findings.
2. **Diagnostic bias awareness:** Awareness of cognitive biases (representativeness heuristic, anchoring bias) helps clinicians avoid premature diagnostic closure when benign disease appears likely.
3. **Tissue diagnosis essential:** Definitive diagnosis requires histopathological assessment. Imaging cannot reliably exclude malignancy in breast lesions.
4. **Risk factor recognition:** Chronic alcohol consumption contributes to male breast cancer risk through multifactorial mechanisms including hormonal disruption and impaired hepatic metabolism.

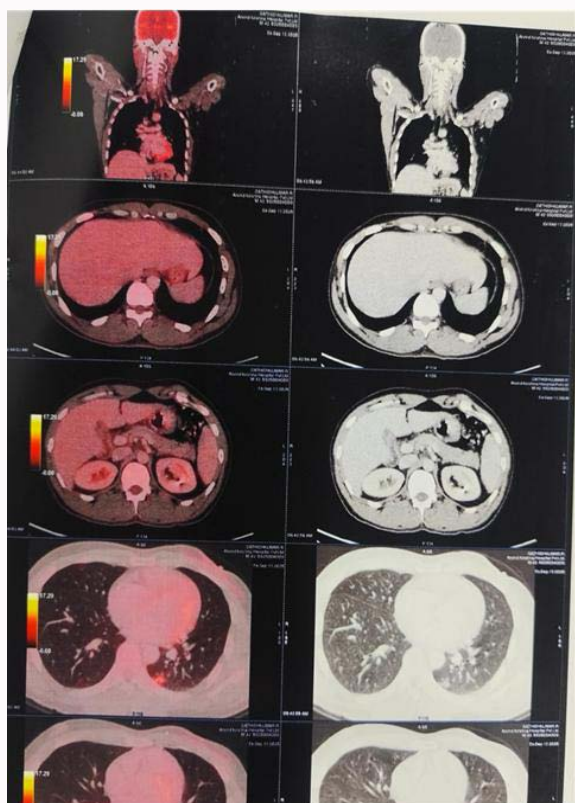


Figure 4: Metastatic workout including PETCT was done and showed no evidence of local or regional spread of the disease.



Figure 5: Post Modified radical mastectomy: Specimen showing complete left breast along with axillary nodes.

5. **Rare disease vigilance:** Maintenance of clinical suspicion for rare conditions prevents delayed diagnosis and improved treatment outcomes.

6. **Multidisciplinary coordination:** Male breast cancer management requires specialized input from multiple disciplines, reflecting the rarity and complexity of this malignancy.

Conclusion

This case presents an instructive example of invasive ductal carcinoma masquerading clinically and radiologically as benign gynecomastia in a 42-year-old male patient. The unexpected

histopathological discovery highlights the diagnostic challenges inherent in male breast pathology and emphasizes the essential irreplaceability of tissue diagnosis in achieving diagnostic certainty. Early recognition of red flag symptoms including nipple discharge, rapid growth, and clinical asymmetry, coupled with appropriate tissue investigation, facilitates earlier malignancy detection and improved therapeutic outcomes. The hormone receptor-positive phenotype in this case offers therapeutic opportunities through multimodal treatment combining surgery, chemotherapy, and long-term endocrine therapy. Healthcare professionals must maintain elevated clinical suspicion for male breast malignancy, particularly in patients with identifiable risk factors such as chronic alcohol use, in order to achieve timely diagnosis and optimize patient outcomes in this rare but significant malignancy.

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