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Inflammatory Breast Carcinoma: A Case Report & Review of Literature

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Abstract
Inflammatory breast carcinoma is a rare and highly aggressive malignancy. Clinically, the presentation is rapid and macroscopic appearance may be mistaken for a benign inflammatory lesion, showing characteristic pathological signs of inflammation, and prominent peau d'orange appearance. The aggressiveness of the condition automatically grants a T4 status in the AJCC TNM staging system. Here we report a case of 45-year-old female with inflammatory carcinoma of the right breast and briefly discuss relevant literature.
Keywords: *inflammatory breast cancer, breast cancer, locally advanced breast cancer.*

Introduction

Inflammatory breast carcinoma, though rare, contributes a large share of the breast cancer-related deaths due to its highly aggressive nature and rapid course. The lesion has typical features of inflammation, i.e., "*rubor*", "*calor*", "*dolor"* and "*tumor*", and hence may be mistaken for a benign inflammatory pathology. The differential diagnosis includes locally advanced breast cancer with cutaneous extension, mastitis or breast abscess and traumatic fat necrosis of the breast, and hence diagnosis may be delayed as these more common conditions may be first thought of. Prompt diagnosis and management are required to tackle the fulminant disease which is associated with a poor prognosis.

Case Report

A 45-year-old female presented with complaints of redness, swelling and heaviness of the right breast for the past 2 weeks. The swelling was insidious in onset and rapidly progressive, with initially only redness noticed, followed by the development of multiple boil-like protrusions from the skin surface. There was no history of fever, trauma, or discharge from the nipple or the lesion. There was no history of similar complaints in the past, in the contralateral breast or any family history of breast disease. The patient is a known diabetic for the last 5 years, with glycemic control achieved with oral hypoglycemic agents.

On examination, the entire upper and inner quadrant of the right breast was defaced by reddish-purple swelling, which was irregular, moderately well-defined but not sharply

demarcated, with interspersed papular-appearing protrusions, with a maximum height of about 1 cm above the skin surface (*figure 1*). The affected skin was tense, indurated, warm and demonstrated pitting, which gave the characteristic *peau d'orange* appearance. There was no definite palpable mass but a diffuse bogginess was evident. The nipple-areolar complex was normal. The breast was tender, and 2 enlarged lymph nodes measuring 2x1 and 2x2 cm and multiple subcentimetric discrete non-tender lymph nodes were palpable in the ipsilateral axilla. The contralateral breast and axilla were normal on examination. FNAC produced a granular hemorrhagic aspirate, which revealed pleomorphic ductal cells, which were also identified in the axillary lymph nodes.

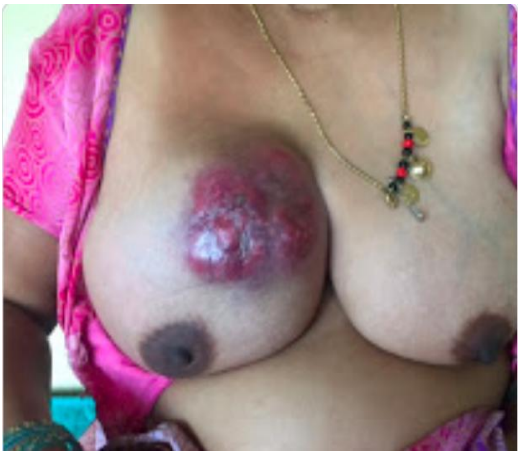

Figure 1: Inflammatory Lesion involving upper inner quadrant of Right breast.

As the patient refused neoadjuvant chemotherapy, a modified radical mastectomy (MRM) with axillary clearance was done (*figure 2)*, with histopathology confirming the diagnosis as inflammatory ductal carcinoma with the characteristic involvement of dermal lymphatics, and tumor deposits were found in 2 of the 6 axillary lymph nodes. Estrogen receptor (ER), Progesterone receptor (PR) and human epidermal growth factor receptor 2 (Her2/neu) were all found to be positive, and so the patient was started on Tamoxifen. The postoperative period was uneventful and the patient was asymptomatic at follow-up at 6 months.

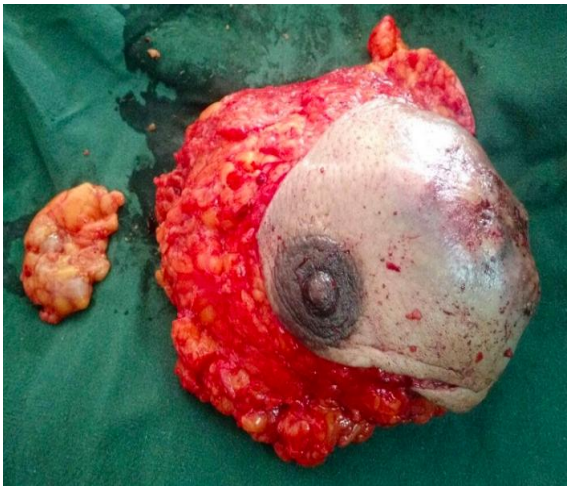

Figure 2a: MRM and axillary dissection specimens

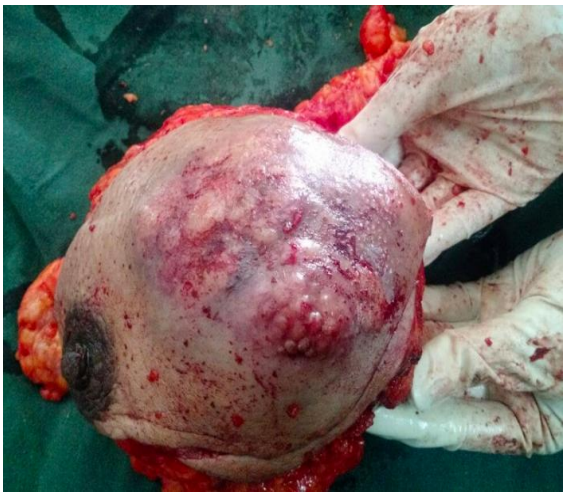

Figure 2b: MRM specimen showing the altered morphology of the breast

Discussion

More common amongst Caucasian women, inflammatory carcinoma of the breast is a rare diagnosis, accounting for just 0.5-2% of invasive breast cancers[1]. The aggressive disease has an earlier age of presentation, with the average age at diagnosis about 59 years, versus 66 years for locally advanced breast cancer[2]. Our patient was just 45 years of age at diagnosis.

While there was initially speculation as to whether inflammatory carcinoma represented locally advanced breast cancer with secondary inflammatory changes, it has been established that the two are separate entities, with different pathogenesis, epidemiology and natural history[3].

Inflammatory breast cancer is a highly aggressive form of breast cancer, is rapidly progressive, with most women having lymph node metastases and one-third having distant metastases at the time of diagnosis; and while accounting for less than 2% of breast cancers, it accounts for 7% of breast cancer-related deaths[4]. In contrast to locally advanced breast cancer (LABC), inflammatory breast cancer has a younger age of onset, rapid onset and progression, a fulminant and unrelenting course, higher rate of metastasis and overall worse prognosis[5].

Locally advanced breast cancer seeding to the skin can cause secondary erythema and induration, giving the gross picture of inflammatory breast cancer, and often biopsy too cannot differentiate the two conditions, and dermal lymphatic invasion, though characteristic of inflammatory carcinoma, is not restricted to it. At the receptor level, locally advanced breast cancer has more favourable molecular subtypes, whereas up to 50% of inflammatory breast cancers are triple negative (Estrogen Receptor, Progesterone Receptor and Her2 negative), which heralds an ominous course. Additional unfavourable features include higher rates of mutated p53 tumor suppressor gene, overexpression of RhoC and loss of WISP3 - which contributes to invasiveness and metastatic potential, and higher levels of vascular endothelial growth factor which promotes angiogenesis[6,7].

The presentation typically is due to a rapidly growing lump or skin changes, and examination reveals features of inflammation, discolouration (reddish-purple) and peau d'orange appearance. Nipple involvement may also be present. Majority of women have lymph node involvement at the time of diagnosis, and many will also have distant visceral metastases. The clinical picture may mimic mastitis and many patients are initially treated with antibiotics, further delaying the diagnosis[8].

Mammographic findings include areas of calcification, parenchymal distortion, skin thickening, and obvious tumor mass if present[9]. Full-thickness skin biopsy should be taken to demonstrate dermal lymphatic invasion, which is the hallmark of the disease [10].

Inflammatory breast cancer is automatically designated T4d according to the AJCC (American Joint Committee on Cancer) TNM (Tumor, Node, Metastasis) staging system[10]. Diagnosis requires all of the following criteria to be met

i) Rapid onset of erythema, edema/peau d'orange or warm breast

ii) Duration of symptoms less than 6 months

iii) Erythema occupying at least one-third of the breast

iv) Pathological confirmation of invasive carcinoma (dermal lymphatic involvement)[10]. All these criteria were satisfied in our case.

Management depends on the receptor status, the extent of the tumor and presence of metastatic deposits. Neoadjuvant chemotherapy followed by surgery and radiotherapy is the treatment of choice[11]. Mastectomy with axillary dissection is advocated, and there is no role for breast conservative surgery and sentinel lymph node biopsy (SLNB) due to high chances of recurrence and false negatives respectively[12].

Conclusion

Inflammatory breast cancer is often mistaken for mastitis and initially treated with antibiotics, with diagnosis only being made when the patient fails to improve with the antibiotic course. This therapeutic misadventure further delays the diagnosis of the already fulminant and volatile disease. Hence, it is imperative that any inflammatory lesion of the breast be thoroughly assessed before being categorized and managed as benign, and inflammatory carcinoma should be kept in mind as a possible differential diagnosis of such cases.

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