Challenges in Managing Infraclavicular Node Metastasis in Breast Cancer with Aggressive Locoregional Surgery: A Case Report

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KEYWORDS

lorem
ipsum
dolor

ABSTRACT:

The treatment of breast cancer with axillary lymph node metastasis can sometimes be difficult to manage. This case report presents an unusual occurrence of lymph node metastasis in a 28-year-old woman diagnosed with infiltrating ductal carcinoma of the breast, accompanied by axillary lymph node involvement. The patient underwent neoadjuvant chemotherapy, followed by a mastectomy and level 3 axillary lymph node dissection. The postoperative histopathological examination revealed a complete pathological response in the breast tissue; however, four axillary lymph nodes were found to have metastatic disease. Three of them were reported to have macro metastases and one node showed fibrosis with evidence of treatment response. As an unusual development, further postoperative staging investigations revealed an infraclavicular lymph node metastasis that was absent in preoperative imaging. Given the isolated nature of the infraclavicular metastasis, a locoregional excision was carried out to mitigate the risk of further distant metastases and enhance local disease control. This rare presentation highlights the difficulties involved in managing breast cancer with metastatic axillary lymph node and the possibility of unexpected disease progression despite initial treatment response.

1. INTRODUCTION

Approximately 97% of the breast lymphatic system drains into the axillary lymph nodes [1]. Therefore, axillary lymph node dissection (ALND) is performed in the presence of nodal metastasis to improve regional disease control and may potentially improve survival. It also provides significant prognostic information [2-5]. The standard treatment for breast cancer with positive axillary node metastasis involves level 1 and 2 axillary lymph node dissection [6]. Although less frequently performed, level 3 dissection is reserved for cases of extensive axillary disease and is crucial in reducing the risk of distant recurrence [7]. Additionally, it acts as an important prognostic indicator for metastasis-free survival. Following a satisfactory axillary node dissection, the incidence of isolated axillary nodal failure is fairly rare [4,5, 8-11].

This case emphasizes the uncommon challenge of addressing isolated infraclavicular lymph node metastasis identified after a level 3 axillary lymph node dissection, in the absence of any distant metastasis.

2. CASE PRESENTATION:

A 28 year old female presented with concerns of a lump in the left breast and axilla that had been noticeable for several weeks. She reported a family history of a maternal aunt diagnosed with breast cancer and had no significant medical and surgical history. Clinical examination revealed a hard, palpable lump in the left breast with no skin or chest wall involvement. She also had a palpable lymph node in the left axilla.

Mammography and ultrasound imaging detected a 40 mm lesion in the left breast accompanied by multiple enlarged lymph nodes in the axilla (Figures 1, 2). A core biopsy of the breast lesion confirmed

Grade 3 Infiltrating Ductal Carcinoma with a receptor profile of ER: 20%, PR: 0%, HER2: Negative, and a Ki-67 Index of 90%. Fine Needle Aspiration (FNA) of the left axillary lymph node revealed metastatic carcinoma, and genetic testing results were negative.

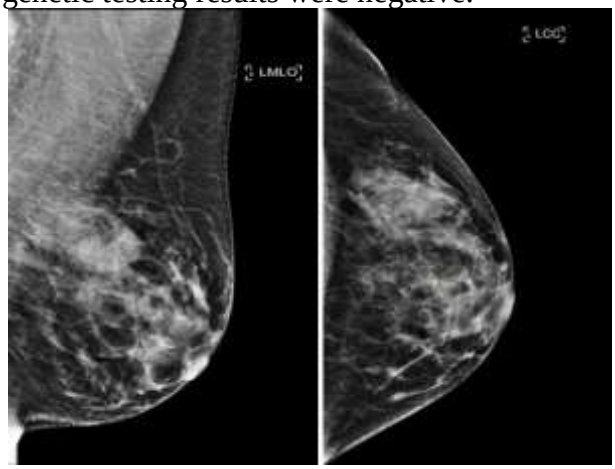

Figure 1: Left breast mammogram with mass in upper outer quadrant

Figure 2: (a) Ultrasound showing a Left breast mass

Figure 2: (b) Abnormal lymph nodes observed in the left axilla on ultrasound

MRI of the Breast was suggestive of a unifocal mass in the left breast with five enlarged axillary lymph nodes extending to the retropectoral region. A Staging CT scan showed no evidence of distant metastasis. Based on the Multidisciplinary Team (MDT) Decision, neoadjuvant chemotherapy (NACT) was

administered. The treatment regimen began with 3 initial cycles of Cyclophosphamide and Epirubicin, followed by 9 weeks of weekly Paclitaxel and Carboplatin. Treatment response was monitored with serial MRI's. The post-NACT MRI indicated an almost complete radiological response (CRR) in the left breast, though the retropectoral lymph nodes remained slightly enlarged. The surgical procedure performed included a left nipple-sparing mastectomy, level 3 axillary lymph node clearance, and immediate reconstruction using an implant.

The final histological analysis revealed a complete pathological response (cPR), with no residual carcinoma detected in the breast and Axillary Node Clearance (ANC) showed a total of 19 lymph nodes of which 3 nodes had macro metastasis with extensive extracapsular spread and 1 node with fibrosis indicative of NACT changes.

The MDT recommended to repeat a staging CT that showed infraclavicular lymph node enlargement, which was absent in the preoperative CT scan. Subsequent PET-CT confirmed a single isolated metabolically active left infraclavicular lymph node near the subclavian vessels and pleura, highly suggestive of nodal metastasis with no evidence of distant metastasis (Figure 3,4).

Figure 3: Preoperative staging CT scan showing no enlarged infraclavicular lymph node

Figure 4: PET-CT showing active uptake in left infraclavicular lymph node

Surgical excision of the left infraclavicular lymph node under localisation was performed. The Final Histopathology showed one lymph node entirely replaced by high- grade tumour with areas of necrosis and focal extracapsular spread. The MDT outcome and plan included initiating radiotherapy targeting the chest wall, supraclavicular fossa (SCF), and internal mammary chain followed by endocrine therapy with Tamoxifen, along with annual clinical and mammographic follow-ups.

3. DISCUSSION:

Axillary lymph node dissection (ALND) is conducted in breast cancer patients to achieve disease control, stage the tumour, and guide decisions regarding adjuvant therapies such as radiotherapy and chemotherapy [12,13]. However, ALND is associated with significant postoperative complications and morbidity, leading to a re- evaluation of its use [14-16]. Major complications include arm lymphedema, restricted shoulder movement, numbness, pain, and diminished quality of life [15-18]. Sentinel lymph node biopsy (SLNB) was developed as a less invasive alternative to ALND to reduce its complications.

However, this procedure is primarily applicable to early-stage breast cancer patients with no clinical signs of axillary involvement [19].

In this case, the patient presented with a clinically node positive axilla and multiple enlarged lymph nodes on imaging. An axillary node clearance up to level 3 was performed, resulting in the removal of 19 lymph nodes. An adequate ALND requires the removal of at least 10 lymph nodes [20], with some studies suggesting that the removal of 20 lymph nodes may improve survival by enhancing the accuracy of disease staging and decision-making for adjuvant therapy [21].

Our patient showed a complete pathological response (cPR) to neoadjuvant chemotherapy (NACT) in the breast; but residual disease remained in the axillary lymph nodes. In general, patients who achieve a pathological complete response (pCR) tend to have better survival outcomes than those with remaining disease.

Moreover, research suggests a strong association between pCR rates in the breast and the axilla, though patients with oestrogen receptor-positive (ER+) cancers often exhibit lower pCR rates in the axilla [22].

Breast cancer typically follows a lymphatic drainage route, beginning in the breast, moving to the axillary lymph nodes, then to the infraclavicular nodes, and ultimately reaching the supraclavicular lymph nodes, which can result in distant metastasis. In this case, despite NACT and surgery, the patient experienced disease progression in the axilla with metastasis to the infraclavicular node that was not evident in pre-NACT imaging. According to the latest NCCN guidelines [23], residual disease in the infraclavicular or supraclavicular region is generally managed with radiotherapy.

In our case, the patient presented with isolated infraclavicular node metastasis in the absence of distant metastasis. Considering the patient's age and overall clinical scenario, the multidisciplinary team (MDT) advised surgical excision of the lymph node under localization, given its location. The aim of this decision was to enhance local disease control by reducing tumour burden and preventing further metastasis.

While recent studies have focused on axillary de-escalation, many have not shown a significant benefit in overall survival (OS) or disease-free survival (DFS) with aggressive surgical management for nodal disease compared to adjuvant therapies alone [24-27]. However, some studies also suggest that aggressive surgical management may improve OS and DFS compared to radiotherapy alone [28, 29].

In this case, various factors contributed to the complexity of decision-making, including the location of the lymph node and the challenges of surgical excision. Despite the challenges, the five-year survival rate for patients with regional metastases to the axillary lymph nodes is reduced by 28-40% [30, 31]. Furthermore, more metastatic axillary lymph nodes are linked to higher treatment failure rates [32]. This case highlights the importance of individualised treatment approaches in managing complex cases of nodal metastasis in breast cancer.

4. CONCLUSION:

Existing literature presents varying perspectives on localized therapy, with a majority supporting adjuvant treatments and limiting extensive surgery due to potential complications that may outweigh survival advantages. This case underscores the importance of personalized surgical approaches in challenging cases, particularly with atypical metastatic presentations. It also highlights the critical need for diligent postoperative monitoring and staging studies to identify metastases that may not be initially detected.

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