

**Case Series - Metaplastic Carcinoma (MC) of Breast-Clinico-pathological Studies.**

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**Abstract**

Metaplastic Carcinoma (MC) is one of the rarest cancers that occur in 0.2 to 1% of cancers of the breast. Metaplastic carcinomas are characterized by their invasive nature; heterologous and histological character expressing epithelial cells into squamous cells or epithelial cells into mesenchymal.

**Keywords:** Metaplastic Carcinoma, Breast Cancer, Heterologous, Mammogram, Neoadjuvant Therapy, Lymphovascular Invasion, Perineural Invasion (PNI)

**Introduction**

Breast cancer is one of the leading occurrences in 30% of women worldwide<sup>1</sup>, and Metaplastic Carcinoma (MC) is one of the breast cancers of women, and MC is always found as invasive cancer and heterologous. The specific

features of MC are instead of epithelial cells, the cells are squamous or mesenchymal cells<sup>2</sup>. Around 0.2 to 1% of MC is invasive in nature<sup>3</sup>.

Metaplastic carcinoma of the breast presents with heterologous expression, and the clinical presentation is often palpable mass. Metaplastic carcinoma can be identified by mammogram and USG<sup>4</sup>. Metaplastic carcinoma of the breast shows inter or intratumoral heterogeneity due to the dedifferentiation of the cancer cells<sup>5</sup>.

Metaplastic carcinomas of the breast were with squamous changes instead of epithelial cells, the size also ranges from 2cm to 10 cm<sup>6</sup>. Metaplastic carcinomas microscopically show cancer cells with spindle cells, osseous

or cartilaginous or matrix producing, and adeno carcinoma cells<sup>7</sup>.

### **Primary Evaluation of Case Study Patients**

#### **Clinical Presentation of Case Series**

Most of the common clinical presentation was palpable mass and was identified by USG and mammogram. This is retrospective data for 4 years from 2019-2023. The median age was 46 years and presented with the left side predominance of 66%, Median tumor size was 4.25cm.

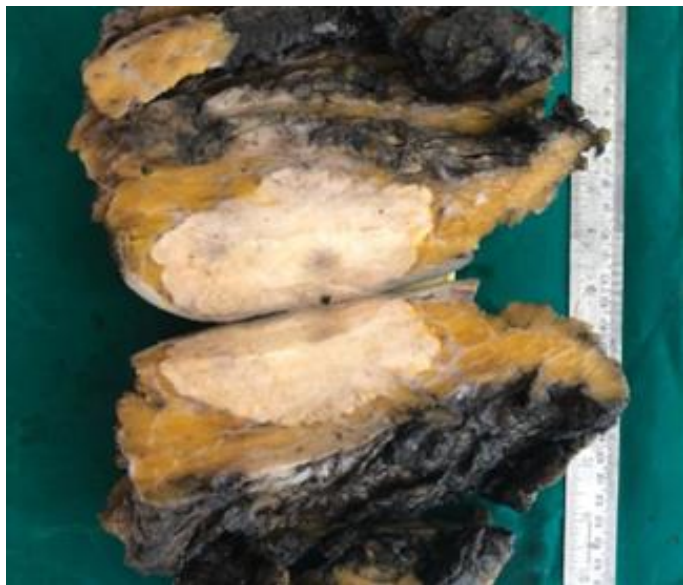


Figure 1: Gross- Grey white well circumscribes mass

#### **Microscopic Evaluation**

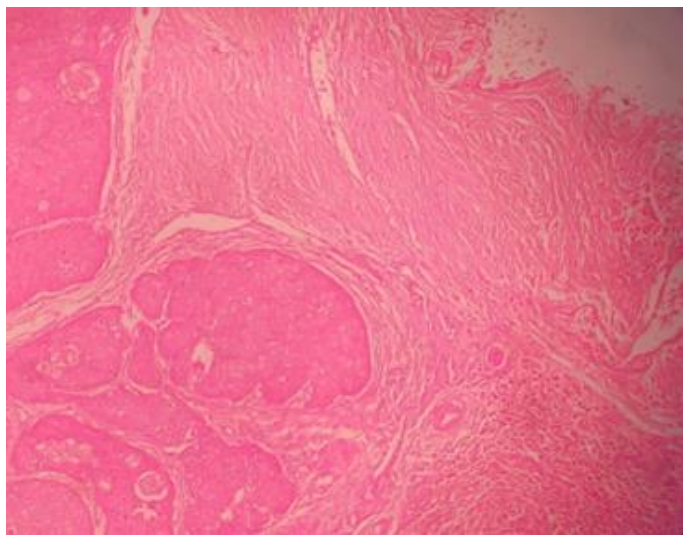


Figure 2: Squamous component-Hematoxylin and Eosin (H&E) X40

The microscopic examination of the patient's cells with Metaplastic Carcinoma showed that the cancerous cells are osseous, cartilaginous, myxoid changes, Rhabdoid, chondrocytic, matrix-producing, squamous, and spindle cells. The cancer cells were intertumoral and intratumoral in heterogenicity. The cancer cells of the case series were grade II Nottingham, triple negative hormonal status, and did not show Lymphovascular Invasion (LVI), Perineural Invasion (PNI), or nodal metastasis.

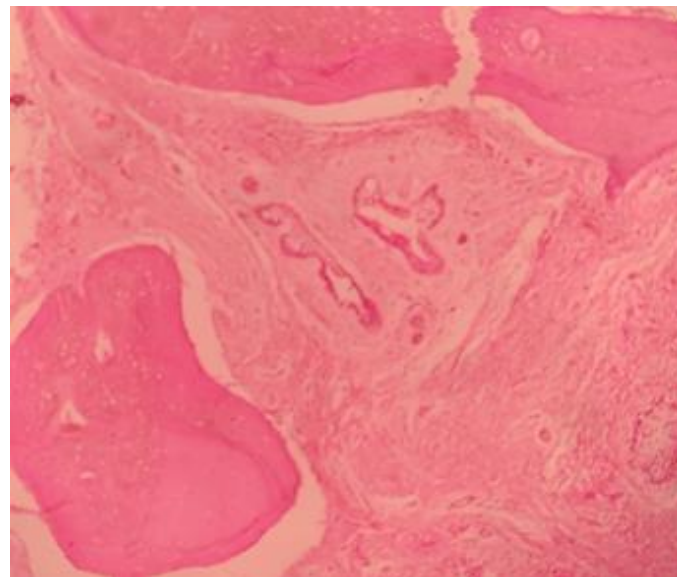


Figure 3: Cartilaginous cells-Hematoxylin and Eosin (H &E) X40

#### **Identification leads to Rarest Occurrence-Metaplastic Carcinoma**

The cancer cells of patients microscopically showed myxoid changes, osseous, matrix-producing, cartilaginous, rhabdoid, chondrocytic, squamous, and spindle cells.

#### **Confirmative Examination**

Patients presented with palpable mass sizes ranging from 2cm to 9 cm, invasive carcinoma of the breast, and differentiation of cells from epithelial to squamous or mesenchymal cells.

The patient's sample showed triple negative status, monoclonal origin, and intra or inter dermal heterogeneity,

microscopically the cells showed myxoid changes, osseous, matrix-producing, cartilaginous, rhabdoid, chondrocytic, squamous and spindle cells.

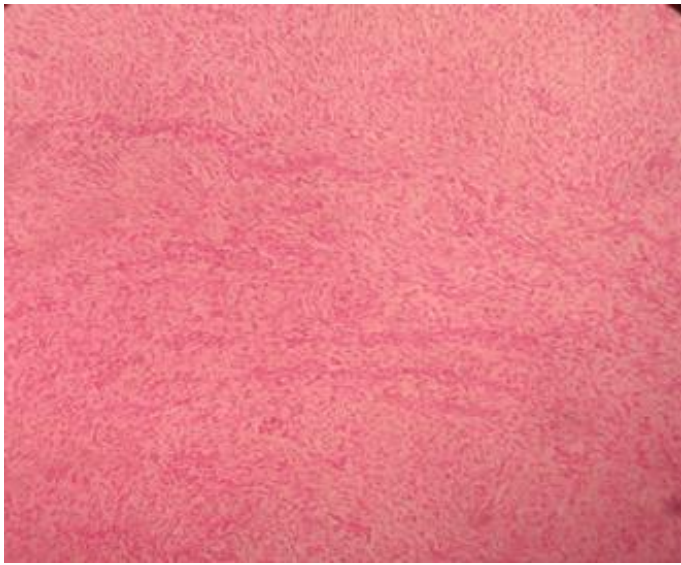


Figure 4: Spindle cells-40x Hematoxylin and Eosin (H&E) X40

#### Case Differentiation

Each patient's cancer cells microscopically were different showing myxoid changes, osseous, matrix-producing, cartilaginous, rhabdoid, chondrocytic, squamous, and spindle cells. Out of 6 cases, 2 cases underwent neo adjuvant therapy with partial response. Out of 6 cases, 3 were in stage 3, 2 were in stage 2, and was in stage 1. Out of 6 cases, 4 patients' breast cancers were on the left side and 2 were on the right side. Out of 6 cases, 4 patients were in <50 years of age and 2 were in >50 years of age.

Out of 6 cases, 3 patients' cancer sizes were <5cm, and 3 patients' cancer size was >5cm. Out of 6 cases, 4 patients had >10 nodes and 2 patients had < 10 nodes. Out of 6 cases, 4 patients showed necrosis, and 2 patients did not show necrosis.

Out of 6 cases, 2 patients showed the ypT3 stage, 2 patients showed the pT2 stage, 1 patient showed pT3, and the other patient showed pT1c.

#### Discussion

Metaplastic carcinoma of the breast is one of the rarest breast cancers and occurs in 1% of breast cancers<sup>8</sup>. Geyer, F. C, reports that metaplastic breast carcinomas are classified as high-grade and low-grade, and high-grade metaplastic carcinomas with the squamous cancer cell, spindle cell, heterologous in nature, showing mesenchymal differentiation and low-grade were Adeno squamous and fibromatosis cells, we in our case series all the patients showed high-grade metaplastic breast cancers<sup>9</sup>.

McMullen, E. R et al reports the triple negative nature of the carcinoma metaplastic carcinoma, and we also found and reported the triple negative nature of the metaplastic carcinoma of the breast that occurred in our present case series<sup>10</sup>.

Victoor, J et al reported Metaplastic carcinoma of the breast in 65-year women sized 19 cm, and Salemis, N. S et al reports that the breast tumor diagnosed in their study were large, in our present case series, out of 6 cases, 3 patients cancer sizes were <5cm and 3 patients cancer size were >5cm<sup>11,12</sup>.

Han, M et al, Samoon, Z et al, Al-Hilli, Z et al reports that metaplastic breast carcinoma is chemo-resistant that shows different responses to neo adjuvant chemotherapy, in our present case series, we found out of 6 patients, 2 patients with meta plastic breast carcinoma underwent neoadjuvant therapy<sup>13-15</sup>.

The etiologic and occurrence of metaplastic carcinoma are always unknown, and neoplasms may be arising as squamous cells says the study of Huws, A. M et al, we also found in our case series patients cancer cells showed microscopically myxoid changes, osseous, matrix-producing, cartilaginous, rhabdoid, chondrocytic, squamous and spindle cells<sup>16</sup>.

Meta plastic breast carcinomas responses to cytotoxic chemotherapy are very poor says the reports of Tray, N et

al and Drekolias, D et al, in our case series, 2 patients underwent neoadjuvant therapy, and we suggest surgery is one of the best approaches to metaplastic breast carcinomas<sup>17,18</sup>.

Studies published by Al Sayed et al and Adams, S reported that immune checkpoint approaches are the highlighted immuno therapy for metaplastic breast cancers<sup>19, 20</sup>. Kim, I et al reported that in their 5 patients with metaplastic breast cancer, they tried Anti - PD-1 therapy, and reported the therapy supported one of the patients<sup>21</sup>.

Fu, Y et al reported, that metaplastic breast cancer can be treated with the novel approaches of mixed intervention of both immuno therapy (toripalimab) and anti-angiotherapy with anlotinib, and 2 of our patients in the case series received neoadjuvant therapy<sup>22</sup>.

In conclusion, we have reported a case series of 6 patients with Metaplastic Carcinoma of the breast, and each patient exhibited a different micro scopically representation, this case presentation will enlighten knowledge among clinicians to diagnoses accurately the occurrence of Meta plastic Carcino mas of the breast, and therapy used in such as chemotherapy, or surgery or radiotherapy has provided very poor outcome, hence we have to invent new, adequate strategic approaches such as molecular therapy or immune checkpoint therapies or mixed therapy to fight against all the cancers, especially Metaplastic Carcinoma of the breast. We can also include cancer patients in clinical trials to bring new insights to the medical world.

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