**Case Report**

# Peri-Operative Challenges in Management of a Huge Metaplastic Breast Carcinoma in a Young Woman – A Case Report

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**Abstract**

Metaplastic breast carcinoma is an uncommon and biologically diverse subtype of invasive carcinoma, contributing to less than 1% of cases. It is characterised by malignant epithelial components admixed with squamous, spindle, chondroid or osseous elements. These tumours frequently grow rapidly to become very large and have high-grade histology, leading to diagnostic confusion with malignant phyllodes tumour or primary breast sarcoma. We reported a 36-year-old woman with a huge metaplastic breast carcinoma complicated by ulceration and secondary infection. Imaging demonstrated a massive heterogeneous cystic–solid mass with enlarged axillary nodes. Core biopsy revealed a malignant spindle cell tumour and immunohistochemistry showed cytokeratin and p63 positivity, confirming it to be a metaplastic carcinoma. She underwent a mastectomy, axillary dissection and immediate bipedicle transversus rectus abdominis myocutaneous flap reconstruction for closure of the large post-mastectomy defect. Intra-operatively, it was complicated by 3.5 L blood loss requiring a large amount of transfusion. The final pathology demonstrated a high-grade metaplastic carcinoma, Grade 3 Triple Negative, with spindle and squamous elements, clear surgical margins with no nodal metastasis.

**Keywords:** Mastectomy; metaplastic breast carcinoma; spindle cell; squamous; TRAM flap

## Introduction

Metaplastic breast carcinoma (MBC) is an uncommon malignancy, constituting less than 1% of breast cancers (1). It is characterised by malignant epithelial cells exhibiting metaplastic differentiation; most commonly spindle, squamous, chondroid or osseous transformation (1,2). These tumours typically present as rapidly enlarging, high-grade masses and are frequently triple-negative, contributing to poorer prognosis compared to invasive ductal carcinoma (IDC) (2).

The spindle-cell-predominant subtype poses substantial diagnostic difficulty due to its morphological overlap with malignant phyllodes tumour, primary breast sarcoma and fibromatosis (3). Radiological features are similarly non-specific; thus, immunohistochemistry (IHC) plays a central role. Positivity for cytokeratin and p63 supports epithelial

differentiation and favours MBC over malignant phyllodes tumour, which lacks epithelial marker expression within the stromal component (1,3).

We present the case of a young woman with a huge MBC and the perioperative challenges faced.

**Case report**

A 36-year-old nullipara presented with a four-month history of a rapidly enlarging left breast mass. Initially a small nodule, the lesion progressed quickly until it replaced the entire breast. She had persistent pain in the affected breast with ulcer formation producing intermittent serous discharge. There was no family history of breast malignancy.

On examination, she was febrile and tachycardic at 110 bpm. She was using her left forearm to support her huge left breast mass which measured 28.7 cm (width), 25 cm (cephalocaudal) and 11.5 cm (thick/projection). The breast had shiny and tense skin with prominent superficial veins. There were multiple ulcers at the inferior and lateral poles, emitting serous fluid. The breast was firm with a lobulated surface. There were several palpable ipsilateral axillary lymph nodes; the largest measured 3 cm.

Laboratory investigations showed borderline anaemia (haemoglobin10.9 g/L), leukocytosis (white cell count 17.8 × $10^9$/L), thrombocytosis (platelet 731 × $10^9$/L) and elevated C-Reactive protein (19.37 mg/dl).

Imaging revealed a large heterogeneous cystic–solid lesion with thick septations and enlarged axillary nodes. CT thorax-abdomen-pelvis described a 22.9 cm tumour causing marked skin thinning and abutting the pectoralis muscle without overt invasion (Figure 1). Multiple sclerotic bone lesions were noted, but bone scintigraphy demonstrated no skeletal metastasis.

A core biopsy demonstrated a malignant spindle cell tumour with marked pleomorphism, brisk mitoses and necrosis. The differential diagnoses included malignant phyllodes tumour and metaplastic carcinoma. IHC showed focal cytokeratin positivity and strong p63 expression, confirming epithelial differentiation and supporting a diagnosis of metaplastic carcinoma.

Following resuscitation and intravenous antibiotics for suspected secondary infection, she underwent a left mastectomy with axillary dissection. The left breast weighed 2.5 kg. Extensive tumour vascularity and friability resulted in 3.5 L blood loss requiring transfusion of six units of packed red cells, four units of fresh frozen plasma and six units of cryoprecipitate.

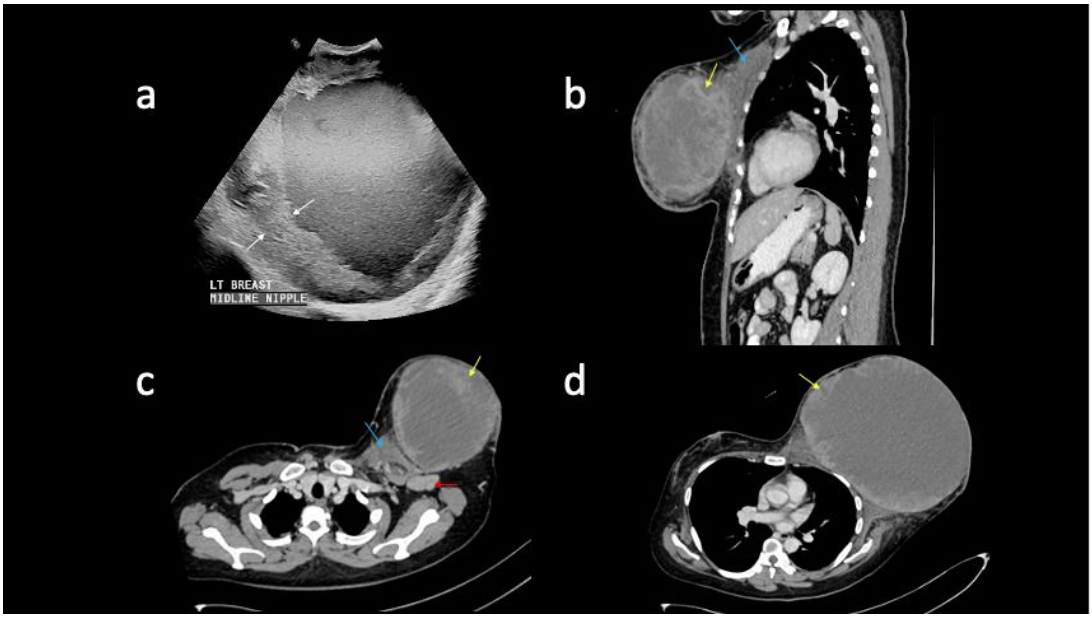



FIGURE 1: (a) Left breast ultrasound. A large complex cystic lesion which had irregularly thickened walls (wall depicted by white arrows) and internal highly echogenic content; (b-d) Contrast-enhanced CT images in axial (c and d) and sagittal (b). Large breast complex cystic lesion with irregular enhancing solid component at the peripheries (yellow arrows). This mass measured 17.7 x 22.0 x 22.9cm (APxWxCC). The underlying pectoralis muscle (blue arrows) was separated from the mass. Enlarged left level 1 axillary lymph node (red arrow).

This huge metaplastic carcinoma was made up of solid and cystic areas. As it was a vascular lesion, it had the oncological angiogenic ability which was important to sustain its rapid growth. These vessels made this tumour behave like a vascular sponge. Once resected, there was a sudden significant loss of intravascular fluid resulting in hypotension. This warranted her to be started on intravenous low-dose noradrenaline infusion to achieve haemodynamic stability.

Intra-operatively, her antibiotics were changed from intravenous cloxacillin to tazocin (piperacillin/tazobactam) due to concerns of contamination from the multiple breast ulcers.

The large chest wall defect required breast reconstruction with a bipedicled transversus rectus abdominis myocutaneous (TRAM) flap. The surgery took a total of seven hours. Apart from being able to close the chest wall wound, she had a satisfactory cosmetic outcome (Fig. 2). She was nursed overnight in the intensive care unit to ensure close monitoring. Postoperatively, the flap remained viable without venous congestion or necrosis. Donor-site healing was uneventful with no abdominal wall weakness or early hernia. She was discharged after two weeks.

Histopathology assessment revealed a high-grade metaplastic carcinoma, Grade 3 Triple Negative, composed of spindle cell and squamous elements with stromal overgrowth, marked atypia and a high mitotic index (Figure 3). There was no skeletal muscle invasion, margins were clear and the axillary nodes showed no metastasis (pT4N0M0). Due to financial constraints, she requested referral to another government hospital for adjuvant radiotherapy.

**Discussion**

The patient presented with a large cystic lesion which was confirmed on ultrasound to have a thickened, nodular wall. The content of the cyst was highly echogenic, with no intra-cystic solid component. Due to the large complex cystic nature of the mass, the differential diagnoses included high-grade IDC (no special type), encapsulated papillary carcinoma, metaplastic carcinoma, medullary carcinoma, mucinous carcinoma or squamous cell carcinoma. Malignant phyllodes are commonly solid masses with intra-mass cystic components. Breast sarcoma commonly presents with a solid-cystic mass with larger solid than cystic components (4,5,6).

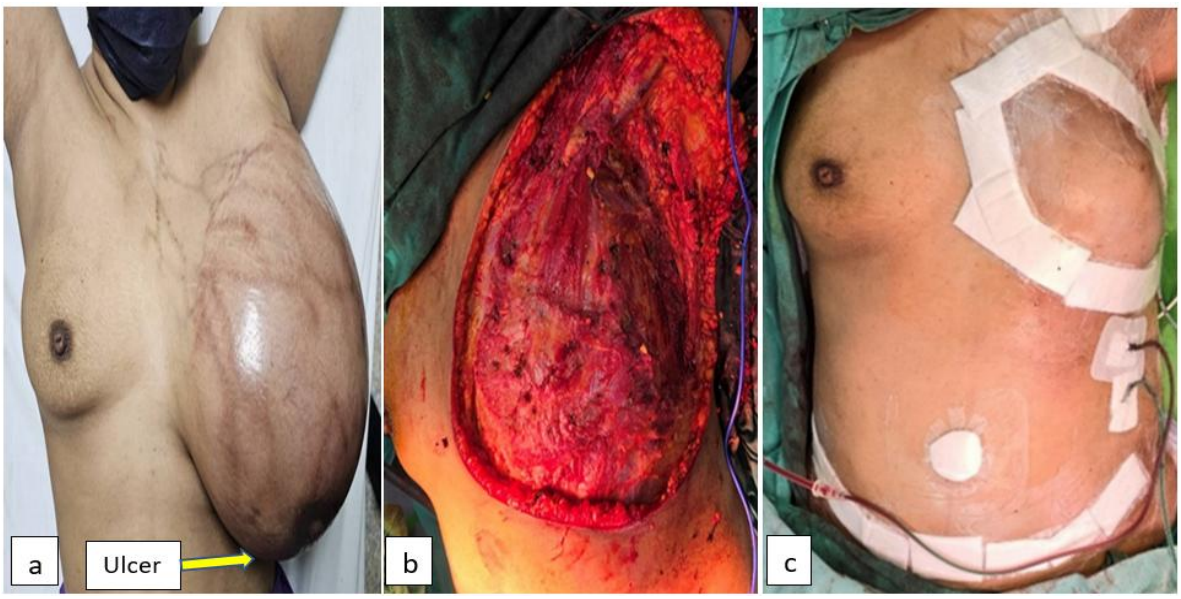



FIGURE 2: Photos of the patient. (a) Pre-operative: Left huge breast carcinoma; (b) Intra-operative: Large post-mastectomy defect exposing pectoralis muscle; (c) Post-operative: Post bipedicle TRAM flap left breast reconstruction

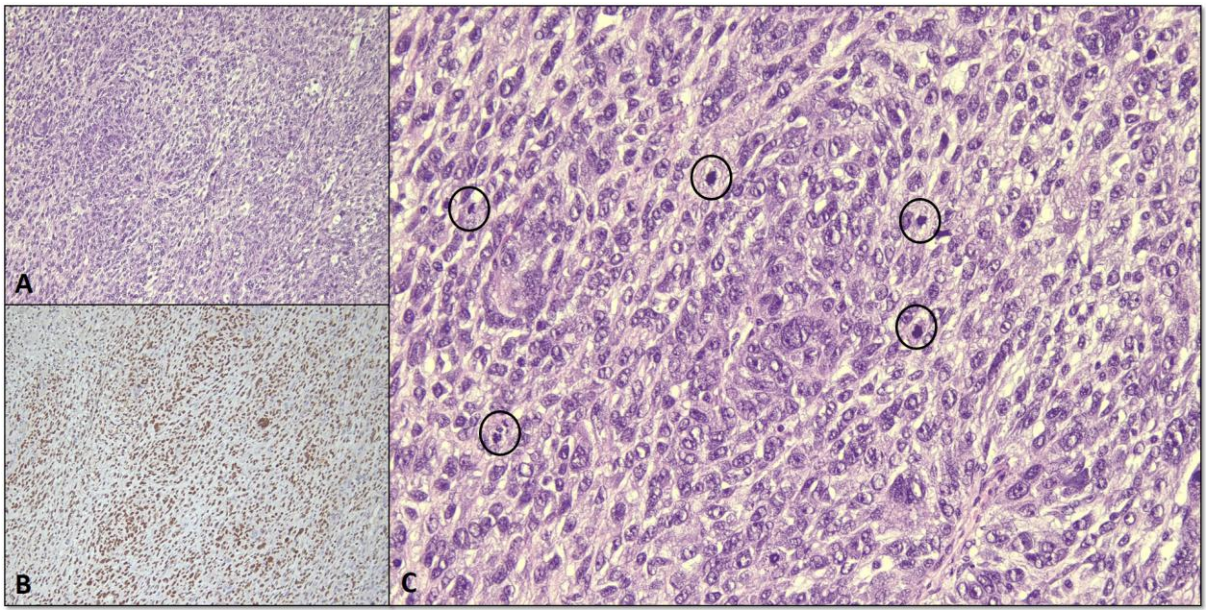



FIGURE 3: Histopathological assessment of the mastectomy specimen. (A) Malignant cells are arranged in solid sheets, composed of spindle and polygonal squamous cells (H&E, 100x); (B) These malignant cells are positive for p63 immunohistochemistry (100x); (C) On higher magnification, the polygonal squamous cells exhibit marked pleomorphism, hyperchromatic to vesicular nuclei, conspicuous nucleoli, with variable amount of eosinophilic cytoplasm. The spindle cell components are arranged in short interwoven fascicles and fascicles in storiform pattern. Some of the malignant cells show multinucleation. Mitosis (black circles) are frequently seen (H&E, 200x).

Histopathological examination confirmed a Grade 3 Triple Negative, MBC. MBC presents in women with a mean age of 48-59 years old (7). On literature review, the youngest reported case was a 22-year-old woman (8). Although not the youngest, our patient was below the mean reported age.

MBC is recognised for its aggressive behaviour, rapid growth,and potential to achieve a remarkably huge size (1). Although tumours larger than 10 cm have been reported in the literature, we believe our case's 22.9 cm MBC is the largest reported size to date. The huge size reflects rapid tumour proliferation with delayed presentation.

Spindle-cell-predominant MBC is among the most difficult breast tumours to diagnose. Histologically, it overlaps significantly with malignant phyllodes tumour, primary breast sarcoma and fibromatosis. Both MBC and malignant phyllodes may exhibit rapid growth, large size, stromal overgrowth and a cystic–solid pattern (9) with fairly similar morphology.

IHC plays a decisive role. Cytokeratin, epithelial membrane antigen (EMA) and p63 positivity support epithelial differentiation and favour MBC, whereas stromal elements of malignant phyllodes tumour lack epithelial marker expression (1,3,10). In our case, cytokeratin and p63 positivity established the diagnosis of an MBC. MBC typically appear as an irregular, heterogeneous mass with variable cystic and necrotic areas. These features mimic both phyllodes tumours and high-grade IDC (9) Hence, an accurate diagnosis requires integrated interpretation of imaging, histological assessment with IHC.

Management of MBC follows established breast carcinoma principles. Mastectomy was the only feasible option given the tumour's extraordinary size. Although nodal metastasis is less common in MBC than IDC (2) axillary dissection is indicated when nodes are clinically suspicious.

Reconstruction after a large tumour resection poses major technical challenges. Large chest wall defects require well-vascularised tissue for adequate coverage. The TRAM flap provides autologous tissue for breast reconstruction, although flap-related complications and abdominal wall morbidity remain important considerations (11,12). However, it carries risks such as flap ischaemia, venous congestion and abdominal wall morbidity. Massive blood loss and hypotension, as occurred here, can further threaten flap viability, but successful reconstruction demonstrated the importance

of careful intraoperative planning and multidisciplinary coordination including adequate blood transfusion, stabilisation of blood pressure, perioperative hydration and infection prophylaxis.

Adjuvant radiotherapy is advised for large or high-grade MBC due to its high local recurrence risk (13). Although MBC responds less favourably to chemotherapy than triple-negative IDC (2), systemic therapy may still be recommended based on receptor status and multidisciplinary consensus.

This case underscores the extreme tumour size that a MBC can reach, the diagnostic complexity of spindle MBC from its mimics. It also highlights the reconstructive challenges after removal of a massive breast tumour and reinforces the importance of coordinated multidisciplinary management.

**Conclusion**

A huge MBC is rare and poses major diagnostic and peri-operative challenges. Accurate diagnosis hinges on careful histopathology assessment supported by IHC. Mastectomy with axillary staging remains the standard treatment for large tumours. Immediate bipedicled TRAM flap reconstruction provides effective coverage of extensive post-mastectomy defects. Due to the tumour's aggressive nature and potential for recurrence or metastasis, adjuvant oncological treatment and close long-term follow-up is essential.

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**Patient consent:** Informed consent has been obtained.

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