

Giant Metaplastic Breast Carcinoma with Extensive Osseous Differentiation Requiring Emergency Mastectomy: A Case Report

Hocine Hamdi

Public Hospital Establishment of Beni Aziz

Soumaya Belhoul

Saâdna Mohamed Abdenmour University hospital, University of Ferhat Abbas

Mouhamed Islem Abderrezzak

Public Hospital Establishment of Beni Aziz

Amina Benouna

Saâdna Mohamed Abdenmour University hospital, University of Ferhat Abbas

Samah Boucheloukh

Public Hospital Establishment of Beni Aziz

Sjaak Pouwels

sjaakpuls@gmail.com

Bielefeld University, University Medical Centre, OWL, Campus Hospital Lippe

Case Report

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Giant Metaplastic Breast Carcinoma with Extensive Osseous Differentiation Requiring Emergency Mastectomy: A Case Report

Authors:

Hocine Hamdi^{1,2}, Soumaya Belhoul², Mouhamed Islem Abderrezzak¹⁻², Amina Benouna², Samah Boucheloukh¹, Sjaak Pouwels^{3,4}

Affiliations:

1. Department of surgery, Public Hospital Establishment of Beni Aziz, Setif, Algeria.
2. Department of General surgery, Saâdna Mohamed Abdenmour University hospital, University of Ferhat Abbès, Setif, Algeria.
3. Department of Surgery, Bielefeld University, Medical School and University Medical Centre, OWL, Campus Hospital Lippe, Detmold, NRW, Germany.
4. Department of Surgical Oncology, Transplant Surgery and General Surgery, Medical University of Gdansk, Gdansk, Poland.

Corresponding author:

Prof. Dr. mult. Sjaak Pouwels, MD, PhD

Department of Surgery, Bielefeld University, Medical School and University Medical Center OWL, Campus Hospital Lippe, Röntgenstraße 18, 32756, Detmold, NRW, Germany

Email: sjaakpwls@gmail.com

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Abstract:

Introduction:

Metaplastic breast carcinoma (MBC) is a rare and aggressive subtype of breast cancer, accounting for less than 1% of all breast malignancies. Characterized by epithelial-to-mesenchymal differentiation, it frequently exhibits a triple-negative phenotype and may contain heterologous elements such as osseous differentiation. Delayed presentation and emergency surgical management remain uncommon and sparsely documented.

Cases Presentation:

A 54-year-old woman with a previously diagnosed breast carcinoma discontinued treatment and repeatedly refused surgery, chemotherapy, and radiotherapy for nearly two years. She subsequently presented with a giant fungating breast mass complicated by severe hemorrhagic anemia requiring urgent resuscitation. Following stabilization, an emergency radical mastectomy with en bloc resection was performed. Histopathological examination confirmed a triple-negative MBC composed of epithelial and sarcomatoid components with heterologous osseous differentiation. Complete (R0) resection with negative margins was achieved. The postoperative course was uneventful, and the patient recovered well before being discharged in satisfactory condition.

Conclusion:

This case illustrates the exceptional rarity of MBC with epithelial, sarcomatoid, and heterologous osseous differentiation while providing a unique insight into its natural progression following prolonged treatment refusal. Despite advanced local disease at presentation, emergency oncologic surgery achieved successful complete resection with a favorable early postoperative outcome. The extensive clinical, radiological, intraoperative, and pathological documentation further enhances the educational value of this report and contributes to the limited literature on this uncommon breast malignancy.

This case report has been reported in line with the SCARE Criteria [1].

Introduction

Metaplastic breast carcinoma (MBC) is a rare and biologically aggressive subtype of invasive breast cancer, accounting for approximately 0.2–1% of all breast malignancies [2]. First described by Huvos et al. in 1973 and formally recognized as a distinct pathological entity by the World Health Organization (WHO) in 2000 [3,4], MBC is currently classified as a heterogeneous group of invasive breast carcinomas exhibiting squamous and/or mesenchymal differentiation. According to the current WHO classification, MBC comprises a heterogeneous group of invasive carcinomas exhibiting epithelial and metaplastic differentiation. Tumors with heterologous osseous differentiation are exceptionally rare [5].

Most patients present during the fifth or sixth decade of life with a rapidly enlarging breast mass. Although these tumors are frequently triple-negative and biologically aggressive, they demonstrate a lower incidence of axillary lymph node metastasis than conventional invasive ductal carcinoma despite often presenting as large, locally advanced lesions [5]. Complete surgical excision remains the cornerstone of treatment even with lack of consensus [6], while multimodal oncologic management is individualized according to pathological stage and multidisciplinary evaluation.

Emergency presentation of MBC is uncommon, and neglected giant tumors complicated by life-threatening hemorrhage are exceptionally rare. Moreover, metaplastic carcinomas with epithelial, spindle-cell (sarcomatoid), and heterologous osseous differentiation remain sparsely reported in the literature. Herein, we describe a neglected giant MBC that

progressed untreated for nearly two years before presenting as a surgical emergency. Beyond its rare pathological features, this case provides comprehensive clinical, radiological, operative, and histopathological documentation, offering valuable insight into the natural evolution of untreated disease and the feasibility of successful emergency oncologic management.

Case presentation:

A 52-year-old female (162 cm, 68 kg; BMI 25.9 kg/m²) with no significant medical, surgical, or allergy history and no relevant family history presented in April 2024 with a painless palpable mass in the upper outer quadrant of the right breast, without associated skin changes or nipple discharge. The patient reported neither tobacco nor alcohol consumption. Initial evaluation included breast ultrasonography, demonstrating a 30 × 22 mm lesion suggestive of fibroadenoma (Figure 1A,1B), and breast magnetic resonance imaging (MRI), which revealed a 52 × 33 × 41 mm irregular spiculated enhancing mass in the upper outer quadrant of the right breast (BI-RADS 6), without radiological evidence of chest wall invasion or regional lymphadenopathy (Figure 2A, 2B). Ultrasound-guided core needle biopsy demonstrated a grade III modified Scarff–Bloom–Richardson (SBR) invasive carcinoma with epidermoid metaplasia. Immunohistochemistry showed ER-negative, PR-positive, and HER2-negative status. Despite these findings, the patient declined definitive surgical treatment and opted for conservative management.

Approximately one year later, the patient re-presented with progressive enlargement of the breast mass after undergoing 12 cycles of doxorubicin-based chemotherapy in 04 months. A repeat breast MRI demonstrated marked interval progression, with the lesion increasing to approximately 10.7 × 10.1 × 7.9 cm, showing heterogeneous signal intensity with central necrotic changes while remaining confined to the breast without definite radiological evidence of pectoralis muscle or chest wall invasion (Figure 3A-3B). Given the continued tumor progression, the patient voluntarily discontinued systemic treatment, sought traditional therapies, and was subsequently lost to regular follow-up.

In July 2025, an exophytic component developed at the site of the known breast lesion. Which underwent rapid size enlargement by April 2026 reaching approximately 26 × 18 cm, becoming ulcerated, extensively necrotic, secondarily infected, and complicated by persistent spontaneous hemorrhage (Figure 4A-4B). Initial laboratory investigations revealed severe microcytic hypochromic anemia with a hemoglobin of 4.9 g/dL. Marked leukocytosis with eosinophilia suggested an inflammatory response associated with the necrotic, secondarily infected tumor. Mild hyponatremia, hypoalbuminemia, and a slight elevation in the Aspartate Aminotransferase (AST). Following transfusion, hemoglobin increased to 9.0 g/dL, leukocytosis resolved, and serum sodium and albumin demonstrated partial correction. (Table 1).

After the initial emergency resuscitation, including transfusion of five units of packed red blood cells. Contrast-enhanced thoracoabdominopelvic CT demonstrated a 160 × 90 mm right breast mass, without clear chest wall invasion and minimal ipsilateral axillary lymphadenopathy. No distant metastases were identified (Figure 5).

Given the life-threatening hemorrhage, urgent surgery was performed. Under general anesthesia, surgery was initiated with the goal of oncologic resection and hemorrhage control. Peroperatively; the tumor was largely encapsulated, without definitive chest wall invasion (Figure 6A), although focal adherence to the pectoralis major muscle was observed. A modified radical mastectomy with en bloc partial resection of the external part of pectoralis major muscle and level I–II axillary lymph node dissection was performed. Complete macroscopic tumor excision was achieved without intraoperative complications (Figure 6B).

Gross pathological examination demonstrated a 32 × 18 × 6 cm mastectomy specimen containing a firm multilobulated tumor measuring 22 × 6.5 cm (Figure 7A), with extensive hemorrhagic and necrotic changes and ulceration of the overlying skin. Histopathological examination revealed a grade III SBR MBC composed of a poorly differentiated epithelial component associated with a mesenchymal component exhibiting pleomorphic spindle-cell or sarcomatoid differentiation (Figure 7B, 7C), and heterologous squamous (Figure 7D) and osseous differentiation with mature bone formation (Figure 7E).

Additional findings included stromal hyalinization, calcification, marked nuclear pleomorphism, a high mitotic index (SBR 9/9), and vascular tumor emboli. Immunohistochemical analysis demonstrated a triple-negative phenotype (ER-negative, PR-negative, HER2 score 0), with CK7 and p63 positivity and a Ki-67 proliferative index of approximately 30% (Figure 7F). Surgical margins were histologically negative, and all 17 axillary lymph nodes were free of metastatic disease (0/17), corresponding to a final pathological stage of ypT4b-N0-cM0.

The postoperative course was favorable, complicated only by a minor superficial wound dehiscence and a moderate size subcutaneous seroma that were resolved with conservative management (Figure 8). The patient was discharged on postoperative day 7 in good general condition and referred for multidisciplinary oncological evaluation to determine the need for adjuvant therapy. The overall disease course spanned approximately 25 months and follow up spanned over 04 months post operatively, as summarized in the accompanying chronology table (Table 2).

Discussion

MBC represents a rare and biologically aggressive subtype of invasive breast cancer. According to the current WHO classification, MBC comprises a heterogeneous group of tumors characterized by the coexistence of epithelial and metaplastic elements, including squamous, spindle-cell, matrix-producing, chondroid, osseous, carcinosarcomatous, and mixed subtypes. Heterologous mesenchymal differentiation is identified in approximately 10–25% of MBCs, whereas tumors demonstrating true osseous differentiation are exceptionally uncommon, representing only 0.003–0.12% of all primary breast carcinomas [6]. Furthermore, most MBCs exhibit a triple-negative immunophenotype (approximately 80–90%), contributing to their aggressive biological behavior, higher rates of recurrence, and poorer overall prognosis compared with conventional invasive ductal carcinoma [7].

MBC typically affects women in the fifth to sixth decades of life and most commonly presents as a rapidly enlarging, painless palpable breast mass [8]. Compared with conventional invasive ductal carcinoma, these tumors are generally larger at diagnosis, exhibit accelerated growth kinetics, and frequently demonstrate central necrosis, reflecting their highly aggressive biological behavior [8,9]. Our patient was representative of the typical age at presentation; however, the clinical course was particularly instructive. Following the initial diagnosis, standard management was initiated with neoadjuvant chemotherapy, but treatment was voluntarily discontinued, and the patient was subsequently lost to follow-up. This interruption of oncological care provided a rare opportunity to document the disease's progression under minimal therapeutic influence. Serial clinical examinations, MRIs, and subsequent staging investigations captured the transition from a localized breast lesion to a massive ulcerated and hemorrhagic tumor, with the most dramatic progression occurring during the two months preceding admission. During this period, rapid tumor enlargement was accompanied by extensive necrosis, recurrent bleeding, profound anemia, and progressive physiological deterioration, ultimately culminating in a surgical emergency. Such comprehensive chronological documentation of disease evolution is rarely available in published literature and provides valuable insight into the natural evolution of this exceptionally aggressive malignancy.

Because of its rarity, MBC is generally managed according to conventional breast cancer treatment principles. Breast-conserving surgery may be considered in selected early-stage tumors, whereas mastectomy is preferred for large or locally advanced lesions [8,10]. Neoadjuvant chemotherapy is frequently employed, although MBC is characterized by relatively poor pathological response rates, making complete surgical excision with negative margins the cornerstone of treatment whenever feasible [10]. Radiotherapy is recommended according to standard indications to improve local control [11]. Our patient initially received standard neoadjuvant chemotherapy but voluntarily discontinued treatment. Following a perceived lack of therapeutic benefit, she elected to pursue alternative herbal and dietary therapies rather than continue conventional oncological care, resulting in delayed definitive treatment, ultimately presenting with life-threatening hemorrhage, profound anemia, and pending hemorrhagic shock. Despite the advanced local disease, the absence of

distant metastases allowed curative-intent en bloc modified radical mastectomy with partial pectoralis major resection, complete axillary lymph node dissection, and histologically confirmed R0 resection.

In contrast to the case reported by Do et al., where surgery was performed as a palliative mastectomy following disease progression despite neoadjuvant chemotherapy and was subsequently followed by rapid metastatic progression and death within two months [12], our patient presented with a life-threatening local emergency characterized by the uncontrolled hemorrhagic complication but without radiological evidence of distant metastases. This distinction allowed a curative-intent oncological procedure resulting in the achievement of histologically negative margins despite the extensive local invasion. Our case highlights that even in exceptionally large, locally destructive MBCs with heterologous osseous differentiation, the absence of metastatic disease should prompt consideration of aggressive primary oncological resection whenever technically feasible. Early diagnosis remains essential, as it increases the likelihood of achieving complete surgical excision.

Unlike conventional invasive ductal carcinoma, MBC demonstrates a lower incidence of axillary lymph node metastasis despite its clinically aggressive behavior, with hematogenous dissemination representing the predominant route of metastatic spread [5]. Consequently, sentinel lymph node biopsy is considered appropriate for clinically node-negative disease, whereas axillary lymph node dissection remains indicated in patients with clinically or pathologically positive nodes. Remarkably, despite a T4b locally advanced disease, our patient had no radiological evidence of distant metastasis, and all 17 resected axillary lymph nodes were free of tumor, emphasizing the dissociation between extensive local invasion and nodal dissemination that characterizes this rare subtype.

Histopathologically, MBC is characterized by variable combinations of epithelial and mesenchymal differentiation, most commonly including spindle-cell and squamous components, while heterologous elements such as osseous differentiation remain exceptionally rare [13]. Immunohistochemical markers including cytokeratins (CK7) and p63 remain valuable for confirming epithelial differentiation and supporting the diagnosis. Our case demonstrated the characteristic admixture of spindle-cell, squamous, and heterologous osseous differentiation with a high Ki-67 proliferation index, consistent with the reported pathological spectrum of MBCs. Furthermore, the availability of histopathological and immunohistochemical documentation, including representative microphotographs illustrating each differentiation pattern, provides an educational correlation between morphology and immunophenotype in this uncommon breast malignancy.

Strengths

This case is strengthened by its complete chronological documentation, capturing the patient's clinical course from the initial diagnosis through treatment interruption, rapid tumor progression, and eventual emergency presentation. The report is supported by comprehensive serial imaging, detailed operative documentation, and extensive histopathological and immunohistochemical analyses, allowing accurate clinicopathological correlation. Furthermore, the achievement of an R0 resection despite the advanced local disease, together with the exceptionally rare emergency presentation of a giant MBC with extensive osseous differentiation, enhances the educational and scientific value of the report.

Limitations

The principal limitations of this report are its single-case design, which limits the generalizability of the findings, and the relatively short postoperative follow-up of four months, precluding assessment of long-term oncological outcomes such as local recurrence, distant metastasis, disease-free survival, and overall survival.

Patient Perspective

The patient experienced significant difficulty accepting her diagnosis and repeatedly declined the proposed oncological and surgical treatments, despite multiple consultations and counseling sessions. She eventually discontinued chemotherapy and pursued alternative approaches, while the progressive nature of the disease continued to affect both her health and her family's quality of life. Even at the time of emergency admission, she remained reluctant to undergo surgery and required extensive discussions regarding the risks of non-intervention before providing informed consent.

Following surgery, she experienced substantial symptomatic improvement and relief from the burdens imposed by the disease, while her family expressed reassurance regarding her recovery and future care.

Conclusion:

This case highlights the aggressive natural history of MBC with heterologous osseous differentiation while demonstrating that curative-intent surgery remains feasible despite extensive local disease when distant metastases are absent. The comprehensive chronological and pathological documentation provides an educational contribution to the limited literature on this rare entity.

Declarations:

1. Ethical approval declaration:

Institutional review board approval was not required for single case reports according to institutional policy.

2. Consent for publication

No identifying images or personal or clinical details that could compromise patient anonymity are presented. The matter was discussed with the patient; written informed consent was obtained from the patient for publication of the case details and accompanying images.

3. Trial registration

Not applicable.

4. Availability of data and materials

All data generated or analyzed during this study are included in this published article. Additional imaging data (ultrasound, MRI/CT DICOM files, histopathology pictures) are available from the corresponding author on reasonable request.

5. Competing interests

The authors declare that they have no competing interests.

6. Funding

This study received no external funding.

7. Author contributions

Hocine Hamdi (HH), Soumaya Belhoul (SB), Mouhamed Islem Abderrezzak (MI-A), Amina Benouna (AB), Samah Boucheloukh (S-Bo), and Sjaak Pouwels (SP) contributed to this manuscript.

HH, SB, MI-A, AB, S-Bo, contributed to the conception, data collection, and drafting of the manuscript. Formal analysis was performed by HH, SB, AB and SP. All authors participated in critical revision of the manuscript, approved the final version, and agreed to be accountable for all aspects of the work.

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9. Declaration of AI use

Artificial intelligence-based tools were used solely to assist with language refinement, including grammar correction, punctuation, and stylistic improvements, as well as to support the clarification and structuring of certain ideas to enhance readability and scientific clarity. No artificial intelligence tools were used for the generation of clinical data, results, figures, or tables. The authors take full responsibility for the content, interpretation, and scientific integrity of the manuscript.

Abbreviation table:

<i>MBC</i>	Metaplastic breast carcinoma
<i>WHO</i>	World Health Organization
<i>MRI</i>	magnetic resonance imaging
<i>SBR</i>	Scarff–Bloom–Richardson
<i>MMC</i>	Mixed metaplastic carcinomas (MMC
<i>AST</i>	Aspartate Aminotransferase
<i>CK</i>	cytokeratins

Tables:

Parameter (hematology)	Results (pre-op)	Results (post-op)	Reference range
Hemoglobin (g/dL)	4.9	10	12–16 (female), 13–17 (male)
MCH (pg)	22	26.5	27–33
MCV (fL)	76.6	81.8	80–100
WBC (×10 ³ /μL)	35	11	4.0–10.0
Eosinophils (%)	15.3	1.4	1–6
Platelets (×10 ³ /μL)	237	417	150–450
Parameter (biochemistry)	Results	Results (post-op)	Reference range
Blood glucose (g/L)	1.3	1.1	0.70–1.10
Serum creatinine (mg/dL)	0.86	0.79	0.6–1.2
Blood urea (g/L)	0.3	0.26	0.15–0.45
Sodium (mEq/L)	128	131	135–145
Potassium (mEq/L)	3.56	3.6	3.5–5.0
Prothrombin activity (%)	80	81	70–100
Parameter (Liver function tests)	Results	Results (post-op)	Reference range
ALT (U/L)	7.33	/	0–40
AST (U/L)	51	/	0–40
Serum Albumin (g/l)	26.33	31	35-45
Tumor markers	Results	Results (post-op)	Reference range
ACE (ng/ml)	1.32	/	< 5.8
CA 15-3 (U/ml)	9.20	/	< 30

Table 1: Preoperative and postoperative hematological and biochemical laboratory findings before emergency surgery and after resuscitation and radical mastectomy.

Date	Clinical course
April 2024	Discovery of a painless right breast mass. Initial imaging and biopsy suggested an MBC. Neoadjuvant chemotherapy initiated.
December 2024	Discontinued chemotherapy and opted for herbal and traditional medicine.
March 2025	Follow-up breast MRI demonstrated disease progression.
July 2025	First exophytic (fungating) protrusion of the breast mass.
April 2026	Rapid acceleration of tumor growth.
June 2026	Presentation with a giant infected fungating breast mass complicated by active hemorrhage and severe anemia, emergency admission followed by radical mastectomy.

Table 2: Timeline of clinical, diagnostic, and therapeutic events.

Figures:

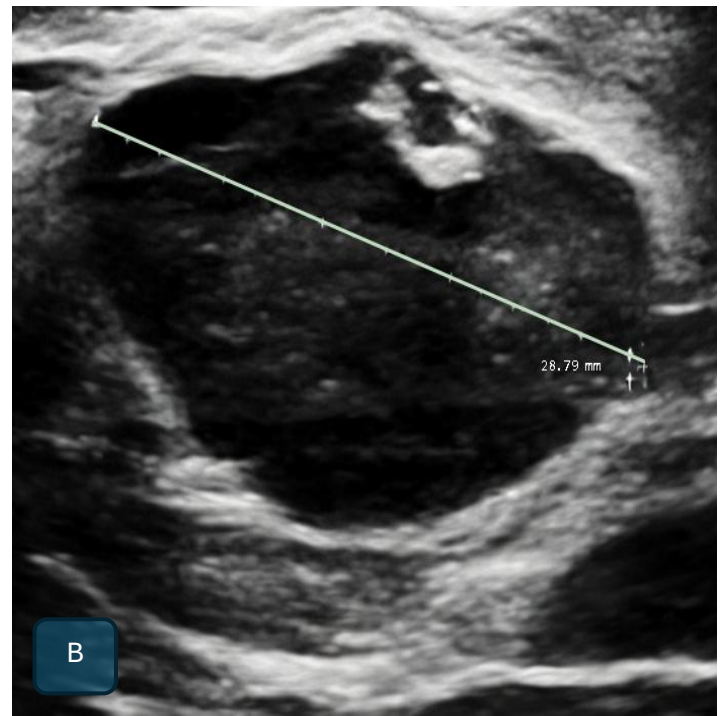


Figure 1A,1B: Initial breast ultrasonography demonstrates a well-circumscribed, homogeneous right breast lesion measuring 30 × 17 mm, interpreted as a benign fibroadenoma.

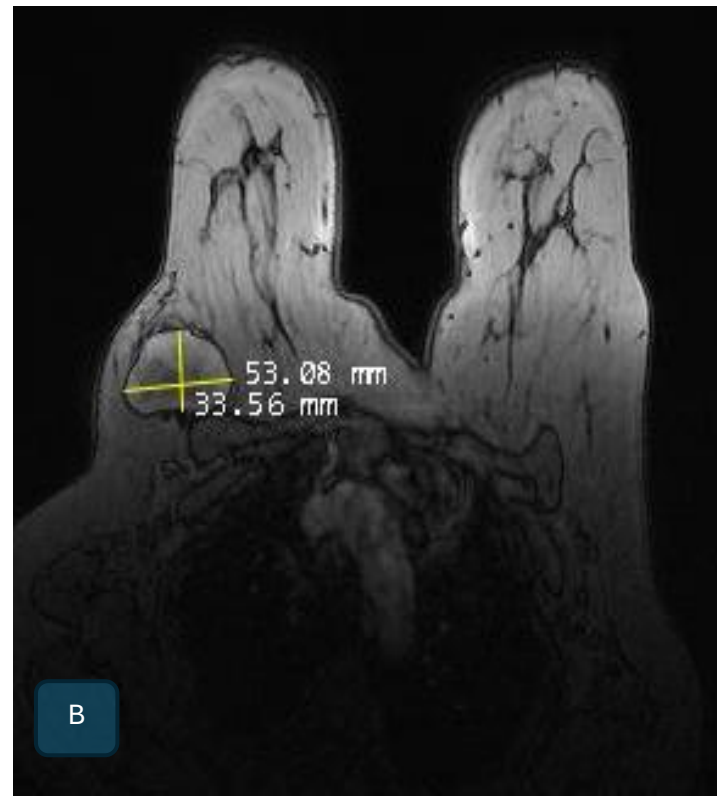


Figure 2A, 2B: Breast MRI demonstrated a single irregular enhancing mass located in the upper outer quadrant (UOQ) of the right breast, measuring 52 × 33 × 41 mm. The lesion was hypointense on both T1- and T2-weighted sequences, with heterogeneous intense contrast enhancement and spiculated, poorly defined margins, highly suspicious for malignancy.

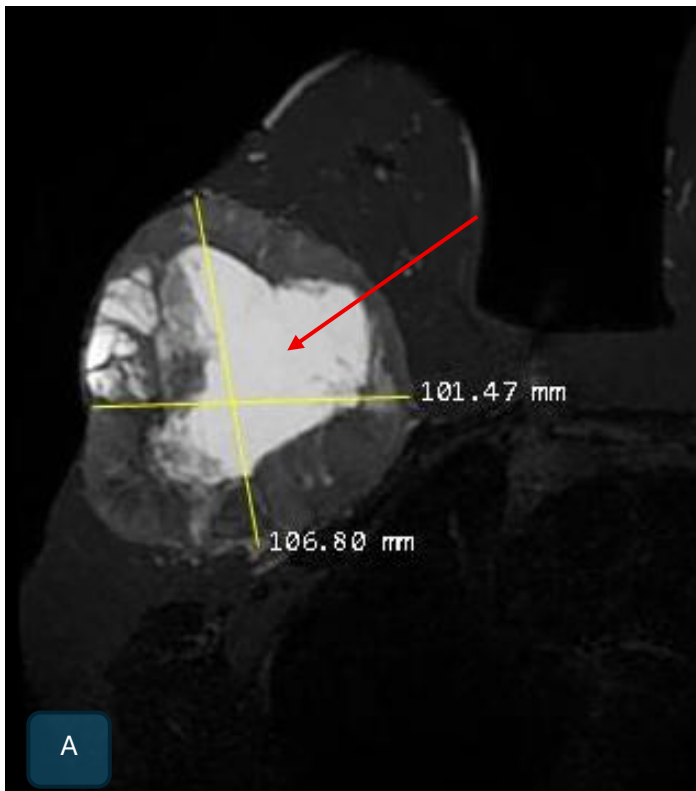


Figure 3A-3B: Follow-up breast MRI demonstrating marked interval enlargement of the right breast mass to approximately $10.7 \times 10.1 \times 7.9$ cm. The lesion exhibits heterogeneous signal intensity with extensive central necrotic/cystic degeneration (red arrow) and remains in close proximity to, but without definite radiological invasion of, the pectoralis muscle.

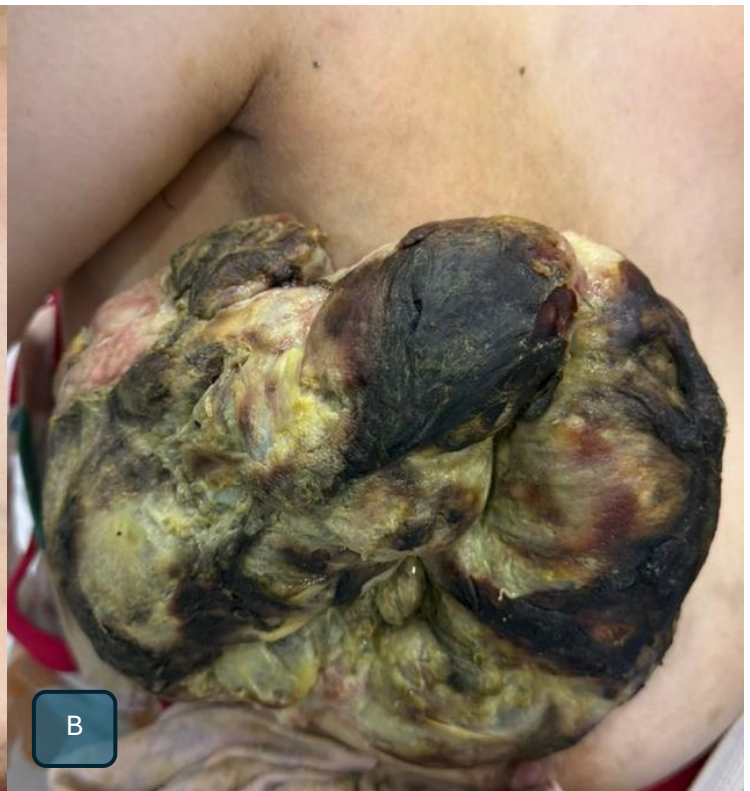


*Figure 4A-4B: Large necrotic and ulcerated tumor of the UEQ of the right breast, secondarily infected, erosions and signs of bleeding, measuring 26*18cm*

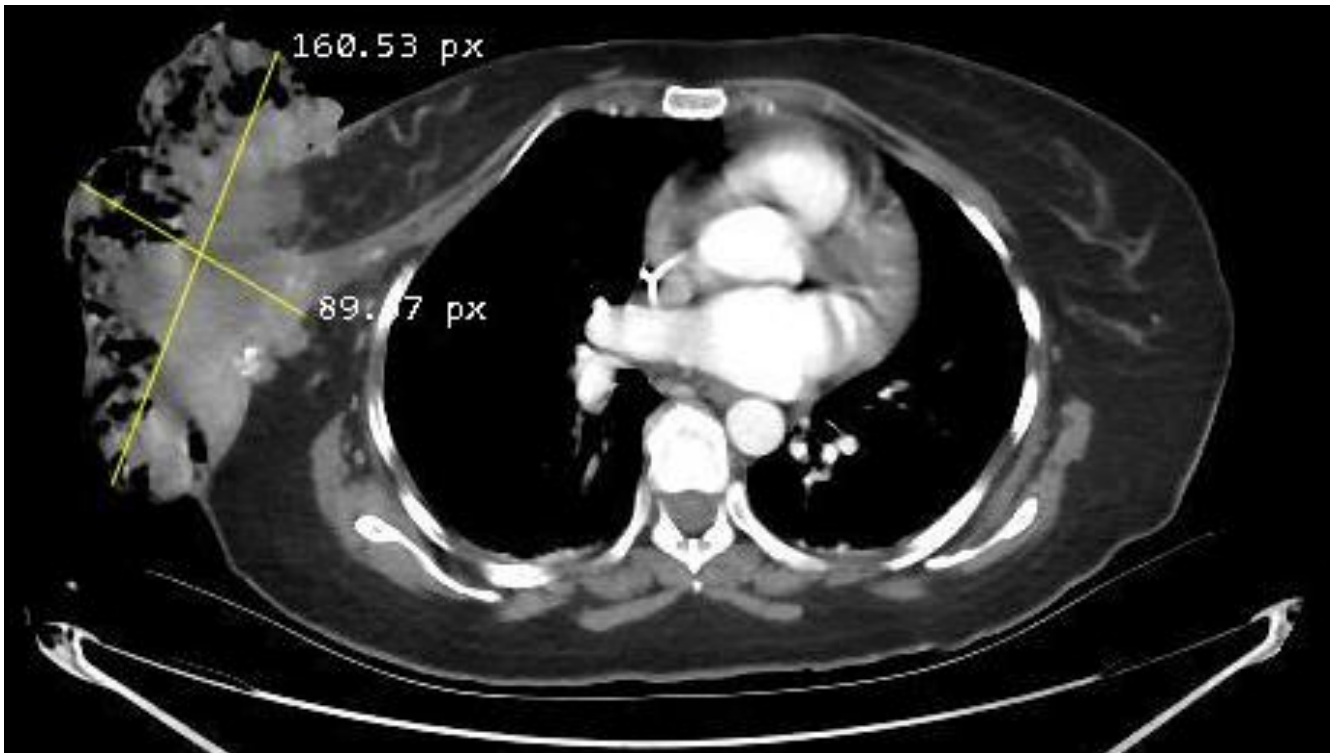


Figure 5: 160 × 90 mm right breast mass, without clear chest wall invasion, signs of necrosis and localized abscesses, and reactive axillary nodal involvement.

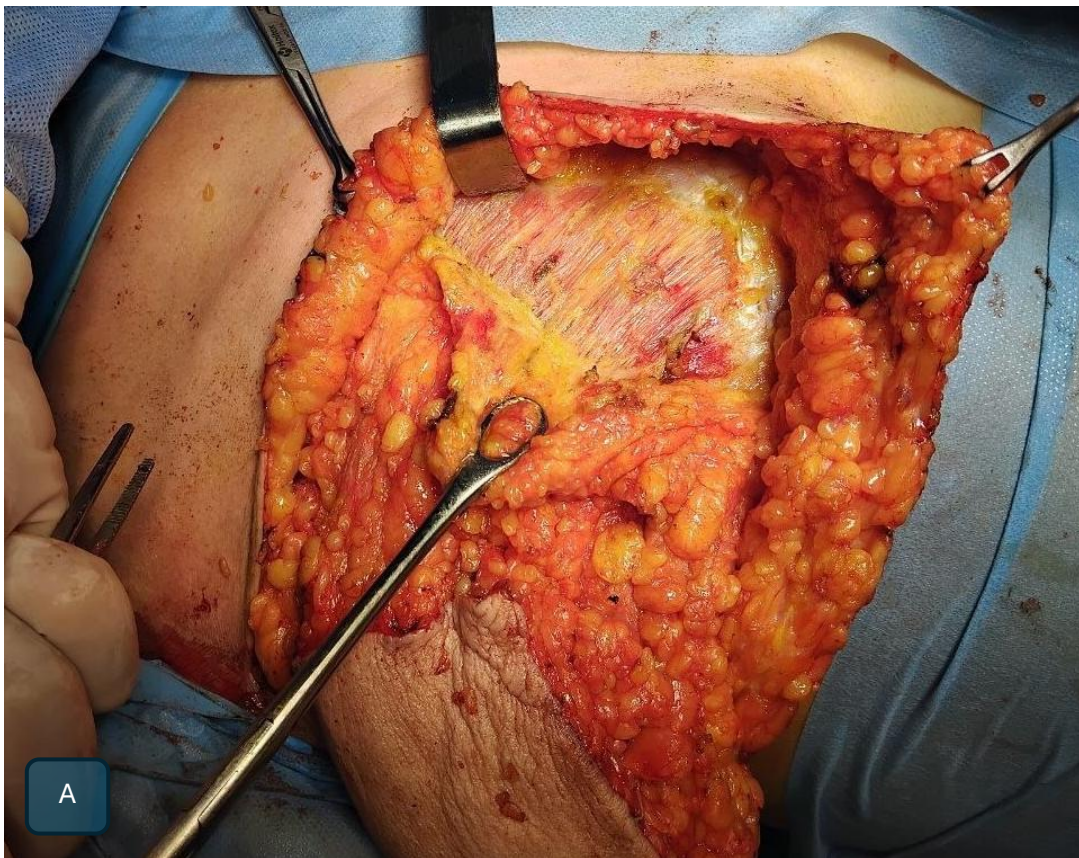


Figure 6A: carcinological mastectomy: no initial signs of chest wall or muscle invasion

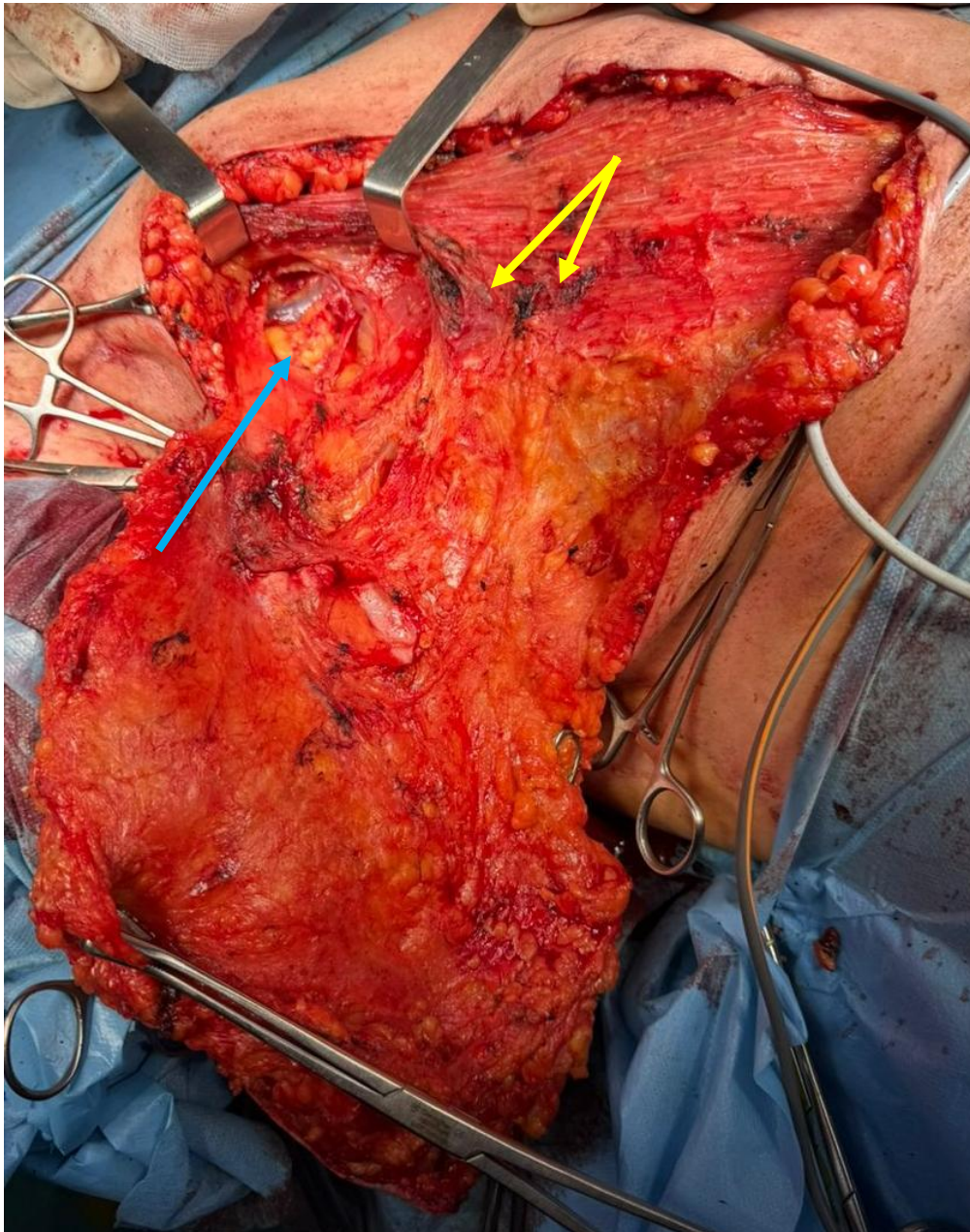


Figure 6B: Radical mastectomy, en Bloc with partial resection of pectoralis major (yellow arrows), and complete lymphatic dissection of the right axillary region (blue arrow).



Figure 7A: Gross specimen, en bloc resection with the remaining breast tissue, the tumor and axillary dissection.

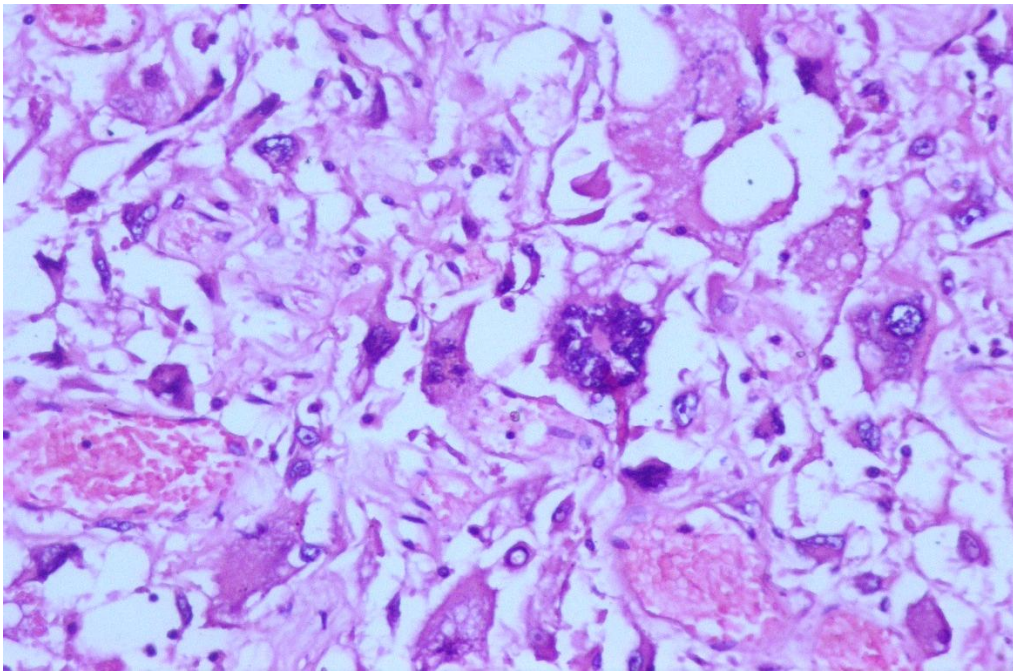


Figure 7B. Histopathological examination demonstrating an epithelial component associated with a mesenchymal component composed of pleomorphic spindle cells (hematoxylin and eosin stain, $\times 20$ magnification).

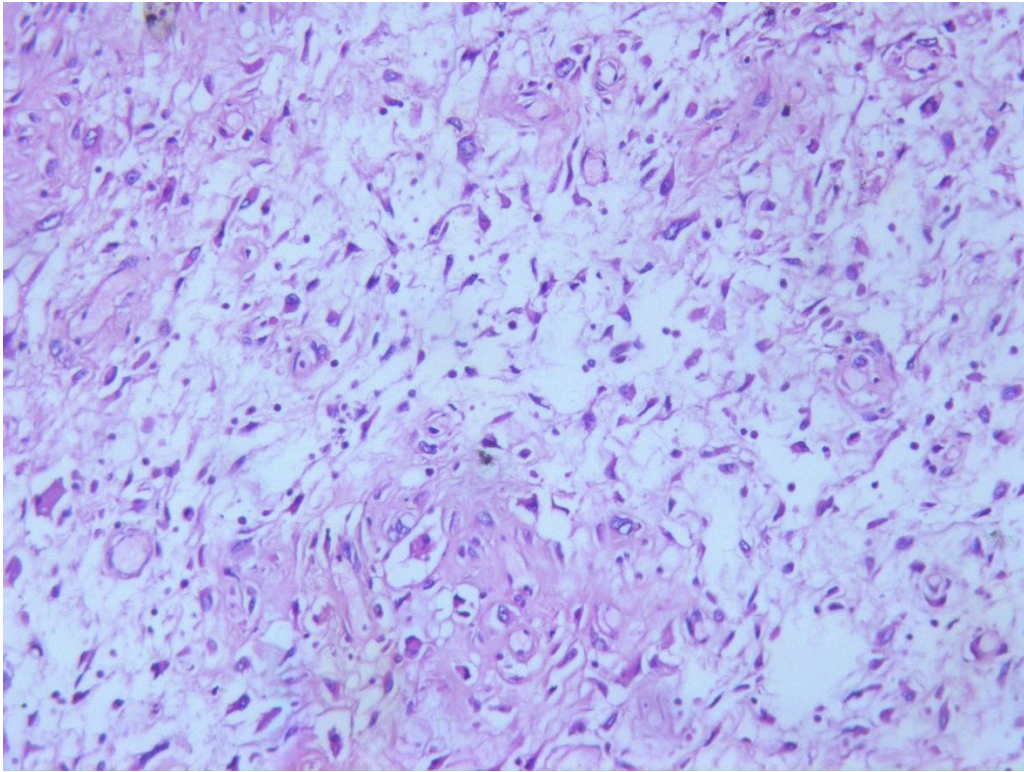


Figure 7C: spindle-cell differentiation ($\times 10$ magnification).

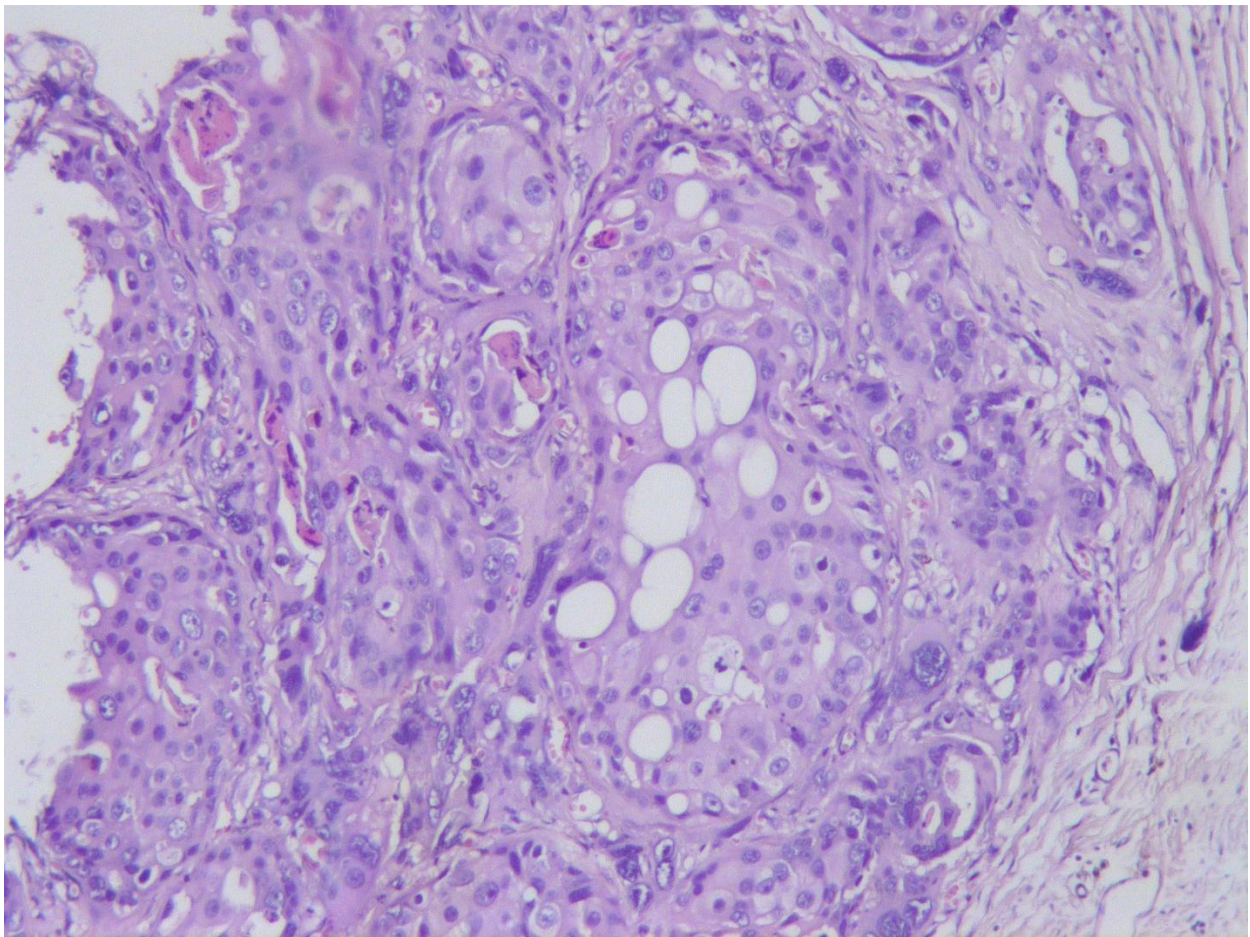


Figure 7D: squamous cell differentiation ($\times 10$ magnification)

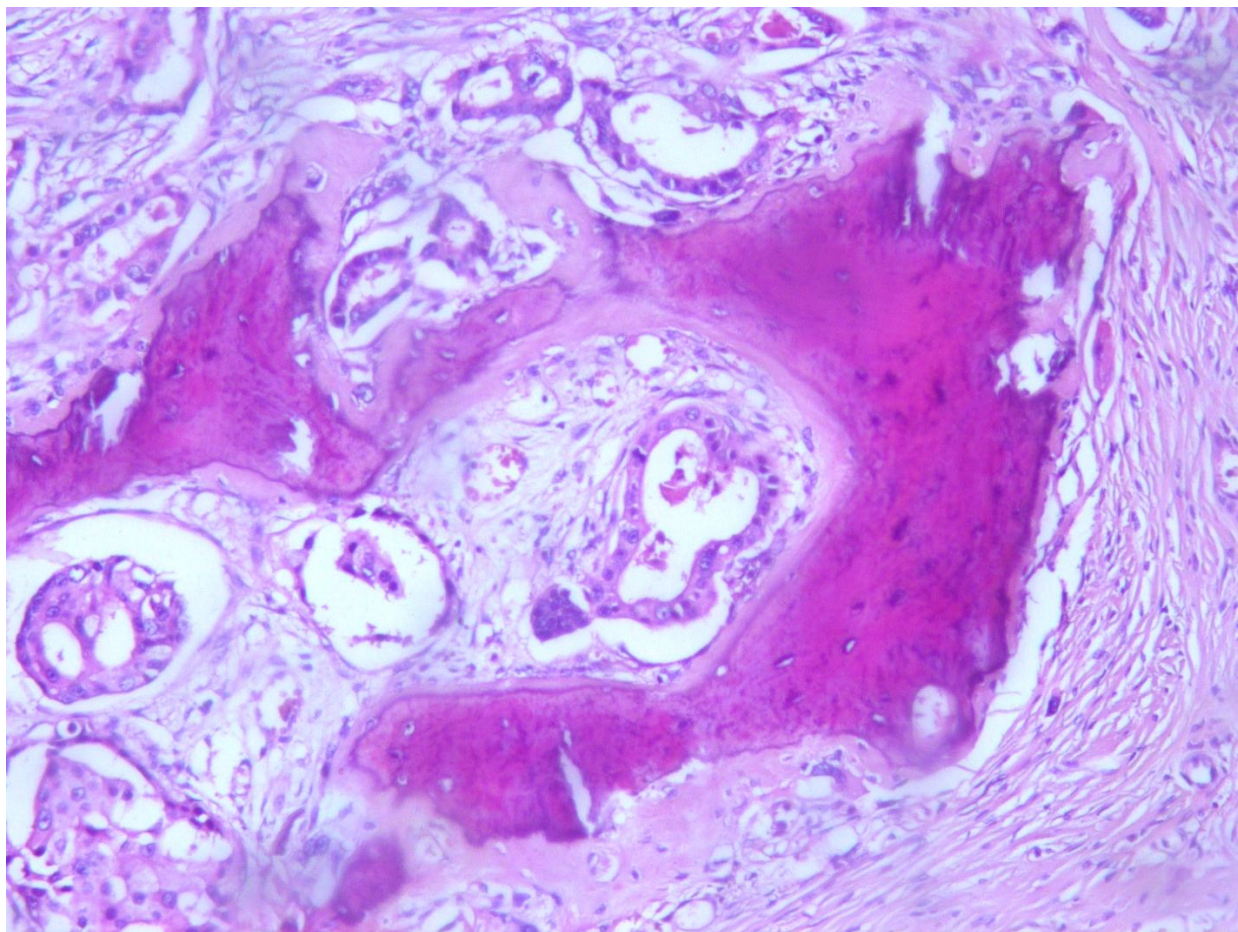


Figure 7E : osseus differentiation and mature bone formation

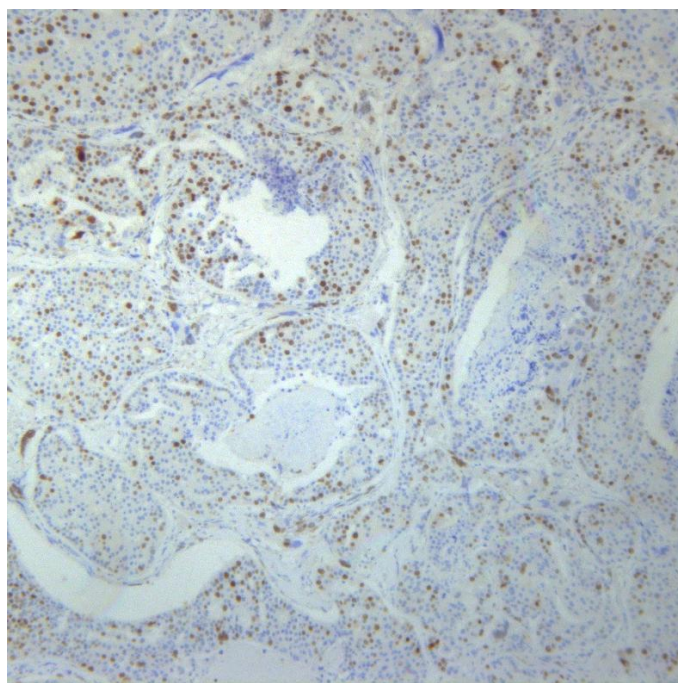
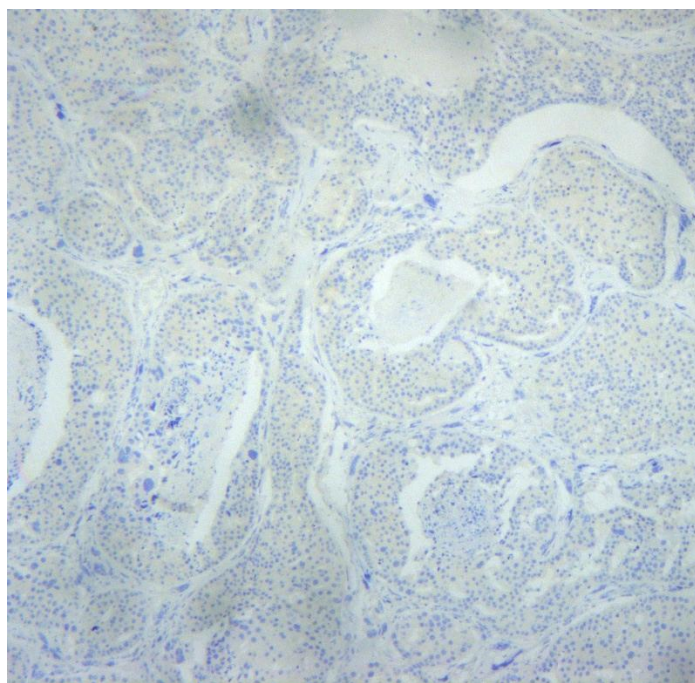


Figure 7F: Immunohistochemistry (left) showing negative ER, PR, and HER2 expression (triple-negative phenotype), and Ki-67 proliferation index of approximately 30% (right).



Figure 8. Early postoperative wound demonstrating minor wound dehiscence and seroma formation.

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