Journal of Carcinogenesis
Covering Genesis to Therapeutics

Journal of Carcinogenesis, ISSN: 1477-3163
2025; Vol 24: Issue 2s, https://carcinogenesis.com/

The Peculiar Leafy Giant: Giant Malignant Phyllodes Tumor With Axillary Lymph Node Metastasis

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ABSTRACT

Background: Malignant phyllodes tumors (MPT) are uncommon fibroepithelial breast neoplasms that usually disseminate hematogenously. Regional nodal involvement is exceptionally rare. We report an extreme presentation of a giant MPT with synchronous axillary metastasis and early systemic relapse, highlighting diagnostic pitfalls and therapeutic dilemmas.

Case presentation: A 44-year-old nulliparous woman presented with a rapidly enlarging 35 × 25 cm right-breast mass three years after excision of a borderline phyllodes tumor. Examination revealed *peau d'orange*, nipple retraction and a palpable 2 cm level-I axillary node. Core biopsy suggested MPT. Staging computed-tomography showed no distant disease. She underwent right modified radical mastectomy with level I–II axillary clearance. The 4.5 kg specimen measured 43.5 × 36 × 12.5 cm. Histology showed marked stromal overgrowth, 14–16 mitoses/10 HPF, lymphovascular invasion and six metastatic axillary nodes (pT4 N1 M0). Adjuvant chest-wall radiotherapy was recommended; however, ^18F-FDG PET performed at four months detected pulmonary metastases and a chest-wall implant. The patient defaulted systemic therapy and was lost to follow-up.

Conclusion: Giant MPT can breach traditional dogma by acquiring lymphatic spread. Axillary intervention should be contemplated when nodes are clinically abnormal. Given the poor post-metastatic survival, early referral to a sarcoma multidisciplinary team and enrolment in clinical trials are advisable.

Keywords: *malignant phyllodes tumor; giant breast tumor; axillary lymph node metastasis; case report; breast sarcoma.*

How to Cite: Shivakumar Shivabasappa, Dr. Girish Kumar, Sharon esther, Dr. Sankar Chandra Vadan, (2025) The Peculiar Leafy Giant: Giant Malignant Phyllodes Tumor With Axillary Lymph Node Metastasis, *Journal of Carcinogenesis*, *Vol.24, No.2s*, 991-996

1. INTRODUCTION

Phyllodes tumors constitute < 1 % of all primary breast neoplasms and are stratified into benign, borderline and malignant categories in the 2019 World Health Organization (WHO) classification [1] . Population-based analyses show an incidence of only 2.1 per million women [2] . While most lesions present as circumscribed nodules < 5 cm, those exceeding 10 cm are designated "giant" and harbour disproportionately higher stromal cellularity, mitotic activity and necrosis [3]. Malignant transformation is recognised in 10–20 % of cases and confers a worse local-recurrence and metastasis risk spectrum compared with benign counterparts.

Despite their rarity, phyllodes tumours have attracted renewed interest because their biological behaviour straddles the benign–malignant divide and challenges conventional breast-oncology paradigms. Molecular profiling has identified recurrent *MED12*, TERT-promoter and *RARA* mutations, supporting a multistep oncogenic pathway distinct from invasive

ductal carcinoma. Clinically, patients tend to present in the fourth decade, several years later than those harbouring fibroadenomas, and the interplay between epithelial and stromal compartments drives the characteristic leaf-like morphology from which the tumour derives its name.

Haematogenous dissemination to lung, bone and brain occurs in 10–20 % of MPT, whereas regional lymph-node metastasis is distinctly uncommon, with reported frequencies of 1.1–3.8 % [4] . Consequently, prevailing guidelines advocate wide local excision with ≥ 1 cm margins and no routine axillary staging, reserving nodal surgery for clinically suspicious disease [5] . We report a giant MPT with synchronous axillary involvement to illuminate the limitations of current recommendations and to discuss evolving locoregional and systemic management strategies.

2. CASE PRESENTATION

Patient information

A 44-year-old nulliparous woman with no major comorbidities noted progressive enlargement of the right breast over eight months, accompanied by dragging pain and functional restriction of the right upper limb. She had undergone wide local excisions for a fibroadenoma (2019) and a borderline phyllodes tumor (2021) elsewhere. Family history was negative for breast or ovarian cancer.

Clinical findings

Inspection revealed marked asymmetry with a bosselated 35 × 25 cm right-breast mass occupying all quadrants. Dilated superficial veins criss-crossed the tense skin; *peau d'orange* was prominent inferiorly and the nipple–areolar complex was retracted. Palpation showed firm-to-hard consistency with focal cystic areas. A solitary, mobile 2 × 2 cm right-axillary lymph node was palpable. No supraclavicular nodes or distant stigmata of metastasis were detected.

Diagnostic assessment

Baseline laboratory parameters were normal. Ultrasonography demonstrated a multilobulated heterogeneously hypoechoic mass with internal vascularity and a suspicious level-I node. Ultrasound-guided core biopsy yielded a spindle-cell neoplasm favouring MPT. Contrast-enhanced CT of the thorax, abdomen and pelvis outlined a heterogeneous enhancing mass without chest-wall invasion, the enlarged axillary node and no visceral metastases.

Therapeutic intervention

After discussion at the institutional breast–sarcoma tumour board, the patient underwent right modified radical mastectomy with level I–II axillary dissection. An elliptical skin paddle encompassing ulcerated lower-pole skin was excised; the wound was closed primarily without reconstruction. Operative blood loss was 600 mL.

Pathological findings

The mastectomy specimen weighed 4.5 kg and measured 43.5 × 36 × 12.5 cm. Serial slicing revealed leaf-like clefts filled with haemorrhagic fluid and necrotic debris. Microscopy demonstrated marked stromal overgrowth, severe nuclear atypia and 14–16 mitoses per 10 high-power fields. Geographic necrosis and lymphovascular invasion were evident. Surgical margins were clear (> 1.2 cm anteriorly). Six of 25 level I–II lymph nodes harboured metastatic spindle-cell deposits, the largest measuring 4.8 mm (pT4 N1 M0; AJCC 8th).

Post-operative course and follow-up

The patient recovered uneventfully and was discharged on post-operative day 5. Multidisciplinary consensus recommended adjuvant chest-wall radiotherapy (50 Gy in 25 fractions) with surveillance imaging. At the four-month review, ^18F-FDG PET–CT demonstrated multiple bilateral pulmonary nodules (SUVmax 8) and an 18 mm chest-wall implant, consistent with metastatic disease. Palliative doxorubicin–ifosfamide chemotherapy was proposed, but the patient declined further treatment and was lost to follow-up.

Tables

TABLE 1. CLINICOPATHOLOGICAL CHARACTERISTICS OF THE PRESENT CASE

Parameter	Value
Age (years)	44
Parity	Nulliparous
Presenting symptom	Rapidly enlarging breast mass with dragging pain
Tumour size (gross)	43.5 × 36 × 12.5 cm

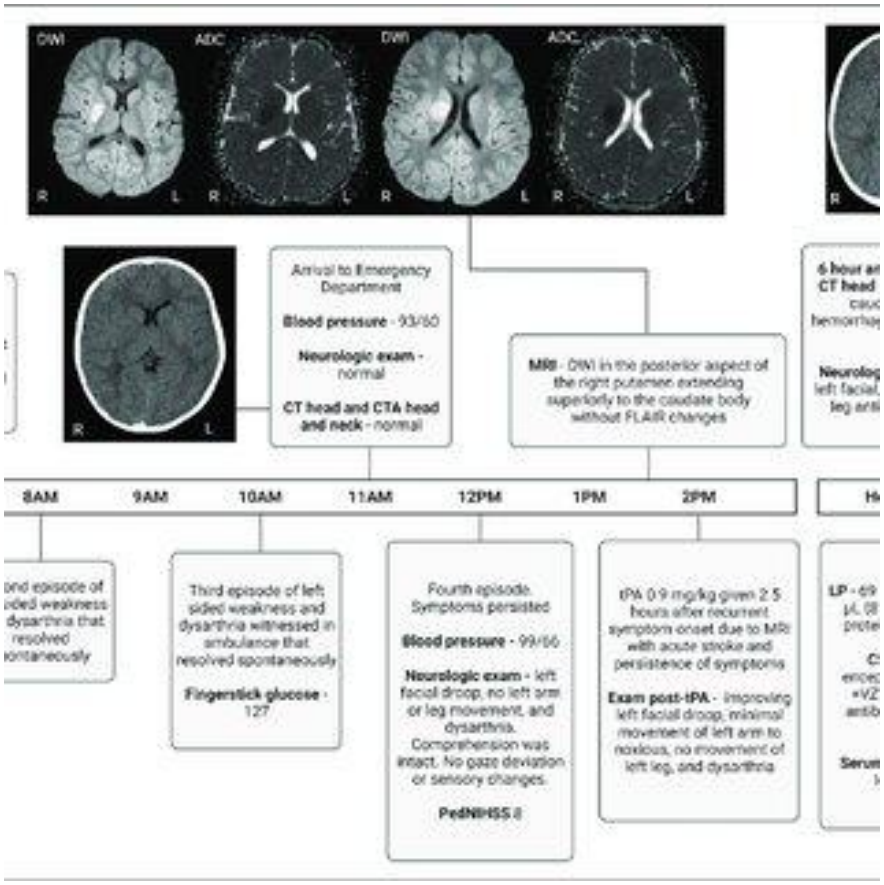
Specimen weight	4.5 kg
Histology	Malignant phyllodes tumour
Mitotic index	14–16 per 10 HPF
Lymphovascular invasion	Present
Positive lymph-nodes / examined	6 / 25
Pathological stage (AJCC 8th)	pT4 N1 M0

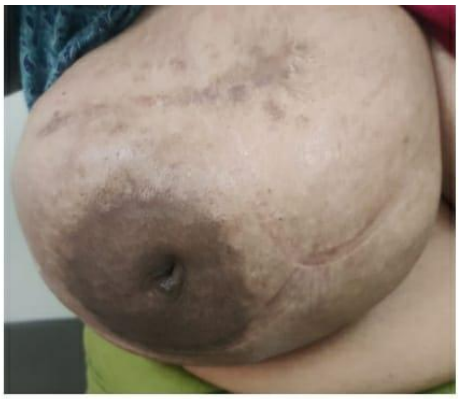
TABLE 2. PUBLISHED CASES OF MALIGNANT PHYLLODES TUMOURS WITH AXILLARY-NODE METASTASIS

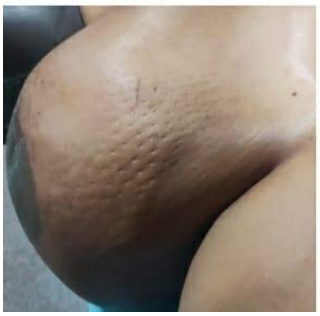
Author (year)	**Tumour size (cm)**	**Nodal status**	**Primary treatment**	**Outcome***
Reinfuss et al. (1993)	> 10 cm	Nodes involved	Mastectomy + axillary dissection	Alive 18 months
Lifrieri et al. (2024)	11 cm	Nodes involved	Modified radical mastectomy	Alive 12 months
Current case (2024)	**43.5 cm**	**6 / 25 positive**	Modified radical mastectomy + axillary dissection	Pulmonary mets at 4 mths

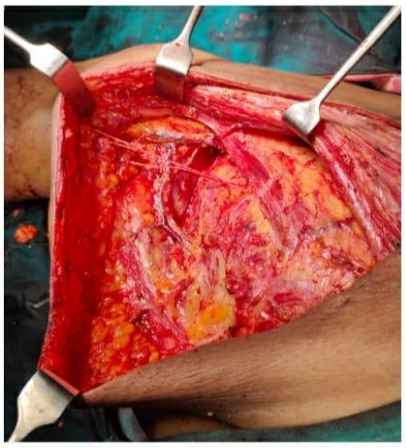
Figures

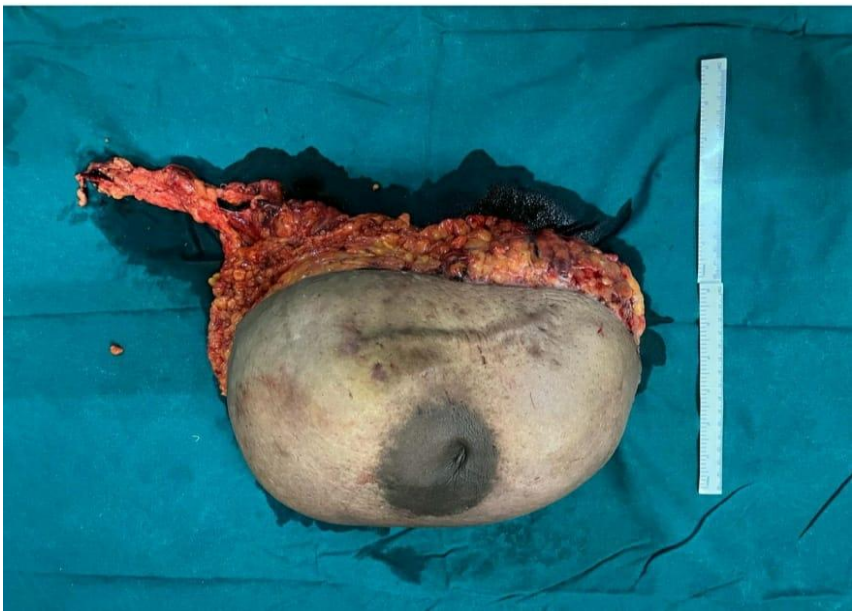
FIGURE 1. TIMELINE OF THE PATIENT'S DISEASE COURSE – GRAPHICALLY SUMMARISES KEY CLINICAL MILESTONES FROM THE INITIAL BENIGN LESION TO METASTATIC RELAPSE.

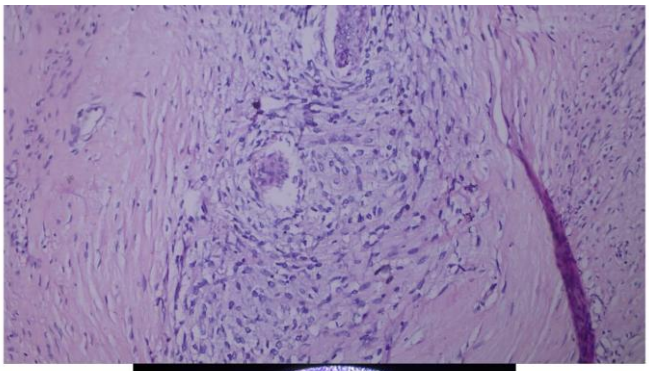


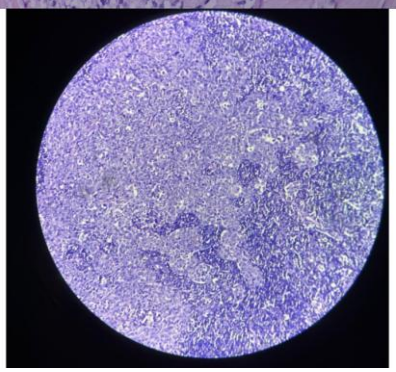












3. DISCUSSION

This case highlights three clinically relevant themes in contemporary MPT management.although haematogenous spread predominates, robust evidence confirms that nodal involvement—albeit uncommon—occurs and may be underestimated in giant or necrotic tumours [6]. Reinfuss et al. identified axillary metastasis in 8 % of 55 malignant cases, particularly when tumours exceeded 10 cm or displayed stromal overgrowth [7].

The benefit of adjuvant radiotherapy remains controversial. Population-based analyses of the SEER database have not shown a cancer-specific survival advantage with routine radiotherapy after margin-negative surgery [6]. Conversely, a 2019 meta-analysis encompassing 1,404 patients reported a 47 % reduction in local-recurrence risk for borderline and malignant histologies, with the greatest benefit in tumours ≥ 5 cm or with positive margins [8].

Systemic therapy for advanced MPT is extrapolated from soft-tissue-sarcoma regimens because randomised phyllodes-specific trials are lacking. The largest institutional series demonstrated no improvement in recurrence-free survival with adjuvant doxorubicin–dacarbazine [9]. Nonetheless, sporadic reports have documented durable responses to anthracycline–ifosfamide combinations in the metastatic setting [10]. With median survival after distant relapse reported at 5–8 months, early referral to sarcoma units and clinical-trial enrolment are prudent.

Emerging molecular insights may refine prognostication: TERT-promoter mutations correlate with malignant histology and inferior survival, whereas *MED12* exon-2 mutations predominate in benign counterparts. Finally, a Danish population-based series identified tumour size > 10 cm, stromal overgrowth, high mitotic index, necrosis and positive margins as independent predictors of local recurrence and disease-specific mortality [12].

4. CONCLUSION

Giant malignant phyllodes tumours can breach traditional dogma by metastasising to regional lymph nodes. Clinicians should remain alert to nodal disease in voluminous, necrotic lesions and incorporate sentinel sampling or axillary dissection when warranted. Owing to the paucity of high-level evidence, management of disseminated or high-risk MPT should be individualised within a multidisciplinary sarcoma framework with strong consideration for clinical-trial participation.

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