Large Malignant Phyllodes Tumor of the Breast: Case Report of a Young Female and Review of Literature

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Introduction
Phyllodes tumors are uncommon fibroepithelial neoplasm of the breast, accounting for 0.3 to 0.5% of all female breast neoplasms, with an incidence rate of about 2.1 per million mostly occurring in women aged 45 to 49 years. The term “phyllodes tumor” by the World Health Organization (WHO) categorizes it into benign, borderline, and malignant tumors based on histopathological characteristics. Malignant phyllodes tumor is an uncommon but aggressive breast malignancy and accounts for approximately 25% of all phyllodes tumors.

Case Presentation:
A 23-year-old female patient Gravida 0 Para 0, previously healthy, with no family history of breast or ovarian cancer was referred to our institution for managing a right breast mass increasing in size over a period of 1 month associated with reddish-brown discoloration of the skin. Breast ultrasound showed an isodense oval mass measuring approximately 16x14x12cm in the right lower outer quadrant of her breast. Core biopsy and FNA done revealed a low grade phyllodes tumor. MRI of breasts showed a huge mass of the right breast occupying all quadrants, measuring 15x14.5 cm in its greatest axis with involvement of the pectoralis major muscle, with no evidence of suspicious axillary lymphadenopathy. Distant metastatic work-up with CT scan of chest abdomen and pelvis and a PET scan did not show distant metastasis. Hence, the patient underwent right total mastectomy with a final pathology compatible with malignant phyllodes tumor. She is on regular follow up and 18 months post-surgery is still disease free.

Conclusion:
Management of malignant phyllodes tumor remains debatable, especially when it comes to the effect of adjuvant radiotherapy and chemotherapy. From a surgical perspective, whether phyllodes tumors should be considered as epithelial breast cancers or as soft tissue sarcoma is another debate. On the other hand, although challenging, accurate identification of phyllodes tumor initially may aid in decreased recurrence.
Our case was a 23-year-old female patient Gravida 0 Para 0, previously healthy, with no family history of breast or ovarian cancer transferred to our institution to receive treatment for a right breast mass increasing in size over a period of 1 month associated with brownish and reddish discoloration of the skin. On physical examination of the right breast a grossly distorted architecture, with reddish-brown discoloration of the skin (Figure 1a, 1b) was observed with no nipple retraction. On palpation of the diffusely hard breast, no nipple discharge and no palpable right axillary lymph nodes were observed. The contralateral breast (left) was normal looking, with no palpable masses, and no left axillary lymph nodes.

The patient underwent investigations with breast ultrasound showing an isodense oval mass measuring approximately 16x14x12cm in the right lower outer quadrant of her breast. Core biopsy and FNA done revealed fragments of myxoid and cellular stroma. These findings were not specific but could indicate a fibroepithelial lesion such as cellular fibroadenoma and low grade phyllodes tumor. MRI of the breasts showed a huge mass of the right breast occupying all quadrants, measuring 15x14.5 cm in its greatest axis with involvement of the pectoralis major muscle, with no evidence of suspicious axillary lymphadenopathy. Distant metastatic work-up prior to the surgical intervention with CT scan of chest abdomen and pelvis and a PET scan did not show distant metastasis. Hence, the patient was
scheduled for right total mastectomy.

The patient went through a right total mastectomy with partial excision of the pectoralis major where the tumor was involved (Figure 3, 4). Primary closure was possible without the need for autologous flap for closure. The final histopathologic result was consistent with features of malignant phyllodes tumor measuring 16.5x15x14cm, with clear negative surgical margins 1.6cm away from the tumor and the deepest surgical margin being 2mm away from the tumor. Post-surgical follow-up showed good wound healing, revealing no flap necrosis (Figure 5). She is on regular follow up and 18 months post-surgery is disease free with no evidence of local recurrence or distant recurrence by PET scan.

Discussion

Extensive studies have been done regarding the treatment of common breast malignancies. However, the optimal management for rare breast tumors including phyllodes tumor has not been well established. Due to its rarity, the current medical literature lacks a sound treatment plan, especially when it comes to the effect of chemotherapy or radiotherapy on managing malignant phyllodes tumor of the breast. Most management protocols depend on retrospective case series. Irrespective of their histologic classification, phyllodes tumors have an unpredictable clinical outcome. Age, tumor size, surgical approach, mitotic activity, stromal overgrowth and surgical margin have been found to be important factors in diagnosis and prediction of recurrence. Kaprisi et al. found that tumor size and surgical margins were predictive of local recurrence, which is very important for treatment of phyllodes tumors to be successful. A review of the literature reveals a local recurrence rate >40% for all pathological types. On the contrary, different studies showed a local recurrence rate of less than 20% depending on the tumor subtype. Furthermore, a delay in treatment increases the possibility of distant metastases. Metastasis usually occurs via the bloodstream and lymphatic metastasis occurs rarely. The most frequently reported sites for metastases are the lung, soft tissue, bone, and pleura. The rate of metastases is 25%–31% for malignant and borderline tumors, whereas it is 4% for all types of phyllodes masses. Guidelines for cases of malignant phyllodes tumor by National Comprehensive Cancer Network include complete surgical resection with negative margins of at least 1 cm and preferably 1 to 2 cm due to the morphologic characteristic of the tumor. The presence of a pseudo capsule containing finger-like or pseudopodia-like projections around the phyllodes tumor tissue is likely, which, if not surgically excised, leads to a local recurrence. Therefore, the tumor with 1–2-cm width of normal tissue should be removed including these pseudopodia of tumors. Total mastectomy is in general not suggested due to poor cosmetic outcomes, unless negative margins cannot be conducted or if the tumor is too large to be completely excised. Adjuvant radiation therapy is debatable in preventing tumor recurrence. Radiation has been found to prevent recurrence of borderline and malignant phyllodes tumor after surgical interventions (breast-conserving surgery and mastectomy) with no impact on disease-free survival. Furthermore, adjuvant radiation therapy is suggested for recurrent and malignant phyllodes tumor. Patients with high risk for recurrence, including those with histological margin less than 5 mm may be candidates for radiotherapy. On the other hand, routine adjuvant systemic therapy after initial excision is not recommended. Chemotherapy for locally recurrent tumor is contentious. Burton et al. reported effective palliation for patients suffering from metastatic disease with chemotherapy based on cisplatin and etoposide. As far as we know, this is the youngest reported case of malignant phyllodes tumor of the breast with this size. In our case, despite the large size of the tumor negative surgical margins of 1.6 cm were achieved by total mastectomy, with no recurrence at 18 months of follow-up. In our
review of the English medical literature we identified 16 cases of large malignant phyllodes tumors of the breast, above 10cm in largest dimension (Table 1), with a size range of 10 to 40cm, with a mean age of 44 years old. Table 1 shows that the most common site of metastasis is lungs 6/16 (37.5%), followed by brain 3/16 (18.7%). Hence, appropriate surgery is the cornerstone and the first step towards successful treatment of phyllodes tumor.

In conclusion, management of malignant

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**Table 1. Comparison the studies evaluated malignant phyllodes tumor**

| Author/year                      | Age | Pre-operative work-up                                                  | Size(cm) | Tumor Site | Type of Surgery | Adjuvant treatment |
|----------------------------------|-----|------------------------------------------------------------------------|----------|------------|----------------|-------------------|
| O.ECW*, K. CK, 2017              | 53  | Core biopsy inconclusive CT chest and abdomen: large tumor with extension to rib and pleura | 40x38x16 | Right      | Radical mastectomy (tumor dissected off with right 6th rib and pectoralis major (primary closure not possible) | None |
| A. Testori et al., 2015          | 33  | PET: positive ALN Skeletal & lung xray normal                          | 40x30x10 | Right      | Modified radical mastectomy (1/9 LNs) | Chemotherapy (adriamicyn and ifosfamide)/radiotherapy |
| R. Krishnamoorthy et al., 2014   | 35  | FNA: borderline phyllodes Core biopsy: biphasic neoplasm with malignant stromal component CT brain and chest & US abdomen no metastasis | 33x32x22 | Right      | Simple mastectomy | Chemotherapy (docornabin and ifosfamide)/Radiotherapy |
| A.P. Gregston et al., 2019       | 32  | Chest CT scan: large solid mass occupying the entire left breast      | 32x32x17 | Left       | Radical mastectomy with split thickness graft | 6 cycles (AdriamycinVR, ifosfamide, and mesna) 4 cycles (gemcitabine and docetaxel) |
| N. Roberts, D.M. Runk, 2015      | 50  | Core needle biopsy: malignant neoplasm with carcinomatous and sarcomatous elements, the cells showed focal marked pleomorphism (>10 mitoses/10HPF) with focal necrosis (ER/PR positive; HER2 negative) CT of chest positive for bilateral chest massesPET Scan: result not mentioned | 31.5x15.6 | Right      | Simple mastectomy | Patient deceased before any therapy could be initiated |
| I. Albalawi, 2018                | 41  | True cut biopsy malignant phyllodes tumor CT scan chest, abdomen and pelvis normal isotopes scan normal | 30x20x13 | Left       | Simple mastectomy | Radiotherapy |
| MA. Sbeih et al., 2015           | 41  | Core biopsy: fascicular pseudoangiomatous stromal hyperplasia or phyllodes tumor Left ALN biopsy: chronic lymphadenitis without neoplastic cells CT chest and abdomen: no metastasis | 20x20x25 | Left       | Simple mastectomy with left chest wall defect was covered temporarily with INTEGRA replaced with split thickness skin graft 5 weeks later | None |

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**Author/year/Year**

Kyriakos Saad, *et al.* Arch Breast Cancer 2020; Vol. 7, No. 3: 136-142

139
M. Takenaka et al., 2011

Core biopsy: low grade myofibroblastic sarcoma
CT suspicion of chest wall invasion
MRI no ALN
CEA/Ca 15-3 normal
Excisional marked stromal hypercellularity without an epithelial component

Core needle biopsy & FNA: fragments of myxoid and cellular stroma, may indicate a fibroepithelial lesion such as cellular fibroadenoma and low grade phyllodes tumor
CT chest abdomen & pelvis negative for metastasis
PET scan negative for metastasis

20x14x9.7 Right Radical mastectomy with pectoralis major excision + axillary lymph nodes dissection (no positive ALNs)

None No LR 17 months after surgery

Our Case, 2020

Core biopsy & FNA: fragments of myxoid and cellular stroma, may indicate a fibroepithelial lesion such as cellular fibroadenoma and low grade phyllodes tumor
CT chest abdomen & pelvis negative for metastasis
PET scan negative for metastasis

16.5x15x14 Right Total mastectomy with partial excision of pectoralis major (with primary closure of defect)

None No LR after 18 months follow-up
PET scan: no distant metastasis

SH. Moon et al., 2019

Core needle biopsy: malignant phyllodes tumor
CT chest metastatic LNs to Right axilla & multiple solitary pulmonary nodules on right lung
FNA of LNs positive for metastasis
PET scan

15.5x13.5x13 Right Modified Radical Mastectomy + TRAM flap (1/32 ALNs)

Chemotherapy (doxorubicin and ifosfamide)

Free of LR at 3 years follow-up and free of distant metastasis (lung metastasis resolved)

T. Saito et al., 1998

NA

15x15 Right Simple mastectomy

Radiotherapy (50Gy),
Chemotherapy (Cyclophosphamide)

1. After 9 months Lung metastasis
2. Died of disease after 18 months of primary diagnosis

S. Khanal et al., 2018

Chest X-ray: negative
US abdomen & pelvis negative
True-cut necrotic areas with fibrocollagenous tissue with proliferation of oval to elongated spindle cells showing mild degree of atypia

15x15 Left Modified Radical Mastectomy

None 3 months’ post-op:
- No LR
- Huge cystic nodule in the brain
- Contrast enhanced computed tomography (CECT) of chest, abdomen and pelvis showed lesions in lower lobe of left lung of 3.9 × 3.6 cm of +40 (HU) in posterobasal segment and right adrenal gland of 5.8 × 5.1 cm of +30HU
- 20 days’ later patient succumbed to disease

J. Kaya, A. Betensley, 2013

Core biopsy & FNA: fragments of myxoid and cellular stroma, may indicate a fibroepithelial lesion such as cellular fibroadenoma and low grade phyllodes tumor
CT chest abdomen & pelvis negative for metastasis
PET scan negative

14x14x10 Right Simple mastectomy without ALND

None

J. Alves et al., 2011

Core biopsy: biphasic neoplasm with malignant stromal component
Chest X-ray & Abdomen ultrasound negative for distant metastasis

13x11x7 Right Partial mastectomy

Radio 1. Free margins but <1mm: re-excision margins
2. CT scan and bone scan negative for metastasis

A. Abdulkareem, 2019

Core biopsy: Epithelial and stromal components
Epithelial is benign, the mesenchymal part showed spindle cell with increased cellularity (mitotic rate 5/10 HPF) no atypia or necrosis

FNA: benign breast lesion

12 Right Modified radical mastectomy

None

M. Sani et al., 2008

CT chest (bilateral lung nodules) Core needle biopsy (proliferation of atypical spindle-shaped cells with marked coagulation necrosis, no epithelial components: sarcoma vs phyllodes)

10x10 Right Simple mastectomy + ALN excision

4 cycles (FEC therapy: cyclophosphamide, epirubicin, fluorouracil)

1. Lung metastasis increased in size (progressive disease)
2. Patient died 4 months post-surgery due to respiratory failure

S. Suzuki-Uematsu, 2010

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Kyriakos Saad, et al. Arch Breast Cancer 2020; Vol. 7, No. 3: 136-142
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Ethical Consideration
A written informed consent was obtained from the patient to publish the case as well as any associated images

Conflict of Interest
None.

References
1. Rowell MD, Perry RR, Hsiu JG, Barranco SC. Phyllodes tumors. Am J Surg. 1993;165(3):376-9.
2. Bernstein L, Deapen D, Ross RK. The descriptive epidemiology of malignant cystosarcoma phyllodes tumors of the breast. Cancer. 1993;71(10):3020-4.
3. Salvadori B, Cusumano F, Del Bo R, Delledonne V, Grassi M, et al. Surgical treatment of phyllodes tumors of the breast. Cancer. 1989;63(12):2532-6.
4. Reinfuss M, Mitus J, Duda K, Sulemack A, Rysz J, et al. The treatment and prognosis of patients with phyllodes tumor of the breast: an analysis of 170 cases. Cancer. 1996;77(5):910-6.
5. Abusalem OT, Al-Masri A. Phyllodes Tumors of the Breast. Mater Sociomed. 2011;23(4):200-5.
6. Briggs RM, Walters M, Rosenthal D. Cystosarcoma phylloides in adolescent female patients. Am J Surg. 1983;146(6):712-4.
7. Mishra SP, Tiwary SK, Mishra M, Khanna AK. Phyllodes tumor of breast: a review article. ISRN Surg. 2013;2013:361469.
8. Fisher SJ, Harrises SA. Phyllodes tumors. Postgrad Med J. 2001;77(909):428-35.
9. Yagishita M, Nambu Y, Ishigaki M, Okada T, Yamanouchi K, et al. Pulmonary metastatic malignant phyllodes tumor showing multiple thin walled cavities. Nihon Kokyuki Gakkai Zasshi. 1999;37(1):61-6.
10. Khoorsavi-Shahi P. Management of non metastatic phyllodes tumors of the breast: review of the literature. Surg Oncol. 2011;20(4):e143-8.
11. Badwe RA, Kataria K, Srivastava A. Surgical Resection of Phyllodes Tumour: a Radical Approach as a Safeguard Against Local Recurrence. Indian J Surg. 2015;77(2):161-3.
12. Kataria K, Dhar A, Ranjan P, Kumar A, Islam S, et al. Radical mastectomy SANS axillary lymph node dissection for large phyllodes tumor: a guarantee against recurrence. Indian Journal of Surgery. 2019;81(6):520-4.
13. Zeng S, Zhang X, Yang D, Wang X, Ren G. Effects of adjuvant radiotherapy on borderline and malignant phyllodes tumors: A systematic review and meta-analysis. Mol Clin Oncol. 2015;3(3):663-71.
14. Barth RJ, Wells WA, Mitchell SE, Cole BF. A prospective, multi-institutional study of adjuvant radiotherapy after resection of malignant phyllodes tumors. Annals of surgical oncology. 2009;16(8):2288-94.
15. Chaney AW, Pollack A, McNeeese MD, Zagars GK. Adjuvant radiotherapy for phyllodes tumor of breast. Radiat Oncol Investig. 1998;6(6):264-7.
16. Ong E, Kong C. CASE REPORT: MASSIVE RUPTURED MALIGNANT PHYLLODES TUMOUR. Journal of Health and Translational Medicine. 2017;20(1):18-20.
17. Testori A, Meroni S, Errico V, Travaglini R, Voulaz E, et al. Huge malignant phyllodes breast tumor: a real entity in a new era of early breast cancer. World J Surg Oncol. 2015;13:81.
18. Krishnamoorthy R, Sivasere T, Prabhuswamy VK, Babu R, Shivawamy S. Giant malignant phyllodes tumour of breast. Case Rep Oncol Med. 2014;2014:956856.
19. Gregston AP, Metter DM, Osborne CRC, Pippen J, Jr. Giant malignant phyllodes tumor with metastasis to the brain. Proc (Bayl Univ Med Cent). 2019;32(1):116-8.
20. Roberts N, Runk DM. Aggressive malignant phyllodes tumor. Int J Surg Case Rep. 2015;8C:161-5.
21. Albalawi IA. A huge phyllodes tumor in the breast: a case report. Electron Physician. 2018;10(6):6951-5.
22. Sbeih MA, Engdahl R, Landa M, Ojutiku O, Morrison N, et al. A giant phyllodes tumor causing ulceration and severe breast disfigurement: case report and review of giant phyllodes. J Surg Case Rep. 2015;2015(12).
23. Takenaka M, Toh U, Otsuka H, Takahashi H, Iwakuma N, et al. Giant malignant phyllodes tumor: a case report. Kurume Med J. 2011;58(2):67-72.
24. Moon SH, Jung JH, Lee J, Kim WW, Park HY, et al. Complete remission of giant malignant phyllodes tumor with lung metastasis: A case report. Medicine (Baltimore).
25. Saito T, Kato K, Kawamori J, Yoshinobu T, Sato T, et al. Radiotherapy to pulmonary metastases of a malignant phyllodes tumor of the breast. International Journal of Clinical Oncology. 1998;3(5):337-41.

26. Khanal S, Singh YP, Bhandari A, Sharma R. Malignant phyllodes tumor with metastases to lung, adrenal and brain: A rare case report. Ann Med Surg (Lond). 2018;36:113-7.

27. Kaya J, Betensley A. Is It Mass or Effusion: A Case of a Large Pleural Metastasis of Malignant Phyllodes Tumor of the Breast. Chest. 2013;144(4):484A.

28. Souza JAd, Marques EF, Guatelli C, Girao DS, Queroz T, et al. Malignant phyllodes tumor of the breast: case report. Revista da Associação Médica Brasileira. 2011;57(5):495-7.

29. Abdulkareem AA. Malignant breast phyllodes: Literature review of management and case report. Saudi Journal of Laparoscopy. 2019; 4(1):1.

30. Sani M, Leow V, Zaidi Z. Malignant phyllodes tumour: a case report. The Internet Journal of Surgery. 2008;21(2).

31. Suzuki-Uematsu S, Shiraishi K, Ito T, Adachi N, Inage Y, et al. Malignant phyllodes tumor composed almost exclusively of a fibrosarcomatous component: a case report and review of malignant phyllodes tumors with metastases. Breast cancer. 2010;17(3):218-24.