J of Nuclear Medicine Technology, first published online February 7, 2023 as doi:10.2967/jnmt.122.265212

RARE CASE OF PHYLLODES TUMOUR OF BREAST WITH CARDIAC AND PANCREATIC METASTASES. FINDINGS ON FDG PET-CT.

Parneet Singh[1], Girish Kumar Parida, Tejasvini Singhal, Pramit Kumar, Komal Bishnoi, Kanhaiyalal Agrawal.

Department of Nuclear Medicine, All India Institute of Medical Sciences, Bhubaneswar,

Corresponding author

Dr Girish Kumar Parida

Assistant Professor

Department of Nuclear Medicine,

All India Institute of Medical Sciences, Bhubaneswar

Email: grishh135@gmail.com

Short title: Cardiac metastasis in Phyllodes tumor

Authors declare no conflict of interest.

No funding received from anywhere for this manuscript.

Abstract:

Phyllodes tumors (PTs) represents a rare breast tumor arising from its stromal component rather than epithelium. Metastatic spread occurs hematogenous with lung, bone, brain and liver being the most common sites. We hereby present 18F-FDG PET-CT scan of one such case of phyllodes tumor showing cardiac and pancreatic metastases which is extremely rare occurrence.

Key words:

Phyllodes tumor, cardiac metastasis, pancreatic metastasis, FDG PET-CT,

Case Report:

A 55 years female presented with pain and rapidly growing lump in left breast. X-ray mammography and ultrasonography (USG) of bilateral breast revealed huge multilobulated radio-dense BIRADS -IV lesion measuring 10.8 x 12.6 cm. Trucut biopsy from the lesion was performed and histopathological examination revealed benign phyllodes. Following this diagnosis patient underwent excision of the lesion and on final histopathology it came out to be malignant histotype with no tumor free margins. The patient then underwent wide local excision of residual left breast mass. For metastatic workup patient underwent CECT abdomen, pelvis and HRCT chest, and no evidence of metastatic disease was found. But one year later she presented with left axillary lymphadenopathy. On axillary node sampling and histopathological examination, it was confirmed as metastasis from phyllodes. The patient was referred for PET-CT scan for disease evaluation which showed widespread metastasis involving left lung, head of pancreas, tumor thrombus in left atrium and multiple skeletal sites (Figure 1). Echocardiography confirmed the presence of mass in left atrium.

Discussion:

Phyllodes tumors (PTs) are rare mesenchymal tumors, arising from the connective tissue of the breast. They are relatively rare acounting for approximately 0.3 – 1% of all breast tumors *(1)*. WHO classifies PTs into three categories namely; benign, borderline, and malignant based on histopathologic features including nuclear atypia, stromal cellularity, mitotic activity, tumor margin appearance and stromal overgrowth*(2)*. Malignant phyllodes constitute approximately 10-15 % of all cases, but are aggressive tumors with rapid growth and around 9-27 % of malignant histotypes harbor metastasis*(2)*.

It usually presents in 35 -55 years of age as breast lump. On examination PTs are usually large (>3cm), mobile and painless mass that is well defined, smooth and multinodular. It may grow slowly, rapidly or may have a biphasic growth. Imaging studies can help in reaching the diagnosis and guiding the biopsy for confirmation of diagnosis *(3)*.

On Mammography PTs, typically appear as smooth, polylobulated mass resembling fibroadenoma. On USG PTs typically are solid, hypoechoic, and well circumscribed, but

sometimes have cystic areas. Breast lesions suspicious for PTs should be subjected to core needle biopsy rather than FNAC, owing to high false negative rate of latter. Once diagnosis is made, CT scan and/or MRI is done to look for disease extent and respectability. When metastasis is suspected, PET/CT is ordered to look for distant spread of tumor *(4)*.

Complete surgical excision with a tumor free margin is the standard of care for PTs due to high recurrence risk. Adjuvant radiotherapy can be considered. Local disease shows good survival approaching as high as 80-90% with surgical management ± radiotherapy. However, for metastatic disease prognosis is dismal with a mean survival of only 11 months. Metastatic disease has been associated with malignant histotype, large tumor size (>5cm), mitotic activity, positive surgical margins, presence of necrosis, young age. PTs respond poorly to chemotherapy and hormonal therapy *(5)*.

Metastatic spread occurs hematogenously and the common sites for metastasis include lung (66%-84.5%), bone (28%-39%), brain and liver*(6)*. Rarely the metastasis spread to other organs like adrenal gland, small intestine, kidney, pancreas, pelvis etc.*(7)*. Cardiac metastasis is very rare and usually seen as a part of multi-organ spread*(4)*. Cardiac metastasis usually involves right side of heart and rarely seen in left chambers*(4)*.

Cardiac metastasis dictates reduced survival, because of associated widespread disease and risk of hemodynamic compromise and sudden cardiac death*(8)*. Echocardiography can detect cardiac metastasis, but usually underestimates its extent*(9)*. Cardiac CT, cardiac MR and PET/CT can delineate exact extent of cardiac metastasis*(9)*. However, PET/CT can also differentiate tumor from thrombus, and can serve as one stop investigation to evaluate whole body spread as in the present case where FDG PET-CT revealed extensively metastatic disease with involvement of both pancreas and left atrium which is an extremely rare occurrence *(8)*.

Conclusion:

Metastasis in malignant phyllodes tumor most commonly involves lung, skeleton, liver and brain. Metastatic spread to other organs is rare. The present 18-F FDG PET-CT scan of malignant phyllodes tumor show metastasis to both pancreas and left atrium which is an extremely rare occurrence.

REFERENCES:

1. Le QH, Mai VT. Malignant phyllodes tumor with synchronous metastases to axillary lymph nodes, lung at the presentation: a case report and literature review. *J Surg Case Reports*. 2021;2021(7):1–3.

2. Zhang Y, Kleer CG. Phyllodes Tumor of the Breast: Histopathologic Features, Differential Diagnosis, and Molecular/Genetic Updates. *Arch Pathol Lab Med*. 2016 Jul 1 [cited 2022 Oct 24];140(7):665–71. Available from: https://pubmed.ncbi.nlm.nih.gov/27362571/

3. Amir RA, Rabah RS, Sheikh SS. Malignant Phyllodes Tumor of the Breast with Metastasis to the Pancreas: A Case Report and Review of Literature. *Case Rep Oncol Med*. 2018 Jun 27 [cited 2022 Oct 24];2018:1–5. Available from: https://pubmed.ncbi.nlm.nih.gov/30050709/

4. Yoshidaya F, Hayashi N, Takahashi K et al. Malignant phyllodes tumor metastasized to the right ventricle: a case report. *Surg Case Reports*. 2015;1(1):1–5. Available from: http://dx.doi.org/10.1186/s40792-015-0121-6

5. Koh VCY, Thike AA, Tan PH. Distant metastases in phyllodes tumours of the breast: an overview. *Appl Cancer Res*. 2017;37(1):6–13.

6. Pourghaderi P, E. Chapin S, M. Nouri A, M Bamboat Z. A rare case of recurrent phyllodes tumor of bilateral breasts with metastasis to the retroperitoneum and duodenum. *Med Case reports Rev*. 2020;3(1):1–3.

7. Karczmarek-Borowska B, Bukala A, Syrek-Kaplita K et al. A rare case of breast malignant phyllodes tumor with metastases to the kidney. *Med (United States)*. 2015;94(33):e1312.

8. Garg N, Moorthy N, Agrawal SK, Pandey S, Kumari N. Delayed cardiac metastasis from phyllodes breast tumor resenting as cardiogenic shock. *Texas Hear Inst J*. 2011;38(4):441–4.

9. Goldberg AD, Blankstein R, Padera RF. Tumors metastatic to the heart. *Circulation*. 2013;128(16):1790–4.

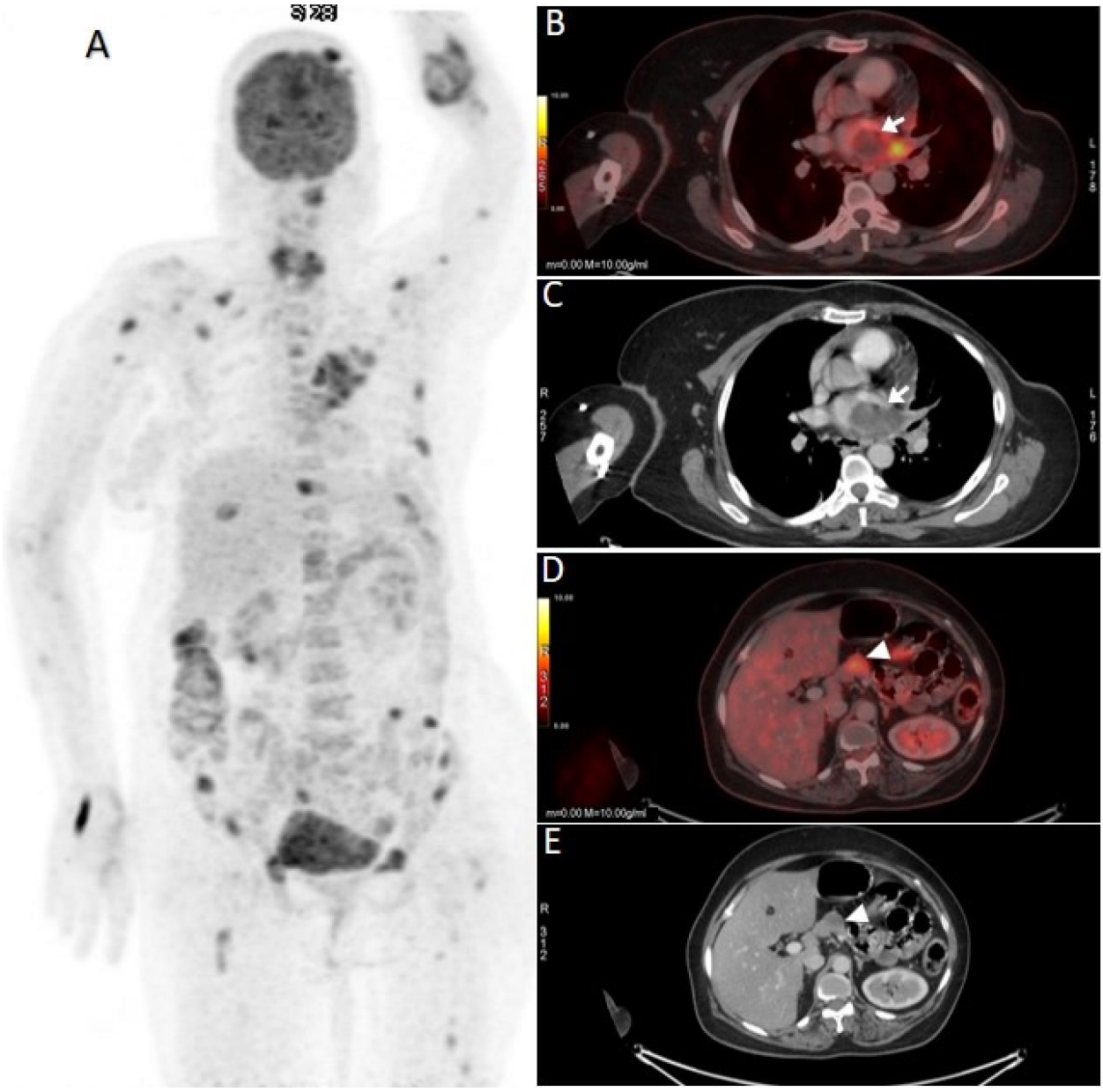

Figure 1: PET-CT images of patient diagnosed with malignant phyllodes tumor. A) Maximum intensity projection image showing multiple foci of abnormal FDG uptake. B) & C) coregistered PET-CT image and CECT images respectively showing tumor thrombus in left atrium (white arrows) and D) & E) coregistered PET-CT image and CECT images respectively showing FDG avid hypodense lesion in pancreatic head (white arrowheads).