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Case Report

Recurrent malignant melanoma presenting as multiple bilateral breast masses: A case report ☆☆☆☆

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ABSTRACT

Malignant melanoma is a tumor that originates from melanocytes. Melanoma commonly metastasizes to the lungs, brain, or any other solid organ. Herein, we describe the case of a 69-year-old woman with a previous history of cutaneous melanoma who presented with a newly developed palpable breast mass. Subsequent imaging findings and histopathologic examination results of biopsy specimens revealed bilateral breast masses consistent with malignant melanoma. Most breast malignancies originate from a primary breast cancer tissue. This case highlights the importance and implications of obtaining a complete medical history when evaluating the possible outcomes of malignant melanoma.

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Introduction

Malignant melanoma is a tumor that originates from the melanocytes. It is the leading cause of deaths due to skin cancers, and up to 90% cases are highly malignant [1]. Moreover, there is an increasing incidence of melanoma in the United States. Risk factors for melanoma include sun exposure and genetic factors such as CDKN2A/p16 mutations [2]. Primary skin lesions are typically managed by surgical excision of the mass [3]. Melanoma can metastasize to the lungs, brain or any

other solid organ including the breast. Metastasis to the breast is a rare presentation and constitutes <5% of all melanoma cases [4,5].

Case report

The patient was a 69-year-old Caucasian woman with a significant medical history significant of interstitial cystitis, hypothyroidism, and multiple skin excisions. Her recent history included the removal of an invasive superficial spreading ma-

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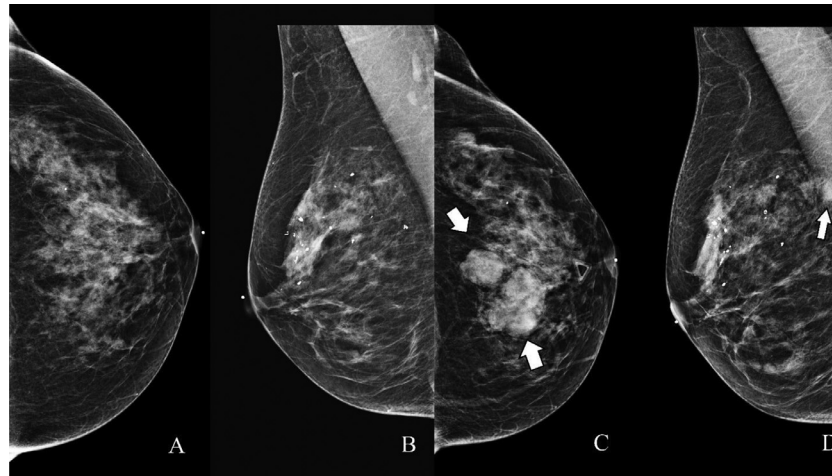


Fig. 1 – Left cranial caudal mammogram acquired 6 months ago (A). The right medial lateral oblique view shows stable microcalcifications from previous imaging (B). A left cranial-caudal mammogram at presentation shows 2 new masses (white arrows; C). The right medial lateral oblique view at presentation shows a new mass (white arrow; D).

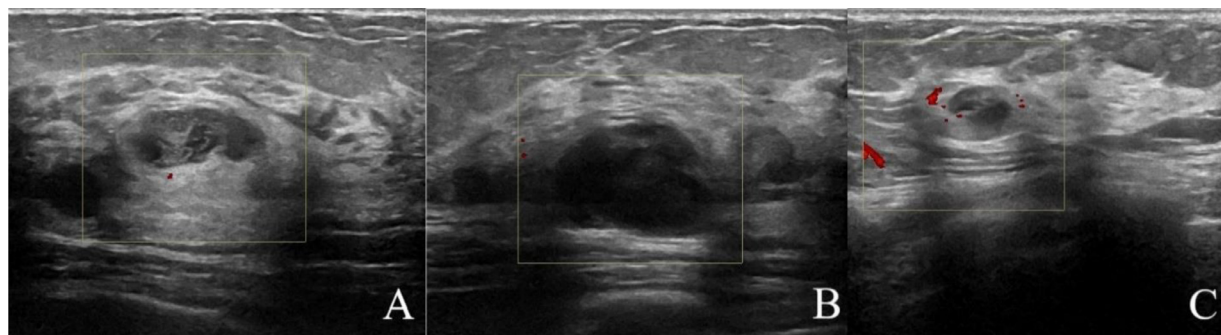


Fig. 2 – Breast ultrasound performed at patient presentation before the core needle biopsy. One mass is identified on the left breast at the 10 o'clock position, 3 cm from the nipple. It shows mixed echogenicity with lobulated margins and measures 2.4 × 2.4 cm and presents with peripheral blood flow (A). Additionally, in the left breast, at the 11 o'clock position, 4 cm from the nipple, hypoechoic oval masses with well-circumscribed margins is seen; it measures 6.1 × 6.7 × 6.9 mm and has slight increased internal echogenicity (B). In the right breast, a mass is noted at the 10 o'clock position, 8 cm from the nipple; this mass had mixed echogenicity and measured 9.5 × 9.6 × 7.7 mm and has indistinct margins (C).

lignant melanoma of the right thigh (Clark level IV, Breslow depth 1.34 mm 2 years prior). Sentinel lymph node radiography using 99m-Tc tilmanocept identified uptake in a right inguinal node at approximately 20 minutes after tracer injection. Subsequently, 3 lymph nodes were removed; the excised specimens were immunostained for Melan A, but no evidence of metastatic disease was observed. Two years after this procedure, she presented to the clinic for routine examination. She stated that she experienced a fall injury 5 months ago, during which, she injured her breast, which subsequently bruised. The patient underwent a screening mammography, which revealed stable, rounded calcifications in the right breast that were present previously (Breast Imaging-Reporting and Data System [BI-RADS] category 2); no new masses or microcalcifications were noted (Figs. 1A and B).

Six months later, the patient presented to the clinic with a newly developed, palpable tender lump in the left breast.

Given the findings of a newly palpable mass, a diagnostic mammography was performed, which revealed new, bilateral, oval circumscribed equal density masses. One of the masses had a macrolobulated margin (Figs. 1C and D). Upon further questioning, the patient stated she noticed the new mass a month ago.

Owing to the mammography findings, a bilateral breast ultrasound was performed, which showed multiple, oval solid, hypoechoic masses with lobulated and well-circumscribed margins and posterior acoustic enhancement (Figs. 2A and C). No axillary adenopathy was present. Both the mammogram and ultrasound were classified as BI-RADS category 4A. The patient underwent an ultrasound-guided core needle biopsy of the 2 most suspicious hypoechoic masses of the left breast in the upper outer quadrant (Figs. 2A and B), and of one hypoechoic mass of the upper outer quadrant of the right breast (Fig. 2C).



Fig. 3 – A head computed tomography demonstrates an 8 x 6 mm hyperdense mass, anterior to the right hemipons (white arrow; A). Another lesion is visualized in the right temporal cortex; it measures 10 x 11 mm (white arrow; B). None of these lesions demonstrate definitive enhancement.

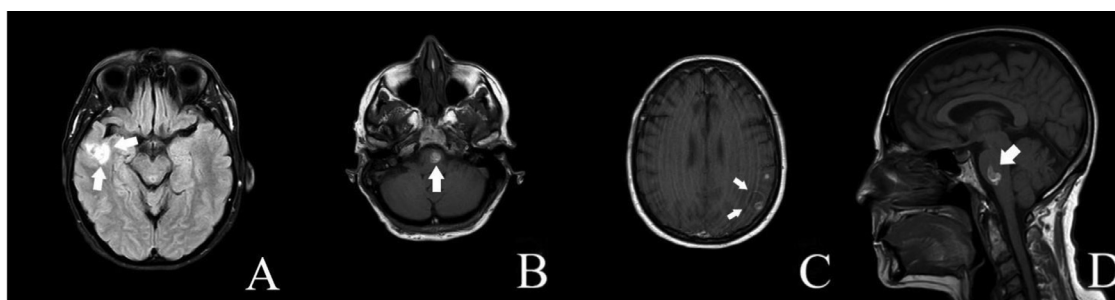


Fig. 4 – Head magnetic resonance image. Multiple intra-axial masses involving the both cerebral hemispheres and the brain stem is noted; it demonstrates many areas of T1 shortening and susceptibility signal that are compatible with hemorrhage. Axial FLAIR MRI shows a lesion in the right temporal lobe with surrounding vasogenic edema (white arrows; A). Axial T1-weighted precontrast MRI shows a lesion in the brainstem with T1 shortening, which may be due to melanin and/or blood products (white arrow; B). Sagittal view of the lesion (white arrow; D). A lesion measuring approximately 1.5 cm in its greatest dimension is seen in the left parietal cortex with this lesion; it demonstrates T1 isointensity, heterogeneous T2 hypointensity, and peripheral T1 shortening with an enhancing mural nodule, measuring approximately 0.6 cm; pronounced surrounding vasogenic edema is also present (white arrows; C).

All 3 biopsied specimens were immunostained for S100 and Melan A protein expression; the immunohistochemistry results revealed that all three biopsies were consistent with metastatic malignant melanoma. The patient subsequently underwent a whole-body positron emission tomography—computed tomography scan, which showed multiple, hypermetabolic, metastatic lesions within the bilateral breasts, lung, spleen, and the left proximal femur most compatible with metastasis. A head computed tomography revealed several intra-axial hyperdense metastases involving both cerebral hemispheres (Fig. 3B). An additional lesion was also present anterior to the right hemipons (Fig. 3A). Subsequent magnetic resonance imaging findings confirmed the metastasis, the majority of which were hemorrhagic and involved both the cerebral hemispheres and the brainstem (Figs. 4A-D, Figs. 5A and B). The patient was referred to an oncology service for further management of her malignant melanoma and was eventually placed on hospice care.

Discussion

Most breast malignancies are derived from a primary cancer of the breast tissue. Metastasis to the breast is an uncommon presentation of any newly palpable breast mass. It has been reported that metastasis presenting as a breast mass constitutes 1.3%-6.6% of all breast tumors [6]. Further, hematological malignancies, such as lymphoma and melanoma are known to metastasize to the breast [7]. There have also been reported cases of primary malignant melanoma that presents as a breast mass [8,9]. Other primary malignancies that can metastasize to the breast include gastric adenocarcinoma and lung carcinoma [3]. Melanoma commonly metastasizes, with presentations in regional lymph nodes (50%), distant metastasis (28%), and in transit (22%). The chance of metastases is directly correlated with the invasion depth of the initial skin lesion. Primary melanoma of the extremities and trunk

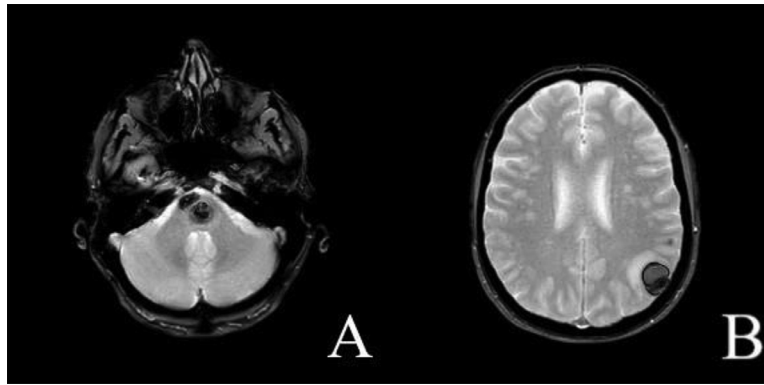


Fig. 5 – Axial T2* MRI shows a hypodense lesion in the brainstem (A) and the left parietal cortex (B).

most likely will present with distant metastasis [10]. Common distant locations of malignant melanoma include the lungs, brain, and solid organs [5].

Melanoma metastasis to the breast often presents with a new lump in the upper outer quadrant [11]. This presentation is usually more common in younger women [8,12]. Metastasis to the breast is more difficult to diagnose than primary breast cancers based on imaging alone. Microcalcifications are an uncommon finding of cancers that metastasize to the breast [13]. It is important to take a proper past medical history and to acknowledge metastasis to the breast as a potential differential of a new mass.

The patient in this case had an initial skin lesion that was Clark level IV, Breslow depth 1.34 mm that was identified 2 years previously, and the finding was consistent with invasion of the reticular dermis. She is an older patient with an extensive history of multiple skin lesions, including squamous cell and basal cell carcinoma, which were surgically removed. The patient's history involving breast trauma and subsequently developing a breast mass is a common initial presentation and is often a confounding factor in the diagnosis of breast cancer. This patient's mammogram demonstrated bilateral predominantly circumscribed masses, which were new. Moreover, one of the masses was palpable and prompted further workup. It is important to consider that bilateral presentation of breast masses may be customarily read as benign. Traditionally, these findings on screening mammography appear benign and typically represent bilateral cysts or fibroadenomas. Because the patient had a newly palpable breast lump that was not present in the previous mammography, ultrasound and core needle biopsy were performed, and the findings were consistent with malignant melanoma. Of note, the ultrasound findings demonstrated posterior acoustic enhancement. Posterior acoustic enhancement is typically associated with cystic lesions; however, this may also be seen in relatively homogeneous solid masses that attenuate the ultrasound beam less than the adjacent tissues. Solid benign masses such as fibroadenomas often exhibit such a transmission. Nonetheless, as observed in the present case, solid malignant lesions may also demonstrate these results. Ultrasound findings and the patient's clinical findings should be taken into account collectively to arrive at a decision of performing biopsy.

Hematoma is a possible differential diagnosis for this patient due to previous trauma. This is unlikely considering a normal screening mammography performed after her trauma. Other possible differential diagnoses for this patient include neurofibromatosis, diffuse papillomatosis, and other sources of metastasis. These pathologies, other than metastasis, are unlikely to develop in 6 months.

Bilateral metastases have been reported to have poor prognosis [12]. Follow-up imaging revealed extensive metastatic disease in various organs including the lungs, brain, and spleen. This case highlights the importance of obtaining a complete medical history and the implications associated with a history of malignant melanoma. Metastases to the breast are uncommon and often not included in the differential diagnosis by a radiologist. The present case demonstrates that while imaging findings indicate a benign state, a good past medical history and an understanding that melanoma can metastasize even in the breast aided in achieving a correct diagnosis and determining appropriate management for patients with a newly developed palpable breast mass.

REFERENCES

- [1] Garbe C, Peris K, Hauschild A, Saiag P, Middleton M, Bastholt L, et al. Diagnosis and treatment of melanoma. European consensus-based interdisciplinary guideline—update 2016. *Eur J Cancer* 2016;63:201–17.
- [2] Rastrelli M, Tropea S, Rossi CR, Alaibac M. Melanoma: epidemiology, risk factors, pathogenesis, diagnosis and classification. *In Vivo* 2014;28(6):1005–11.
- [3] Drueppel D, Schultheis B, Solass W, Ergonenc H, Tempfer CB. Primary malignant melanoma of the breast: case report and review of the literature. *Anticancer Res* 2015;35(3):1709–13.
- [4] Kurul S, Taş F, Büyükbabani N, Mudun A, Baykal C, Çamlıca H. Different manifestations of malignant melanoma in the breast: a report of 12 cases and a review of the literature. *Jpn J Clin Oncol* 2005;35(4):202–6.
- [5] Vergier B, Trojani M, Mascarel ID, Coindre J-M, Treut AL. Metastases to the breast: differential diagnosis from primary breast carcinoma. *J Surg Oncol* 1991;48(2):112–16.
- [6] Bassi F, Gatti G, Mauri E, Ballardini B, Pas TD, Luini A. Breast metastases from cutaneous malignant melanoma. *Breast* 2004;13(6):533–5.

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- [7] Di Bonito L, Luchi M, Giarelli L, Falconieri G, Viehl P. Metastatic tumors to the female breast: an autopsy study of 12 cases. *Pathol Res Pract* 1991;187(4):432–6.
- [8] He Y, Mou J, Luo D, Gao B, Wen Y. Primary malignant melanoma of the breast: a case report and review of the literature. *Oncol Lett* 2014;8(1):238–40.
- [9] Al Samaraee A, Khout H, Barakat T, Fasih T. Breast metastasis from a melanoma. *Ochsner J* 2012;12(2):149–51.
- [10] Zbytek B, Carlson JA, Granese J, Ross J, Mihm M, Slominski A. Current concepts of metastasis in melanoma. *Expert Rev Dermatol* 2008;3(5):569–85.
- [11] Moschetta M, Telegrafo M, Lucarelli NM, Martino G, Rella L, Stabile Ianora AA, et al. Metastatic breast disease from cutaneous malignant melanoma. *Int J Surg Case Rep* 2013;5(1):34–6.
- [12] Majeski J. Bilateral breast masses as initial presentation of widely metastatic melanoma. *J Surg Oncol* 1999;72(3):175–7.
- [13] Cangiarella J, Symmans WF, Cohen JM, Goldenberg A, Shapiro RL, Waisman J. Malignant melanoma metastatic to the breast. *Cancer Cytopathol* 1998;84(3):160–2.