



Sonographic appearance of a metastasis to the breast from a cerebellar medulloblastoma

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Medulloblastoma metastatic to breast diagnosed by corebiopsy
Sonographic appearance of a metastasis to the breast from a cerebellar
medulloblastoma

For Peer Review

Keywords : Medulloblastoma, metastasis, breast, sonography, core biopsy

Abstract

We present the case of a 29 year old 29-year-old woman with a medulloblastoma of the cerebellum who developed a breast mass during the course of her disease. Core biopsy of the breast lesion revealed a metastatic medulloblastoma. Development of metastasis to the breast from medulloblastoma is very rare and the prognosis for such patients is poor. It is important to distinguish a primary breast cancer from metastasis to the breast, as both since the therapeutic options as well as the prognosis are very different. To our knowledge, it is the first report of the sonographic appearance of a medulloblastoma metastatic to the breast diagnosed by corebiopsy.

Introduction

Core-biopsy of the breast is now a well-established procedure for the evaluation of suspected breast mass before treatment¹. We report a case of metastatic medulloblastoma to the breast which was diagnosed by core-biopsy under sonographic guidance. Metastatic tumors to the breast are rare and may mimic primary breast neoplasms. Preoperative diagnosis is extremely useful for determining appropriate treatment^{1,2}.

Medulloblastoma is a highly malignant tumor of the cerebellum that has a strong propensity to disseminate along the cerebrospinal pathways. Medulloblastoma is primarily a tumor seen in children and teenagers and which is particularly rare in adults. Standard treatment consists of complete excision of the tumor followed by radiation to the entire craniospinal axis with a boost to the primary tumor site. The role of adjuvant chemotherapy in adults is controversial. Relapse is most commonly within the posterior fossa and systemic metastases are rare.¹ Extraneural metastases most commonly involve bone and bone marrow, followed by lymph nodes.^{1,2} Although even less common, metastases to the breast have been reported in adults.²⁻⁶ We report an extremely rare occurrence of metastatic medulloblastoma to the breast, describing its sonographic appearance and its diagnosis using ultrasound-guided core biopsy.

Case report

A 29 year old 29-year-old woman was referred to our institution for percutaneous biopsy of a palpable mass in her right breast. She had a history of médulloblastoma medulloblastoma of the cerebellum treated by complete surgical exeresis resection without the need for a shunt and radiotherapy ventricular shunt, followed by craniospinal radiotherapy, in another hospital, 5 years previously. Secondary Secundarily, 3 years after the excision of the médulloblastoma medulloblastoma, she developed a bicytopenia (Hemoglobin 7,4 g/dL, platelets 34 x 10³ /L). A bone scan revealed diffuse osteoblastic desease disease. Bone marrow aspirate was positive for medulloblastoma cells. Nine cycles of carboplatin and etoposid were administred after which the patient was in complete remission. Two years after later, a tumor appeared in the upper outer quadrant of the right breast. Sonographic examination was performed using an a Xario scanner (Toshiba Inc, Tokyo, Japan) equipped with a 10-12 MHz a 14 MHz linear-

array transducer. The lesion was oval, hypoechoic, homogeneous, relatively well-circumscribed with a vascular signal in power doppler sonography (Figure 1a, 1b).

Sonographically guided core biopsy of the mass was performed using an automated biopsy gun (16-gauge) which allows obtaining a 20-mm-long core of tissue a 20mm-long sample of tissue to be taken (Achieve biopsy needle; Allegiance, McGraw-Hill, IL, USA). Five pieces of good quality specimen were obtained for histologic study. Histopathology examination of the cores obtained showed a malignant tumor composed of small round cell synaptophysin positive synaptophysin-positive cells, confirming the diagnosis of medulloblastoma metastasis (Figure 2a, 2b). Contrast enhanced computed tomography of the thorax, abdomen and pelvis revealed two homogeneous soft tissue masses in the mid and lower abdomen. The retroperitoneal lymph nodes were enlarged. She has now received 4 cycles of chemotherapy (ifosfamide and adriamycin) and had a good clinical response. Four cycles of chemotherapy (ifosfamide and adriamycin) were given, but the disease progressed over the ensuing months and the patient died 14 months after presenting with the breast mass.

Discussion

When a patient previously treated for a cancer presents with a breast lump, the differential diagnosis between benign and malignant (primary or secondary) breast tumor is based on clinical, imaging, and histologic criteria. It is important to make a distinction between these lesions since the optimal treatment is vastly different^{1,2,7,8,9}.

The most important factor suggesting the diagnosis of secondary breast malignancy is a history of cancer. Nevertheless, metastases to the breast from extramammary neoplasms are rare and accounts for only 2% of all breast tumors. The incidence of breast metastasis ranges from 0.5% to 6.6% in autopsy series^{7,8}. Apart from the lymphoproliferative diseases, the common primary malignancies which metastasize to the breast in decreasing order of frequency are in order of decreasing frequency: melanoma, rhabdomyosarcoma, lung tumors, ovarian tumors, renal cell carcinoma, thyroid/cervical carcinomas and intestinal

carcinoïd carcinoid^{1,2,3,7}. Metastases to the breast from a medulloblastoma is are rare.

Médulloblastoma is primarily a tumour of the child and the teenager and is particularly rare in the adult, approximately 1% of the cerebral tumours of the adult. Medulloblastoma is the most common malignant brain tumor in children. In adults, however, medulloblastoma is a rare event and accounts for approximately 1% of all adult brain tumors^{1,10}. It is an undifferentiated undifferentiated embryonal neuroepithelial tumor arising from the cerebellum with a tendency to infiltrate the subarachnoid space with subsequent spread via the cerebro-spinal fluid.

Extraneural metastases are rare and have been reported in 10-30% 8-13% of cases^{4,1}. The most frequently affected sites of dissemination are bone, bone marrow, lymph nodes, lungs, pleura, liver and others viscera.^{1,2} The mechanism of breast metastasis in medulloblastoma is not known. Both Lymphatic and haematogenous spread have both been suggested^{5,2}.

Identifying secondary neoplasms of the breast clinically and by imaging is complex. The majority of metastases present as rapidly growing, painless, palpable, firm breast masses. Mammographic examination of these lesions usually reveals one or more well-circumscribed masses which are frequently interpreted as benign^{3,7-9}. On sonography, the majority of metastases are round or oval, hypoechoic and circumscribed. The lesion may resemble a benign mass such as a fibroadenoma. Occasionally a variety of ultrasound findings have been reported including well or poorly defined hyper or hypoechoic solids masses with acoustic shadowing or increased through transmission^{1,2,7,8}. In addition, vascularity of some lesions can be visualized with color-flow Doppler⁸. Previous report have proposed that the presence of intralesional vascularity is suggestive of a malignant masse⁶.

In our observation, clinic clinical and sonographic characteristics features of the breast lesion are aspecific. For problem solving, percutaneous biopsy (either fine needle or core biopsy) play a key role in the diagnosis of breast lesion^{1,7}. Fine needle aspiration cytology (FNAB) is known for its high degree of accuracy, but results show considerable variability depending on the expertise of the cytopathologist. It was the preferred diagnostic procedure in the previous previously published reports of breast metastasis from médulloblastoma medulloblastoma^{5,7,8,9,10,5,6}. Now, percutaneous large-core breast biopsy became has become a standard of care. Guided by sonography, core biopsy of breast lesion has a high accuracy. The

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3 advantage of performing a core biopsy is to obtain histologic samples in which the
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5 architectural description and tissue element recognition is are possible and which are
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7 superior to the cellular aspirate derived from FNAB^{1,7}. Immunohistochemistry has an
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9 additional valuable role. Medulloblastomas are frequently positive for vimentin, synaptophysin
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11 and neuron-specific enolase (NSE) staining^{10,6}.

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13 The development of extraneural metastases of a medulloblastoma in breast tissue is
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15 associated with a poor prognosis. Nevertheless, as demonstrated by the current case,
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17 medulloblastoma is a chemosensitive tumor that is amenable to salvage treatment therapy.
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19 There have been several reports of prolonged remissions after salvage chemotherapy for
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21 extra-neural relapse^{4,10}.

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25 In conclusion, the occurrence of metastatic medulloblastoma to the breast is a possible
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27 event. Imaging has plays an important role in confirming the clinical suspicion of a lump,
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29 characterisation characterization of the lesion and guiding percutaneous biopsy. Overall
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31 survival of adult patients with recurrent medulloblastoma remains poor but meaningful
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33 extended survival can be obtained despite multiple recurrences.

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Illustrations

Fig. 1a. Breast ultrasound. Sonogram shows an oval, relatively well-defined hypoechoic solid mass with no posterior shadowing.

Fig. 1a. Breast ultrasound. Transverse sonogram shows 19-mm (maximum diameter) oval, relatively well-defined hypoechoic solid mass with posterior acoustic enhancement.

Fig. 1b. Power Doppler examination shows evidence of significant intralesional vascularity.

Fig. 2a. Morphological aspect of the lesion in hematein eosin safran consistent with metastatic medulloblastoma, X 200.

Fig. 2b. Intra-cytoplasmic immunnoreactivity for synaptophysin in numerous tumor cells, X 200.

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In conclusion, the occurrence of metastatic medulloblastoma to the breast is a possible event. Imaging plays an important role in confirming the clinical suspicion of a lump, characterization of the lesion and guiding percutaneous biopsy. Overall survival of adult patients with recurrent medulloblastoma remains poor but meaningful extended survival can be obtained despite multiple recurrences.

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Fig. 1a. Breast ultrasound. Transverse sonogram shows 19-mm (maximum diameter) oval, relatively well-defined hypoechoic solid mass with posterior acoustic enhancement.

Fig. 1b. Power Doppler examination shows evidence of intralesional vascularity.

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Fig. 2b. Intra-cytoplasmic immunoreactivity for synaptophysin in numerous tumor cells, X 200.



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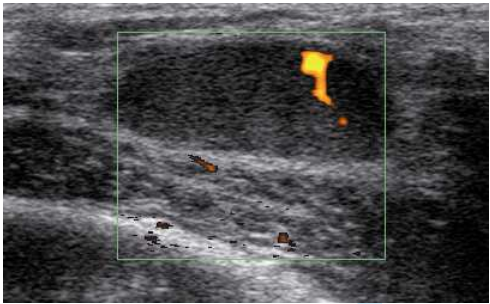


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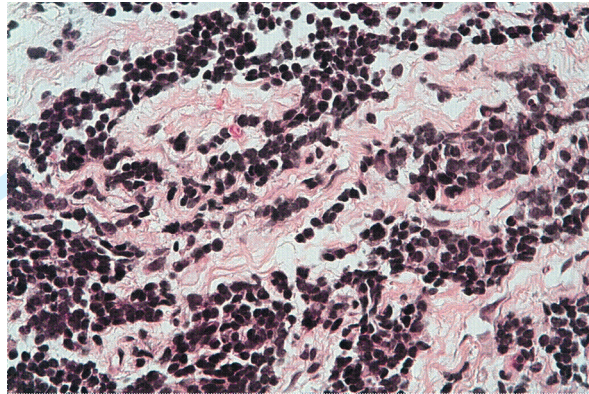


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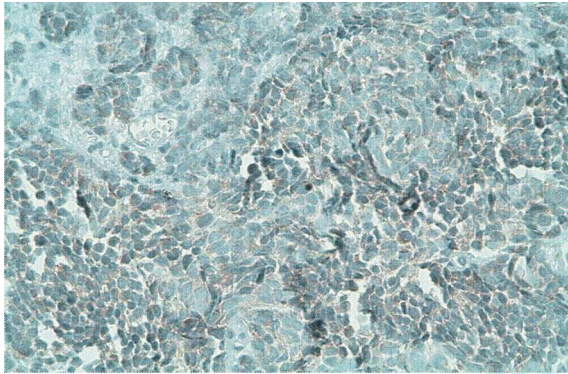


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