

Breast metastasis from multiple primary rhabdomyosarcoma in upper extremity

Ramesh Omranipour,
Mohamad Reza Hadi

Department of Surgical Oncology
of Cancer Institute, Imam Hospital,
Tehran, Iran

Abstract

We report a 16-year-old girl with a multiple primary rhabdomyosarcoma of right upper extremity who developed contralateral breast metastasis in her clinical course. She was diagnosed to have multiple primary rhabdomyosarcoma of the right upper extremity with lung metastasis one year prior to finding a mass in her left breast. The excisional biopsy of the breast mass confirmed metastatic rhabdomyosarcoma. Despite aggressive chemotherapy and subcutaneous total mastectomy, she developed a widespread bone and lung metastasis in few months and expired. Metastatic rhabdomyosarcoma of the breast is very rare but it should be considered in adolescent females with primary alveolar rhabdomyosarcoma, specially located on an extremity.

Introduction

Rhabdomyosarcoma is the most common soft tissue Sarcoma in childhood accounting for half of all pediatric soft tissue sarcoma. It can involve the breast as either primary or secondary. The incidence of breast metastasis in rhabdomyosarcoma is reported to be approximately 6%¹ and is mainly seen in adolescent girls.² Here, we describe a 16-year-old girl with multiple primary rhabdomyosarcoma of the upper extremity who developed contralateral breast metastasis.

Case Report

A 16-year-old woman was presented to our breast clinic with a palpable lump in the left breast. She had undergone chemotherapy because of multiple rhabdomyosarcoma of the right hand and the forearm with the right lung metastasis 11 months before. She was in remission when she found her left breast mass.

On examination, she had a 20 mm discrete palpable non-tender mass in the upper inner quadrant of the left breast. An ultrasound of the breast confirmed the presence of four well-defined hypo echoic solid masses ranging from 6 to 20 mm compatible with multiple fibro adenomas.

A fine needle aspiration biopsy (FNAB) showed some round cells, which was inconclusive. The excision of the largest mass in upper inner quadrant of the left breast was performed and a histological analysis was consistent with rhabdomyosarcoma. Subsequent staging evaluations, including abdominal ultra sound, computed tomography (CT), magnetic resonance imaging (MRI) of the extremities and bone scan did not reveal any local recurrence or new systemic metastasis. She had undergone a systemic treatment but after four cycles, she was readmitted because of a huge right axillary mass and the diffused involvement of the left breast (Figures 1 and 2). The palliative resection of the right axillary tumor and the subcutaneous mastectomy were done (Figures 3 and 4). Despite the aggressive systemic therapy, the clinical course was marked by lung metastasis and the progression of the disease.

Discussion

Metastases to the breast from solid tumors, excluding contralateral breasts, are quite rare. The primary lesion in most cases of metastasis to the breast is melanoma, lung and ovarian carcinoma in adults and rhabdomyosarcoma in children.^{3,4}

In one series,⁵ 9 out of 13 pediatric cases with breast metastasis are reported to be from rhabdomyosarcoma.

Metastatic rhabdomyosarcoma of the breast usually occurs in adolescent girls and is often bilateral.^{1,2,6-8}

As the age increases, breast is not a favorite site of metastasis because the amount of fibrous tissue increases and the blood supply decreases, probably due to hormonal states.⁹

Howarth reported¹ seven out of 108 consecutively diagnosed patients with rhabdomyosarcoma, who had developed clinically evident metastatic tumors of the breast. Sex distribution and age of these patients indicated that the physiologic state of the breast was an important determining factor in the development of such metastasis. All these patients had primary tumors located on an extremity or the buttock.

Metastatic rhabdomyosarcoma to the breast often presents a solitary nodular mass. Multiple lesions and the diffused involvement are less common.^{10,11}

Correspondence: Ramesh Omranipour, Cancer Institute, Emam Khomeini hospital, Keshavarz Boulevard, Tehran, Iran, 14518.
Tel. +98.2188723410 - Fax: +98.2188723410.
E-mail: omranipour@ sina.tums.ac.ir

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Ultra sonography is the ideal imaging modality to evaluate breast lesions in children and may be used to guide a FNAB. Although their ultrasonography appearance is non-specific, they often appear as hypoechoic round or lobulated nodules with either posterior enhancement or indifferent shadowing.

CT and MRI can demonstrate the nature of these lesions. On MRI, the metastases from rhabdomyosarcoma were characterized by multiple tumors with high signal intensity on T2 – weighted images and fast annular contrast enhancement.¹² MRI appeared to be the best technique for the evaluation of the residual disease after therapy.¹³ Positron emission tomography CT imaging can be used for primary staging and the follow up of metastasis in all pediatric solid tumors.¹⁴

Although primary rhabdomyosarcoma of the breast can be diagnosed by FNAB, the secondary involvement often needs tissue biopsy and the histological type is often alveolar. Indeed, metastatic rhabdomyosarcoma to the breast is almost confined to adolescent females having tumors with an alveolar histology.^{1,8} Few cases of breast metastasis from embryonal type were also reported.¹⁵⁻¹⁷ Rhabdomyosarcoma is treated with multidisciplinary approaches of chemotherapy, surgery and radiotherapy. For alveolar rhab-



Figure 1. Axillary involvement and contralateral breast metastasis in 16 yr old girl with alveolar rhabdomyosarcoma of the hand and forearm.



Figure 2. Multiple primary lesion of hand and forearm.



Figure 3. Specimen of palliative subcutaneous mastectomy.

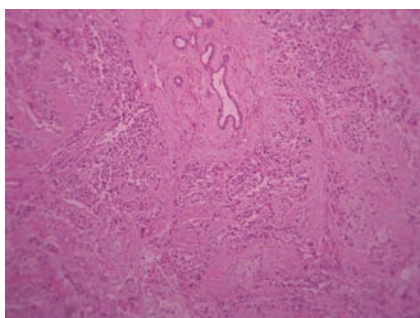


Figure 4. Breast's unremarkable epithelial component is seen in upper central and metastatic sarcoma in its periphery.

domyosarcoma, there is no established protocol of chemotherapy, and surgery plays a significant role in the treatment. Extent of surgery ranging from the excision of a mass to radical mastectomy. However, the prognosis for alveolar rhabdomyosarcoma cases is still poor. Santos Miranda *et al.*¹⁸ reported a long-term survival of the alveolar rhabdomyosarcoma of the maxillary sinus with breast metastasis.

We found only four reports of¹⁹⁻²² similar cases with alveolar rhabdomyosarcoma of the extremities in the literature. In a series of 189 patients with metastatic rhabdomyosarcoma reported by D'Angelo from Italian Soft Tissue Sarcoma Committee there were 7 adolescent with breast involvement. The primary tumor was located in the extremities in three of them. All these cases had a dismal prognosis like our case. Our patient is unique because the initial presentation of the primary lesion with multiple involvements of the hand and forearm. We conclude that adolescent females with alveolar rhabdomyosarcoma of the extremities have a risk of developing breast metastasis, which is a poor prediction of survival.

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