Introduction

Myxofibrosarcoma is a connective tissue neoplasm of fibroblastic origin set in a myxoid matrix and has been classified by some as a myxoid variant of malignant fibrous histiocytoma [1, 2]. Fibrocyte proliferation yields stellate and spindle shaped cells with eosinophilic cytoplasm, indistinct borders, and elongated hyperchromatic, pleomorphic nuclei [1, 3-5]. The tumor is highly vascularized with distinct curvilinear thin walled capillaries [1, 3, 5]. Some tumors exhibit mucin-producing vacuoles resembling pseudolipoblasts [1, 3-5]. Apart from these general histologic parameters, myxofibrosarcomas demonstrate wide histologic variability based on the grade of the neoplasm [4, 6, 7]. Low grade tumors are hypocellular and composed mainly of myxoid tissue [1, 4, 6, 8]. High grade tumors, however, are hypercellular, malignant fibrous histiocytoma-like tumors with less myxoid tissue than their lower grade counterparts and present with multinucleated giants cells, increased mitotic activity, and areas of necrosis [4, 5, 7, 9]. These tumors stain positive for vimentin, CD34, and occasionally actin [3, 7, 8]. Gross presentation is most often of a slow-growing, painless, palpable and ill-defined subcutaneous mass [1, 4]. Tumors are glistening, gelatinous, gray to white lesions upon resection [3, 10].

Myxofibrosarcoma is a common soft-tissue sarcoma in elderly patients, presenting in the extremities (77%), trunk (12%), retroperitoneum or mediastinum (8%) and head (3%) [1]. Myxofibrosarcoma is, in fact, one of the most common neoplasms of the limbs of elderly patients [3, 7]. The majority of acral myxofibrosarcomas are observed in the leg rather than the arm, often attributed to the fact that the leg contains a greater volume of connective tissue and thus has a greater chance for malignant development [3, 7, 11]. Cases arising in the hand are rare but have been reported [12].

Case report

We present a 62 year-old African-American female with a past medical history significant for pulmonary embolism and a giant cell tumor of the right hand 16 years previously, treated at an
outside facility. The patient presented to Tulane University Medical Center with a left hand mass which was subsequently excised and diagnosed as myxofibrosarcoma. The patient had also been complaining of some pleuritic chest pain as well as back pain and increased episodes of belching, weight loss, and changes in appetite. The patient was found on a Positron Emission Tomography (PET) exam to have bilateral metastatic pleural and pulmonary nodules as well as hypermetabolism with surgical correction in the left hand. A mediastinal mass was subsequently found on the patient and the patient was admitted for an endoscopic ultrasound and fine needle aspiration (FNA) of this mediastinal mass (Figure 1). Her mediastinal mass was adjacent to the gastroesophageal junction. The patient’s FNA of the mass was diagnosed as myxofibrosarcoma metastatic from her left hand (Figure 2).

Surgery for the metastatic disease was considered but ultimately not performed due to the diffuse metastatic disease. The patient followed up with her medical oncologist 6 days after discharge from the hospital and was advised about the fatal nature of her illness and recommended palliative chemotherapy. The patient moved out of state to be closer to her family and was subsequently lost to follow-up.

Discussion

Myxofibrosarcomas exhibit a multinodular growth pattern and are most often superficial lesions, distinguishing them from most other sarcomas which present as deeper tumors [1, 3, 5]. Masses are most commonly found in the subcutaneous tissue, sometimes with dermal involvement [1, 4, 8]. Rarely, myxofibrosarcomas originate in deep fascial or intramuscular tissue [1, 3, 4]. Despite their normally superficial derivation, myxofibrosarcomas display highly infiltrative growth patterns and spread extensively along fascial planes, making surgical resection especially difficult [2, 4]. Possibly related to this detail is the notoriously high rate of recurrence in myxofibrosarcoma cases, which does not correlate to tumor grade or size [3, 4, 12]. Merck et al found recurrence is more likely in more superficial tumors, however, there is not a general agreement in the literature regard-
Metastatic limb myxofibrosarcoma

Table 1. Reported cases in the literature of metastatic myxofibrosarcoma

<table>
<thead>
<tr>
<th>Tumor site of origin</th>
<th>Site of metastasis</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scapula</td>
<td>Bone and buttocks</td>
<td>Angervall et al, 1977[10]</td>
</tr>
<tr>
<td>Thigh</td>
<td>Paravertebral tissue</td>
<td>Angervall et al, 1977[10]</td>
</tr>
<tr>
<td>Popliteal fossa</td>
<td>Inguinal lymph nodes</td>
<td>Angervall et al, 1977[10]</td>
</tr>
<tr>
<td>Knee</td>
<td>Inguinal lymph nodes</td>
<td>Angervall et al, 1977[10]</td>
</tr>
<tr>
<td>Lower leg</td>
<td>Lung and liver</td>
<td>Kaya et al, 2008[4]</td>
</tr>
<tr>
<td>Upper arm</td>
<td>Lung</td>
<td>Kaya et al, 2008[4]</td>
</tr>
</tbody>
</table>

ing relationship between tumor depth and likelihood of recurrence [10]. Various papers have reported myxofibrosarcoma recurrence rates between 16-54%, most reporting on the higher end of the spectrum [2, 5, 6, 9, 12]. Myxofibrosarcoma has consistently demonstrated evolution into a higher grade lesion following recurrence [4, 6]. Patients with close surgical margins should therefore be considered for radiation therapy, and recurring masses should be widely excised, including the scar from the previous surgery [13].

Though recurrence rate for myxofibrosarcoma is high irrespective of tumor grade, metastasis is quite rare and occurs almost exclusively in higher grade tumors [3, 6, 7, 9]. As a general rule, the vast majority of upper extremity connective tissue neoplasms are benign; metastasis from this region is extremely rare [14]. Many papers claim favored sites of myxofibrosarcoma metastases to be the lung, pleura, lymph nodes, and skeleton, but specific examples are sparse [1, 11]. Some papers report cases of metastases without specifying site of tumor origin: authors Mentzel et al report 6 cases of myxofibrosarcoma with metastasis to the lung, 5 cases with metastases to the lymph nodes, 2 cases with metastases to skin and soft tissue and 1 case with metastasis to the bone, and authors Merck et al report cases of myxofibrosarcoma metastases to the lung, pleura, lymph nodes, and skeleton [6, 12]. Authors Huang et al report cases of primary myxofibrosarcoma of the arm, axilla, back, inguinal area, leg, and shoulder with 6 metastases to the lungs, 2 metastases to the pleura, 1 metastasis to the pelvic bone, and 1 metastasis to the axillary lymph nodes, but it is unclear which primary tumor produced which incidence of metastasis [15]. The only specific examples of reported cases of metastatic myxofibrosarcoma found in a literature search using PubMed are exhibited in Table 1. Our search yielded only 6 specific cases of metastatic myxofibrosarcoma from lower extremities, 2 specific cases of metastatic myxofibrosarcoma from upper extremities, and 6 specific cases of myxofibrosarcoma of any origin with metastases to the lung.

Though myxofibrosarcoma has a low metastasis rate, this case and the others we found in our literature search show that myxofibrosarcoma does in fact metastasize and can be fatal. These cases demonstrate the importance of wide surgical margins during initial tumor resection and aggressive follow-up, including thorough search for metastatic disease and consideration of radiation therapy in case with close surgical margins, measures which can drastically improve outcome in patients with myxofibrosarcoma.

Conclusion

We are reporting what we believe to be the first case of metastatic myxofibrosarcoma of the hand, and also the first case of myxofibrosarcoma metastatic to the mediastinum or the lymph nodes at the level of the gastroesophageal junction. Myxofibrosarcoma is a common tumor in the geriatric patient population, traditionally thought to be a non-metastatic lesion. These tumors do, however, have the potential to metastasize and can be fatal. It is important to search for metastatic disease and ensure wide surgical margins to provide the best possible outcome.
Acknowledgement

This work was fully supported by Tulane University and Tulane University Hospital.

Address correspondence to: Dr. Emad Kandil, Endocrine Surgery Section, Department of Surgery, Tulane University School of Medicine, 1430 Tulane Avenue, Room 8510 (Box SL-22), New Orleans, LA 70112 Tel: (504) 988-7520; Fax: (504) 988-4762; E-mail: ekandil@tulane.edu

References


