Intramuscular Lipoma Arising Within the Pectoralis Major Muscle Presenting as a Radiographically Detected Breast Mass

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Lipomas are commonly encountered benign mesenchymal neoplasms composed of adipocytes that arise in the superficial subcutaneous tissues of the extremities and trunk. Occasionally, these tumors can originate from either within muscle (intramuscular) or between muscles (intermuscular). The former typically occurs within skeletal muscle of large muscles of an extremity, such as the thigh and shoulder. Intramuscular lipomas arising specifically from the pectoralis muscle are exceedingly rare. In this report, to our knowledge we describe the second case of an intramuscular lipoma arising within the pectoralis muscle. Similar to the first published report, our patient’s tumor was clinically thought to be a breast mass. However, this example is unique in that it is the first of its kind to be found incidentally during screening ultrasound. Intramuscular lipomas are not routinely included in the radiologic differential diagnosis of a breast mass. However, when the tumor is posteriorly located and appears to involve the pectoralis muscle, the diagnostic possibility of intramuscular lipoma should be entertained.

(REPORT OF A CASE)

A 63-year-old woman presented in December 2009 for routine mammographic screening. Mammography was performed in craniocaudal and mediolateral oblique views, which showed a nodular density with microcalcifications located in the outer and central quadrants of the left breast posteriorly. Because the density was radiographically suspicious, a unilateral diagnostic mammogram with spot magnification views was performed (Figure 1). The mammogram showed a 2-cm partially marginated density in the posterolateral aspect of the breast with associated peripherally located microcalcifications. A larger 3-mm calcification was seen along the lateral aspect of the density. Sonography was performed, which further defined this 2.0 × 1.6 × 0.5-cm oval hypoechoic nodule. Additionally, a 2.4 × 0.8 × 0.6-cm oval, well-defined hyperechoic mass that was not appreciated on the initial mammogram was identified (Figure 2). This mass appeared to involve the pectoralis muscle. The radiologic differential diagnosis of both nodules included fibroadenoma and hamartoma. Ultrasound-guided core biopsies of the masses were performed.

Pathologic evaluation of the posterolateral 2-cm mass revealed a nodular focus of benign tissue with focal duct hyperplasia, apocrine metaplasia, and calcifications. Biopsies of the second, posteriorly located, 2.4-cm nodule showed multiple cores of mature adipose tissue infiltrating histologically unremarkable skeletal muscle (Figure 3). Separate fragments of breast parenchyma were not included in the specimen. After correlating with the radiologic features, the diagnosis of intramuscular lipoma was made. The intramuscular lipoma was determined to be arising within the pectoralis muscle. The patient elected not to have the nodules excised and to be followed clinically.

COMMENT

Lipoma is a benign mesenchymal tumor composed of mature white fat and represents the most common soft tissue neoplasm. Most lipomas occur subcutaneously; however, they may also arise in the deep soft tissues. Intramuscular lipoma is a subtype of lipoma occurring in a deep location, typically in the large muscles of an extremity, such as the thigh and shoulder. It commonly presents as a painless, slow-growing mass. Intramuscular lipomas, like other subtypes of lipoma, commonly occur in adults between the ages of 30 and 60 years. The reported frequency of intramuscular lipoma among all benign lipomatous tumors is 0% to 5%. Because of its location in the deep soft tissues, and its radiologic findings, intramuscular lipoma can often be concerning for the possibility of a malignant tumor, such as a liposarcoma. Histologically, intramuscular lipoma is characterized by...
Intramuscular lipomas are not uncommon in the large muscles of the extremities. Pectoralis muscle involvement by intramuscular lipoma, however, is exceedingly rare, with only one convincing reported case in the literature. A 70-year-old woman who presented with a 7-year history of a slow-growing “swelling” in her right breast, which itself was painless; however, associated pain over the right shoulder for 6 months prior to presentation was noted. The tumor was large (16 × 8 cm) and firm. A computed tomography scan was performed, which highlighted the homogenous fat density with intervening septations bisecting the pectoralis major muscle. In the present case, the mass was relatively small (2.4 × 0.8 × 0.6 cm) and the patient was asymptomatic.

Radiologically, intramuscular lipomas are well-defined, encapsulated tumors. On mammography, a clue to the presence of an intramuscular lipoma of the pectoralis muscle is anterior displacement of the muscle. On ultrasound, intramuscular lipoma shows a well-defined hyperechoic mass, which may be encased by skeletal muscle fibers. As noted in a prior case, intramuscular lipoma of this location may be missed on mammography if the tumor is small in size. In the present case, after retrospective review of the original mammogram, the intramuscular lipoma was not seen because the area of interest in the inferior pectoralis muscle was not present in the mediolateral oblique view. It is important to have an adequate mediolateral oblique mammographic view, which should include the pectoralis muscle. The presence of the pectoralis muscle on the mediolateral oblique view depends on multiple variables, including the length of the thorax and pectoralis muscle, muscular development, and positioning by the radiographer. This is important not only for detecting an intramuscular lipoma but, more importantly, for the detection of abnormal axillary lymph nodes, which may be the only manifestation of the presence of an occult breast carcinoma.

In this case, because the masses were benign and not causing unwanted symptoms, the patient elected to have the masses clinically followed. The differential diagnosis of intramuscular lipoma in this location, both radiologically and histologically, includes a hemangioma infiltrating skeletal muscle. Hemangiomas often have a prominent adipose component when present intramuscularly. In our case, the tumor showed no evidence of vascular proliferation. An additional consideration, because of the deep location and fat component, is that of a liposarcoma, especially lipoma-like well-differentiated liposarcoma. This tumor can be difficult to distinguish radiologically from an intramuscular lipoma. In the present case, the lipomatous tumor was relatively small, measuring 2.4 cm in greatest dimension. Although an excisional biopsy was not performed, the tumor was present in multiple tissue cores and was likely adequately sampled to confirm the absence of atypical stromal cells and lipoblasts.

The treatment of intramuscular lipoma, in any location, is complete surgical excision. The recurrence rate reported in the literature is variable. Recurrence of intramuscular lipoma most likely depends on the adequacy of excision. In this case, because the masses were benign and not causing unwanted symptoms, the patient elected to have the masses clinically followed.

In summary, intramuscular lipomas are not uncommon in the large muscles of the extremities. Pectoralis muscle involvement by intramuscular lipoma, however, is exceedingly rare, with only one convincing reported case in the literature.

**Figure 1.** Mammogram with spot magnification view showing a 2-cm partially margined density in the posterior lateral aspect of the breast with associated microcalcifications (arrow).

**Figure 2.** Ultrasound of the left breast showing a 2.4-cm well-defined hyperechoic nodule involving the pectoralis muscle (arrow).
the current literature. The previously reported case clinically simulated a breast malignancy, whereas in the present case the intramuscular lipoma radiologically simulated a benign fibroepithelial lesion. Because intramuscular lipoma in this location is extremely uncommon, it is not often included in the radiologic differential diagnosis. With an adequate mediolateral oblique mammographic view, intramuscular lipoma should be considered due to its submammary location, radiologic density, and circumscription. It is important for the pathologist to be aware of intramuscular lipoma presenting in this location. One must also recognize a similar scenario in which separate fragments of unremarkable fat and skeletal muscle are found together in a breast core biopsy specimen. Often this is the case when a breast mass is present in a deep location and the pectoralis muscle is sampled incidentally. Ideally, the diagnosis of intramuscular lipoma should be made on the histologic evidence of mature adipose tissue infiltrating skeletal muscle. Careful correlation of the histologic and radiologic findings is necessary to help distinguish between incidental sampling of the pectoralis muscle and a benign intramuscular lipoma.

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References