

Top Five Lesions That Do Not Need Referral to Orthopedic Oncology



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KEYWORDS

- Lipoma • Enchondroma • Osteochondroma • Nonossifying fibroma • Paget disease • Bone biopsy
- Liposarcoma • Chondrosarcoma

KEY POINTS

- Radiography, not MRI or computed tomography, is most useful for diagnosing bone tumors.
- Most bone and soft tissue tumors have a characteristic age of presentation and radiographic appearance.
- Biopsy is not always required to diagnose many bone and soft tissue tumors.

INTRODUCTION

For many practicing orthopedic surgeons, encountering a potential bone tumor in a patient is an unwelcome challenge. Although most lesions are benign, the possibility of missing a malignancy causes understandable anxiety. Biopsy may confirm a suspected benign diagnosis but may be an unnecessary, invasive procedure in many cases, because careful analysis of clinical presentation and imaging findings will suffice for many lesions.¹ Most orthopedic surgeons are also familiar with the caveat that an inappropriately performed biopsy of a musculoskeletal malignancy may alter or harm a patient's outcome, and should be performed or guided by the treating oncologic surgeon.²

Many readily identifiable musculoskeletal lesions have an indolent or self-limited course and do not require treatment. Orthopedics has a built-in advantage in that x-ray, a cheap and readily available test, can often identify the underlying bone biology.³ Some of the lesions that are identifiable on radiography include fibrous dysplasia, nonossifying fibroma, enchondroma,

osteochondroma, Paget disease, and marrow infarction.^{4,5}

Further, several soft tissue lesions can be reliably identified with MRI alone, including lipoma, well-differentiated liposarcoma (atypical lipoma), benign nerve sheath tumors, diffuse pigmented villonodular synovitis, fibromatosis (extra-abdominal desmoid tumor), congenital venous malformations ("intramuscular hemangioma"), and periarticular cysts (eg, Baker cysts).⁶⁻¹¹

Need for Referral

Several of these lesions are indolent and sufficiently identifiable by clinical and imaging findings that routine referral to orthopedic oncology is not required.^{12,13} Of course, physicians must make the appropriate decision for their patients, taking into account the clinical findings and their own training and diversity of their practice.

Five proposed lesions are as follows:

1. Lipoma
2. Enchondroma

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3. Nonossifying fibroma
4. Paget disease
5. Osteochondroma

LIPOMA

Clinical Features

Lipoma is the most common neoplasm of the soft tissues.^{14,15} It presents as a slowly enlarging, superficial or deep mass that has often been present for years and is most common in the proximal extremities, upper back, and abdomen. Lipomas do not diminish in size during weight loss, which sometimes leads to their discovery.

Superficial lipomas are distinctive on physical examination, presenting as soft, compressible masses with a doughy consistency. In contrast, deep lipomas may not be compressible because of the constraint of the enveloping muscle. In the absence of appropriate imaging, this may lead to unwarranted concern of a malignancy. Although superficial masses are unlikely to be painful, deep masses can be associated with activity-related symptoms.

Imaging Features

Although MRI is the gold standard for soft tissue masses, musculoskeletal ultrasound can be highly accurate in diagnosing superficial lipomas, which will appear as uniformly hypoechoic masses. When appropriately performed, ultrasound will identify the correct diagnosis for greater than 90% of superficial lipomas.¹⁶

On computed tomography (CT), lipomas will appear as a homogeneously low-density mass. When density is quantified on CT, lipomas will typically demonstrate negative Hounsfield units, as fat has lower density than water.⁶

Although ultrasound or CT imaging may suffice for diagnosis, MRI is always definitive. The key observation is that the appearance of the mass will be similar to that of nearby subcutaneous fat in all pulse sequences (Fig. 1),⁶ These images should include at least a T1 and either a T2 with fat saturation or an STIR (short tau inversion recovery) sequence. Properly performed T1 images should preferably have a repetition time (TR) of less than 500 ms; values near 1000 ms are closer to proton density-weighted sequences and of less value because they also pick up water signal. Contrast administration is not required.

A special case is subcutaneous lipomas. Even grossly visible and palpable masses may not be evident on MRI, because the fat signal of the lipoma blends in with the surrounding subcutaneous fat. The combination of a visible and palpable subcutaneous mass and the absence of a mass on MRI is effectively diagnostic of a subcutaneous lipoma.

Differential Diagnosis

Although the diagnosis of lipoma, particularly with MRI, is usually straightforward, a few other lesions can have some overlapping features. Luckily, none of these poses a significant danger to the patient, and thus by extension to the diagnosing clinician.

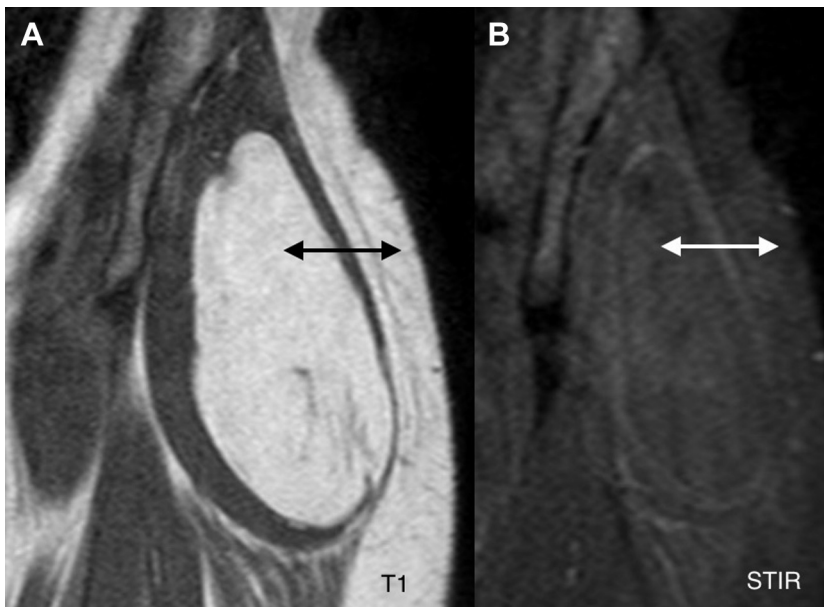


Fig. 1. Intramuscular lipoma. Thigh MRI with T1 (A) and fluid-sensitive short tau inversion recovery (STIR) sequences (B), both demonstrating identical appearance of tumor tissue to nearby subcutaneous fat (double headed arrows).

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