Liposclerosing Myxofibrous Tumor: A Rare Association with Avascular Necrosis of the Femoral Head

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Introduction

Liposclerosing myxofibrous tumor (LSMFT) is a rare, benign tumor first described by Ragsdale and Sweet in 1986 [1-5]. LSMFT are typically discovered incidentally on radiograph, computed tomography (CT), or magnetic resonance imaging (MRI) with similar prevalence among males and females [2, 3, 6, 7]. Microscopic analysis can reveal a variety of histopathologic features, including myxofibrous tissue, fibrous dysplasia-like features, and ischemic ossification with an unclear pathogenesis leading to debates about whether LSMFT constitutes a distinct diagnosis [3, 6, 8, 9] versus a variant of fibrous dysplasia or intraosseous lipoma. Most LSMFTs occur in the proximal femur and are associated with infrequent malignant transformations; however, they have not been linked to avascular necrosis (AVN) of the femoral head [1, 3, 4, 6, 7, 9].

Objectives

- This case report documents a patient diagnosed with a rare Liposclerosing myxofibrous tumors (LSMFT) who initially presented with avascular necrosis (AVN).
- Additionally, to the authors' knowledge and review of the literature, this is the first report linking LSMFT to AVN. This report will discuss the clinical presentation, imaging, diagnosis, and management of the case.

Case Presentation

- A 42-year-old woman with a past medical history of alcoholic liver disease on chronic prednisone therapy presented with progressive left hip pain over three months. She reported pain primarily in the anterior hip and groin, exacerbated by rotation and had no history of trauma.
- **Physical Exam**
  - MSSK: Decreased active and passive ROM at end points, increased pain with internal and external rotation, with mild crepitus of the left hip. 5/5 strength bilaterally.
  - Neurological: Intact sensation and 2+ DTRs bilaterally
  - Tests: + FABER and log roll test on left hip
- **Clinical Course**
  - Radiographs of left hip revealed sclerotic lesion in femoral neck (Figure 1).
  - T1 and proton density MRI revealed AVN of the left femoral head and a well-circumcised mixed sclerotic lesion in the left femoral neck (Figure 2).
  - Radiology diagnosed the lesion as a LSMFT.
  - Patient underwent a cementless total left hip arthroplasty.
  - Histological analysis confirmed AVN and diagnosed the lesion as a benign sclerotic bone tumor consistent with LSMFT (Figure 3).
  - Patient begin physical therapy and had unremarkable follow-up appointments and imaging (Figure 4).
  - Patient reported significant pain relief and returned to work.

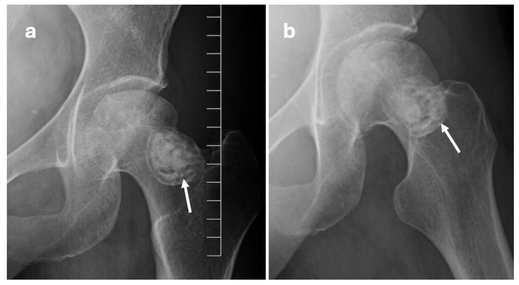

Figure 1: Anteroposterior (a) and lateral (b) radiographs of the left hip reveal lucency in the superior femoral head accompanied by cortical irregularity, as well as a 3.6 cm sclerotic lesion in the femoral neck (white arrows).

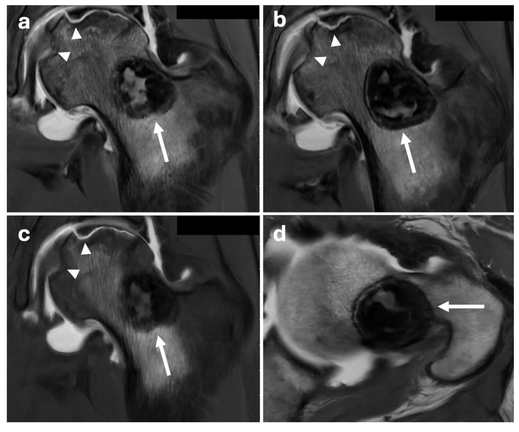

Figure 2: Coronal MRI images with proton density-weighted (a and b) and T1-weighted (c) sequences demonstrate avascular necrosis of the superior femoral head, with instability indicated by cortical breakthrough in the superior medial region, along with contrast-enhanced areas of necrosis (white arrowheads). Coronal proton density-weighted (a and b), T1-weighted (c), and axial T1-weighted (d) images show a well-circumscribed lesion in the left femoral neck, exhibiting mixed sclerotic and cystic characteristics without aggressive features, measuring 2.4 x 2.6 x 2.5 cm (white arrows).

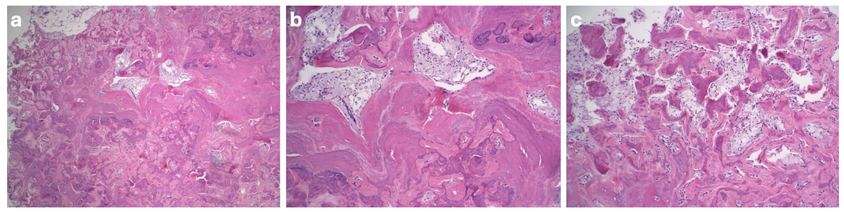

Figure 3: Composite H&E-stained sections of tumor, which demonstrated a sclerotic bone tumor with a predominance of variably mineralized/woven bone with scattered clusters of foamy macrophages (a-c, 40x, 200x, and 40x magnification, respectively). Focal mature adipose tissue was associated with the lesion (top left corner of (a) (40x magnification). No distinct fibrous component or osteoblastic rimming of the bony trabeculae were appreciated. There was no cytologic atypia or evidence of malignancy.

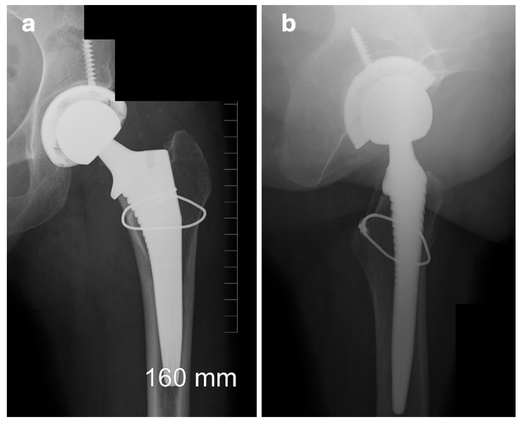

Figure 4: Anteroposterior (a) and cross table lateral (b) radiographs of the left hip at two-week follow-up revealed intact left total hip arthroplasty device with cerclage wire about the femoral component without evidence of loosening or subcutaneous edema.

Discussion

- Differential Diagnoses: LSMFT, fibrous dysplasia, or intraosseous lipoma
- LSMFT is a benign, rare tumor, with 80% to 90% of cases located in the intertrochanteric region, typically presenting around age 40 (4-6, 9, 10). AVN commonly affects individuals aged 20 to 40 with a history of trauma, dislocations, corticosteroid use, and alcohol abuse (12, 13, 14).
- **Diagnosis**
  - Most LSMFT are found incidentally on imaging(6). Radiographs show an indolent, lytic lesion with sclerotic margins, while T1-weighted MRI images reveal moderate homogeneity, and T2-weighted images show high-intensity heterogeneity (9, 12). AVN is diagnosed based on hip pain, stiffness, and decreased ROM, with radiological confirmation, though MRI is the gold standard (13).
- **Pathogenesis**
  - The pathogenesis of LSMFT remains unclear, with potential origins including developmental changes from childhood, lipoma involution, and trauma-induced fibrous dysplasia (6, 7, 13). Non-traumatic AVN of the femoral head is linked to reduced blood flow (14). Corticosteroids and alcohol contribute to ischemia through mechanisms like adipocyte hyperplasia, increased intra-osseous pressure, and endothelial damage (13, 17). In our patient, corticosteroid use and alcohol abuse, may have contributed to AVN development, potentially independent of LSMFT. However, the growing LSMFT in the ipsilateral femur could elevate intra-osseous pressure and further compromise blood flow to the femoral head.
- **Pathology**
  - The histopathological diversity of LSMFT complicates diagnosis, with histological examination often revealing a mix of lipoma, myxoma, myxofibroma, fibroxanthoma, fat necrosis, and fibrous dysplasia-like features (6, 8, 11). Due to these variations, some researchers suggest that LSMFT may be a variant of fibrous dysplasia or interosseous lipomas, rather than a distinct entity (11, 13, 14).
- **Treatment**
  - Given the potential for malignant transformation, most patients with LSMFT undergo surgery, which also addresses the AVN (6, 12, 15).

Conclusions

- LSMFT tumors are associated with several previously reported complications, including malignant transformation, bone pain, and pathological fractures. However, this case emphasizes that LSMFT may increase the risk of AVN of the femoral head due to lesion growth which ultimately reduces blood flow.
- Furthermore, patients diagnosed with LSMFT should undergo heightened monitoring for AVN, particularly when presenting with high-risk factors such as prolonged corticosteroid use or alcohol abuse.

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References