24yo M with progressive left thigh pain and swelling, worse with walking.

Bing Hu
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Adductor Insertion Avulsion Syndrome
a.k.a. Thigh splints

- Traction periostitis due to repetitive avulsive stress at insertion of adductor brevis and longus
  - May also occur after single episode of exertion
  - Less often, adductor magnus or pectineus

- Activity-related hip, groin, or thigh pain and swelling, relieved with rest
- Young athletes, military personnel
- Female predominance

- Physical exam shows tenderness over adductor muscles, pain with resisted hip adduction and external rotation
- Symptoms resolve in 1-2 months with rest

- Akin to shin splints (soleus m. insertion onto tibia)
Adductor muscles exert an anteromedially directed pull upon linea aspera.

Excessive force leads to periosteal stripping anteromedially.

Initial

3-month followup

Radiographs usually normal

May show periosteal reaction along proximal third of medial femoral shaft

CT may better delineate periosteal reaction and intracortical fracture

Initial

3-month followup

Thin rim of hyperintense signal along medial periosteum of proximal to mid femoral shaft, along course of the adductor muscle insertions

Corresponding increased medullary marrow signal at level of periosteal abnormality

Intracortical fluid cleft heralds stress fracture
Bone scintigraphy is most sensitive for detection of thigh splints, although not specific.

Elongated foci of increased uptake on medial (and, to a lesser degree, lateral) femur without focal fracture.

Spans 15-44% length of femoral shaft
Ddx:

• Osteomyelitis

• Tumor
  – Osteoid osteoma
  – Intracortical hemangioma
  – Intracortical osteosarcoma
  – Ewing’s, LCH, lymphoma in children
Stress Fractures of the Femur

Fatigue type
• 4th most common site (7.2% according to Matheson et al; after tibia, tarsals, metatarsals)

Insufficiency type
• 2nd most common site (after pelvis/sacrum)

Usually transverse orientation

Neck, Diaphysis

Compressive or Tensile side
Longitudinal stress fracture of femoral diaphysis

Longitudinal, intracortical fracture in medial cortex of upper femoral shaft below lesser trochanter, parallel to cortical surface.
Longitudinal stress fracture of femoral diaphysis

Longitudinal stress fracture of femoral diaphysis

- Gradual onset of hip, groin, proximal thigh pain, resolving in 6-11 months with rest

- May be fatigue or insufficiency type

- Demographics varies
  - Younger, athletic
  - Older, risk factors for osteoporosis
  - Female predilection for insufficiency type

- Hypothetical mechanism
  - Compressive force greatest at medial cortex of upper femur from axial loading, resulting in cortical remodeling and weakening
  - Concomitant stress from hip adductors, pectineus, and iliopsoas m.
  - Overload due to incapacitation of contralateral lower limb
References


