Musculoskeletal Case of The Day

Canadian Association of Radiologists 76th Annual Scientific Meeting
Friday April 26th, 2013

David A Leswick
University of Saskatchewan Department Medical Imaging
No conflicts of interest

www.usask.ca/medicine/imaging/
Case 1:
59 y.o. female with enlarging thigh mass
Images from 3T Siemens Skyra MRI

Cor T1 [TE 10 TR 750]
Case 1

Ax T2 FS [TE 77 TR 3700]  Ax T1 FS Gd [TE 13 TR 800]
Case 2

56 y.o. female with enlarging tender left thigh mass
Hip replacement 2 years prior
Case 2

- Asymmetric vs. the right
- Anatomically localized to TFL
Findings:

Case 1:

• Asymmetric enlargement TFL
  – Some non-specific edema lateral aspect
  – No discrete focal mass lesion within
  – No increased fatty content within

• Gluteus medius and gluteus minimus fatty atrophy

Case 2:

• Asymmetric enlargement TFL
  – Normal muscular echotecture
  – No discrete focal mass lesion within
  – No increased fatty content within

• Ipsilatereal hip replacement
Diagnosis:

• Hypertrophy of the Tensor Fascia Lata

Differential:

• Pseudohypertrophy from denervation
  – Including muscular dystrophy or traumatic

• Exercise

• Radiation

• Myositis

• Tumor if focal mass lesion was present
Anatomy & Function TFL

• Anatomy:
  – Origin anteriorlateral aspect iliac crest
  – Fuses with portions of gluteus maximus to form ITT
  – ITT tract inserts anterior-lateral proximal tibia
  – Innervation by superior gluteal nerve

• Functions:
  – Pelvic stabilizer\(^{(2)}\)
  – Hip abductor group\(^{(2)}\)
  – Overlap of hip abduction with gluteus minimus and medius\(^{(2, 3)}\)

1. Image from Pourier on Creighton University website (copyright expired)
Hypertrophy of TFL as Tumor Mimic

• First reported by Ilaslan et al in series of 8 cases\(^{(1)}\)
  – 3/8 tender masses
  – 3/8 had prior pelvic surgery with altered mechanics
    • Contralateral THA x2, Ipsilateral DDH with Salter osteotomy
  – 3/8 had neuropathy
    • Diabetic x1, Charcot-Marie-Tooth x1, Guillian Barre x1
  – 3/8 went to biopsy:
    • Hypertrophied muscle x1, necrosing myopathy x1, non-inflammatory myopathic process x1

True vs. Psuedohypertrophy

• True hypertrophy\(^{(1)}\)
  
  – increase in size of muscle fibers

• Psuedohypertrophy\(^{(1)}\)

  – Secondary to accumulation of excess fat and connective tissue in the muscle
  
  – Seen in muscular dystrophy or denervation

---

TFL Hypertrophy

• Today thought to be 2 main causes
  – Total Hip Arthroplasty
  – Gluteus Minimus and Maximus defficiency
TFL and THA

• Soft tissue injuries vary with surgical procedure
  – Anterolateral minimally invasive approach\(^{(1,2)}\)
    • Hip dissection intermuscular between TFL & G Med.
    • Common injury to superior gluteal nerve
  – Modified direct lateral\(^{(1)}\)
    • Approach includes max 3cm incision distal G Med
    • No other major soft tissue damage

TFL and THA

- 44 patients with THA, followed with MRI$^{(1)}$:
  - 16 via modified direct lateral (mDL)
  - 21 via anterolateral minimally invasive (ALMI)
  - G. Med atrophy: > via mDL technique
  - TFL atrophy: No increase with ALMI
  - TFL hypertrophy: only with mDL approach

- 26 patients with modified anterolateral approach THA, followed with MRI$^{(2)}$:
  - TFL unchanged in 27% (7/26)
  - TFL hypertrophy (nonfatty) in 12% (3/26)
  - TFL atrophy in 61% (16/26)

---

TFL Hypertrophy with Adductor Tendon Tears

• 35 patients for MRI of adductor tendon injury reviewed\(^{(1)}\)
  – No difference in TFL cross-sectional area or diameter with and without adductor tendon tear
  – Nonsignificant trend to increased size TFL on side of adductor tendon tear vs. contralateral side
  – Significant increase ratio TFL:sartorius area on side with adductor tendon tear

TFL Hypertrophy with Adductor Tendon Tears and mDL THA

• Suggests common etiology for TFL hypertrophy as pelvic stabilizer and hip adductor in presence of gluteus medius deficiency

• Likely underlying cause in both cases presented

Thank you for your time

David A Leswick
University of Saskatchewan Department of Medical Imaging
David.Leswick@saskatoonhealthregion.ca