Musculoskeletal Radiology Update 2016

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No Disclosures
Evolution of Radiology

Source: see citations figure 1
Evolution of Radiology

Source: see citations figure 2
Radiology Changes 1980’s

Source: see citations figure 3
Radiology Changes 1990’s

Source: see citations figure 4
Radiology Changes 2000’s

Source: see citations video 1
Who Are We?

• Boise Radiology Group

• MSK Fellowship Trained Radiologists:
  • Shane Ball, MD Chief of MSK Division
  • Brian Berkey, MD
  • Michael Fuchs, MD
  • Drew Hill, MD
  • Wayne Mortensen, MD
What Do We Do?
What Do We Do?
What is MSK Ultrasound?

- Isn’t that just a bunch of white noise?
- Is that a baby?
- It looks like grey blobs!
What is MSK Ultrasound?

• High frequency sound waves (3-18 MHz) to resolve soft tissues for diagnostic and interventional purposes

• Recent advances in ultrasound technology allow for:
  • Higher resolution
  • Increased penetration
  • Increased precision
Why MSK Ultrasound?

• Less Expensive
• Fast
• Safe
  • No radiation
  • No contrast (yet!)
• Dynamic Imaging
  • Interactive (That hurts!!)
  • Comparison to contralateral
Why MSK Ultrasound?

• MRI Killer?

Source: See citations figure 5
Why MSK Ultrasound?

• MRI Killer? Not Quite!

Source: See citations figure 5
Why Not MSK Ultrasound?

- Limitations
  - Operator dependent
  - Limited field of view
  - Soft tissue envelope
  - Artifacts
  - Limited penetration
    - Narrow range of contrast between soft tissue structures
How Does This Relate to Sports Medicine?

St Luke’s
Sports Medicine
Application: Head to Toe

- Head and Neck
  - TMJ
  - C-spine
  - Strap Muscles
  - Muscles of Mastication
- Chest
  - Sternocostal
  - Sternoclavicular
  - Intercostal
- Shoulder
  - Rotator cuff
  - Calcific tendonopathy
  - AC joint
  - Subacromial/subdeltoid bursa
  - Joint Injection/Aspiration
- Elbow
  - Medial epicondylitis
  - Lateral epicondylitis
  - Joint Injection/Aspiration
- Wrist
  - Flexor tendon injection
  - Extensor tendon injection
  - Joint Injection/Aspiration
- Hand
  - Ligaments (Gamekeeper’s)
  - Rheumatoid Arthritis
  - Joint Injection/Aspiration
- Abdomen
  - Hernias
  - Muscle tear
- Pelvis
  - Sports Hernia
  - SI Joint
  - Symphysis Pubis
  - Hamstring s
- Hip
  - Piriformis
  - Quadratus Femoris
  - Iliopsoas
  - Joint Injection/Aspiration
- Femur
  - Quads
- Knee
  - Baker’s Cyst
  - Ganglion cyst
  - Collateral ligaments
  - Joint Injection/Aspiration
- Ankle
  - Peroneal tendons
  - Flexor tendons
  - Achilles tendon
  - Ligaments
  - Joint Injection/Aspiration
- Foot
  - Morton Neuroma
  - Gout
  - Joint Injection/Aspiration
- Abdomen
  - Hernias
  - Muscle tear
- Pelvis
  - Sports Hernia
  - SI Joint
  - Symphysis Pubis
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  - Peroneal tendons
  - Flexor tendons
  - Achilles tendon
  - Ligaments
  - Joint Injection/Aspiration
- Foot
  - Morton Neuroma
  - Gout
  - Joint Injection/Aspiration
Application: Shoulder

• Diagnostic:
  • Rotator Cuff

• Interventional:
  • Calcific tendonopathy
tenotomy and lavage
  • Subacromial/subdeltoid
    bursal injection
Application: Shoulder

- Interventional:
  - Calcific tendonopathy tenotomy and lavage
Application: Wrist

- Wrist
  - Extensor tendon injection
  - Flexor tendon injection
  - Joint Injection/Aspiration
Application: Wrist

- Wrist
  - De Quervain’s Tenosynovitis

- First extensor compartment:
  - extensor pollicis brevis
  - abductor pollicis longus

Source: see citations figure 6
Application: Wrist

- Wrist
  - De Quervain’s Tenosynovitis

- First extensor compartment:
  - extensor pollicis brevis
  - abductor pollicis longus
Application: Hip/Pelvis

- Hip/Pelvis
  - Iliopsoas bursitis
  - Piriformis syndrome
  - Ischiofemoral Impingement
    - Quadratus Femoris
  - Joint Injection/Aspiration
Application: Hip/Pelvis

- Hip/Pelvis
  - Iliopsoas bursitis
Application: Foot/Ankle

- Ankle
  - Peroneal tendons
  - Flexor tendons
  - Achilles tendon
  - Ligaments
  - Joint Injection/Aspiration
  - Morton Neuroma
  - Gout
  - Joint Injection/Aspiration
Application: Foot/Ankle

- Ankle
  - Peroneal tendons
Summary

• These are not “my machines!” They are our machines and can be a benefit to you and your patients.

• MSK Ultrasound is an evolving, improving tool with many Sports Medicine applications

• Benefits include speed, cost, safety and real time information

• Limitations include limited field of view and artifacts, mostly related to penetration.
Summary

• Common Sports Medicine related ultrasound guided interventions include:
  • Rotator cuff calcific tendinopathy therapy
  • De Quervain’s tenosynovitis therapy
  • Iliopsoas bursal injection
  • Peroneal tendon sheath injection
  • Many, many others

• Sports Medicine patients with joint, tendon, ligament and muscular pain/dysfunction may benefit from application of diagnostic and therapeutic ultrasound procedures.
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Shout out for Sports Medicine Conference
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  • Brian Berkey
  • Michael Fuchs
  • Drew Hill
Thank you!

Please call (208) 706-7028 with all MSK imaging related questions
• Figure 1: http://www.zazzle.com/radiographer_radiologist_x_ray_radiology_evolution_shirts-235277359472696950, retrieved 3/1/16
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• Figure 3: http://www.vintag.es/2016/02/incredible-vintage-photos-of-people.html, retrieved 3/1/16
• Video 1: Copyrighted video used for educational purposes under Fair Use Doctrine
• Figure 4: http://www.back9network.com/article/golfstinks-10-annoying-things-average-golfers-do/, retrieved 3/1/16
• Figure 5: http://www.rad-planning.com/newsletter/2012/1203_2_MRI_fires.html, retrieved 3/1/16
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