

Imaging of Thumb Ligament Injuries

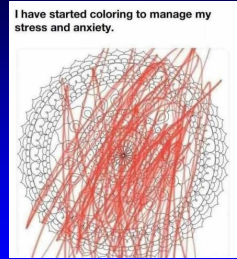
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Disclosures

- Consultant: Bioclinica
- Book Royalties: Elsevier
- Contractor: POCUS PRO
- Advisory Board: Philips
- Not relevant to this talk



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Introduction: thumb

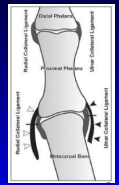
- Opposing thumb: functionally important
 - Present in humans, apes, pandas, koalas, lemurs, chameleons
 - Thankfully not in cats or dogs
 - Important for texting and deleting emails
- Injury mechanism: direct impact or fall
 - Skiing, football, rugby, even pickleball
- Hand injuries: 15% of all football injuries
- Bone, joint, tendon, ligament
- Osteoarthritis: 1st CMC joint very common



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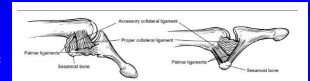
Anatomy: joints

- Metacarpophalangeal (MCP) joint:
 - Radial and ulnar collateral ligaments of capsule
 - Proper and accessory components
 - Proper taut in flexion
 - Accessory: more palmar, taut in extension
 - *Also attaches to volar structures
 - Adductor pollicis aponeurosis: superficial to UCL
- Interphalangeal joint: UCL and RCL
- Volar plate: fibrocartilaginous



From: Hirschmann A, et al. AJR 2014; 202:819

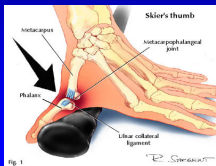
From: Heyman P et al. J Am Acad Ortho Surg 1997; 5:225



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Gamekeeper's Thumb

- Injury of the ulnar collateral ligament (UCL) of the thumb MCP
 - Historically, chronic injury in Scottish gamekeepers
 - Frequently, due to acute MCP joint hyperabduction
 - **Skier's thumb**: up to 86% of thumb base injuries



Acute Mechanism

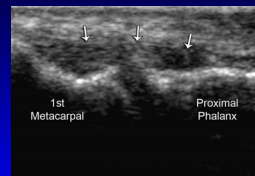


Chronic Mechanism

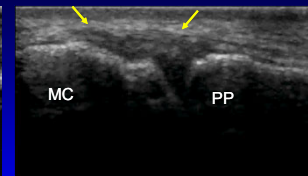


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Ulnar Collateral Ligament: thumb



1st Metacarpal Proximal Phalanx

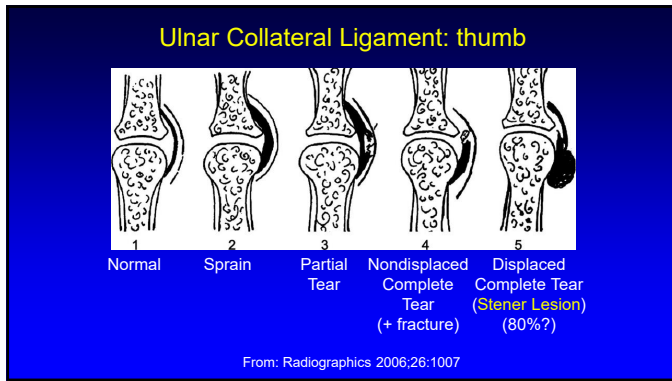


MC PP

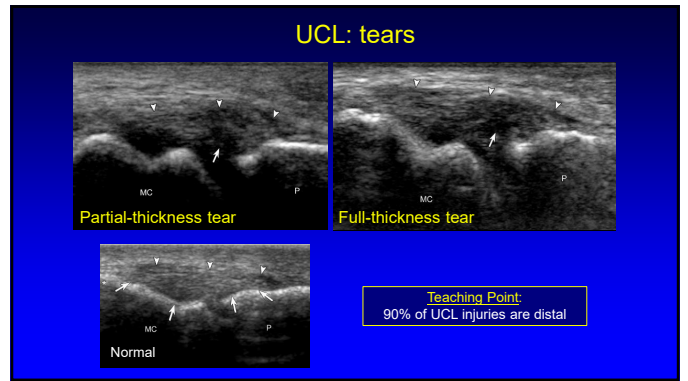


Note: sliding of adductor aponeurosis with isolated interphalangeal joint flexion

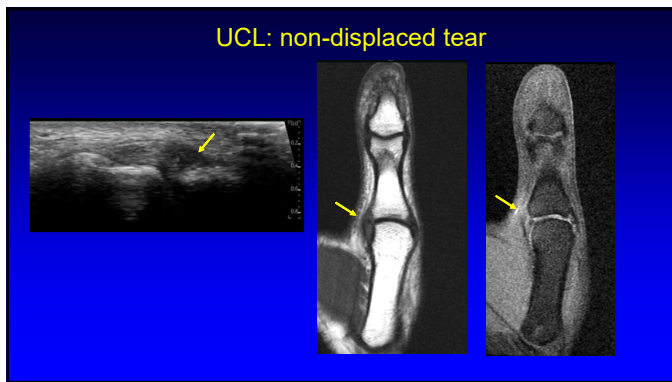
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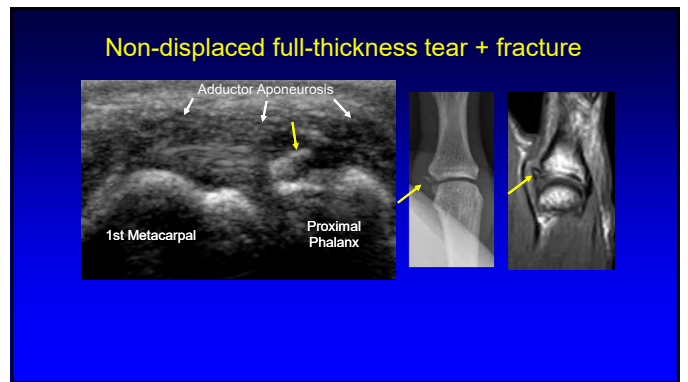
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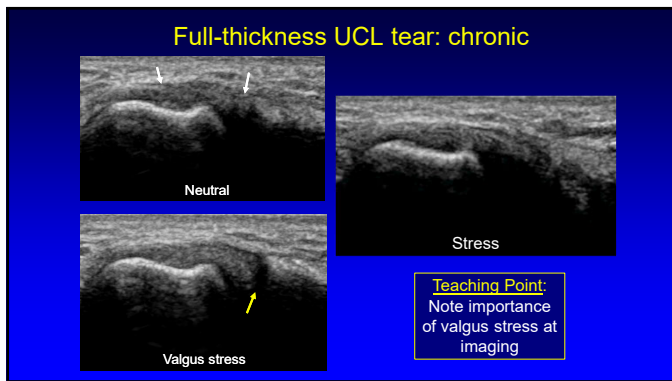
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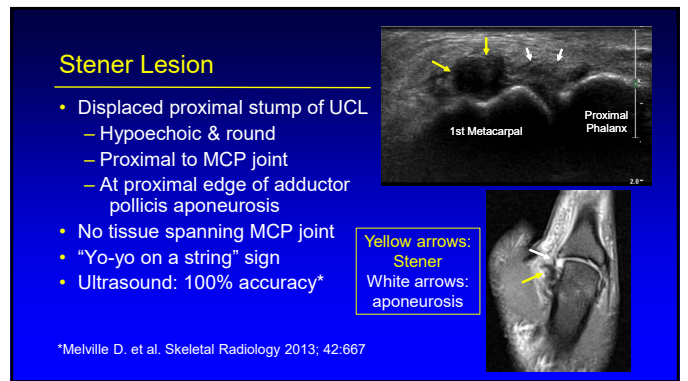
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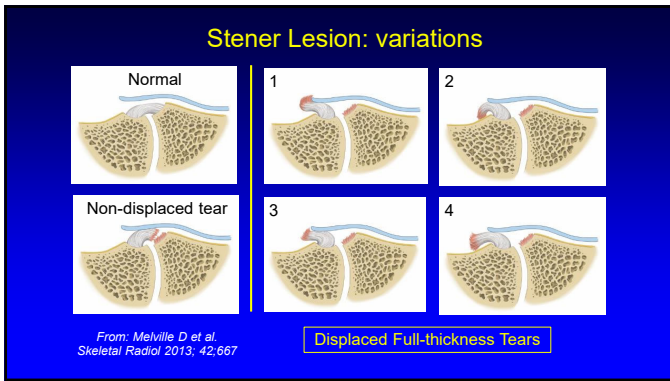
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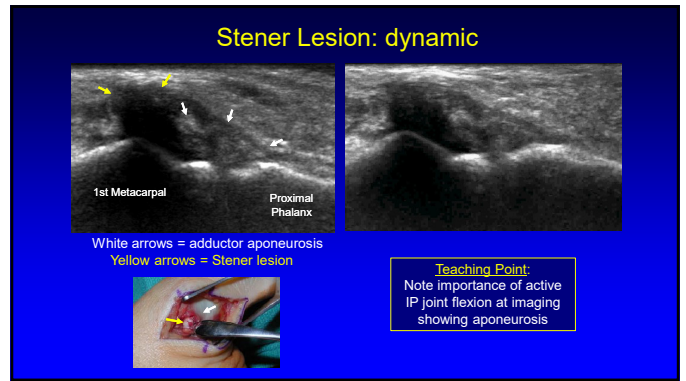
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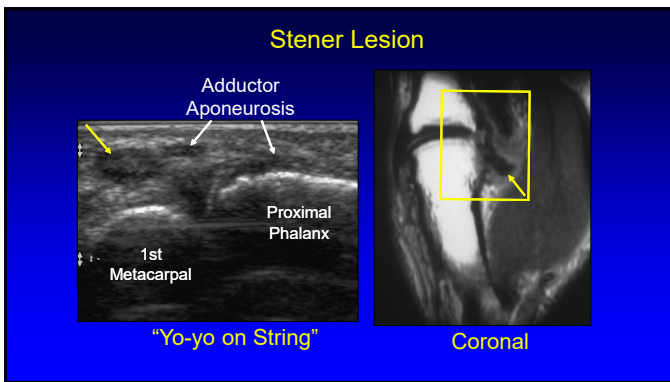
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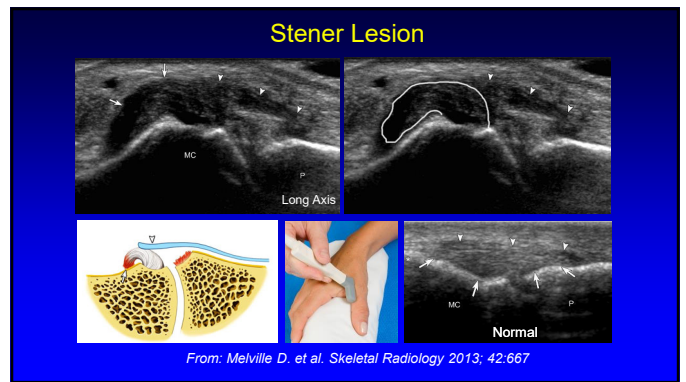
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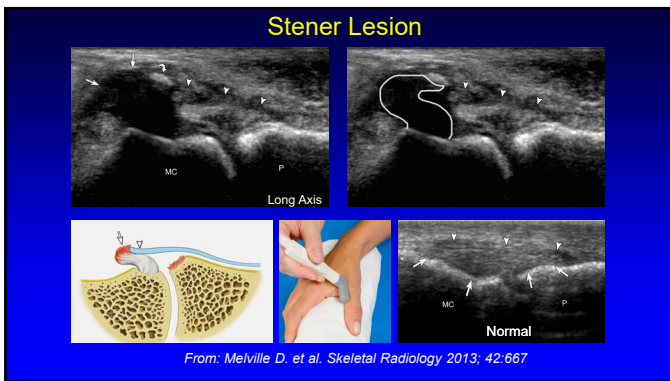
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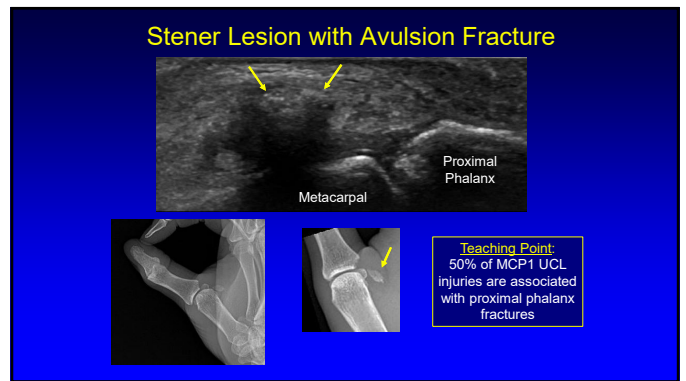
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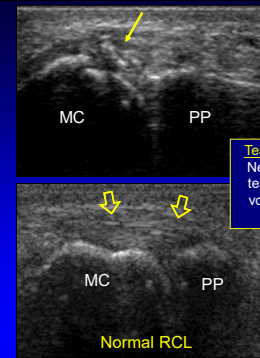
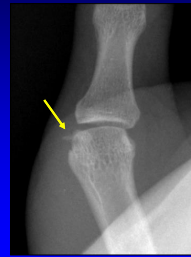
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Ultrasound Pitfalls: Gamekeeper's thumb

- Not scanning in correct plane
 - Use bone contours for guidance
- Misinterpretation of adductor aponeurosis as intact fibers
 - Passively flex interphalangeal joint
- Not recognizing a chronic full-thickness tear
 - Dynamic valgus stress imaging
- Not recognizing Stener lesion:
 - Round area proximal to joint

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Capsular Avulsion: 1st MCP Joint



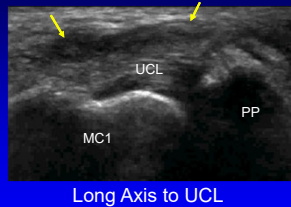
Teaching Point:
Nearly all UCL tears will have volar ligament injuries

Manneck S et al. Skeletal Radiol 2021; 50:505

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Adductor Pollicis Aponeurosis

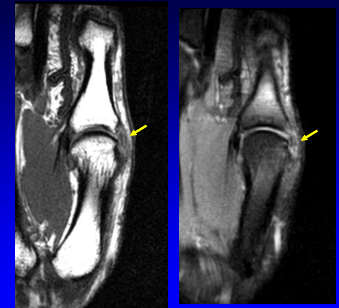
- Superficial to UCL of 1st MCP
- Examine long axis to UCL with passive 1st IP joint flexion/extension
- Commonly injury with Gamekeeper's thumb
 - Hypoechoic and thickened
- Isolated injury: uncommon
 - Diffusely hypoechoic thickened



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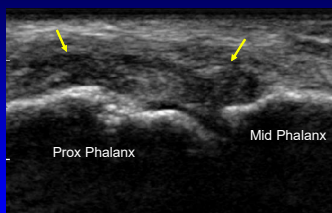
1st MCP Joint: RCL Tear

- Varus stress injury
- Abnormal increased signal on MRI
- Hypoechoic on ultrasound
- Volar and ulnar subluxation of proximal phalanx
- 25% with UCL tears will also have RCL tear

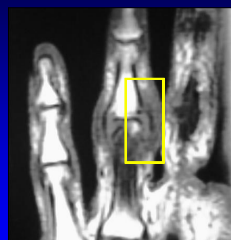


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Radial Collateral Ligament Tear: PIP joint



Long Axis



Coronal T1w

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Take-home Points

- 1st MCP UCL injuries associated with RCL and volar injuries
- Ultrasound is 100% accurate in diagnosis of Stener lesion
- Stener: variable appearance
- Ultrasound: dynamic evaluation:
 - IP flexion: abductor aponeurosis
 - Valgus stress: chronic tear

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www.jacobsonmskus.com
Twitter handle: @jjacobsn

The image is a blue-bordered slide. The top half is split into two photographs: an aerial view of a modern university campus on the left and a city skyline at sunset with a bridge over a river on the right. A small logo with a red 'C' and 'JACOBSON' is in the bottom right of the left photo. Below the photos, a white box contains the text 'Syllabus on line and other educational material:' followed by the website 'www.jacobsonmskus.com' in yellow. Below that, the Twitter handle '@jjacobsn' is listed.