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### **Abstract Text:**

#### **INTRODUCTION**

Flexor tendon injuries of the hand occasionally present diagnostic challenges in clinical practice. Physical examination alone can have limited accuracy, particularly for partial lacerations where pain, swelling, or delayed presentation can obscure findings. Multiple imaging modalities have been tested for their ability to visualize flexor tendon injuries, but their relative diagnostic performance remains unclear. This study systematically evaluated the diagnostic accuracy of ultrasound, MRI, and CT for detecting hand flexor tendon injuries.

#### **MATERIALS & METHODS**

A systematic review and meta-analysis were conducted per PRISMA guidelines. Multiple databases were searched for studies examining ultrasound, MRI, or CT for primary (unrepaired) hand flexor tendon injuries in adults or cadavers. Studies with 3 or more cases were included. Two reviewers screened titles, abstracts, and full papers independently. Then, study details were extracted including imaging techniques, sensitivity/specificity data, and other noteworthy findings. Meta-analysis used random-effects models to pool diagnostic accuracy measures with 95% confidence intervals. Study heterogeneity was measured with  $I^2$  statistics and forest plots were created for visualization. A combined sensitivity-specificity plot allowed comparison between imaging types.

#### **RESULTS**

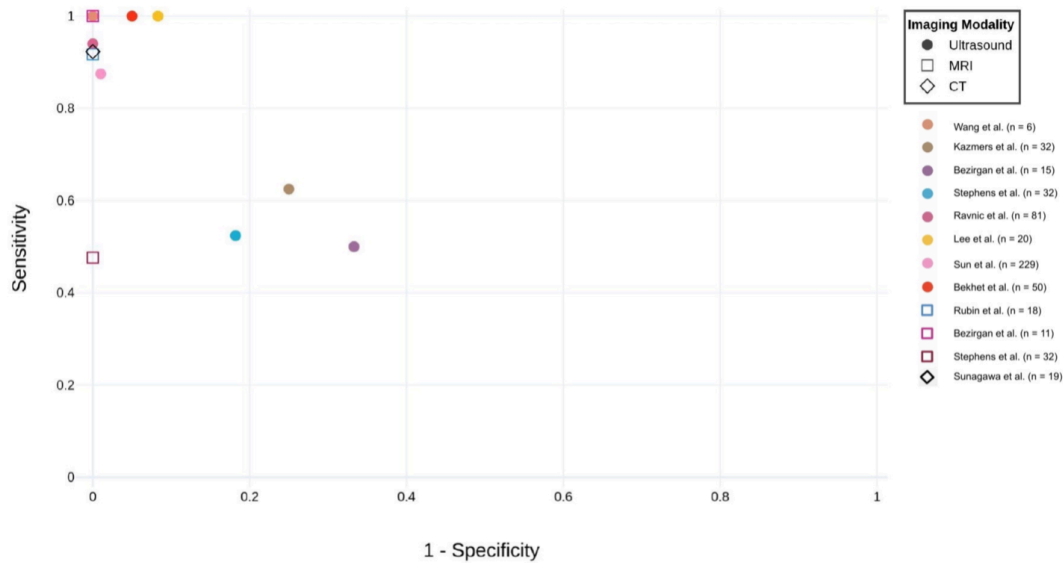
Sixteen studies qualified for analysis: 12 ultrasound, 6 MRI, and 1 CT study. Three studies examined both ultrasound and MRI. Ultrasound studies had pooled sensitivity of 91% (95% CI: 0.78-0.99) and specificity of 97% (95% CI: 0.88-1.00). MRI studies showed pooled sensitivity of 88% (95% CI: 0.55-1.00) and specificity of 100% (95% CI: 0.95-1.00). The CT study had 92% sensitivity and 100% specificity. Heterogeneity was high for sensitivity in ultrasound ( $I^2 = 88.74%$ ) and MRI ( $I^2 = 80.86%$ ) studies. Specificity heterogeneity was moderate for ultrasound ( $I^2 = 62.35%$ ) and absent for MRI ( $I^2 = 0%$ ).

#### **CONCLUSIONS**

This analysis demonstrates that both ultrasound and MRI yield high sensitivity and specificity for detecting primary flexor tendon injuries of the hand. Ultrasound has clear practical advantages due to lower cost, ability to visualize tendon movement in real time, and greater availability in clinics and emergency departments. Though more expensive and less accessible, MRI may be more specific for ruling in flexor tendon injuries. We therefore recommend the use of ultrasound, and secondarily MRI, as effective diagnostic tools in cases of

suspected tendon injuries when clinical exam is indeterminate.

**Sensitivity vs. 1-Specificity across Included Studies and Imaging Modalities**



**Title**

DIAGNOSTIC ACCURACY OF IMAGING MODALITIES FOR HAND FLEXOR TENDON INJURIES: A SYSTEMATIC REVIEW AND META-ANALYSIS

**Lead Presenter Email**

daniela.armella.tangarife.med@dartmouth.edu

**Abstract Details**

**Category**

Tendon

**What change in practice does this abstract address?**

Evidence-based selection of imaging modalities for suspected hand flexor tendon injuries, hoping to standardize pre-surgical imaging protocols for said lacerations.

**Has this material been previously submitted?**

No

**Has this material been previously presented or accepted for presentation?**

No

**Has this material been previously published?**

No

**Is the presenting author a resident, fellow, or medical student?**

Yes

**If yes, do you want this submission to be considered for the resident research contest?**

Yes

**Was the subject of this abstract supported by a research grant from the AAHS?**

No

**Are you a therapist?**

No

**Are you a member of the 2026 Taiwan Society for Surgery of the Hand (TSSH) Guest Society?**

No

**At what institution was the work prepared as states in the abstract?**

**Name**

Geisel School of Medicine at  
Dartmouth

**City**

Hanover

**State/Province**

New Hampshire

**Country**

USA

## Preferred Presentation Format

Paper or Poster

## Comments to Organizers

## Staff Section

### First Presenting Author

#### ***Presenting Author***

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Daniela Armella Tangarife, BA  
**Email:** Email Address Viewable Only to Person

Geisel School of Medicine at Dartmouth  
1 Rope Ferry Rd  
Hanover NH  
USA

### Second author

---

Max L Silverstein, MD  
**Email:** Email Address Viewable Only to Person

Division of Plastic & Reconstructive Surgery, Stanford University  
School of Medicine  
770 Welch Road  
Stanford CA  
USA

### Third author

---

Jennifer K Shah, BS, BAH  
**Email:** Email Address Viewable Only to Person

Division of Plastic & Reconstructive Surgery, Stanford University  
School of Medicine

291 Campus Drive  
Stanford CA  
USA

#### Fourth author

---

Walter C. Lin, MD  
**Email:** Email Address Viewable Only to Person

The Buncke Clinic  
45 Castro Street  
Suite 121  
San Francisco CA 94114  
USA

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