

# 2023 NEHS Annual Meeting Abstract Submission

COMPLETE

NEHS Vice President, Daniel Mastella, M.D., is currently accepting abstract submissions for presentation at our Annual Meeting on December 1, 2023.

This meeting will be held at the Sturbridge Host Hotel in Sturbridge, MA.

Therapists, NPs, and PAs are also encouraged to submit.

THE DEADLINE FOR SUBMISSION IS OCTOBER 15, 2023

RESIDENTS AND FELLOWS ONLY. Please indicate if you want your paper to be considered for the prestigious H.Kirk Watson, M.D. Founder's Award. The abstracts for award consideration will be presented in the morning and the award will be presented in the afternoon.

## CREATED

## IP ADDRESS



PUBLIC

Oct 15th 2023, 5:30:59 am



## \* ABSTRACT TITLE

Metacarpal Head Roundness of Thumb Ulnar Collateral Ligament Rupture Patients vs. Healthy Controls

## \* Contact Person Name

Ingmar Legerstee

## \* Contact Person Email

## \* Contact Person Phone Number

**\* Name of who will present abstract at NEHS meeting on December 1, 2023 Please note that the same person cannot present more than one abstract at the meeting.**

## \* Please indicate if the presenter is:

Not currently a resident or fellow

**\* List full names of abstract authors Please note - one of the lead authors must be present at the meeting to answer questions about the paper.**

I. Legerstee  
L. Freundt  
J. Pratap  
J. Lans  
A. Bhashyam  
N. Chen

**\* ABSTRACT - should include background information and a description of methods, programs, or practices.**

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Introduction

Authors have suggested that a flat metacarpal head of the thumb might be more prone to ligamentous injuries due to its small range of motion. Understanding the relationship between metacarpal head morphology and ulnar collateral ligament (UCL) ruptures may be beneficial in establishing the probability of this diagnosis prior to ordering advanced imaging modalities. This study aimed to compare the roundness of the thumb metacarpal head in individuals with a full-thickness UCL tear to the roundness in patients without any thumb pathology on radiographs.

Methods

Six urban hospital databases in a single city in the United States were searched between January 2004, and December 2021, to find patients with a thumb UCL rupture and patients without any thumb pathology on radiographs. To analyze the roundness of the metacarpal head, the distance (A) from the ulnar to the radial edge of the articular surface was divided by the radius (r) of the circle that fits through the surface of the metacarpal head on an anterior-posterior hand radiograph. A novel statistical method was created in Python for automated circle fitting and quantitative measurements, shown in Figure 1. The mean A/r ratio of the metacarpal head in thumb UCL rupture patients was compared to that in healthy control patients using an unpaired Student's t-test.

Results

The A/r (roundness) ratios ranged between 0.47 and 1.95 across all 182 patients in the dataset. The mean roundness for healthy control patients (n = 100) was  $1.125 \pm 0.025$  (mean  $\pm$  standard error of the mean). The mean roundness for UCL rupture patients (n = 82) was  $1.164 \pm 0.029$ . An unpaired Student's t-test showed no significant difference in means ( $p = 0.485$ ).

Conclusions

We found no difference in metacarpal head roundness between patients with a full-thickness thumb UCL tear compared to healthy control patients. This suggests a small range of motion of the metacarpophalangeal joint of the thumb does not raise the probability of sustaining a thumb UCL full-thickness tear in the case of trauma.

Level of Evidence: III (Diagnostic)

**Please attach files with diagrams and/or photos to support your abstract (10 MB limit)**

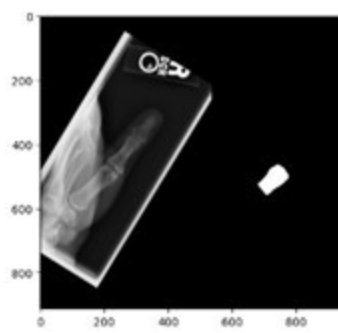
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figure\_1.jpg

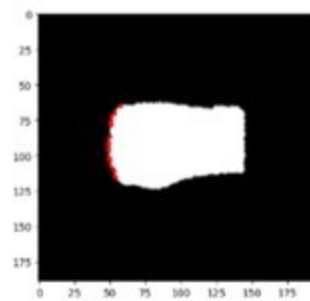
**\* Please attach the abstract presenter's CV**

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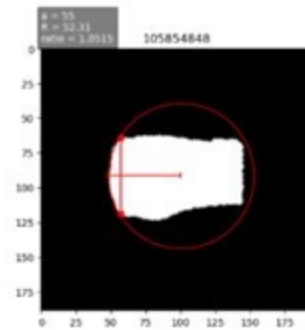
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*Metacarpal head segmentation*



*Generate 2D point cloud for articular surface*



*Least-squares fitting and measurements*