# Regional Ulnar Nerve Strain Following Decompression and Anterior Subcutaneous Transposition in Patients With Cubital Tunnel Syndrome

Ian Foran, MD,*§ Kenneth Vaz, MD,*§ Jakub Sikora-Klak, MD,*§ Samuel R. Ward, PhD,*†‡
Eric R. Hentzen, MD, PhD,*§ Sameer B. Shah, PhD*‡§

*California Orthopaedic Association*
*2017 Annual Meeting*

Ian Michael Foran, MD

# I and my co-authors have nothing to disclose

Kenneth Vaz, MD
Jakub Sikora-Klak, MD
Samual R. Ward, PhD
Eric R. Hentzen, MD, PhD
Sameer B. Shah, PhD

# Background

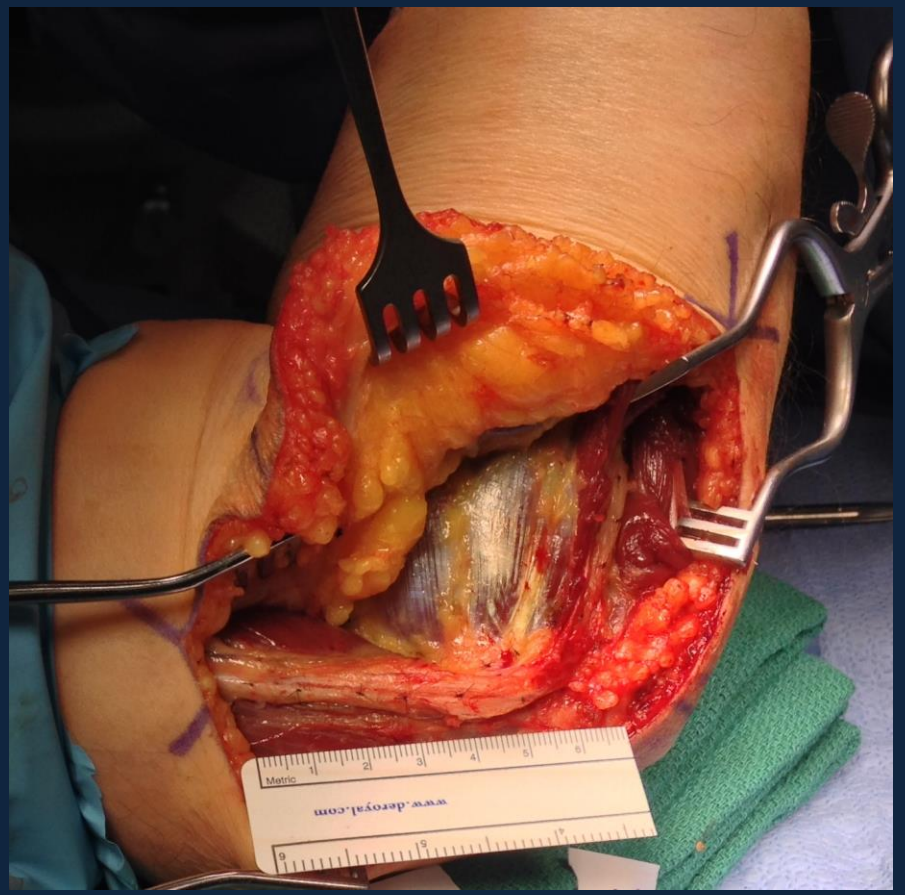
Second most common entrapment neuropathy

End Result

- Mechanical/Structural
- Vascular/Ischemic

How we get there?

- Tension
- Compression
- Repetitive shear/friction



# Cubital Tunnel Syndrome: Surgical Options

Simple Decompression

Anterior Transposition



## Anterior Transposition Compared with Simple Decompression for Treatment of Cubital Tunnel Syndrome

A Meta-Analysis of Randomized, Controlled Trials

By Michael Zlowodzki, MD, Simon Chan, MD, Mohit Bhandari, MD, MSc, Loree Kalliainen, MD, and Warren Schubert, MD

*Investigation performed at the University of Minnesota, St. Paul, Minnesota*

**Essentially equivalent**

**Treatment for ulnar neuropathy at the elbow (Review)**

Caliandro P, La Torre G, Padua R, Giannini F, Padua L

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# Equivalence ≠ Excellence

Surgery sometimes fails (30%)

- Unclear biomechanical reasons

Revision surgery less effective

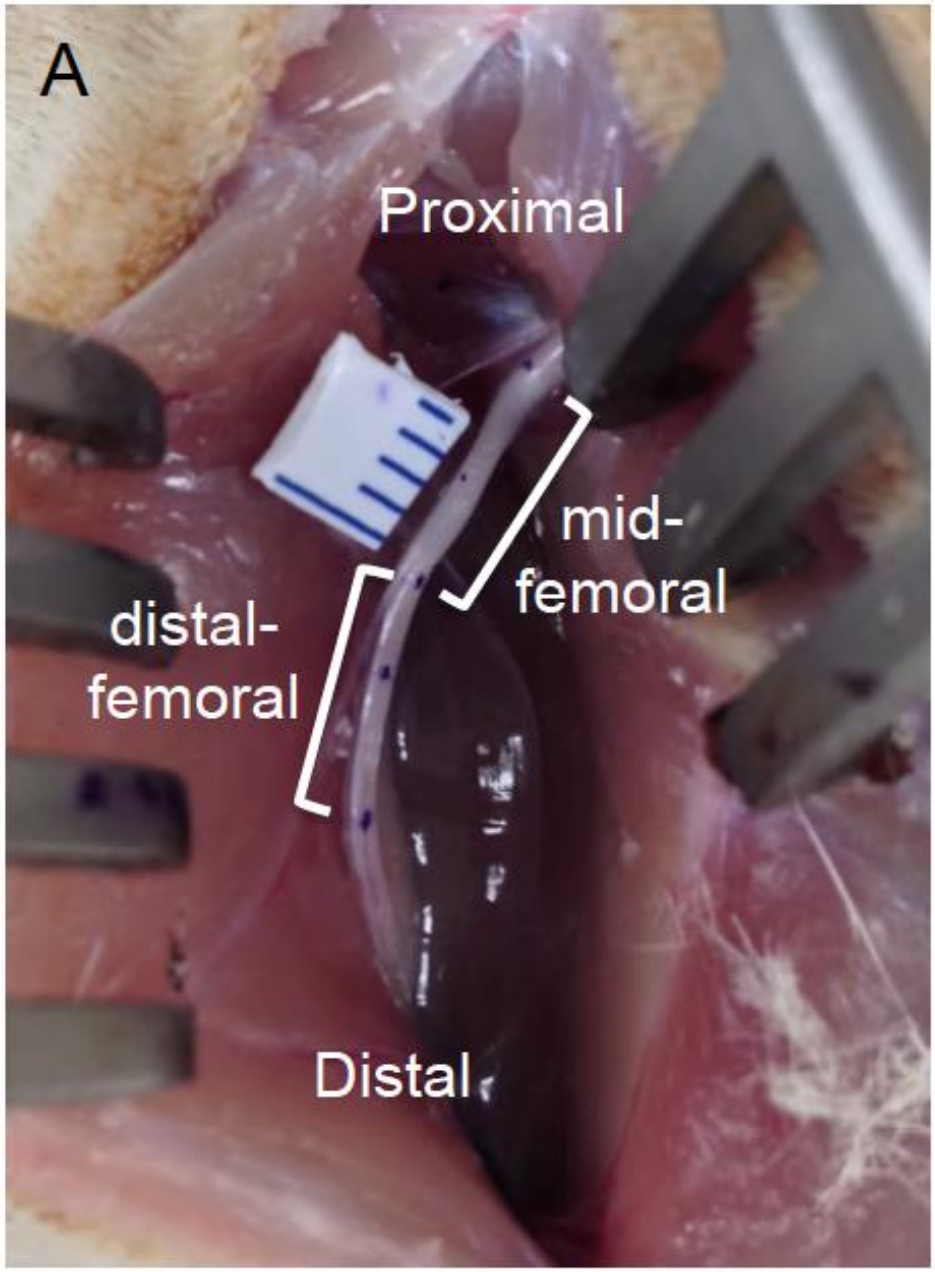
Heterogeneous post-operative protocols

# Questions

What is the biomechanical basis for these surgeries?

If we understand the biomechanical basis, can we select patients better?

Can we develop better post-operative protocols?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mid-
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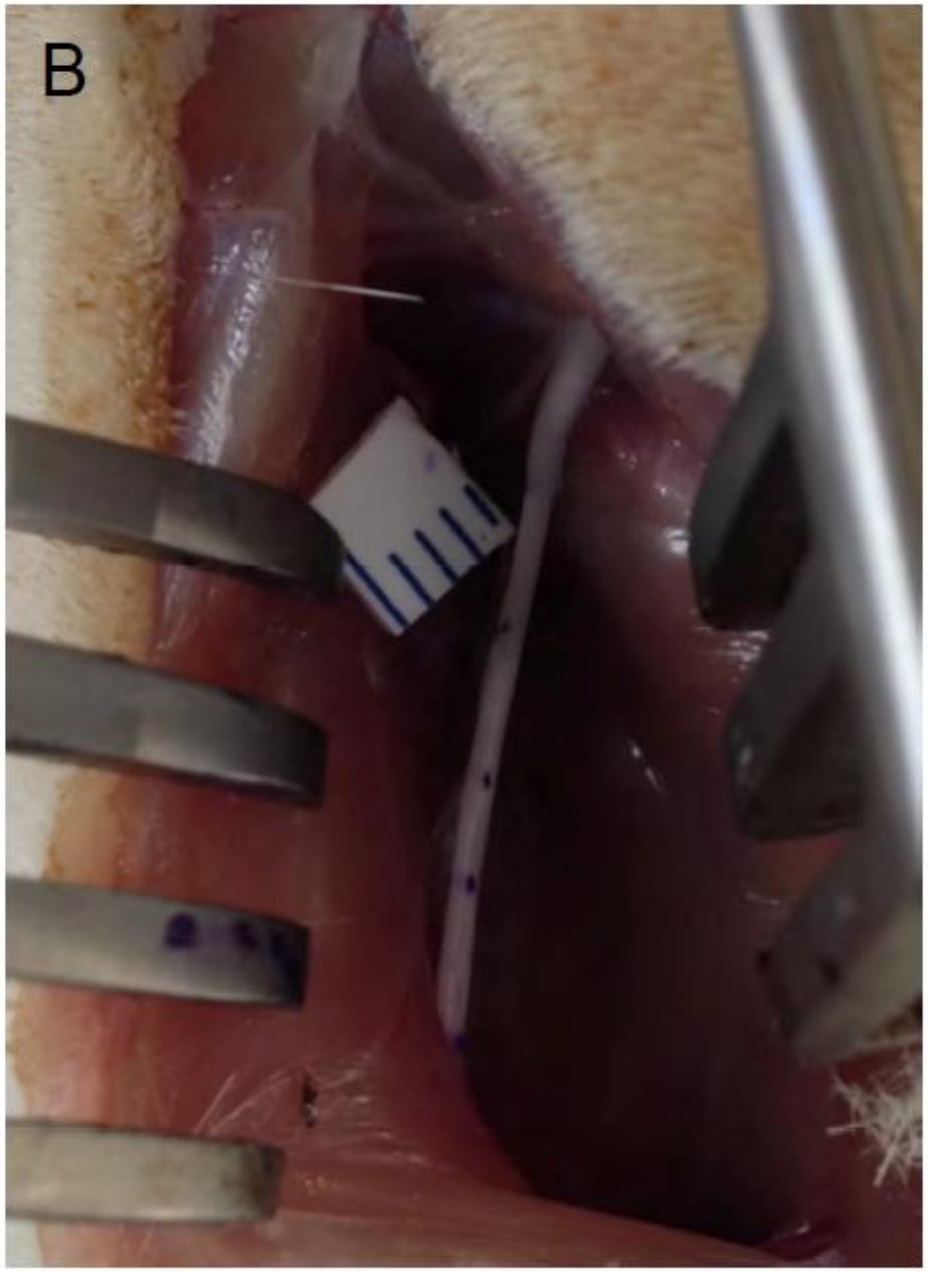
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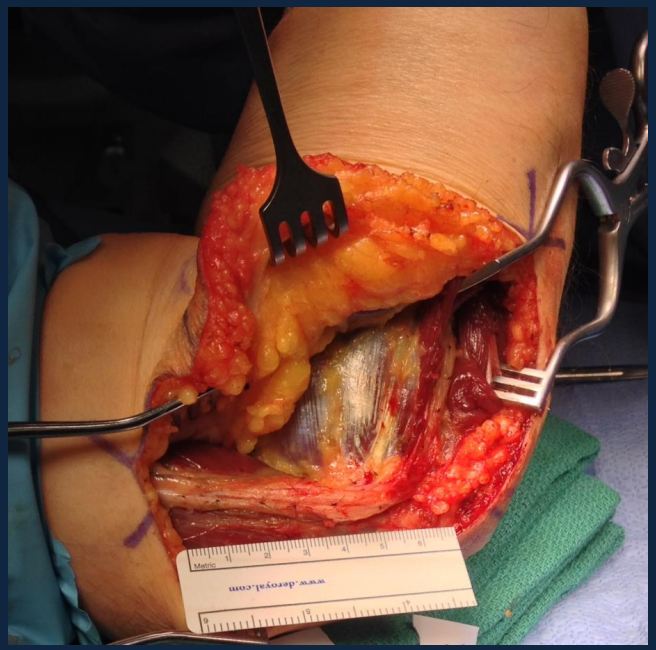
# Methods

- 7 patients, 8 ulnar nerves, diagnosed with CubTS

- 3 Surgical interventions
- 4 Elbow/wrist positions
- 3 Nerve regions

- 2-way ANOVA and Tukey post-hoc anlaysis

# Surgical Interventions



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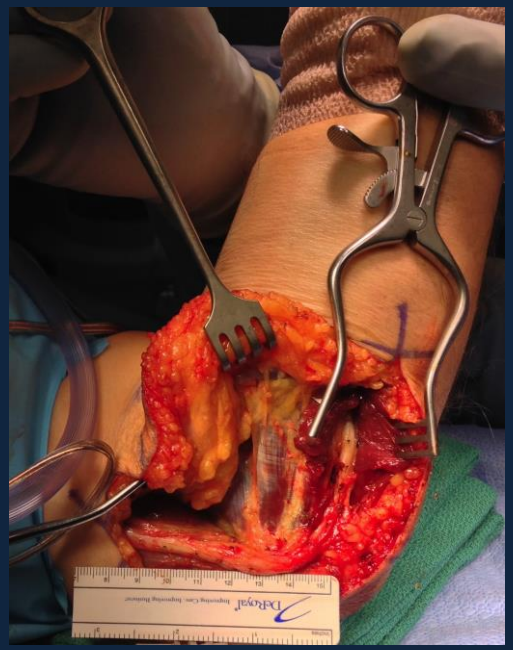

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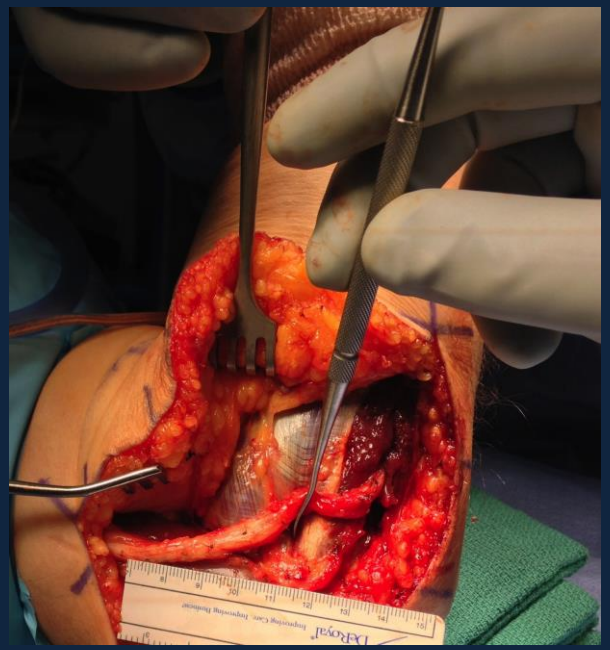

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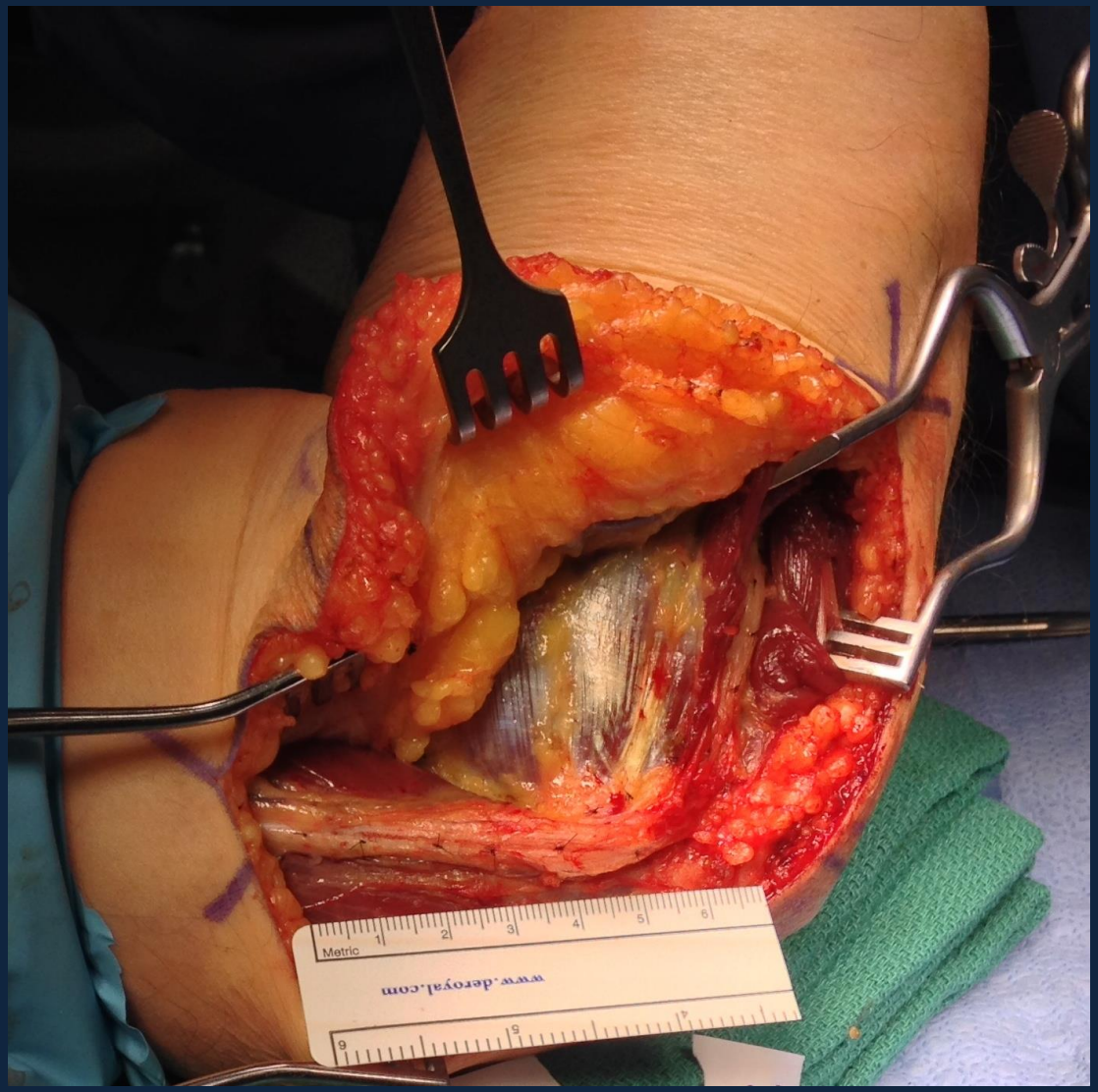
# SD



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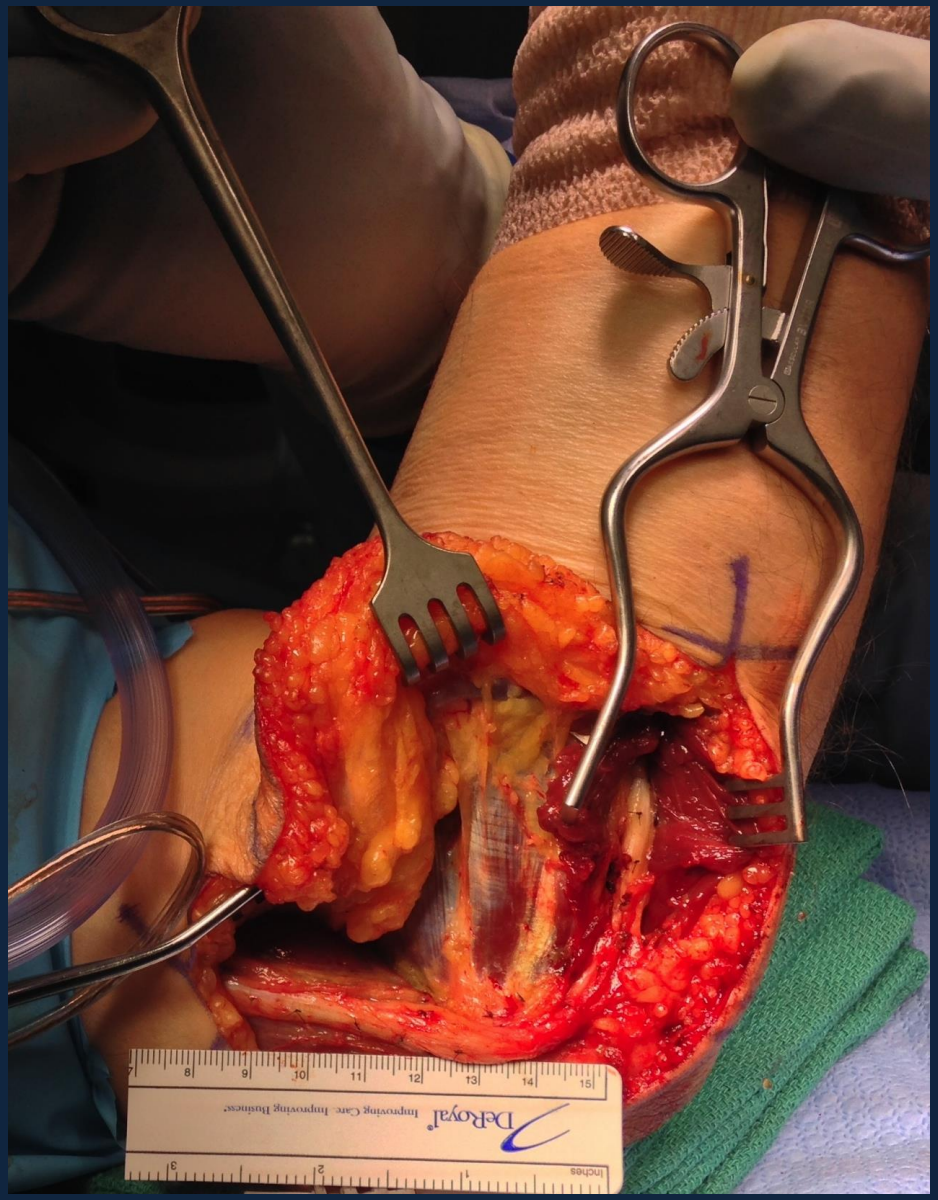

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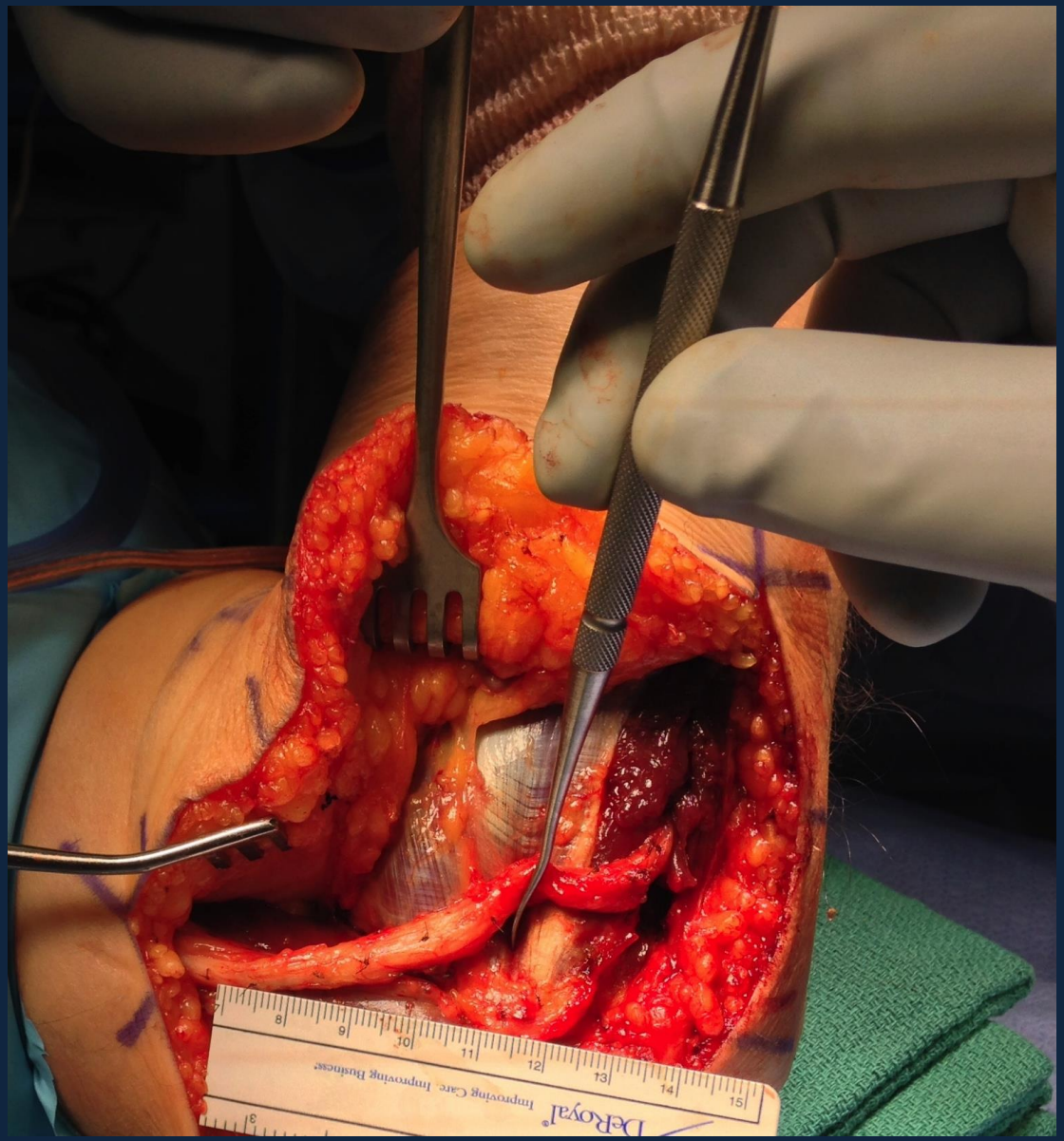

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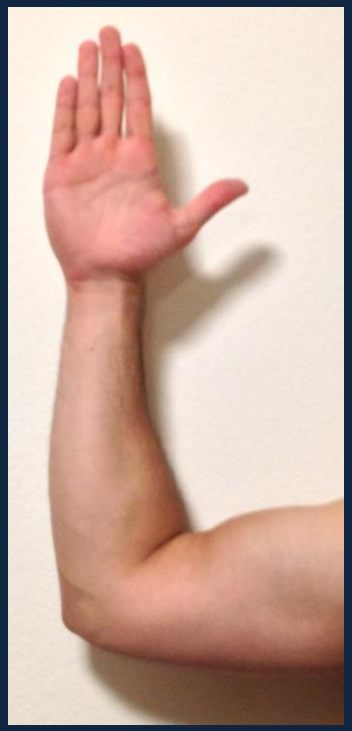

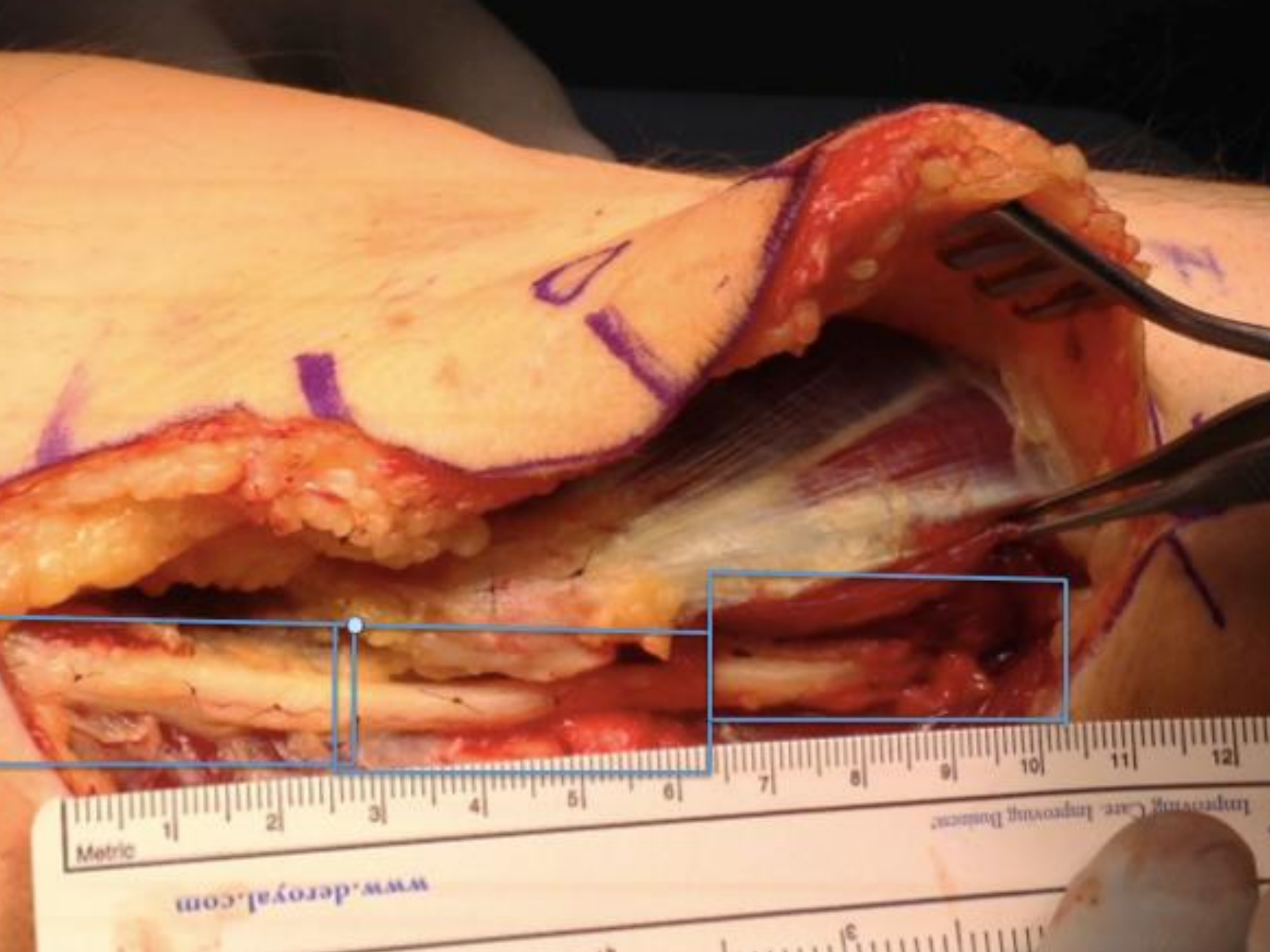
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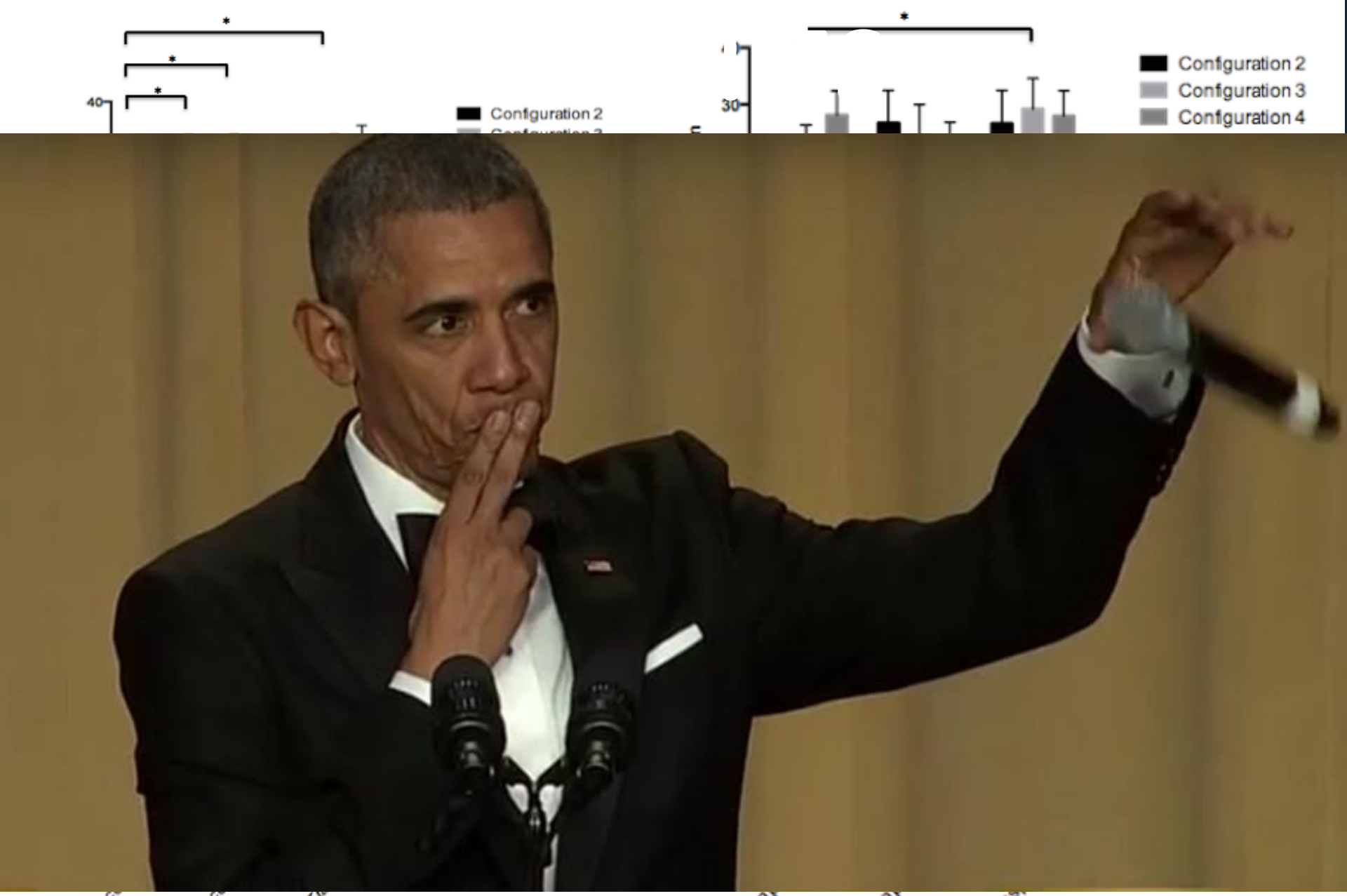
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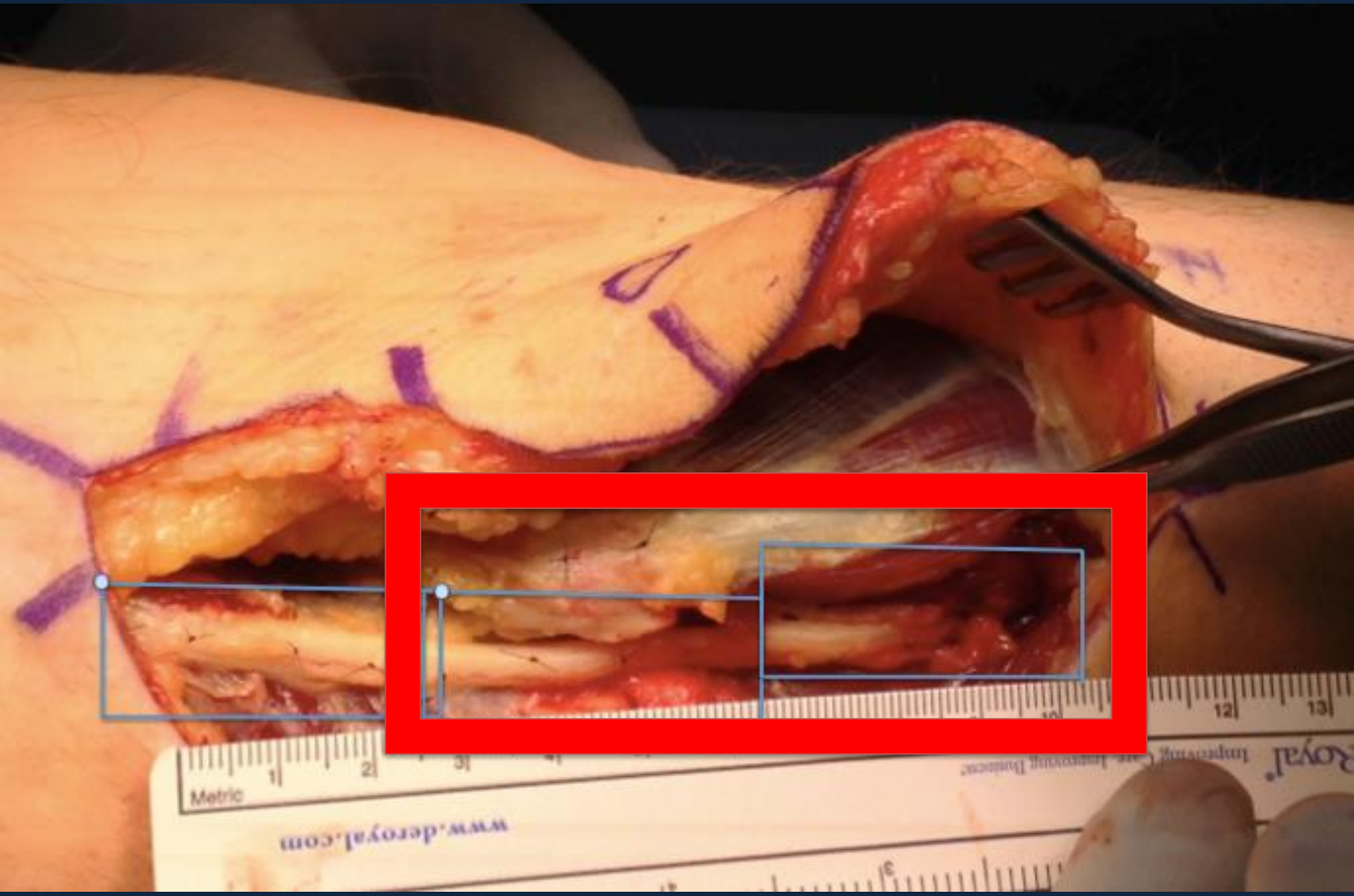
40
Configuration 2
*
30
Configuration 2
Configuration 3
Configuration 4
Simple Dec
Circumferential Dec
Simple Decomp
Circumferential Decomp
Trans

# Anticipated Results

1. With elbow extension, anterior transposition and circumferential decompression ***increase*** strain ($p<0.01$)

2. With elbow flexion, anterior transposition ***decreases*** strain ($p<0.01$)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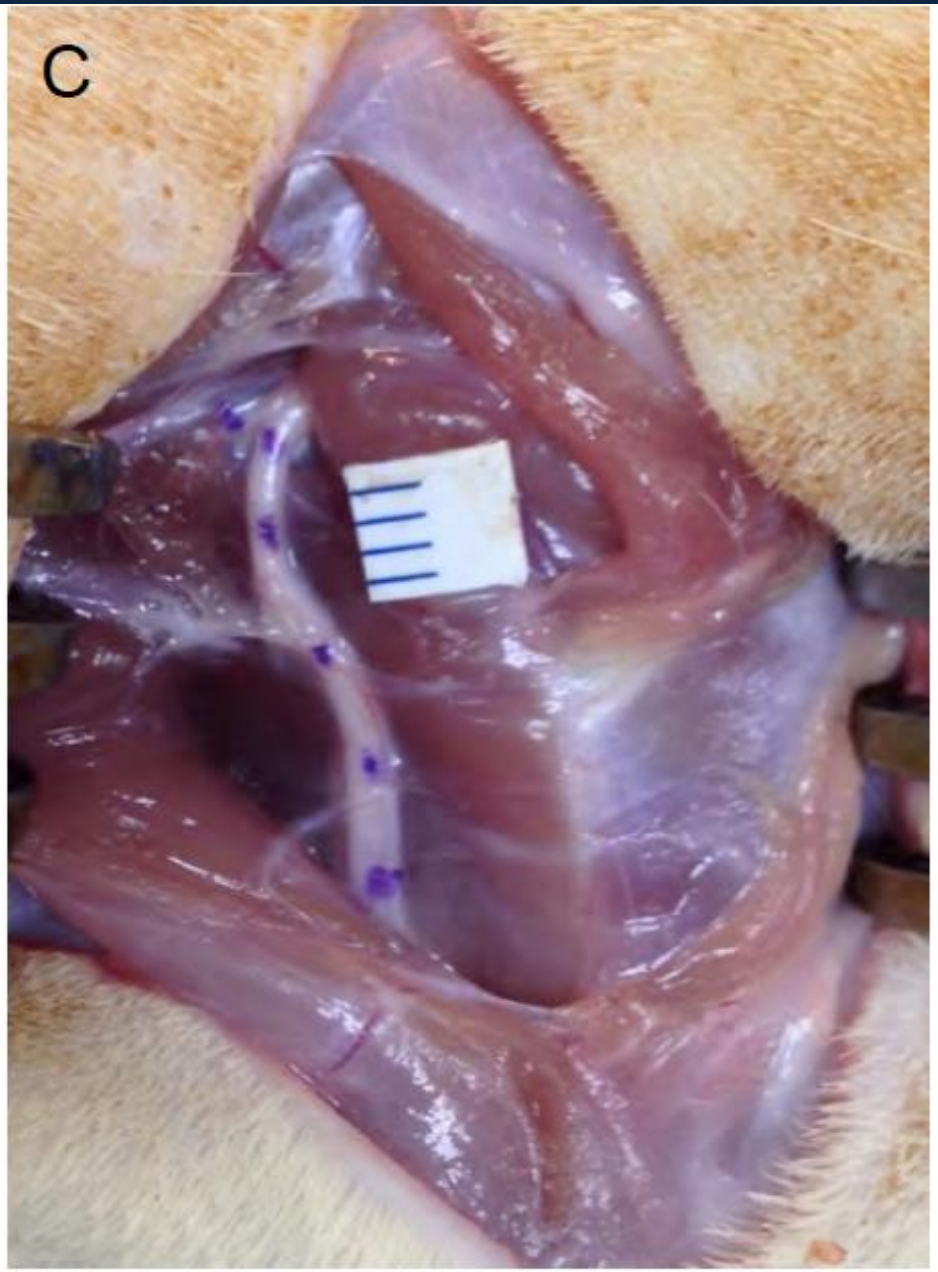
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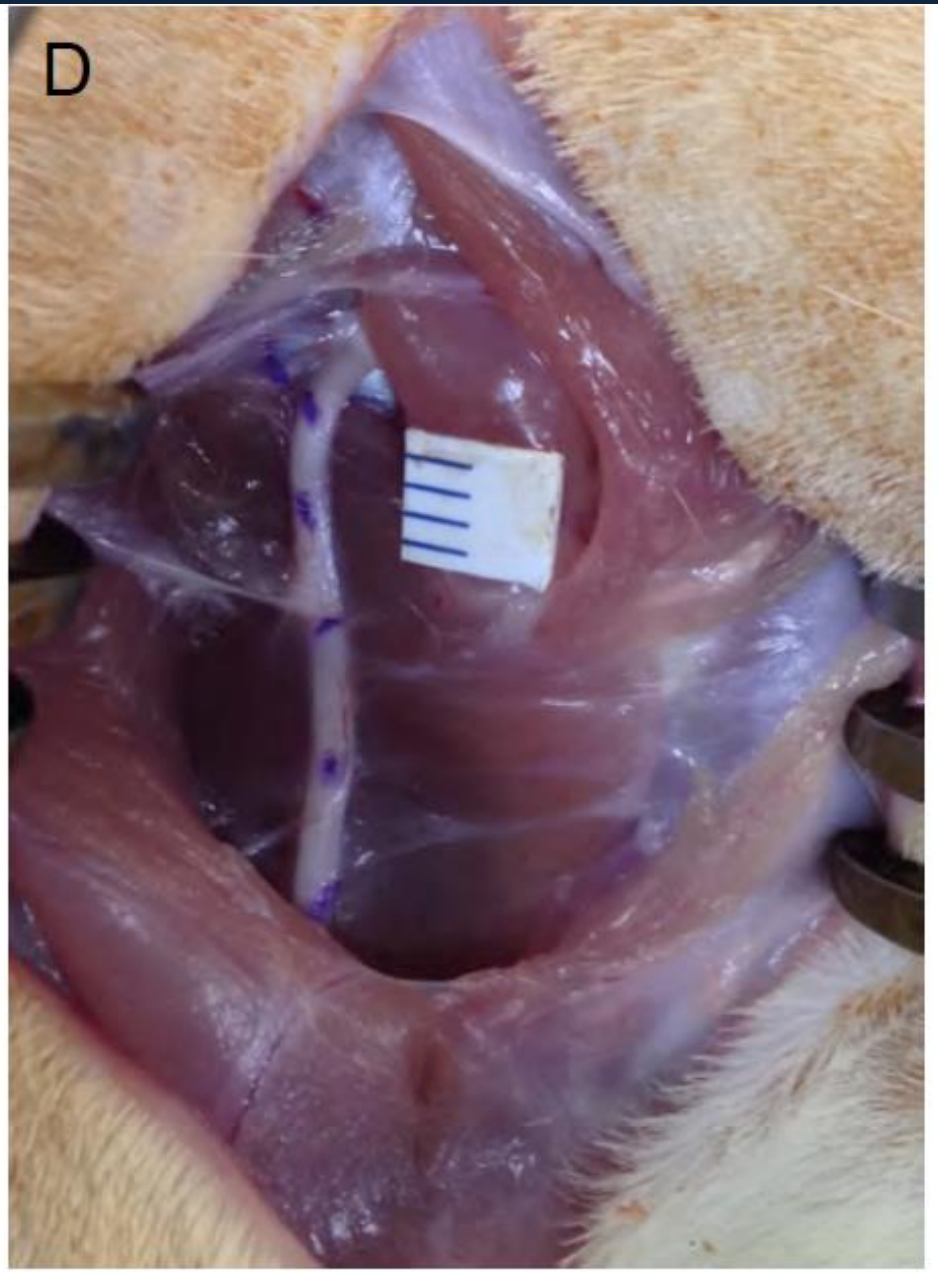
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# Conclusions

There may be biomechanical subpopulations that would benefit from one procedure over another

Soft tissues released during circumferential decompression contribute to ulnar strain

Central and distal regions should be areas of high concern in revision surgery

May be considerations for rehabilitation protocols

Thank you

Kenneth Vaz, MD
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