Endoscopic Cubital Tunnel Release

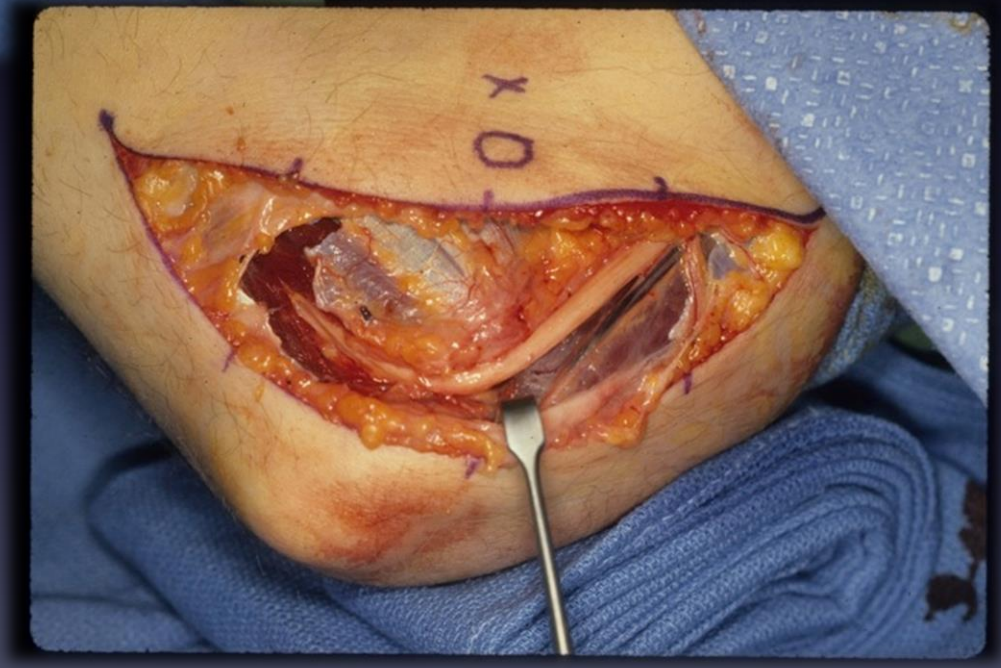
Neil G. Harness, MD

Kaiser Permanente Orange County

University of California Irvine

Surgical Principles

- Release all possible compression sites
- Preserve the vascularity of the ulnar nerve
- Allow early mobilization of the elbow



Minimal Invasion…

Minimally Invasive Surgery

- Google Search
  - "Minimally Invasive Surgery"
    - Over 20 million results
  - "Minimally Invasive Cubital tunnel surgery"
    - Over 33,000 results

Small incision = Better outcome?

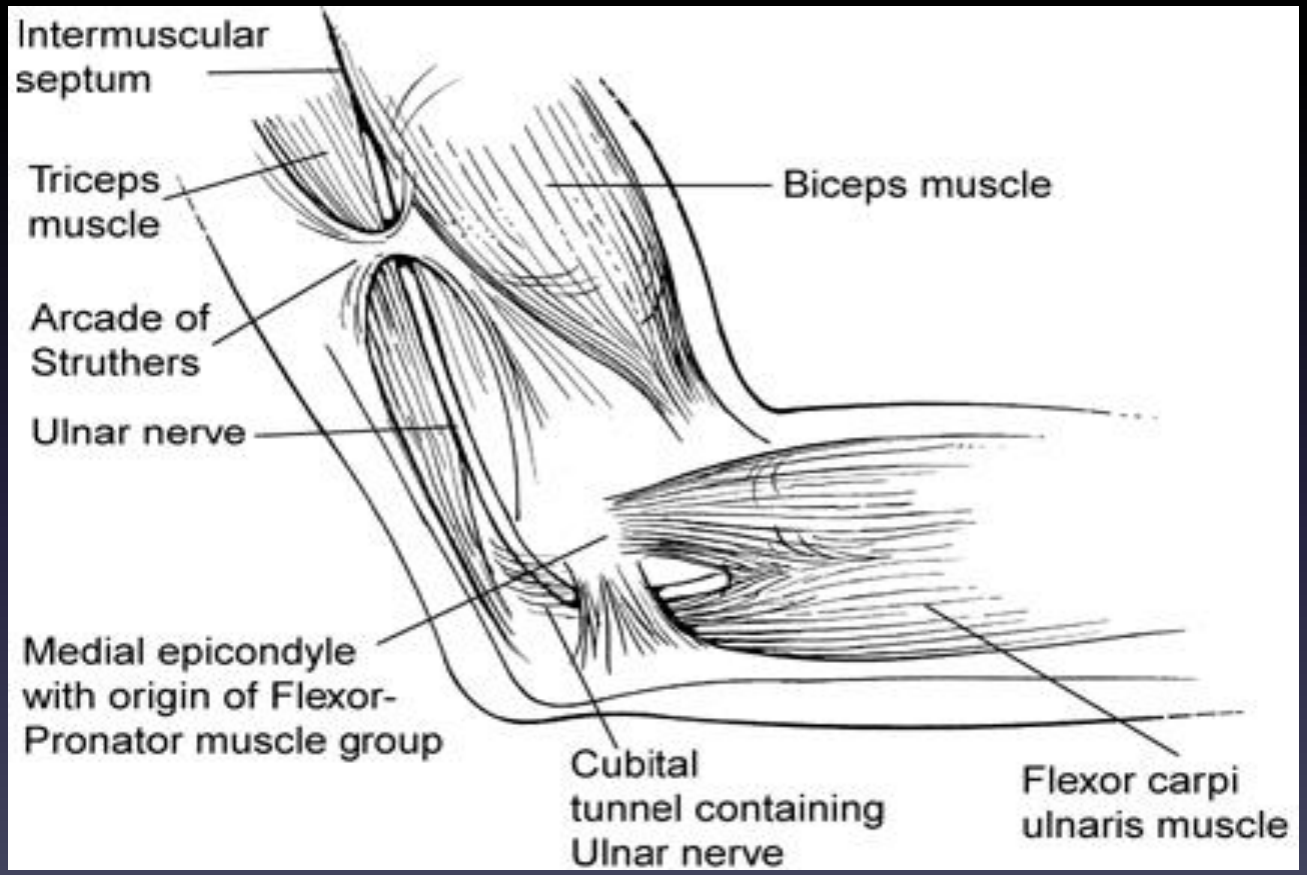
Where's the evidence?

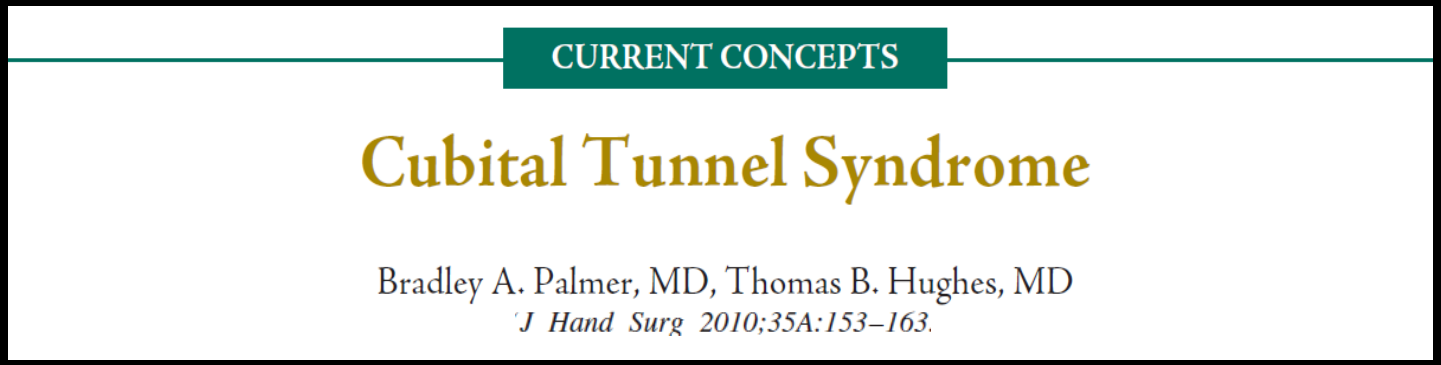
Endoscopic Cubital Tunnel release

- "It is a patient driven procedure that is performed through a smaller incision, is less invasive, and results in faster recovery time."
  - Tyson K. Cobb, MD

Is this the right thing to do?

Points of compression





- 4 Prospectively Randomized controlled trials
  - In-situ vs. anterior transposition
    - Bartels et al, 2005, Biggs et al, 2006, Gervasio et al, 2005, Nabhan et al, 2005
  - No statistical difference clinical results
  - Higher complication rate with transposition

SCIENTIFIC ARTICLE

Simple Decompression Versus Anterior Subcutaneous and Submuscular Transposition of the Ulnar Nerve for Cubital Tunnel Syndrome: A Meta-Analysis

Sheina A. Macadam, MD, Rajiv Gandhi, MD, Michael Bezuhly, MD, Kelly A. Lefaivre, MD

J Hand Surg 2008;33A:1314–1324.

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

J Bone Joint Surg Am. 2007;89:2591-8

- 2 meta-analyses in-situ vs. transposition
  - Including submuscular transposition
  - No difference in reported outcomes for transposition of any type

Treatment for ulnar neuropathy at the elbow (Review)

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

- 3 Studies included in meta analysis
  - 1461 papers reviewed, 6 RCTs
  - 131 pts had in-situ decompression and 130 had transposition in 3 included studies
  - 2 studies submuscular, 1 study subcutaneous
  - No difference in NCV's or clinical resolution between methods

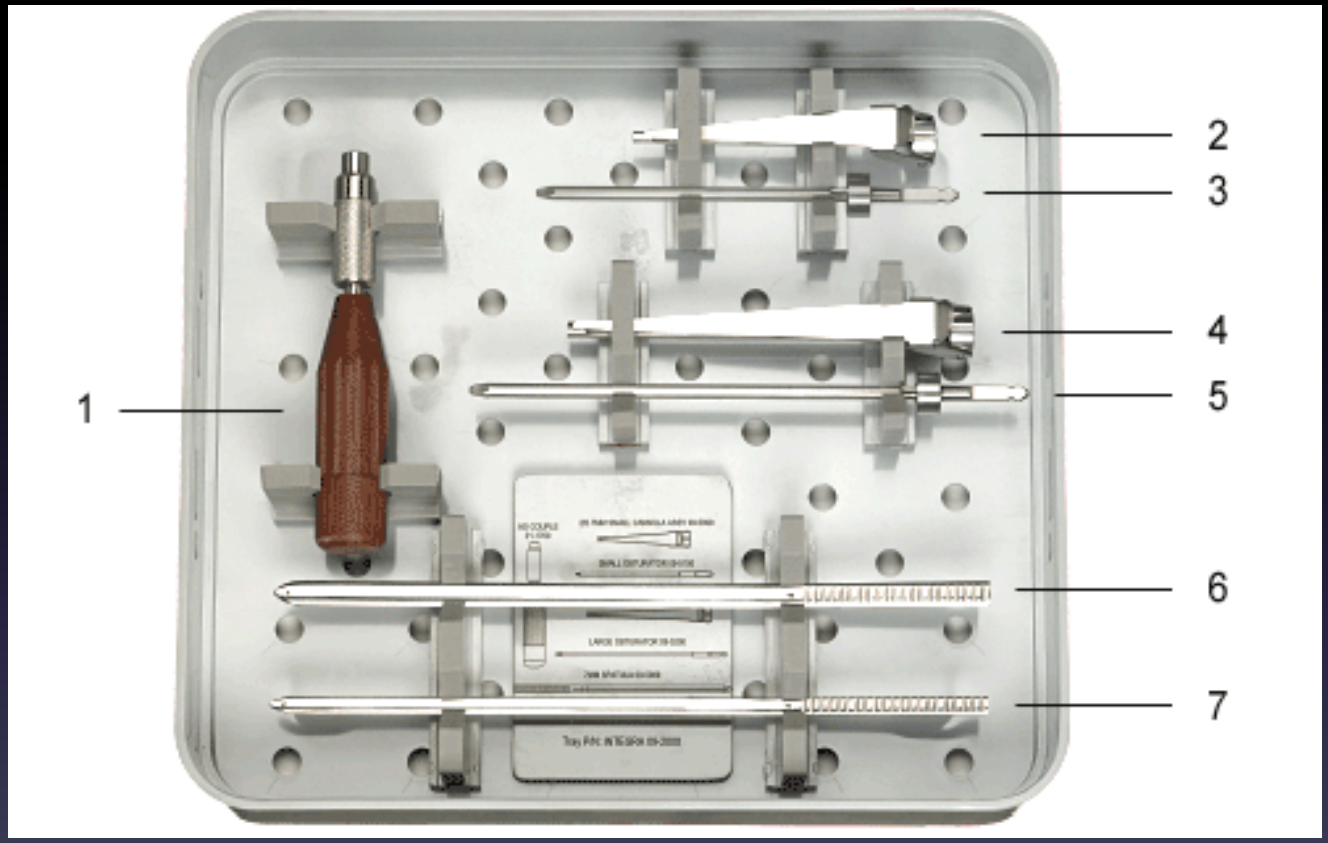
Why Endoscopic?

- Endoscopic allows for a extended in-situ release with smaller incision and potential quicker return to function
- Concerns
  - Technically demanding
  - Have all points of compression been released adequately?
  - Possible injury to ulnar nerve, cutaneous sensory branches, crossing vessels.

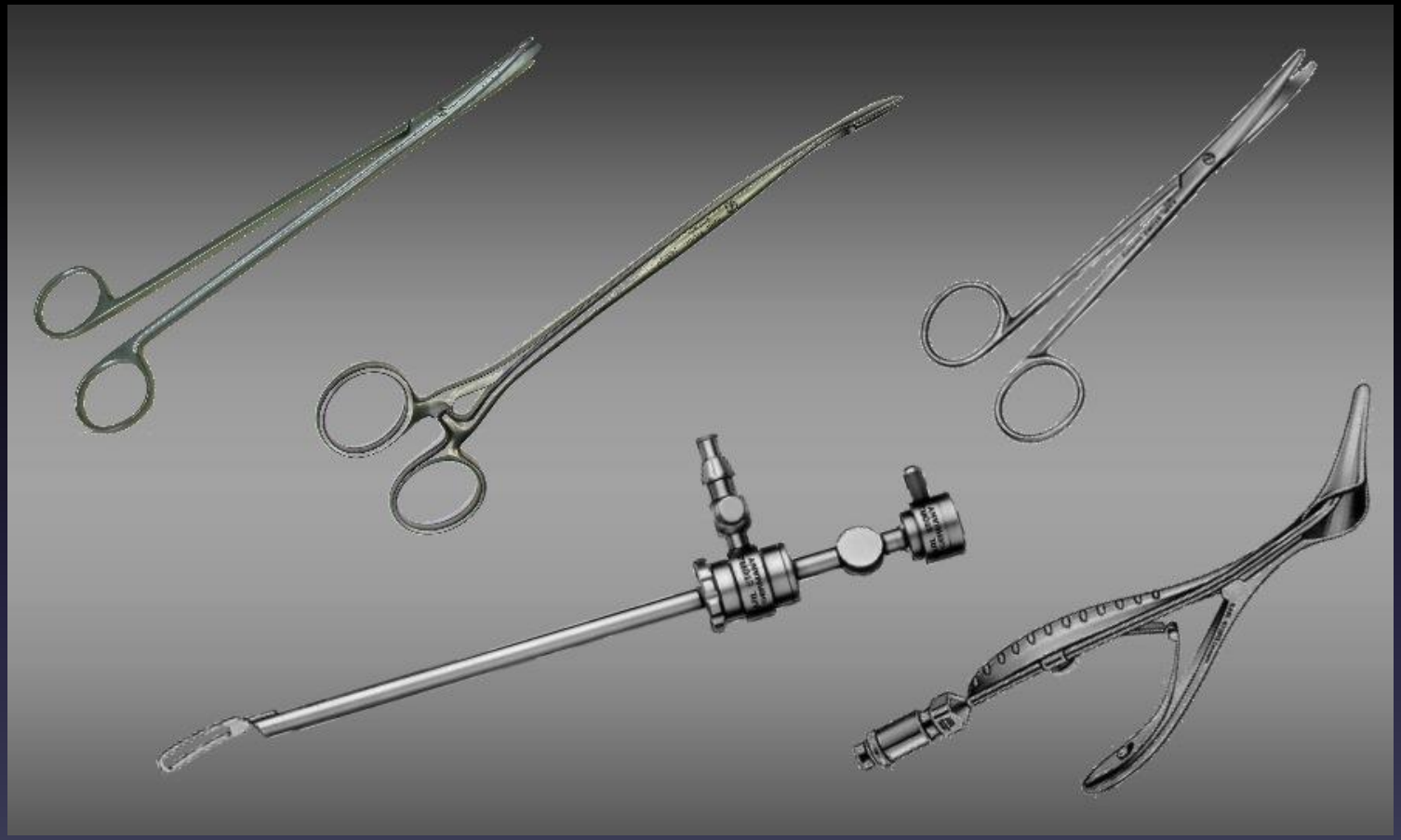
Endoscopic Cubital Tunnel Release

- 2 different surgical approaches
  - Cannulated push cut
    - EndoRelease (Integra), Clear Cannula (AM Surgical), Segway (Double barrel design)
  - Direct dissection
    - Storz (Hoffman)

Integra



Storz



Indications

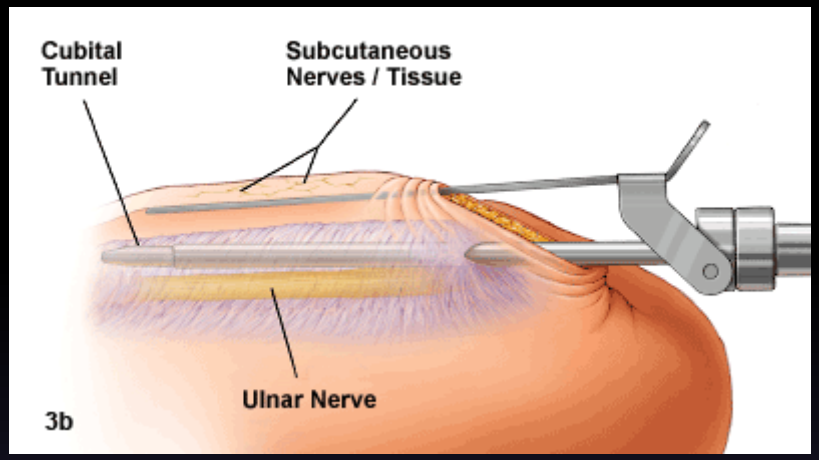
- Persistent symptoms despite appropriate course of non-operative management

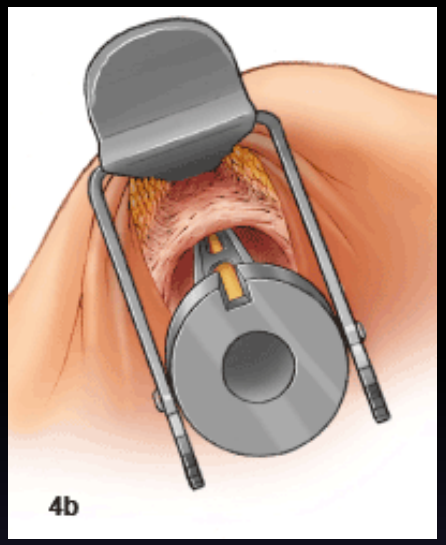
Contraindications

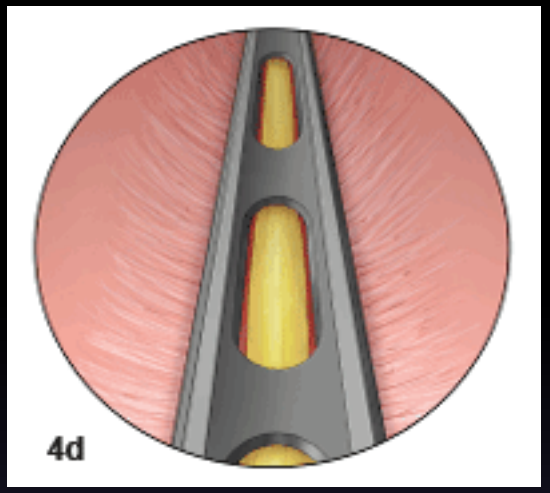
- Masses or space occupying lesions
- Severe elbow contractures requiring release
- Symptomatic subluxation of the ulnar nerve
- Prior ulnar nerve surgery
- Prior transposition
- Prior elbow trauma with scarred and adherent nerve
- Limited external rotation of the shoulder

Technique

- Plexus block or general anesthesia
- Incision 15-20 mm long along retrocondylar groove
- Cubital tunnel retinaculum incised allowing direct visualization of the ulnar nerve


Cubital
Tunnel
Subcutaneous
Nerves / Tissue
Ulnar Nerve
3b


4b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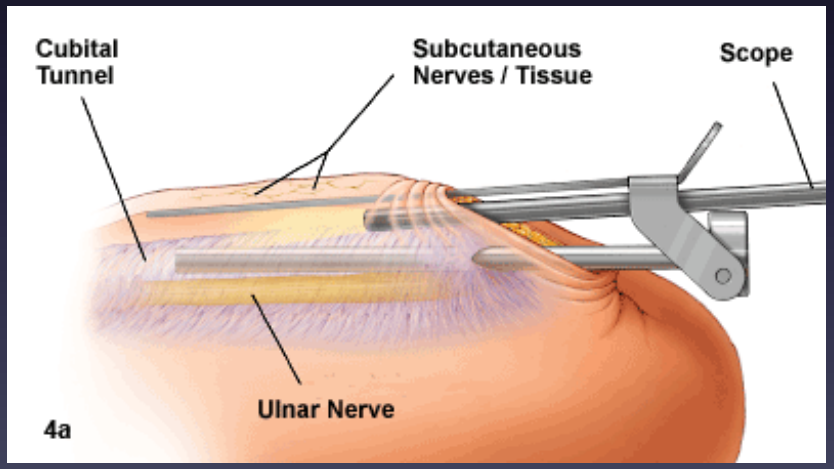
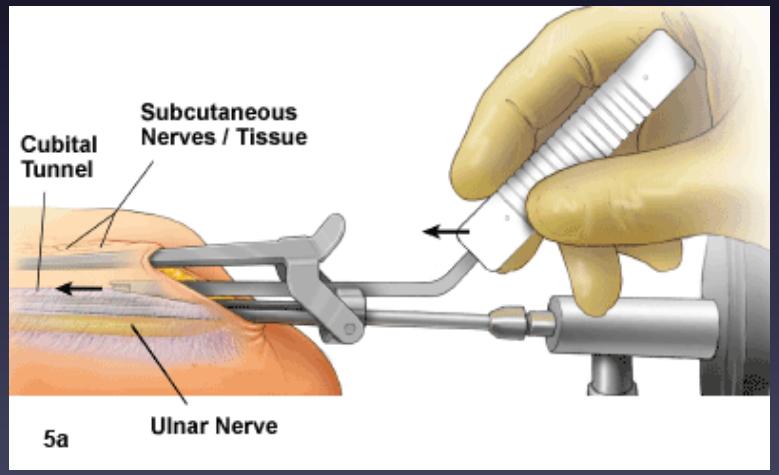
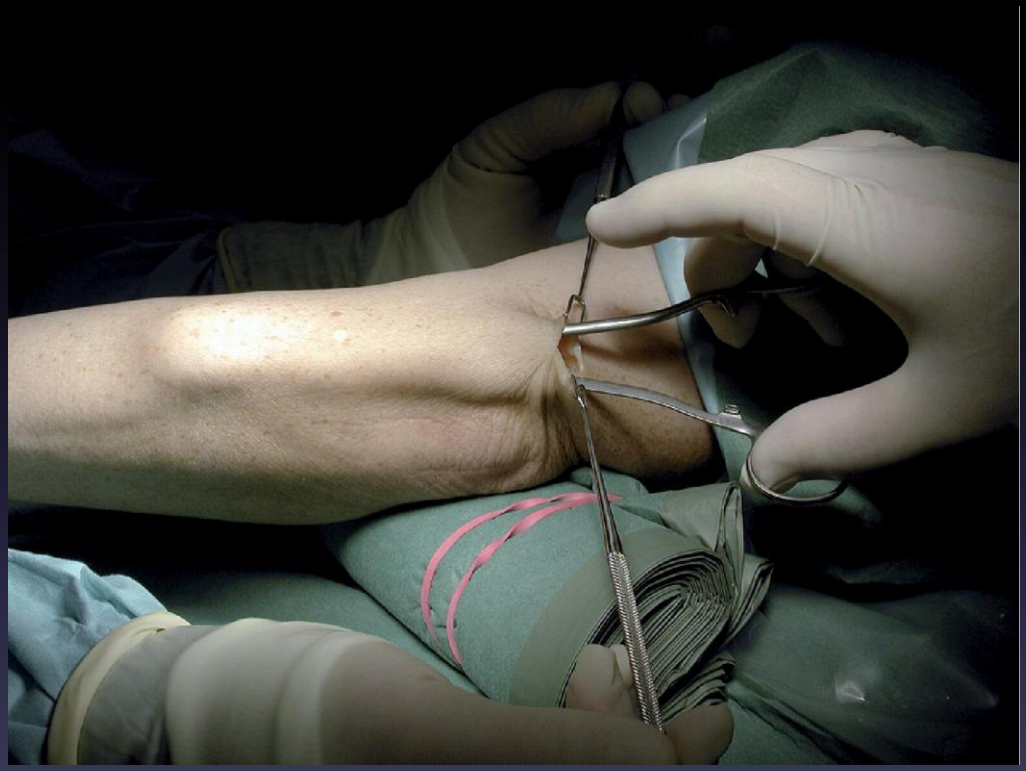
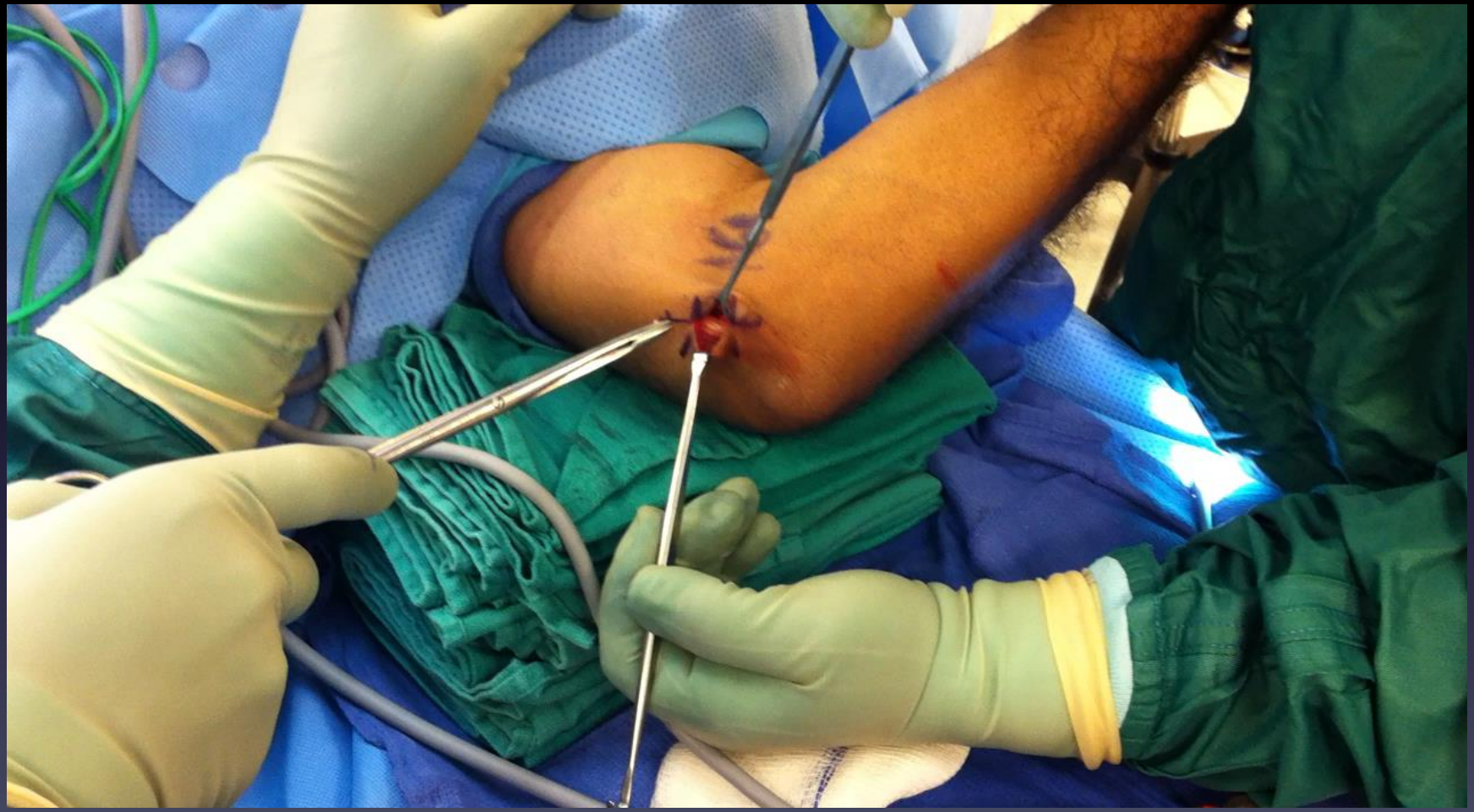
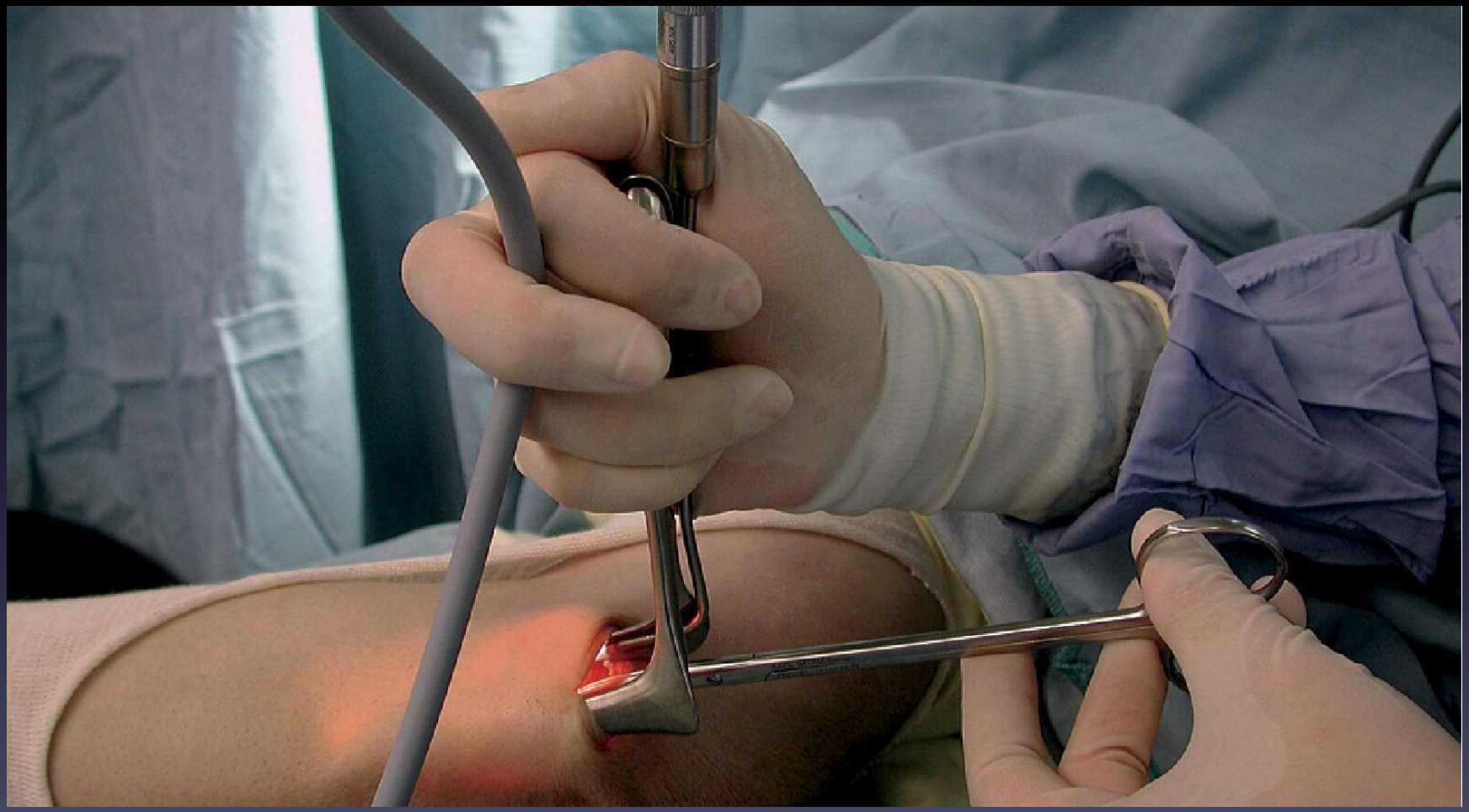

Cubital
Tunnel
Subcutaneous
Nerves / Tissue
Scope
Ulnar Nerve
4a


Cubital
Tunnel
Subcutaneous
Nerves / Tissue
Ulnar Nerve
5a

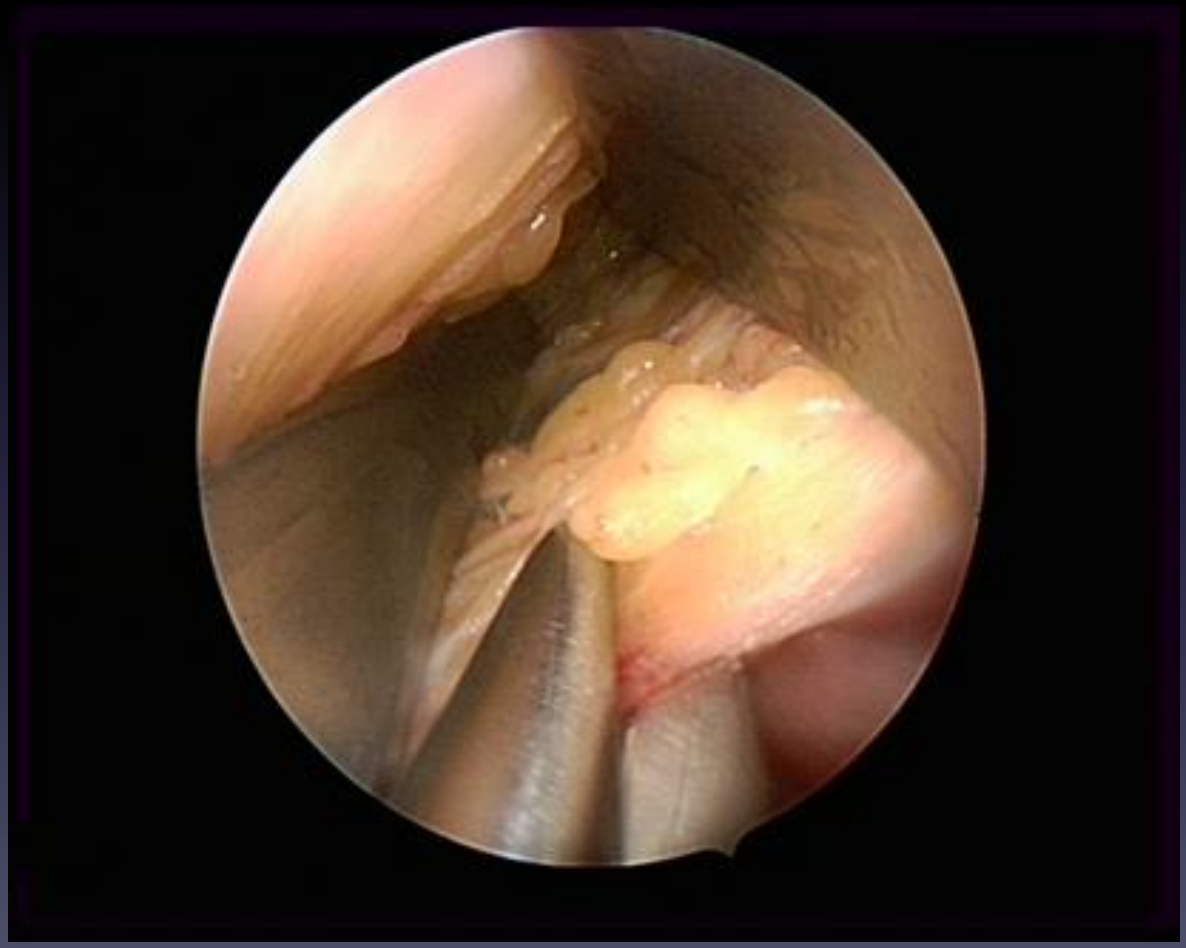




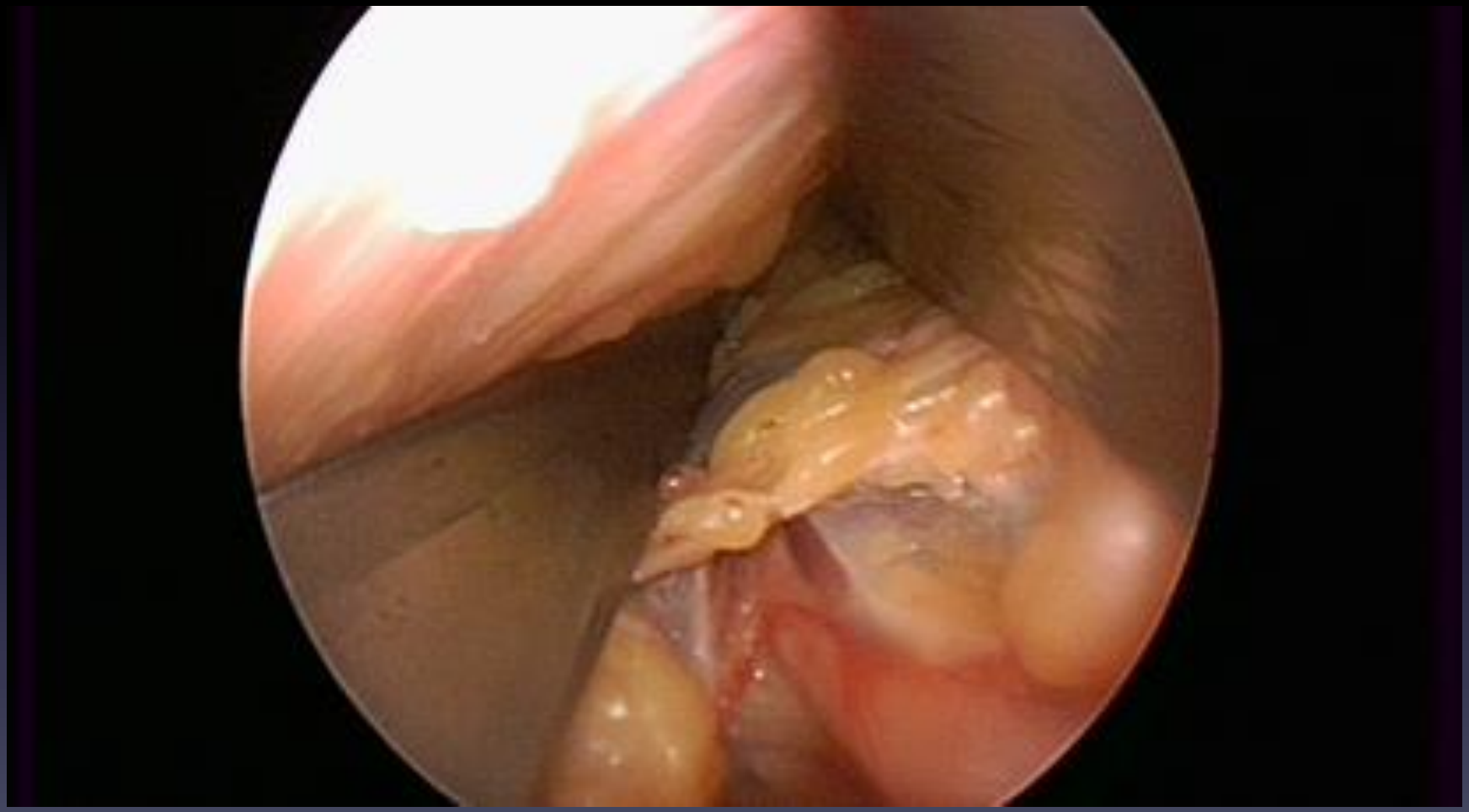


Leading edge of Osborne's Ligament

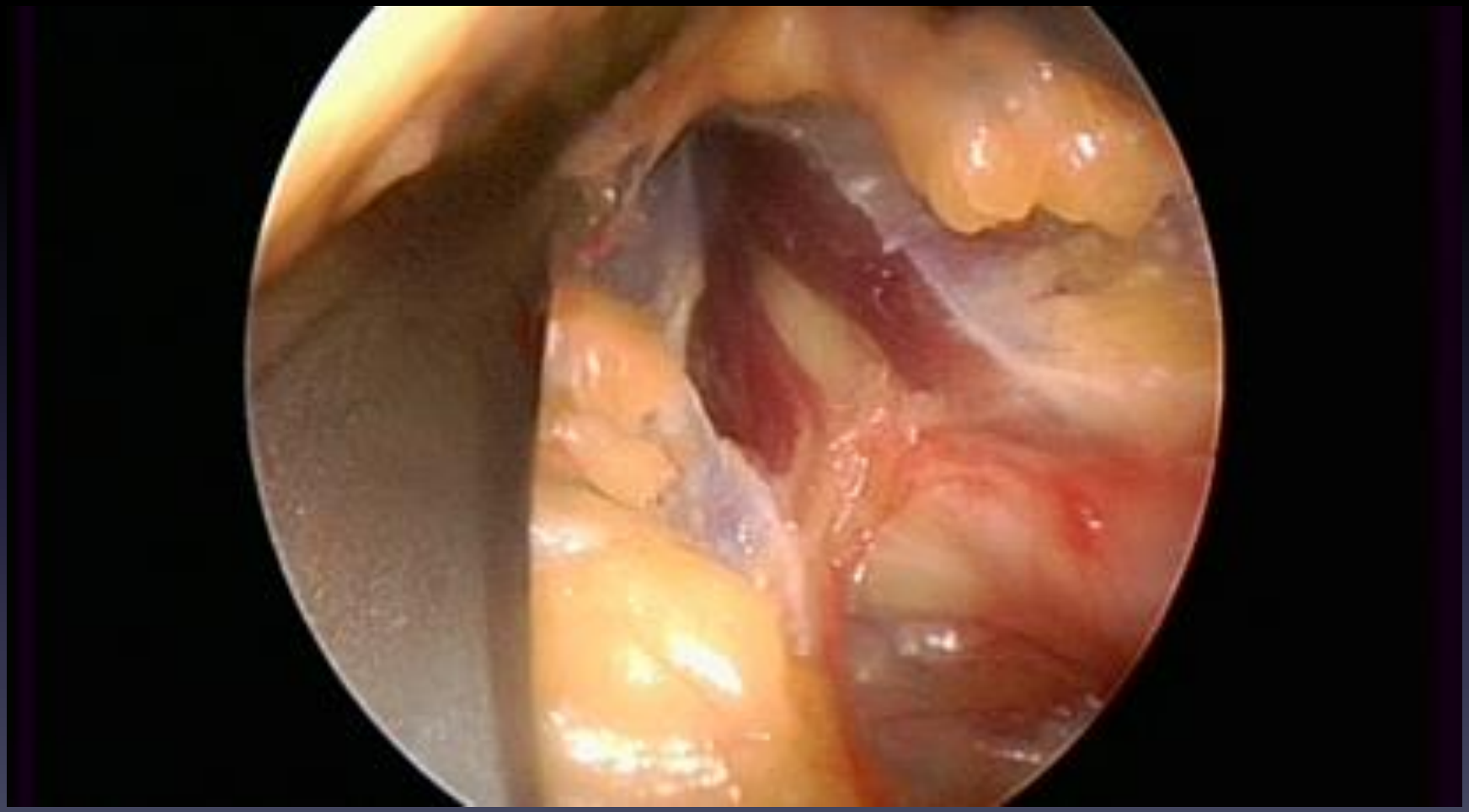
Releasing Osborne's Ligament



FCU Fascia

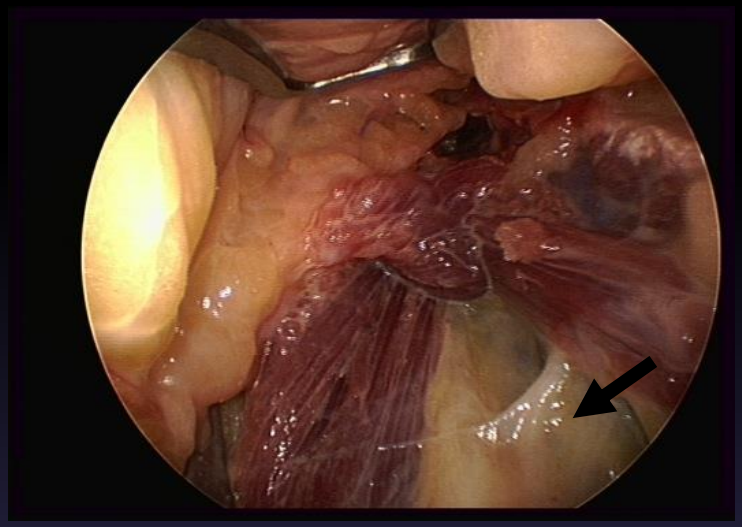


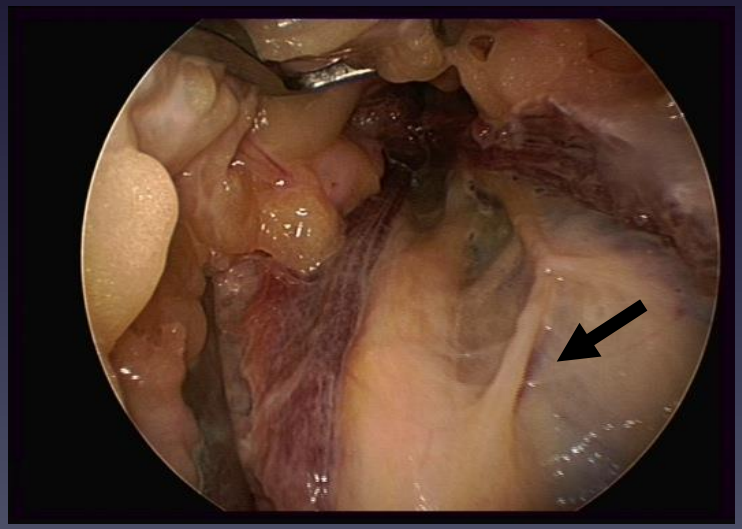
FCU Fascia released

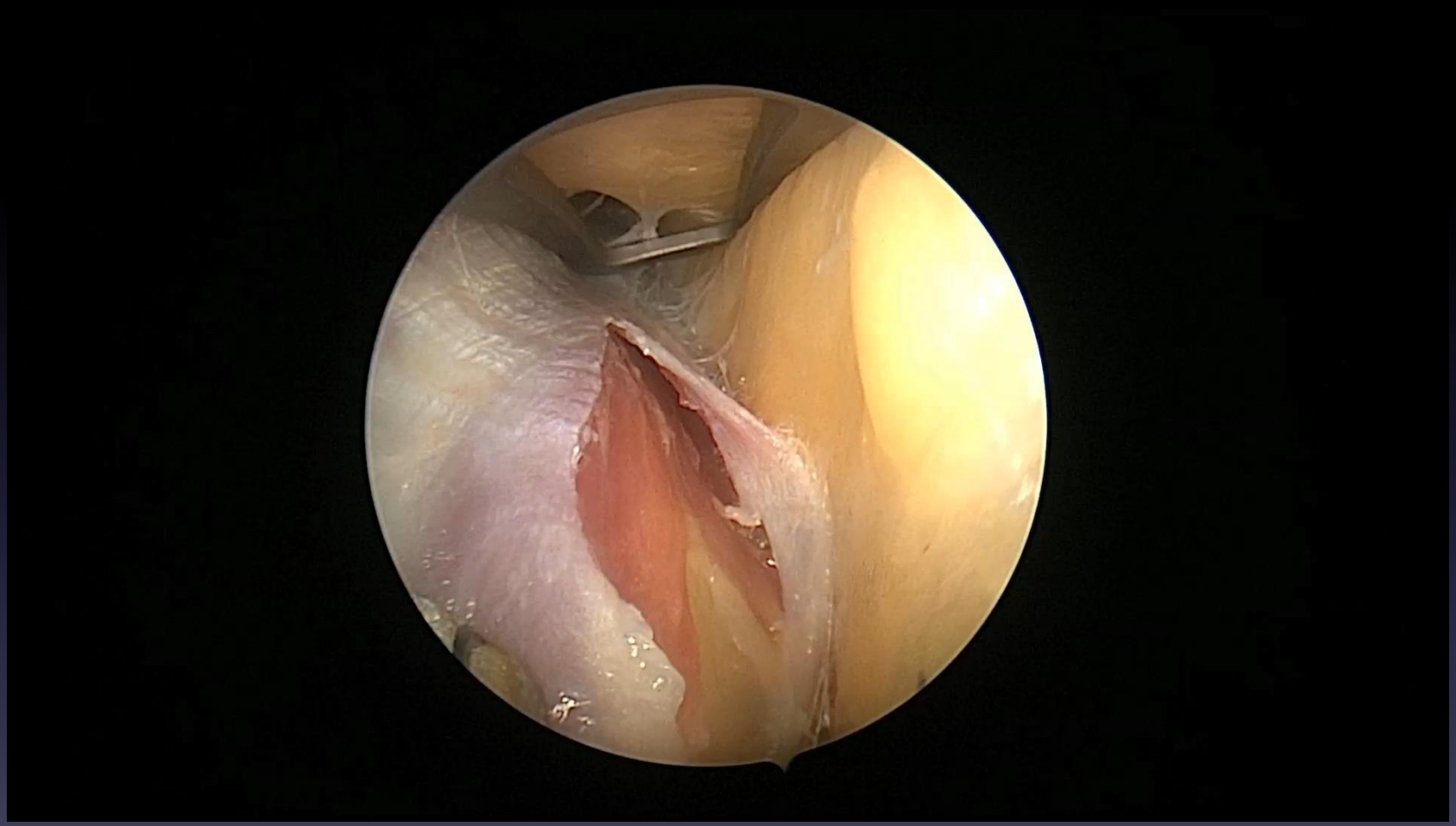


1st fibrous arcade

Distal release







Surgical Pearls

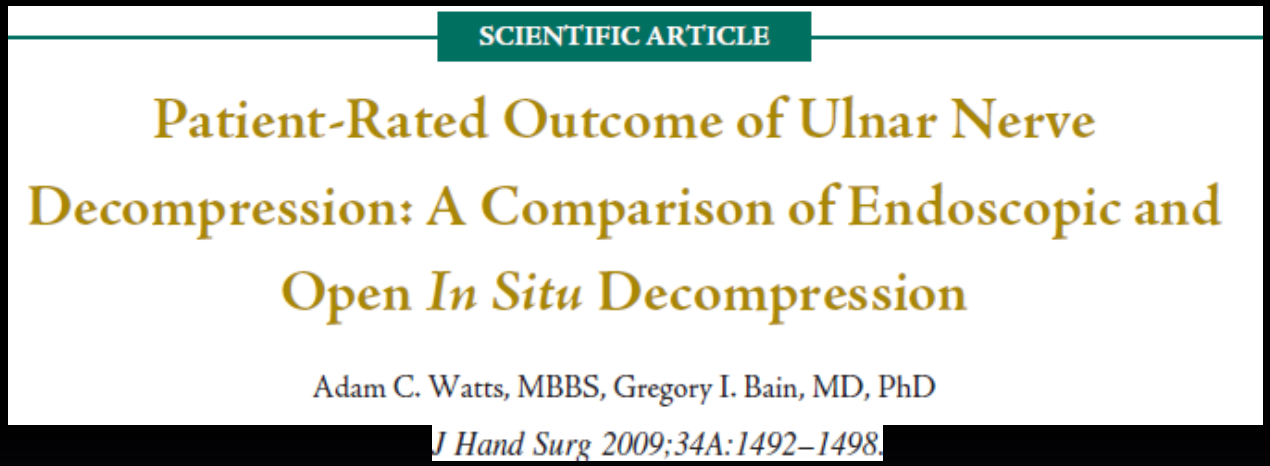
- Release of the submuscular membrane
  - Thickened fibrous bands at 3, 5 and 7 cm distal to the retrocondylar groove
  - Avoid muscle branches to FCU
- Place arm on bump to elevate
- Use slightly larger incision for first few cases
- Use the hooded speculum as a dissector

Surgical Pearls

- Adipose tissue (Proximally)
  - Makes visualization difficult
  - Avoid creating multiple layers
  - Use of speculum simultaneously with arthroscope with rounded dissector
- Use 20 gauge Angiocath though skin placed adjacent to ulnar nerve to deliver Marcaine at end of case

The evidence

- Tsai, et al JHS 1999
  - 76 patients (85 elbows)
- Hoffman, JHS Br 2006
  - 76 nerves in 75 patients
- Ahcan and Zorman, JHS 2007
  - 36 patients


SCIENTIFIC ARTICLE

Patient-Rated Outcome of Ulnar Nerve Decompression: A Comparison of Endoscopic and Open *In Situ* Decompression

Adam C. Watts, MBBS, Gregory I. Bain, MD, PhD

J Hand Surg 2009;34A:1492–1498.

- 34 patients
  - Retrospective, 12 month follow up
  - Equivalent results
  - Less pain and higher satisfaction with endoscopic group
  - Higher complication rate in open group (11% vs 40%) – includes scar tenderness and numbness at the elbow

The Evidence

- 3 Technique papers
  - Hoffman
  - Mirza
  - Cobb

Potential complications

- Injury to branches of the medial antebrachial cutaneous nerve
- Injury to the ulnar nerve
- Hematoma (most common, Cobb JHS 2010)
- Keloid formation
- Recurrent cubital tunnel
- Nerve instability

Post op care

- Soft dressing – tegaderm and ace wrap
- Immediate range of motion allowed
- Full motion expected by first post op visit
- Most patients feel ready for return to full activities between 4-6 weeks.

Endoscopic Cubital Tunnel Release

- Two different surgical approaches
- Steep learning curve
- Potential for less post op pain and faster recovery
- Further prospective comparative studies needed.