Endoscopic Cubital Tunnel Release

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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

- Intermuscular septum
- Triceps muscle
- Arcade of Struthers
- Ulnar nerve
- Medial epicondyle with origin of Flexor-Pronator muscle group
- Cubital tunnel containing Ulnar nerve
- Flexor carpi ulnaris muscle
• 4 Prospectively Randomized controlled trials
  – In-situ vs. anterior transposition
  – No statistical difference clinical results
  – Higher complication rate with transposition
• 2 meta-analyses in-situ vs. transposition
  – Including submuscular transposition
  – No difference in reported outcomes for transposition of any type
• 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 an 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
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
Leading edge of Osborne’s Ligament
Releasing Osborne’s Ligament
FCU Fascia
FCU Fascia released
1st fibrous arcade
Distal release

Precise Dissection of Fine Structures – e.g. Nerve Branches
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
• 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.