Complications of Elbow Arthroscopy: 4 Ways To Avoid

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DISCLOSURES

The following relationships exist:

1. Royalties and stock options
   - None
2. Consulting income
   - Smith & Nephew
3. Research and educational support
   - Arthrex
   - Mitek
   - Smith & Nephew
4. Other support
   - None
ELBOW ARTHROSCOPY

• More commonly performed
• Indications expanding
• Elbow difficult to arthroscope
• Very congruent
  – Proximity of neurologic structures
  – Most “at risk” for serious complications
  – Neurologic complications devastating
ELBOW ARTHROSCOPY COMPLICATIONS

• Kelly et al. (Mayo) JBJS 2001
  – Largest and most comprehensive review
  – 473 consecutive patients
• Serious complication rate of 1%
  – No permanent neurologic injuries
• Minor complications (11%)
  – Superficial portal site infections
  – Minor contractures
  – Transient nerve palsies
ELBOW ARTHROSCOPY COMPLICATIONS

• Anecdotal cases of nerve injury
• Severe damage reported
  – Ulnar nerve
  – Radial nerve
• PIN
  – Median nerve
• Almost all reported cases of severe nerve injury occurred during “at-risk” procedures
  – Arthroscopic capsular release
  – Bony procedures
• Radial head resection
• Case report of ulnar nerve transection
  —Revision capsular release
4 Ways To Avoid Complications

- Surgical Tips
  - Increase safety
  - Improve effectiveness
  - Reduce complications
PEARL #1

Portals

• Define landmarks and palpate ulnar nerve
  – Utilize proximal anterior portals when possible
PROXIMAL PORTALS

• Anterior portal placement
  – Proximal portals safer
    • N/V structures further away
    • Proximal portal visualization equivalent
  – Ensure ulnar nerve not subluxated
ANTEROLATERAL PORTALS

Lateral Epicondyle

Radial Nerve
ANTEROMEDIAL PORTALS

- Median Nerve
- Medial Epicondyle
PEARL #2

• Beware Radial Nerve
  – Avoid anterolateral capsule adjacent to radial head
• Radial nerve distance from capsule
  - Arthroscopic correlation in 24 cadavers
  - Brachialis between radial nerve and capsule at joint line and proximal
  - Radial nerve in direct contact with capsule distal to joint line in 50% of specimens

• **Recommended avoiding capsule near radial head when possible**
CLINICAL STUDY

• Assess complications
  – Retrospective chart review
  – 269 consecutive elbow arthroscopies
  – 3 year period
## PROCEDURES

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<tr>
<th>Procedures</th>
<th>Number</th>
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<tbody>
<tr>
<td>Lateral Epicondylectomy</td>
<td>161</td>
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<tr>
<td>Extensive Debridement with Ulnohumeral Arthroplasty</td>
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<td>Diagnostic Arthroscopy with Open MCL Repair</td>
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<td>Plica Excision</td>
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- Multiple procedures in some patients
RESULTS

- 16 Minor Complications (5.9%)
- 3 Major Complications (1.1%)
- 250 No Complications

Total: 272
RESULTS

- 3 Major Complications (1.1% incidence)
  - RSD (1)
  - Septic elbow (1)
  - Portal fistula (1)
RESULTS

• 16 Minor Complications (5.9% incidence)
  - Superficial portal infections (6)
  - Temporary nerve palsies (5)
  - Olecranon bursitis (3)
  - Prolonged portal drainage (1)
  - Heterotopic ossification (1)

• Overall complication rate (7%)
TEMPORARY NERVE PALSIES (5)

- **Posterior interosseous nerve (4)**
  - Lateral epicondylectomy (2)
  - Debridement/capsular release (2)
    - Treated successfully with B complex vitamins / E-stim / physical therapy
- **Ulnar nerve (1)**
  - Loose body removal / pre-existing ulnar nerve symptoms
    - Required transposition
- Complete nerve function returned by 1-6 months in all patients
PIN INJURY

• Prolonged dysfunction in:
  - 2 of 161 tennis elbow releases
  - 2 of 80 extensive debridements/capsular releases
RADIAL NERVE AT RISK

- Arthroscopic debridement/capsular release
  - Nerve injured 2.5% of cases
  - Demanding procedures
    - Extensive manipulations laterally
    - Capsule excised adjacent to nerve
  - Nerve injury risk comparable to open surgery
RADIAL NERVE AT RISK

- **Arthroscopic tennis elbow release**
  - Nerve injured 1.3% of cases
  - Not so demanding
    - Limited debridement / manipulation
- Emphasizes risk due to proximity
• Osteotomes effective and decrease iatrogenic damage
  - Use small hand held osteotomes for removal of bony spurs and prominences
OLECRANON OSTEOPHYTES

“Mickey Mouse Ears”
PEARL #4

- Protect and decompress ulnar nerve when indicated
ELBOW CONTRACTURE

- Ulnar nerve symptoms common pre-op
  - Compressive neuropathy 2° osteophytes and/or scarring
  - More likely with increasing motion loss
- Often subclinical
  - Pain at cubital tunnel with forced flexion
ULNAR NERVE MANAGEMENT

• Morrey et al (JBJS, 2001)
  – 13 of 45 patients undergoing open debridement had post-op ulnar nerve symptoms
  – Only 7 of 13 had pre-op symptoms
  – 6 patients required additional operation to decompress nerve
ULNAR NERVE MANAGEMENT

• Carefully assess patients pre-op
• All patients with any pre-op nerve symptoms should undergo decompression
• Pre-op flexion of $\leq 95^\circ$ probably decompressed regardless of open vs. arthroscopic approach
SUMMARY

- Elbow arthroscopy proven safe and effective
- Knowledge of arthroscopic neural anatomy very important
- Careful arthroscopic technique reduces risk
  - Proximal anterior portals
  - Avoid anterolateral capsule
  - Small osteotomes
  - Decompress ulnar nerve
THANK YOU