Elbow Contracture Release
Arthroscopic Management
4 Steps

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Elbow Contractures

• Involve terminal extension, well tolerated
  – Exceptions
    • Basketball players - affects jump shot
    • Gymnasts - affects routines
    • Weight- lifters - can not lock out

• Lack of flexion not well tolerated
  – Females: Can not get to hair, make-up
  – Males: Hard to fix tie, shave
Intrinsic Factors

• Amendable to arthroscopic intervention
  – Synovitis
  – Loose bodies
  – Capsular contracture
  – Joint incongruity
  – Post-traumatic arthritis
  – Articular surface ankylosis
Extrinsic factors

- Not amendable to arthroscopic intervention
  - Heterotopic bone
  - Myositis ossification
  - Muscular contractures
  - Collateral ligament contracture

- Many factors may coexist and probably do!
Arthroscopic Release

- **Indications:**
  - Young athlete
    - Loose bodies
    - Osteochondritis dissecans
    - History of hyperextension
  - Middle age patients
    - Primary osteoarthritis
    - Rheumatoid arthritis
  - History of radial head fracture
Arthroscopic Release

• Contraindications:
  – Extrinsic Factors
    • Extensive heterotopic ossification
    • Spastic elbow contractures
  – Pre-operative ulnar nerve symptoms
    • Venerable to scarring
    • Less than 90 degrees flexion
Timing of Release

• Traditional
  – Wait at least 1 year
    • Bone scan un-reactive
    • Alkaline phosphotase levels

• In reality:
  – Patients rarely gain motion after 6 months
    • Exception: Pediatric fractures
  – Soft tissue contractures continue to mature

• Consider release after 6 months with no improvement
  • Hotchkiss R: Green Operative Hand, 1999
Arthroscopic Release

- Patient may be either supine or prone
  - Supine may be easier if early in learning curve
    - Easier to convert to open procedure
- Distend joint
  - Remember joint will accept minimal amount of fluid due to capsular contracture
Anterior Capsule Release

- Must cut, not peel up!
- Excise 1-2 cm of capsule
- Start at coronoid fossa
  - Stay on bone
  - Work medial intermuscular septum to lateral
Anterior Capsule Release

- Cut and excise the capsule!
- See Brachialis muscle fibers
  - Shaver cutting capsule
Anterior Capsule release

- Release capsule septum to septum
- Switch portals
- May peel brachialis muscle fibers off humerus
  - Use shaver as an elevator!
  - Humerus is seen above, capsule below as brachialis is peeled off
Posterior Compartment Release

- Scope in posterocentral portal
- Establish posterolateral portals
- Excise olecranon tip if needed
- Debride gutters
  - Olecranon tip as seen with scope in posterocentral portal
Structures at Risk

• **Posterior Interosseous Nerve**
  – Adjacent to anterior capsule distal to radiocapitellar joint
  – Use proximal anterolateral portals
  – Stay on humerus

• **Ulnar Nerve**
  – Do not debride posterior to medial intermuscular septum
  – Beware medial gutter
  – May make small incision
    • Release nerve to protect
Elbow Contracture
Supine Position
Results

- Kim SJ, Kim HK, Lee JW
- 25 patients
  - Preoperative extension: -21 degrees
  - Preoperative flexion: 113 degrees
  - Postoperative extension: -14 degrees
  - Postoperative flexion: 130 degrees

» Arthroscopy 11: 680, 1995
Results

• Phillips BB, Strasburger S
• 25 patients
  – Preoperative extension: -31 degrees
  – Preoperative flexion: 118 degrees

  – Postoperative extension: -7 degrees
  – Postoperative flexion: 134 degrees

  » Arthroscopy 14:38, 1998
Conclusions

• Joint contracture due to multiple causes
• Customize surgery to the pathology
  – Open Release – Extrinsic Factors
    • Heterotopic bone
    • Muscle spasticity
    • Nerve Entrapment
  – Arthroscopic Release – Intrinsic Factors
    • Capsule contracture
    • Loose Bodies
    • Synovitis

Can always convert to open!!!
THANK YOU

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Arthroscopy for Arthritis

• The Elbow
  – Indications
    • Inflammatory arthritis
      – Elbow affected 20% to 50%
      – Synovectomy
        » Good for pain relief
    • Radiocapitellar arthritis
    • Sequelae of degenerative arthritis
      – Loose bodies
      – Elbow contracture
        » Remove osteophytes
        » Capsule release
Osteophyte Removal

• Pain relief
  – Terminal range of motion
• Potential improved range of motion
Osteophyte Removal
Results

- Ward WG, Anderson TE
  - 35 athletes
    - 90% Improvement in pain
    - 34 of 35 believed operation worthwhile

Radiocapitellar Arthritis

- History of previous radial head fracture
- Inflammatory arthritis
  - Resection controversial
    - Elbow instability
- Osteochondritis dissecans
- Physical Examination
  - Painful forearm pronation/supination
  - Radiocapiteallar crepitation
Arthroscopic Radial Head Resection

• Surgical Technique
  – Arthroscope in superior medial portal
  – Working portal
    • Superior lateral portal
      – Resect anterior portion radial head
      – Pronate/supinate forearm
        » Protect radial nerve
        » Beware of suction
    • Soft spot portal
      – Cutting block technique
Surgical Technique
Radial Head Excision
Ulnohumeral Arthroplasty

• Popularized by Morrey
• Outerbridge-Kashiwagi procedure
  – Fenestration of olecranon fossa
  – Excision of coronoid osteophytes
• Kashiwagi
  – 8 cm posterior triceps-splitting incision
• Redden and Stanley
  – Arthroscopic technique
    » Arthroscopy 9: 14-16, 1993
Surgical Technique

- **Posterior Compartment**
  - Excision olecranon tip
  - Identify olecranon fossa
  - Create defect
Ulnohumeral Arthroplasty

Results

• Redden JF, Stanley B (12 patients)
  • All patients relief of pain and locking
  • Minimal change in range of motion
    » Arthroscopy 9: 14-16, 1993

• Cohen AP et al (18 open, 26 arthroscopic)
  • Arthroscopic group: improved pain relief
  • Open group: Improved flexion
    » Arthroscopy 16: 701-706, 2000

• Savoie FH et al (24 patients)
  • Arc of motion improved from 50 degrees to 131 post –op
  • CAPSULE RELEASE !!!!
    » J Shoulder Elbow Surg 8: 214-219, 1999