Introduction to Shoulder Arthroscopy

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SpR Northern Deanery
History of Arthroscopy

Bozzini, in 1806, presented his “Lichtleiter” to the Rome Academy of Medicine
History of Arthroscopy

• 1853 - A.I. Désormaux
  “gazogene endocystoscope” - Turpentine
• 1886 - Nitze and Leiter
  “cystoscope” - Incandescent bulb
• 1912 - Dr. Severin Nordentoft
  Jacobaeus Laparoscope - examine knees
  41st Congress German Surgical Society, Berlin
History of Arthroscopy

- Professor Kenji Takagi, 1918, cystoscope to examine tuberculous knees
History of Arthroscopy

Masaki Watanabe, MD
University of Tokyo

• 1959 Watanabe # 21- first production scope
• 1967 Watanabe #22-first fibre optic scope
• 1970 Watanabe #25-ultra thin fibre optic arthroscope
History of Arthroscopy

1964 - Robert W. Jackson
1969 – Richard O’Connor

1st & 2nd AAOS Instructional courses
History of Shoulder Arthroscopy

• 1931 – Burman – Cadaveric joints
• 1965 – Andren et al – Clinical reports
• 1979 – Conti
• 1980 – Wiley & Older
• 1970’s -80’s – Watanabe
  – Osteochondral #; loose bodies; Labral lesions; Biceps brachii
  – Clarified position of portals
Shoulder Arthroscopy

- Arthroscopic Subacromion decompression
- Arthroscopic Acromioplasty
- Arthroscopic Rotator cuff Surgery
  - one row
  - double row
- Capsular Release
- Arthroscopic AC resection arthroplasty
- Arthroscopic AC instability reconstruction
Shoulder Arthroscopy

Instability Surgery

• Arthroscopic Bankart repair
• Capsular shift
• Arthroscopic Latarjet procedure
• Rotator interval closure
• Repair of HAGEL lesion
• Repair of SLAP lesion
Shoulder Arthroscopy

- Suprascapular nerve release
- Brachial plexus nerve release
- Axillary nerve release
- Quadrilateral and triangular space release

- Latissmus dorsi transfer for rotator cuff deficiency, irreparable tears
Basic Instrument

Arthroscope - 30° and 70° scopes
Basic Instrument

- Arthroscope sheath with matching sharp and blunt trochars
- Punches, Graspers, Seizers, Probes
The Stack
Arthroscopy Equipment

Fluid Management System
Arthroscopy Equipment - Shaver
Arthroscopy Equipment

Arthroscopy Electrocautery System - Radiofrequency

- ArthroCare® Coblation
- VAPR, Depuy Mitek
Instrumentation
Anchor Sutures

• Metal Anchor Suture

• Bio Anchor Suture

• Knotless Anchor Suture
Patient Position

• Beach chair the most common

• Lateral
Lateral Position

Advantages
• Comfortable for beginners
• Easy tool switching
• GlenoHumeral Procedures

Disadvantages
• Difficult Cuff repairs
• To convert to open procedure
Beach Chair Position

Advantages
• Gleno-Humeral Procedures
• Easy Cuff Repair
• Easy conversion to Open procedure

Disadvantages
• Less comfortable for beginners
• Difficult Tool Switching
Shoulder Arthroscopy portals

- Identify major Subcutaneous Landmarks
- Humeral Head
- Gleno – Humeral Joint
- Localisation of the Joint Plane
Shoulder Arthroscopy portals
Posterior Portal

Posterior Portal – Soft spot

• 2 cm inferior and 2 cm medial to the posterolateral corner of the acromion

• Passage to the posterior one-third of the deltoid and an interval between infraspinatus and teres minor

• Structures at risk
  – Quadrangular space - posterior humeral circumflex artery and axillary nerve
  – Triangular space - scapular circumflex artery
  – Both spaces are 7-8 cm inferior to the posterior border of the acromion
Anterior Portal – High Anterior

- Located one-half the distance between the coracoid process and the anterolateral edge of the acromion
- Passage through the skin subcutaneous tissue and the anterior one-third of the deltoid

- Structures at risk
  - Musculocutaneous nerve, normally located 3 cm inferior and just medial to the coracoid process
Portals for Anterior Instability Surgery
Antero Medial Portal
Lateral Portal

- 2-3 cm distal to the lateral border of the acromion
- Passage through the deltoid muscle
- Structures at risk:
  - Axillary nerve
Supraspinatus fossa portal (of Neviaser)

- Soft spot bordered anteriorly by the posterior margin of the clavicle, laterally by the medial border of the acromion, posteriorly by the scapular spine
- Passage through the trapezius and the muscle belly of the supraspinatus
- Structures at risk
  - Suprascapular nerve and artery
  - Located in the fossa approx. 3 cm medial to the portal
SLAP Repair

Cuff Repair
# Documentation

<table>
<thead>
<tr>
<th>Operation</th>
<th>Op Code</th>
<th>Glenohumeral Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Labrum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LHB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capsule</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rotator Interval</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recess</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose body</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HAGL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SGHL/ MGHL/ GH[</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Portale</th>
<th>Examination</th>
<th>Range of movement</th>
<th>External Rotation</th>
<th>Forward Elevation</th>
<th>Abduction</th>
<th>Anterior instability</th>
</tr>
</thead>
<tbody>
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</table>

<table>
<thead>
<tr>
<th>Rotator Cuff</th>
<th>Supraspinatus</th>
<th>Normal</th>
<th>Size of tear</th>
<th>Shape of tear</th>
<th>n/a</th>
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</thead>
<tbody>
<tr>
<td>Infraspinatus</td>
<td>Normal</td>
<td>Size of tear</td>
<td>Shape of tear</td>
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<tr>
<td>Subscapularis</td>
<td>Size of tear</td>
<td>n/a</td>
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</tbody>
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<table>
<thead>
<tr>
<th>DRAWING TOOLBOX</th>
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<tbody>
<tr>
<td>Spray Can</td>
</tr>
<tr>
<td>Pencil</td>
</tr>
<tr>
<td>Anchor suture</td>
</tr>
<tr>
<td>Grade I</td>
</tr>
<tr>
<td>Grade II</td>
</tr>
<tr>
<td>Grade III</td>
</tr>
<tr>
<td>Grade IV</td>
</tr>
<tr>
<td>Subacromial</td>
</tr>
<tr>
<td>LHB</td>
</tr>
<tr>
<td>Supraspinatus</td>
</tr>
<tr>
<td>Infraspinatus</td>
</tr>
<tr>
<td>Clear drawings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subacromial Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acromion</td>
</tr>
<tr>
<td>Impingement?</td>
</tr>
<tr>
<td>Supraspinatus - from above</td>
</tr>
<tr>
<td>Bursa</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Acomiolavicular Joint</td>
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<tr>
<td>Normal</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Closure &amp; Post Op</th>
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</thead>
<tbody>
<tr>
<td>Closure</td>
</tr>
<tr>
<td>Dressings Only</td>
</tr>
<tr>
<td>OPA</td>
</tr>
<tr>
<td>2 weeks - nurse practitioner for wound Physio</td>
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<tr>
<td>As per protocol</td>
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<table>
<thead>
<tr>
<th>Suggestions for long term treatment (optional)</th>
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<tbody>
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</table>

- A copy has been sent to the GP
- Photos or video have been taken
- Anchors used
- Anchors number
- Anchors type

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![Diagram of shoulder joint](image-url)
Complications of Shoulder Arthroscopy

REFERENCES


Complications

Small NC (Arthroscopy 1986)

• First report: 5.3% complication rate
• Relatively Safe procedure

Review Articles – Early 90’s

Biginlani et al (Orthop Rev. 1991)

Curtis et al (Arthroscopy 1992)

• 6.5 – 7% complication rate
Complications

Review articles – Late 90’s

• McFarland  (J South Orthop Assoc 1997)
  – Neurologic comp 0-30%
  – Infection rate 0.04-0.23%

• Berjano (Arthroscopy 1998)
  – 179 patients - 9.49% complication rate
Complications

These reviews have shown that the Increased complexity of the procedures performed correlates with increased complication rates.
General Complications

• Anaesthesia
  – Airway Compromise embolism
  – Related to Interscalene Blocks

• Infections: 0 - 4%

• DVT
Complications

- Stiffness – Commonest - 2- 15 %
  Contracted / Captured shoulder
  Treat - Physiotherapy
    - Arthroscopic capsular release

- Fluid Extravasation
  - Soft tissue oedema
  - Airway compromise
  - Skin necrosis
  - Neuropraxis
Complications

• Nerve Injury
  – Secondary to traction or Contusion
  – Avoided by Careful Portal Placement & Arm manipulation
  – Cuff surgery – 1-2%
  – Instability Surgery – 1–8%
Complications

- Muscle and Tendon Injury
  - Cuff Injuries
  - Deltoid detachment (over aggressive SAD)
  - Rare

- Osseous
  - Isolated cases of acromial #
  - Heterotrophic ossification
Complications

• Hardware problems
  – Breakage
  – Pullout
  – Lysis
  – Synovitis / Foreign body reaction
Complications

• Chondrolysis
  – Iatrogenic injury
  – Thermal injury
  – Bupivacaine induced
Shoulder Arthroscopy

Awareness and understanding of potential complications help make shoulder arthroscopy a reliable and safe technique.
Thank You