견관절의 관절경적 해부학과 진단적 관절경 검사

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신 상 진

ANESTHESIA

1) General anesthesia: hypotensive anesthesia is preferred
systolic pressure; 90 mmHg, systolic-to-pump pressure; 30 mmHg
2) Regional anesthesia (interscalene block): decreased blood loss
decreased postoperative analgesic requirements

PATIENT POSITION

1) Lateral decubitus position
- General anesthesia is preferred
- Arm position: 15° forward flexion
45° abduction (GH joint), 20° abduction (subacromial space)
- Body position: 20~30° posterior tilt (glenoid surface parallel to the floor)
- Traction: 5~15 lb
- Advantages: accentuation of tears of the glenoid labrum
improve arthroscopic access to inferior portion of the GH joint
- Disadvantages: difficult to convert open procedures (especially anterior approach)

2) Beach chair position
- Interscalene block is preferred (GA can cause hypotension)
- Sit up at a minimum of 60°
- Advantages: reduce risk of neuropraxia
normal view of intra-articular anatomy
improve mobility of the patient's arm
easy conversion to open procedures
- Disadvantages: need assistant or special device to control arm
difficult to access for axillary pouch and posterior recess

*** Control of bleeding during shoulder arthroscopy**

1) use an arthroscopy pump
2) add epinephrine in the arthroscopic solution
3) hypotensive anesthesia (most effective)

PORTAL PLACEMENT

* Surface Landmarks

- Clavicle, acromion, coracoid process, supraclavicular fossa, AC joint

Glenohumeral Arthroscopy

1) Standard posterior portal

- Location: 2 cm inferior and 1 cm medial to the posterolateral corner of acromion soft spot-muscular interval between infraspinatus and teres minor muscle
- feel the step-off between the posterior glenoid rim and the humeral head
- advance the trocar toward the coracoid
- ideally, the cannula is introduced at the midequator of the glenoid
- main viewing portal
- quadrangular and triangular space are located 7~8 cm inferior to the posterolateral corner of the acromion

2) Accessory posterior portal

A. Posterolateral portal
- Location: 2 cm lateral to the standard posterior portal
- for the posterior instability

B. Port of Wilmington
- Location: 1 cm lateral and 1 cm anterior to the posterolateral corner of the acromion (between the supraspinatus and infraspinatus muscles and 5~10 mm medial to the musculotendinous junction)
- for labral repair in the posterosuperior quadrant of the glenoid

3) Anterior portals

A. Anterosuperior portal
- Location: rotator interval in the triangle (inside-out technique)
  1 cm lateral to the anterolateral corner of the acromion (outside-in technique)
- if diagnostic procedures, the anterosuperior portal may be placed

anywhere in the rotator interval, otherwise distal clavicle excision-more medial, RSDL-more higher

B. Anteroinferior portal
- Location: just proximal to the subscapularis tendon
- for inferior labrum and capsule procedures
- portal to nerve distance; musculocutaneous nerve 22.9 mm, axillary nerve 24.4 mm

4) Accessory anterior portal

A. Nevaiser portal
- Location: notch between the posterior AC joint and the spine of the scapula
- for supraspinatus tendon repair and distal clavicle resection
- suprascapular nerve and artery are 3 cm medial to this portal

B. 5 O' Clock portal
- Location; 1 cm inferior to the anteroinferior portal through the subscapularis tendon
- cephalic vein is at risk (only 1 cm away)

Visualizing from the posterior portal during GH arthroscopy

1) Biceps tendon and superior labrum
2) Posterior labrum and capsule recess
3) Inferior axillary recess and inferior capsular insertion to the humeral head
4) Inferior labrum and glenoid articular surface
5) Supraspinatus tendon of rotator cuff
6) Posterior rotator cuff insertion and bare area of the humeral head
7) Articular surface of the humeral head
8) Anterior superior labrum, superior and middle glenohumeral ligaments, and subscapularis tendon
9) Anterior inferior labrum
10) Anterior inferior ligament

Visualizing from the anterior portal during GH arthroscopy

1) Posterior glenoid labrum and capsule insertion into the humeral head
2) Posterior rotator cuff, including infraspinatus and the supraspinatus tendons

3) Anterior glenoid labrum and inferior glenohumeral ligament attachments to the humeral head
4) Subscapularis tendon and recess and middle glenohumeral ligament attachment to the labrum
5) anterior surface of the humeral head with subscapularis attachment and biceps tendon passage through the rotator interval

Subacromial Bursoscopy

1) Posterior portal

- same standard posterior portal of GH arthroscopy
- withdraw the cannula from GH joint and angled more superiorly and palpate the undersurface of the acromion with the trocar
- place the trocar as lateral as possible

2) Anterior portal

- same anterosuperior portal of GH arthroscopy (lateral to CA ligament)

3) Lateral portal

- Location: 2~3 cm lateral edge of the acromion on the line of the clavicle notch (approximately midportion of the acromion)

Visualizing from the posterior portal during subacromial arthroscopy

1) Inferior surface of acromion and the coracoacromial ligament
2) Lateral edge of the acromion
3) Greater tuberosity and the attachment of the supraspinatus and infraspinatus tendon
4) Critical area of the rotator cuff at and just medial to the tendon-bone junction
5) Medial wall of the subacromial bursa and AC joint
6) Posterior bursal curtain
7) Posterior aspect of the rotator cuff attachment to the tuberosity
8) Anterior cuff, the rotator interval, and the anterior bursal curtain

ARTHROSCOPIC ANATOMY

1) Anterior triangle

- the biceps tendon, the subscapularis tendon, the glenoid

2) Biceps tendon

- biceps anchor and the superior glenoid rim
- pulley complex (SGHL. Medial and lateral band of CHL)

3) SGHL (superior glenohumeral ligament)

- anterior superior aspect of the glenoid to the upper part of the lesser tuberosity
- prevent anterior translation of the humeral head with the arm adducted and external rotated
- prevent inferior subluxation to the humeral head (sulcus sign)
- present more than 90% in an anatomic study
- variations in the glenoid attachment site

4) MGHL (middle glenohumeral ligament)

- intersecting the subscapularis tendon at 60° angle
- anterior humeral neck just medial to the lesser tuberosity and medial and superior glenoid rim and scapular neck
- resist anterior translation of the humeral head at 45° of abduction
- absent in 30% of cases

5) IGHL (inferior glenohumeral ligament)

- glenoid to the anatomic neck of humerus
- Anterior band: prevent anterior translation of the humeral head when arm is abducted 90° and external rotated
  restrict inferior translation when arm is abducted and internally rotated
- Posterior band: prevent inferior translation of the humeral head when arm is abducted 90° and external rotated,
  restrict posterior translation when arm is abducted and internally rotated
- Axillary pouch: cautious of the axillary nerve

6) Labrum

- any detachment of the labrum below the glenoid equator id pathologic
- Sublabral foramen: 14%, normal variant
- Buford complex: absence of anterior superior labrum
  cord-like MGHL attached to the superior labrum just anterior to the base of the biceps anchor

7) CHL (coracohumeral ligament)

- from the base of the coracoid into the intertubercular groove of the

humerus
- surround the biceps tendon and form medial sling of the biceps with SGHL

8) Glenoid
- pear shaped, inverted pear shaped
- central bare area

9) Bare area
- between the insertion of the posterior capsule and the edge of the articular surface
- propotional to age
- punctuate holes for tendon fibers and vessel penetration along the exposed subchondral plate and no articular cartilage remains lateral to the bare area

10) Intra-articular rotator cuff
- rotator cable: a thickening in the capsular tissue on the under surface of the cuff oriented perpendicular to the biceps tendon
- rotator crescent

11) Rotator interval
- anterior border of the supraspinatus tendon and the superior border of the subscapularis tendon

COMPLICATIONS AND PROBLEMS IN SHOULDER ARTHROSCOPY

1) Transient stretch neuropraxia in lateral decubitus position
2) Visual distortion
3) Bleeding: acromial branch of the coracoacromial artery
4) Extravasation of the fluid into the soft tissue
5) Arrhythmia caused by the placement of epinephrine into the arthroscopic solution

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