The Scapula and Shoulder Girdle

How it impacts operative and Non-operative treatment

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Introduction

- Basic knowledge: The continuous cooperation between the four joints of the shoulder is a prerequisite for a normal function.
- Separation of the acromio-clavicular joint leads to significant disturbance in scapular and shoulder girdle biomechanics.
- The goal of the treatment is to restore function as close to normal as possible.
- Is it possible to restore anatomy and biomechanics by non-operative treatment?
- Does the scapula play a role?
Scapular Motion

Anterior-posterior tilting

Upward/downward rotation relative to the glenoid cavity

Internal and external rotation
Scapular function and AC-dislocation

- Dislocation of the AC-joint leads to depression, anterior tilting and internal rotation of the scapula
- This may lead to additional symptoms not directly related to the AC-joint
Scapular function and AC-dislocation

• Acromioclavicular instability (Gumina et al Arthroscopy 2009):
  • 24/34 (70.6 %) scapular dyskinesis
  • Overall Constant score 83 injured side vs 91 healthy shoulder (ns)
  • Constant score 75 w scap dys vs 88 without scapular dyskinesis (p<0.05)

• Bak, SECEC 2011: Scapular dyskinesis is significantly more common in patients with shoulder pain/instability, and the absence of dyskinesis after treatment is significantly correlated to a better outcome
How does the Scapula and the Shoulder Girdle impact operative and Non-operative treatment?

• The primary goal of the treatment is to re-establish the connection between the scapula (acromion and coracoid) and the lateral clavicle end, and thereby restoring biomechanics

• Is it possible with surgery? With non-operative treatment?

• The secondary goal is to restore function independent of the radiologic result
Petri et al., Arthroscopy 2016: Clinical Results After Conservative Management for Grade III Acromioclavicular Joint Injuries: Does Eventual Surgery Affect Overall Outcomes?

• a trial of nonoperative treatment is warranted because successful outcomes (71%) can be expected even in patients who eventually opt for surgery

• patients who presented more than 30 days after their injury were less likely to complete nonoperative treatment successfully
Non Operative in the High Level Athlete

**Schlegel et al AJSM 2001** - 25 Grade 3 nonoperatively - 4/25 suboptimal outcome but not poor enough to warrant surgery

**Schlegel AOSSM 2005** - 15 NFL quarterbacks - 12/15 initially treated non-operatively successfully

**McFarland et al AJO 1997** - 16/20 non-operative Grade 3 pain-free with normal function. 70% MLB team physicians would initially treat non-operative
Proposal – type III A and type III B

Type IIIA
- Stable
- Rapid improvement
- No scapular dyskinesis
- Basmania view normal

Type IIIB
- Unstable
- No improvement
- Scapular dyskinesis
- Basmania view override
Suggestion for treatment for case 1?

Type IIIA

- Stable on AP and piano key test
- Neo-ligament?
- Progressive improvement
- No scapular dyskinesis
- Basmania view normal
- Full ROM

- Role of scapula – re-union by non-operative treatment restoring scapular function
Suggestion for treatment for case 2 – 65 y.o?

Type IIIB

- Unstable on AP and piano key test
- No or slow improvement
- Scapular dyskinesis
- Basmania view positive
- Restricted ROM
- Reduced daily function

- Role of the scapula? Unable to restore function and "reunion" by conservative means – a clear case for surgical reconstruction
Timing of treatment and a suggestion for an algorithm

Beitzel et al. Arthroscopy 2014
Clinical and radiological re-evaluation after 3-6 weeks

Persisting pain & scapula dyskinesis

Cross body adduction view (Basamania/Alexander)

Type IIIA
Continue non-surgical treatment

Overriding of the distal clavicle

Type IIIB
Opt for surgical treatment

No overriding of the distal clavicle

No persisting pain & full function

Continue non-surgical treatment

Consider surgery if conservative treatment failed (Type IIIB)
Copenhagen AC-joint outcome study 2017-2019

• 100 consecutive acute AC-dislocations type 2, 3 and 5

• Analysis of prognostic factors
  • Scapular dyskinesis
  • AP-instability
  • Piano-key test
  • Basmania view

• Hypotheses:
  • approximately 80 % of grade 3 obtain normal function after 3 months
  • approximately 60 % of grade 5 obtain normal function after 3 months
  • A positive Basmania view and the presence of scapular dyskinesis is associated with a poor result.
CONCLUSION

• The articulation between the scapula and the clavicle plays an important role in shoulder function.

• Separation of the AC-joint results in a secondary scapular dyskinesis in the majority of cases. This may lead to other symptoms not related to the AC-joint.

• There is a correlation between a good outcome and a normal scapular function.

• The key to a good outcome seems to be related to the reestablishment of a stable connection between the scapula and the clavicle.
Thank you for your attention
from soon to become grandpa..
Rockwoods classification 1984

• **Type I** - minor sprain
• **Type II** - AC-lig + 50 %
• **Type III** - AC + CC-lig > 100 %
• **Type IV** - Complete posterior locked dislocation
• **Type V** - Severe type III (”Ear tickler”) >300 %
• **Type VI** - Inferior dislocation under coracoid