Shoulder traction study

Does separation appear during traction force at the glenohumeral joint

A radiological videoanalysis

Teacher's meeting
Utrecht 2014
Introduction

- Quantitative analysis of traction

  - Gokeler Alli et al, 2002
    - no significant increase of distance glenohumeral

  - Mennell JB, 1945
    - separation of the head of humerus is clearly visible
Introduction

- single investigation
- non standardize conditions
- clearly visible separation
Traktion glenohumeral
In vivo measurement of joint play motion

Purpose

- Radiological analysis of traction under standardized conditions
- In maximally loose-packed position
- Videoanalysis
- Is there visible and significant separation between the head of humerus and the glenoid fossa
In vivo measurement of joint play motion

- Subjects

- 4 volunteers (2 female, 2 male, mean age 54)
- Right shoulder
- No signs of instability, no shoulder injuries
- Normal range of motion
- Right-handed
Materials

- Philips Inturis Allura
- High speed coronary-angiograph-system
- 12 pictures/sec
Shoulder Traction Study

Otto Bock sholder brace
Stamina pocket balance

Traction belt

Shoulder Traction Study
Electrical vernier calipers
Methods

- Starting position:
  - 60° abduction
  - Midposition ext/int rotation
  - No traction impulses
  - Scapula-fixation
  - Distance acromion-BV 40 cm
Methods

- Tractionimpuls
  - 90° to treatmentplane
  - Up to 18 kg tractionforce
Statistics

<table>
<thead>
<tr>
<th>subject</th>
<th>Joint space without traction (mm)</th>
<th>Joint space with traction (mm)</th>
<th>Difference (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.20</td>
<td>11.01</td>
<td>2.91</td>
</tr>
<tr>
<td>2</td>
<td>9.92</td>
<td>13.33</td>
<td>3.41</td>
</tr>
<tr>
<td>3</td>
<td>7.64</td>
<td>10.49</td>
<td>2.85</td>
</tr>
<tr>
<td>4</td>
<td>6.43</td>
<td>9.52</td>
<td>3.09</td>
</tr>
<tr>
<td>mean</td>
<td>8.05</td>
<td>11.09</td>
<td>3.04</td>
</tr>
<tr>
<td>SD</td>
<td>1.45</td>
<td>1.62</td>
<td>0.28</td>
</tr>
</tbody>
</table>
Summary/Limitation

• Traction movement is visualizable and measurable
• Large effect size
• In healthy, asymptomatic subjects
• Small sample size
• resting position is essential
• optimal fixation is necessary
Note for thanks

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