A positive result on both the Paxinos test and bone scan ruled in a diagnosis of acromioclavicular joint pain


Clinical impact ratings GP/FP/Primary care ★★★★★ Surgery ★★★★★

In patients with shoulder pain (mapped within an area bounded by the midpoint of the clavicle and the deltoid insertion), what is the accuracy of clinical and imaging tests for diagnosing acromioclavicular joint (ACJ) pain?

**METHODS**

- **Design:** Blinded comparison of the clinical and imaging tests with results of the ACJ infiltration test as the reference standard.
- **Setting:** A university hospital in Sydney, New South Wales, Australia.
- **Patients:** 38 patients (mean age 44 y, 58% women) who had shoulder pain that was mapped within an area bounded by the midpoint of the clavicle and the deltoid insertion. Exclusion criteria included previous clavicular or ACJ surgery, clavicular fracture, previous or known allergies to lidocaine or radiopaque contrast medium, medium, and pregnancy.
- **Description of tests:** Clinical tests included examination (by a physician) for tenderness of the ACJ, and the Paxinos and O’Brien signs with the results declared as positive (for ACJ pain) or negative. Imaging tests included plain radiographs, magnetic resonance imaging, and bone scanning. A radiologist with expertise in musculoskeletal conditions ranked an image of the ACJ as normal or abnormal.
- **Diagnostic standard:** Patients received an ACJ infiltration of lidocaine (2 ml of a 2% solution) plus methylprednisolone (1 ml containing 40 mg) into the ACJ through the direct anterior approach. Patients who felt that the superior shoulder pain had been alleviated by >50% within 10 minutes after the lidocaine injection were considered to have ACJ pain. Patients who did not have >50% relief were considered not to have the condition.
- **Outcomes:** Sensitivity, specificity, and positive and negative likelihood ratios of the clinical and imaging tests.

**MAIN RESULTS**

74% of patients had ACJ pain. The table shows the sensitivity, specificity, and positive and negative likelihood ratios of the clinical and imaging tests. A positive test result on both the Paxinos test and bone scan had a positive likelihood ratio of 55 whereas a negative test result on both tests had a negative likelihood ratio of 0.03.

**CONCLUSIONS**

In patients with shoulder pain (mapped within an area bounded by the midpoint of the clavicle and the deltoid insertion), highly sensitive tests had low specificity and highly specific tests had low sensitivity for diagnosing acromioclavicular joint pain. A positive test result on both the Paxinos test and a bone scan ruled in the diagnosis.

**Commentary**

The well done study by Walton et al showed an impressive likelihood ratio of 55:1 for a combination of the Paxinos test and a bone scan for diagnosing ACJ pain. The Paxinos test is a simple test where the joint is passively compressed by the practitioner, whereas the O’Brien test is a more complex manoeuvre involving active compression of the joint by resisted shoulder flexion. The results show a poorer sensitivity for the O’Brien test than what has been shown in other studies (16% vs 41%). Tenderness was the most sensitive indicator of all, but its specificity is so low that it adds little to diagnostic accuracy.

The positive rate of 74% for diagnostic blocks (localisating pain around the ACJ) suggests that the pain diagram alone was a good diagnostic tool. However, pain from the C5-6 and C6-7 facet joints may also refer to this region. Good manual examination of the cervical spine can detect most of these cases and should routinely accompany shoulder examination.

It is notable that (1) no data were provided on the reproducibility of the respective tests and (2) the study was conducted in a specialist shoulder clinic. In clinical practice, test availability and affordability are crucial. Physical examination is quick, inexpensive, and radiation free, whereas bone scans are time consuming, expensive, and irradiate the whole body. Going directly to diagnostic injection, the reference standard, on the basis of a positive pain diagram and positive physical examination, is practical, cheaper, and often therapeutic.

The remaining question is whether the imaging control used in this study adds anything to the diagnostic accuracy and treatment efficacy of injecting into the ACJ—a joint that is accessible to most practitioners without the need for expensive imaging equipment.

Michael Yelland, MBBS, FRACGP
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**Diagnostic properties of clinical and imaging tests for detecting acromioclavicular joint pain**

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (95% CI)</th>
<th>Specificity (CI)</th>
<th>LR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paxinos test</td>
<td>79% (59 to 92)</td>
<td>50% (19 to 81)</td>
<td>1.57 0.42</td>
</tr>
<tr>
<td>Acromioclavicular tenderness</td>
<td>96% (82 to 100)</td>
<td>10% (0.3 to 42)</td>
<td>1.07 0.36</td>
</tr>
<tr>
<td>O’Brien test</td>
<td>16% (5 to 35)</td>
<td>90% (55 to 100)</td>
<td>1.60 0.93</td>
</tr>
<tr>
<td>Radiographs</td>
<td>41% (23 to 61)</td>
<td>90% (55 to 100)</td>
<td>4.11 0.65</td>
</tr>
<tr>
<td>Bone scan</td>
<td>82% (63 to 94)</td>
<td>70% (35 to 93)</td>
<td>2.74 0.26</td>
</tr>
<tr>
<td>Magnetic resonance imaging</td>
<td>83% (66 to 96)</td>
<td>50% (19 to 81)</td>
<td>1.70 0.30</td>
</tr>
</tbody>
</table>

*Diagnostic terms defined in glossary. CI and LR calculated from data in article.*