Radiological features of osteoarthritis of the acromioclavicular joint and its association with clinical symptoms

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ABSTRACT

Purpose. To determine whether increasing age is associated with increased radiological features of osteoarthritis of the acromioclavicular joint (ACJ) in a general population, and whether clinical symptoms correlate with radiological features.

Methods. Anteroposterior and axillary shoulder radiographs of 240 patients aged 20 to 80 years were randomly selected. The presence of stigmata of osteoarthritis of the ACJ including sclerosis, cysts, lysis, and osteophytes were recorded, and the width of the ACJ was measured. To determine the correlation between clinical symptoms and radiological features, the same radiological features were assessed for 100 further patients who had undergone either arthroscopic subacromial decompression (ASD) alone (n=50) or ASD plus ACJ excision (n=50, age-matched controls) based on clinical examination.

Results. Radiological features of osteoarthritis of the ACJ increased significantly with increasing age but were not related to gender or the side affected. Of the 10 features, only medial acromial sclerosis and superior clavicular osteophytes were more prevalent in patients with ASD plus ACJ excision than in those with ASD alone (p=0.016). The sensitivity, specificity, positive and negative predictive values of these features were poor. Therefore, clinical symptoms were not associated with radiological features of osteoarthritis of the ACJ.

Conclusion. Radiological features should only be used as an adjunct in the decision to excise the ACJ. A thorough clinical examination is crucial in the assessment of ACJ pathology.

Key words: acromioclavicular joint; joint diseases; osteoarthritis; osteophytes; sclerosis

INTRODUCTION

Radiological features of osteoarthritis, namely joint space narrowing, osteophytes, subchondral sclerosis, cysts, and lysis are common in the acromioclavicular

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joints (ACJs) of the elderly.1–7 The pattern of osteoarthritis in museum specimens (of the early 1900s) from persons over 40 years of age was consistent.1 Radiological features of osteoarthritis increase with advancing age in asymptomatic individuals.2–4

We aimed to determine whether increasing age was associated with increased radiological features of osteoarthritis of the ACJ in a general population, and whether clinical symptoms correlate to radiological features.

MATERIALS AND METHODS

Anteroposterior (AP) and axillary shoulder radiographs of 240 patients aged 20 to 80 years were randomly selected (10 men and 10 women in each decade, with equal numbers of left and right shoulders) via the picture archiving and communication system (PACS) of our hospital. Patients with previous shoulder surgery, trauma, or glenohumeral osteoarthritis were excluded.

Radiographs were assessed by a single examiner blinded to the age and gender. The presence/absence of each stigma of ACJ osteoarthritis including sclerosis, cysts, lysis, and osteophytes was scored as one/zero. Osteophytes were further subdivided into superior or inferior. The total score was 10 when all features were present. The width of the ACJ (joint space) was measured on AP radiographs, averaging the 3 measurements at the superior and inferior margins of the joint and halfway between these 2 points.

The same radiological features were assessed for 100 further patients who had undergone either arthroscopic subacromial decompression (ASD) alone (n=50) or ASD plus ACJ excision (n=50, age-matched controls) by the same examiner. The surgical decision was based on clinical examination and a good response to local anaesthetic and steroid injection into the subacromial bursa and ACJ. None of the ASD patients had come back for ACJ excision due to persistent shoulder pain.

Correlations in ages, genders or shoulder sides were assessed using the Chi squared test. The change in the width of the ACJ with advancing age was assessed using multiple regression analysis. The number of patients in each radiological feature was compared between the ASD alone and the ASD plus ACJ excision groups using Fisher’s exact test. A p value of <0.05 was considered statistically significant.

RESULTS

The total score for stigmata of osteoarthritis of the ACJ increased significantly with advancing age (range, 0–8; Spearman’s rank=0.65; p<0.01). The width of the ACJ (joint space) decreased significantly with advancing age (range, 0.5–12.3 mm; Spearman’s rank= –0.40, p<0.01). Gender and shoulder side did not significantly affect osteoarthritis of the ACJ.

Of the 10 radiological features of osteoarthritis of the ACJ, only medial acromial sclerosis and superior clavicular osteophytes were more prevalent in patients with ASD plus ACJ excision than in those with ASD alone (p=0.016, Table). The corresponding sensitivity (66% and 60%) and specificity (66% and 66%) of these features were poor, as were their positive (0.62 and 0.64) and negative (0.64 and 0.62) predictive values. Therefore, clinical symptoms were not associated with radiological features of osteoarthritis of the ACJ.

<table>
<thead>
<tr>
<th>Radiological features</th>
<th>No. of patients</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASD alone (n=50)</td>
<td>ASD &amp; ACJ excision (n=50)</td>
</tr>
<tr>
<td>Medial acromial sclerosis</td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>Inferior acromial osteophytes</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>Superior acromial osteophytes</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Acromial cysts</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Acromial lysis</td>
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<td>3</td>
</tr>
<tr>
<td>Lateral clavicular sclerosis</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Inferior clavicular osteophytes</td>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td>Superior clavicular osteophytes</td>
<td>17</td>
<td>30</td>
</tr>
<tr>
<td>Clavicular cysts</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>Clavicular lysis</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
DISCUSSION

Our sample was representative of the general population (both symptomatic and asymptomatic), because it was selected from the PACS on the basis of age, gender, and shoulder side. Future studies can combine gender and shoulder side for analysis to improve statistical power, as these parameters did not significantly affect the ACJ score or width of the ACJ.

In our study, radiological features of osteoarthritis of the ACJ (e.g. joint space narrowing and stigmata of osteoarthritis) increased significantly with advancing age, which was consistent with other studies.\(^2,5\) Osteophytes on the inferior ACJ are often responsible for impingement of the subacromial space.\(^6\) In our study, this feature was present in 62% of the 240 radiographs, but did not correlate with either ACJ symptoms or subacromial impingement. Therefore, radiological features should only be used as an adjunct in the decision to excise the ACJ. A thorough clinical examination is crucial in the assessment of ACJ pathology.

REFERENCES