Radiological development of osteoarthritic changes in the distal radioulnar joint after ulnar shortening osteotomy for idiopathic ulnar impaction syndrome

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Objective

- We investigated factors influencing the radiological development of osteoarthritic changes in the distal radioulnar joint (DRUJ) and the clinical outcomes after ulnar shortening osteotomy (USO) in patients with idiopathic ulnar impaction syndrome.

Methods

- This study included 51 patients (55 wrists) who had undergone USO for idiopathic ulnar impaction syndrome for a mean follow-up of 52.7 months (range, 24 to 165).

- Twenty-one wrists (38%) showed new osteoarthritic changes in the DRUJ and the wrists were classified into two groups (with or without new osteoarthritic changes).

- The following factors were analysed to determine the factors associated with new osteoarthritic changes: 1) demographic factors; 2) radiologic aspects, including ulnar variance, radioulnar distance, cystic changes in the lunate, morphology of the ulnar head, morphological DRUJ type in the coronal plane, and the shapes of the sigmoid notch in the transverse plane (classified according to Tolat et al.).

- Patients were evaluated for wrist pain, grip strength, range of wrist motion, and the Mayo Modified Wrist Score at the final follow-up.

Morphology of the ulnar head

- Convex
- Round

Morphological DRUJ type in the coronal plane

- Neutral
- Negative
- Positive

The shapes of the sigmoid notch in the transverse plane

- Flat face
- Ski-Slope
- C-type
- S-type

Results

- Logistic regression analysis revealed that amount of shortening, and the shapes of the sigmoid notch in the transverse plane were significantly associated with the development of osteoarthritic changes in the DRUJ after USO.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Osteoarthritic changes (-)</th>
<th>Osteoarthritic changes (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of shortening</td>
<td>2.7 mm</td>
<td>3.1 mm</td>
</tr>
<tr>
<td>The shapes of the sigmoid notch</td>
<td>Flat face : Ski-Slope : C-type : S-type 9 : 21 : 3 : 1</td>
<td>Flat face : Ski-Slope : C-type : S-type 12 : 7 : 0 : 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of shortening</td>
<td>2.30</td>
<td>1.07 ; 4.95</td>
<td>0.033</td>
</tr>
<tr>
<td>The shapes of the sigmoid notch</td>
<td>4.75</td>
<td>1.37 ; 16.50</td>
<td>0.014</td>
</tr>
</tbody>
</table>

- There was no difference in all clinical outcomes between the two groups.

Conclusion

- Radiological development of osteoarthritic changes after USO, were associated with amount of shortening, and the shapes of the sigmoid notch in the transverse plane.

- Osteoarthritic changes of the DRUJ did not affect the clinical outcomes after USO.