

## Disorders of the lower radioulnar joint

### CHAPTER CONTENTS

<b>Disorders of the inert structures . . . . .</b>	<b>329</b>
Capsular pattern . . . . .	329
Traumatic arthritis . . . . .	329
Arthrosis . . . . .	329
Monoarticular steroid-sensitive arthritis . . . . .	329
Rheumatoid arthritis . . . . .	329
Non-capsular pattern . . . . .	330
Limited supination . . . . .	330
Painful supination . . . . .	330
Limited pronation . . . . .	330
Disorders of the triangular fibrocartilage complex . . . . .	330
<b>Disorders of the contractile structures . . . . .</b>	<b>331</b>

### Disorders of the inert structures

Pain felt at the wrist during pronation and supination movements of the forearm inculcates the distal radioulnar joint. The source can be the joint capsule,<sup>1</sup> the ligaments<sup>2-4</sup> or the articular disc.

#### Capsular pattern

The capsular pattern of the lower radioulnar joint presents with pain at the end of range of the two movements (pronation and supination, Fig. 22.1) and indicates arthritis. Usually there is only pain at end-range but sometimes there may be equal limitation, or slightly more limitation of supination than of pronation.

#### Traumatic arthritis

Traumatic arthritis is usually not the result of a single injury but of repeated and excessive pronation/supination

movements. There is constant pain, aggravated by movement. Swelling may be seen at the ulnar side of the distal forearm. Treatment consists of one or two intra-articular injections of 10 mg of triamcinolone acetone.

#### Arthrosis

When a fracture of the distal part of the radius fails to unite properly, arthrosis at the distal radioulnar joint may follow. Mal-union of the distal part of the ulna does not give rise to persistent problems<sup>5</sup> and painless ulnar styloid non-union is a frequent incidental radiographic finding.<sup>6</sup>

The patient feels discomfort with movement of the joint. On examination, the extremes of both rotations are uncomfortable. The condition may be helped by strapping the distal part of the forearm; if this does not help, intra-articular triamcinolone may be tried.

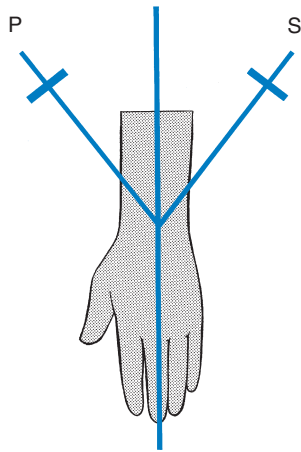
#### Monoarticular steroid-sensitive arthritis

Arthritis may develop without a provable cause such as rheumatoid or traumatic arthritis. Furthermore, the condition will worsen when attempts are made to mobilize the joint. Such a condition responds particularly well to intra-articular triamcinolone.<sup>7</sup>

#### Rheumatoid arthritis

Rheumatoid arthritis (RA) involves the wrist in up to 95% of cases. The distal radioulnar joint is affected in 31–75% of these patients and is frequently the first compartment of the wrist involved,<sup>8</sup> often bilaterally.<sup>9</sup> Triamcinolone suspension injected intra-articularly once or twice a year may keep the joint free from symptoms.<sup>10</sup>

Long-standing rheumatoid arthritis results in ligamentous laxity. At the distal radioulnar joint this leads to the so-called



**Fig 22.1** • The capsular pattern of the lower radioulnar joint.

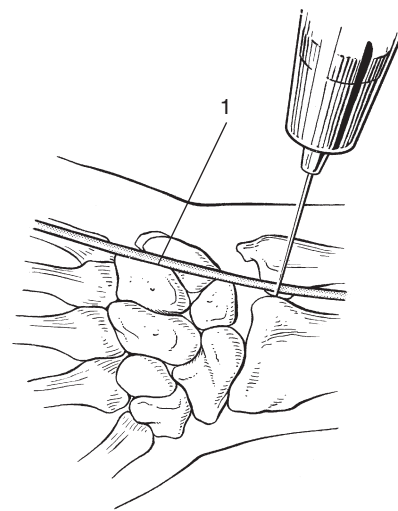
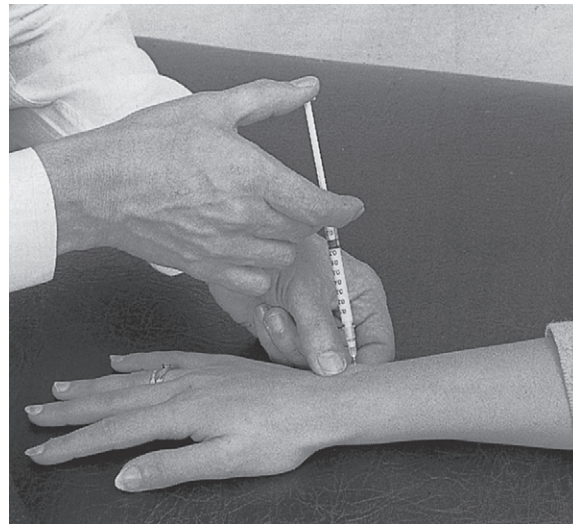
'caput ulnae syndrome': dorsal subluxation of the distal part of the ulna, supination of the carpus on the forearm, and palmar dislocation of the tendon of the extensor carpi ulnaris.<sup>11-14</sup>



#### **Technique: intra-articular injection**

The patient sits at the couch with the arm lying in pronation. A 1 mL syringe filled with triamcinolone acetonide and fitted with a 2 cm needle is used. The joint line, which is very short, is identified just radially to the head of the ulna. Gliding movements between the ulna and radius may help to find it. As the extensor digiti minimi tendon lies just dorsal to the joint line, care must be taken to avoid puncturing it (Fig. 22.2).

The needle is inserted vertically downwards at the midpoint of the joint line, about 5 mm proximal to the lower edge of the ulna. It is thrust down and will hit bone at about 1.5 cm. It is then manoeuvred in an oblique direction towards the radius, until it slips beyond it without resistance. The injection is then carried out.



**Fig 22.2** • Injection of the radioulnar joint: 1, extensor digiti minimi.

## Non-capsular pattern

### Limited supination

After a mal-united Colles' fracture, shortening of the radius may be responsible for an irreversible limitation of supination only, with the end-feel of a bony block.<sup>15,16</sup> The movement may be painful in recent cases but should become painless in due course.

A dorsal dislocation of the ulna also presents with a block to supination and a visible dorsoulnar prominence. The mechanism for dorsal subluxation and dislocation is extreme pronation and extension, which pull the ulnar head out through the dorsal capsule. Triangular fibrocartilage complex avulsion and attenuation of the palmar radioulnar ligament will allow this dislocation.<sup>17</sup>

### Painful supination

In tenosynovitis of the extensor carpi ulnaris, passive supination may be painful at the end of the range. This is a localizing

sign, indicating that the lesion lies in the groove at the base of the ulna. The tenosynovitis will, of course, be diagnosed by interpreting resisted movements at the wrist (see p. 345).

### Limited pronation

A block to pronation is present in palmar dislocations of the ulna. On inspection-palpation there will be a volar-ulnar prominence and a palpable radial sigmoid notch.<sup>18</sup>

## Disorders of the triangular fibrocartilage complex

During the last few decades it has become obvious that triangular fibrocartilage complex (TFCC) tears are a common source of ulnar-sided wrist pain. The TFCC plays an important role in load bearing across the wrist, as well as in distal radio-ulnar joint stabilization.

Palmer devised a classification system of TFCC tears in 1989.<sup>19</sup> The main division is between traumatic type I and atraumatic (degenerative) type II tears. The traumatic conditions (type I) follow hyperpronation or axial load-and-distraction injury to the ulnar part of the wrist (e.g. fall on an outstretched extremity<sup>20</sup>) and include perforation and avulsion<sup>21</sup> with or without fracture.<sup>22</sup> Type IA (*A*vascular articular disc) tears are the most common. The other type I tears are peripheral in nature: type IB (*B*ase of the styloid) tears; type IC (*C*arpal detachment) tears; type ID (detachment from the *r*adius). The degenerative disorders (type II) result from chronic injuries after repetitive loading on the ulnar side of the wrist.<sup>23</sup> They vary from triangular fibrocartilage wearing to chondromalacia and ligament perforation.<sup>24</sup> Degenerative changes in the TFCC often accompany those in the distal radioulnar joint.<sup>25</sup>

TFCC disorders result in ulnar-sided wrist pain.<sup>26</sup> Uncomplicated cases show a capsular pattern at the radioulnar joint. Complicated cases may present with some subluxation of the joint (limitation of pronation or supination). A provocative test for TFCC lesions, the ulnar grind test, has been described. It involves dorsiflexion of the wrist, axial load, and ulnar deviation or rotation. If this manoeuvre reproduces the patient's pain, a TFCC tear should be suspected.<sup>27</sup> Another quick and highly sensitive test to evaluate tears of the TFCC is the 'press test', which axially loads the wrist in ulnar deviation as the patient pushes him- or herself up from a seated position.<sup>28</sup> The best place to palpate the TFCC is between the tendons of the extensor and flexor carpi ulnaris, distal to the styloid and proximal to the pisiform. In this soft spot of the wrist, there are no other structures than the TFCC.<sup>29</sup> Acceptable methods to confirm the clinical diagnosis are magnetic resonance imaging (MRI)<sup>30</sup> and high-resolution ultrasonography.<sup>31</sup>

The treatment depends on type and degree of the lesion. Most symptomatic lesions respond very well to relative rest and one or two intra-articular injections into the distal radioulnar joint. Surgery is the treatment of choice when gross instability occurs. Instability is found when the ligamentous components of the TFCC proper – the dorsal and palmar radioulnar ligaments – are torn.<sup>32</sup> Early surgery is then preferred.<sup>33,34</sup> Chronic disorders of the TFCC, often combined with instability, require arthroscopic<sup>35–37</sup> or open repair,<sup>38</sup> including ulnar shortening.<sup>39,40</sup> The results are good.<sup>41</sup>

## Disorders of the contractile structures

Resisted pronation and supination are not tested in the standard functional examination, because they are not relevant at this level. However, resisted pronation can be performed as an accessory test in order to examine the pronator quadratus muscle. This being said, a lesion of this structure has never been described and does not seem to exist. Resisted pronation movement also tests the common flexor tendon (in the case of golfer's elbow) and the pronator teres muscle, but in lesions of these two structures, pain is felt near the elbow (see Ch. 19).

Resisted supination does not test any structure in the wrist region, only those at the elbow – the brachial biceps and supinator brevis.



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