

# DISLOCATION OF THE DISTAL RADIOULNAR JOINT ASSOCIATED WITH A TRANSSTYLOID RADIOCARPAL FRACTURE DISLOCATION A CASE REPORT AND REVIEW OF THE LITERATURE

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Dislocations of the distal radio-ulnar joint (DRUJ) can be isolated or combined with fractures. Cases of DRUJ dislocations have been described with Galeazzi fractures, open radius and ulna fractures and intra-articular fractures of the distal radius. We report a case of a volar DRUJ dislocation combined with a transstyloid radio-carpal dislocation. Because of severe instability of the wrist, open reduction of the radial styloid combined with an open reduction of the dislocated DRUJ is advised.

**Keywords** : dislocation ; distal radio-ulnar joint ; radio-carpal fracture ; dislocation.

**Mots-clés** : luxation radio-cubitale distale ; fracture ; luxation radio-carpienne.

## CASE REPORT

A 34-year-old right-handed man was involved in a motorbike accident where he was thrown off his bike, landing on his right hand. He sustained a severe twisting injury of his wrist. On physical examination, he had a severely swollen wrist with marked deformity of the carpus. Further examination revealed a radial shift of the carpus combined with a volar dislocation of the proximal carpal row. Clinically there were no neurovascular lesions.

Radiographs showed a transstyloid fracture dislocation of the radiocarpal joint (fig. 1). A true AP or lateral view was not performed. A dislocation of the DRUJ was not noted.

Surgery was performed through an incision over the radial styloid. The fracture could easily

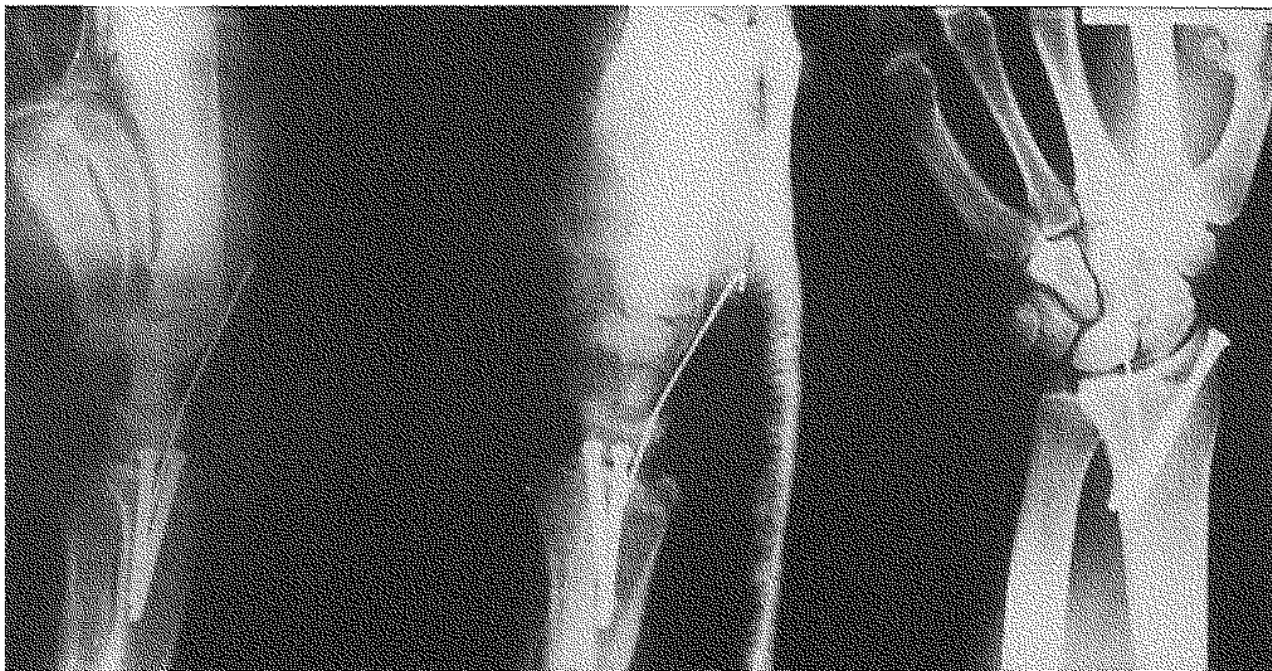


*Fig. 1.* — Radiograph showing the transstyloid radiocarpal fracture dislocation.

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*Fig. 2.* — Radiograph of the remaining DRUJ dislocation after operative reduction and fixation of the radial styloid fracture.

be reduced and fixed with cannulated screws. A spontaneous reduction of the radiocarpal joint occurred. A K-wire was used to stabilize the lunate in a reduced position.

On the first postoperative day, the patient complained of severe pain in the wrist which was locked in supination. An AP radiograph revealed a slight superposition of the ulnar head and the ulnar border of the radius. A true lateral radiograph of the wrist (both in and out of plaster) showed a palmar displacement of the DRUJ (fig. 2). Attempt at a closed reduction was unsuccessful, as shown on the middle radiograph in plaster (fig. 2). Therefore a dorsal V-shaped incision as described by De Smet (4) was used to perform an open reduction of the dislocation (fig. 3).

There was an entrapment of the extensor carpi ulnaris on the DRUJ surface combined with a rupture of the triangular fibrocartilage complex at the radial insertion. Lateral traction on the ulnar head combined with a pronation movement was sufficient to achieve an easy reduction. The exten-

sor carpi ulnaris was anchored back in place and the dorsal radioulnar ligaments were reattached.

An above elbow plaster cast with the wrist in pronation was applied for 4 weeks. Progressive exercises were allowed following this period. Six months following the injury the patient had 40° extension, 30° flexion and 70° supination with 60° pronation. There were no complaints of pain; the patient has resumed his previous job as a car mechanic. A slight weakness in his dominant hand was noted (4-kg grip strength loss 32<sup>R</sup>-36<sup>L</sup>).

At one year, stability of the wrist was good but with the remaining slight weakness in grip strength. Good carpal stability was noted on the radiograph (fig. 4); there was mild osteoarthritis. It was decided to leave the screws in place until symptoms recurred.

## DISCUSSION

Dislocation of the DRUJ is often misdiagnosed because of associated fractures. It can be combined

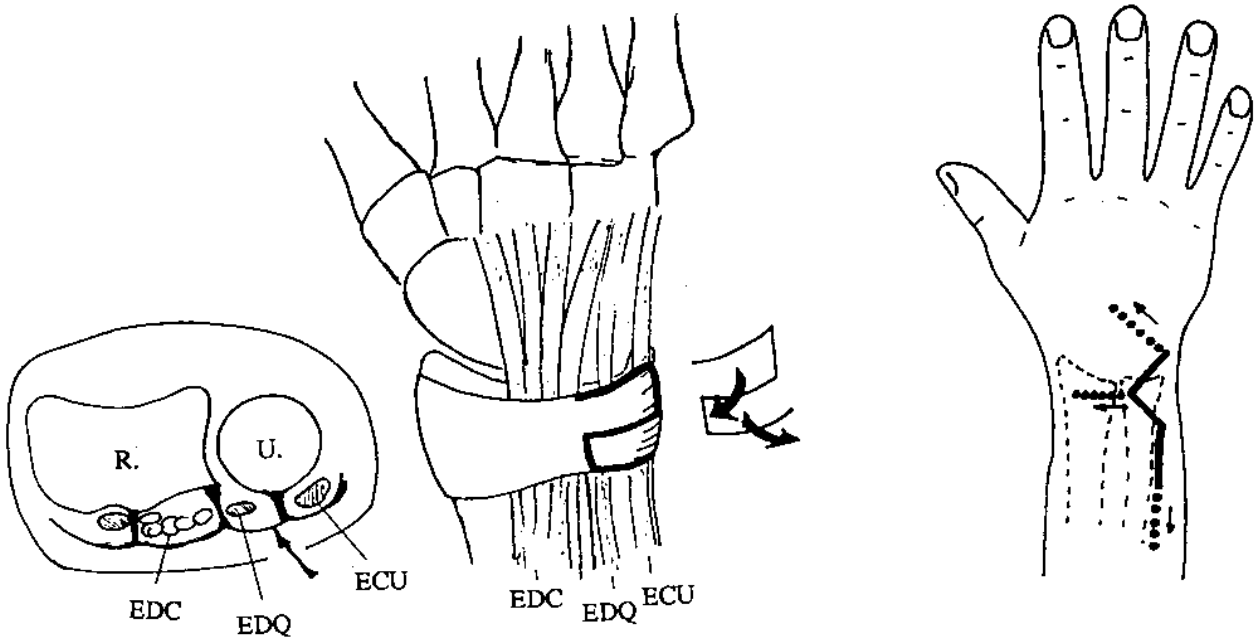


Fig. 3. — Outline of the dorsal (V-shaped incision) used to treat the pathology of the DRUJ.

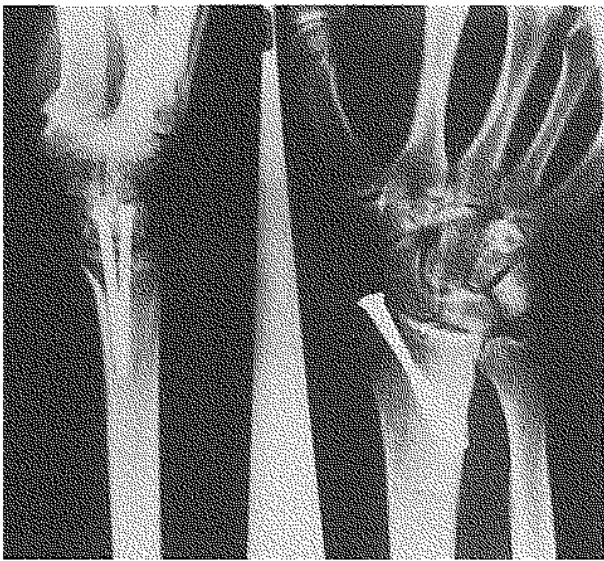


Fig. 4. — Radiograph showing slight arthritis of the radiocarpal joint at 1 year following evaluation.

with intra-articular distal radius fractures as well as Essex-Lopresti and Galeazzi fractures.

The mechanism of DRUJ dislocations is a rotational force caused by a fall, with the arm rotating above the hand fixed against the ground (1, 2,

5, 7). Catapult injuries over handlebars of motorcycles are common causes (1). Palmar dislocations are caused by hypersupination of the wrist. This mechanism can also cause a transstyloid radiocarpal fracture dislocation.

The stability of the DRUJ is maintained by three ligaments, the triangular fibrocartilage complex and the dorsal and palmar radioulnar ligaments. The articular surfaces between radius and ulna also play a role in the stability (5). The triangular fibrocartilage complex restrains the ulnocarpal joint, stabilizes the DRUJ and transmits transverse forces from the carpus to the ulna. In dislocation of the DRUJ, this ligamentous complex can easily be injured, causing instability of the distal radioulnar joint (1, 3, 4).

The clinical features are often misleading. Usually surgeons focus on the obvious fracture and often misdiagnose or even do not recognize the DRUJ dislocation. One should be suspicious when, in the acute phase, the arm is painful and locked in pronation as occurs in a dorsal DRUJ dislocation, or in supination, as occurs in a palmar dislocation (6). On inspection the ulnar head becomes more prominent when dislocated dorsally.

However, in a volar dislocation, there are no visual changes (1, 3, 5, 6, 7). The diagnosis can only be confirmed with a strict lateral and AP-radiograph (1, 5). Interpretation of these radiographs is sometimes difficult; however special attention should be paid when the clinical features are present (1, 6). In doubtful cases a CT-scan can provide the exact information.

In isolated cases of DRUJ dislocation, closed reduction is often sufficient. However, when the dislocation is associated with a fracture, the restoration of the anatomical alignment is the primary goal in the treatment of this dislocation (1). However in our case, an anatomic reduction of the radiocarpal fracture dislocation did not alter the deformity at the DRUJ. Due to the severe instability of this lesion, closed reduction is not recommended.

Special attention should be given to the DRUJ if a radiocarpal dislocation occurs. Reduction of this dislocation does not alter the situation at the DRUJ. Because of entrapment of several structures such as the extensor carpi ulnaris or the fibrocartilage complex, the pathology can easily be visualized through a dorsal V-shaped incision over the distal DRUJ (1, 3, 4) (fig. 3).

Since the palmar distal radioulnar ligaments are less important, there is no need to perform a palmar approach, even if a palmar dislocation is present. The reduction can easily be achieved, through the dorsally V-shaped incision, the triangular fibrocartilage complex can be sutured, and the ruptured dorsal radioulnar ligaments can be repaired.

## REFERENCES

1. Aulicino P. L., Siegel J. L. Acute injuries of the distal radioulnar joint. *Hand clinics*, 1991, 7, 283-293.
2. Bruckner J. D., Lichtman D. M., Alexander A. H. Complex dislocations of the distal radio-ulnar joint. *Clin. Orthop.*, 1992, 275, 90-103.
3. Dameron T. B. Traumatic dislocation of the distal radioulnar joint. *Clin. Orthop.*, 1972, 83, 55-63.
4. De Smet L., Fabry G. Ulnar approach to the wrist. *Acta Orthop. Belg.*, 1992, 58, 356-359.
5. Graham H. K., McCoy G. F., Mollan R. A. B. A new injury of the distal radioulnar joint. *J. Bone Joint Surg.*, 1985, 67-B, 302-304.
6. Heipe K. G., Freehafer A. A., Van 't Hof A. Isolated traumatic dislocation of the distal end of the ulna or distal radio-ulnar joint. *J. Bone Joint Surg.*, 1962, 44-A, 1387-1394.
7. Rose-Innes A. P. Anterior dislocation of the ulna at the inferior radioulnar joint. *J. Bone Joint Surg.*, 1960, 42-B, 515-521.

## SAMENVATTING

*D. STOFFELEN, Y. FORTEMS, L. DE SMET, P. BROOS. Luxatie in het distale radioulnaire gewricht in combinatie met een transstyloïdale radiocarpale dislocatie.*

Dislocaties van het distale radioulnaire gewricht kunnen in combinatie met of zonder fracturen voorkomen. Er werden gevallen beschreven van distale radioulnaire gewrichtsdislocaties met Galleazi fracturen, open radius en ulna fracturen in intraarticulaire fracturen van de distale radius.

Wij bespreken het geval van een volaire distale radioulnaire gewrichtsdislocatie in combinatie met een transstyloïdale radiocarpale dislocatie.

Omwille van ernstige instabiliteit van de pols, is het aangewezen om een open reductie te doen van het radiale styloid in combinatie met een open reductie van het distale radioulnaire gedислоceerde gewricht.

## RÉSUMÉ

*D. STOFFELEN, Y. FORTEMS, L. DE SMET, P. BROOS. Luxation de l'articulation radio-cubitale distale associée à une luxation radio-carpienne transstyloïdienne.*

Les luxations de l'articulation radio-cubitale distale peuvent se présenter isolées ou associées à des fractures. Certains cas furent décrits associés à une fracture de Galleazi, une fracture ouverte du radius et du cubitus ou à une fracture intra-articulaire de l'extrémité inférieure du radius.

Nous rapportons un cas de luxation antérieure de l'articulation radio-cubitale inférieure associée à une luxation radio-carpienne transstyloïdienne.

Vu l'instabilité grave du poignet, il est indiqué de réaliser une réduction à ciel ouvert de la styloïde avec réduction de l'articulation radio-cubitale luxée.