Fixation of Dorsal Ulnar Corner Fractures of the Distal Radius Through a Single Anterior Approach

A Prospective Study with CT Documentation

Josefina Álvarez, Jonathan Lans, Alberto Fernández, Jesse Jupiter

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Introduction

Displaced dorsal ulnar corner fractures are unique challenges because they affect both radiolunate and distal radioulnar (DRU) joints.

Operative treatment may require both volar and dorsal approaches.

While it has been reported about volar approach to dorsal lunate components, we show how *the ball-tipped reduction clamp* (Fig. 1) facilitates this without requiring excessive stripping of the volar radius to rotate the proximal fragment, as described by Orbay.

This technique can be done by most surgeons through the well-established volar FCR approach.

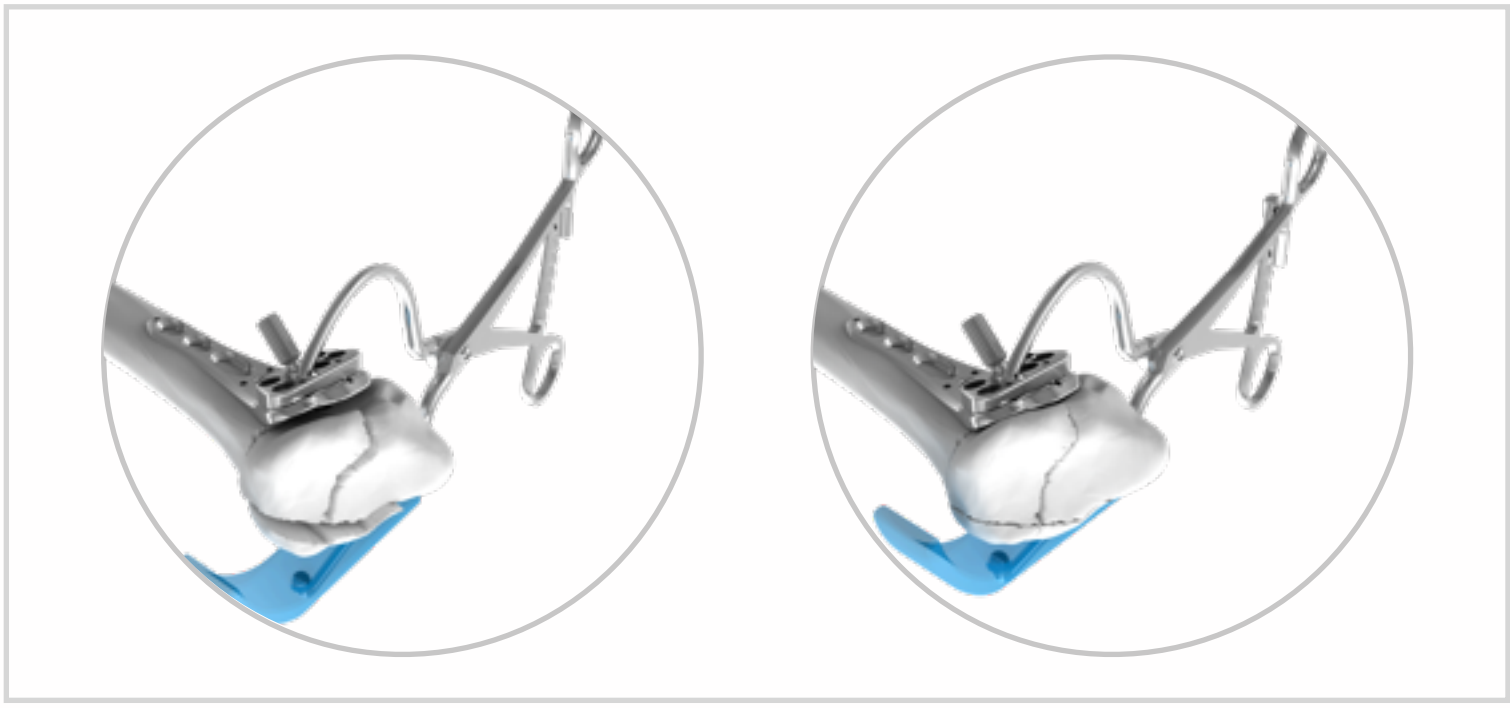


Fig. 1: **Ball-tipped reduction clamp**

Methods

In this prospective single-surgeon study we selected 61 patients with a split lunate facet or a dorsal lunate facet as part of the overall distal radius fracture, out of a total of 177 distal radius fractures.

The correlation between the outcome and the fracture characteristics was assessed.

Documentation was collected on the accuracy of reduction comparing preoperative and postoperative axial CT scans and clinical data at the latest follow-up after surgery (1 year in average).

All patients were treated operatively within 10 days of injury. The surgical approach was the standard FCR exposure without additional tendon release. The fracture was reduced using ligamentotaxis, manual manipulation and a specific radiolucent bone reduction clamp over the dorsal lunate facet. The fixation in each case was done with a 2.4 mm Variable Angle Distal Radius Plate System®.

Pre and early post-operative axial and sagittal CT scans were used to measure the fracture gap at the sigmoid notch, the intra-articular step off, the degree of ulnar subluxation and any screw penetration into the joint.

Results

Mean fracture gap was corrected significantly from 2.0 mm pre-op to 0.48 mm post-operatively. Mean fracture step was corrected significantly from 1.4 to 0 mm. Mean ulnar subluxation was corrected but the improvement was not significant. Less favorable outcome was related to patients with greater residual ulnar subluxation. At the final follow-up there was a significant difference in wrist extension and flexion between the affected and non-affected sides. However, there was no significant difference in forearm pronation and supination.

Examples are shown on the next pages.

Conclusions

Using a standard volar approach with the important inclusion of a radiolucent reduction clamp which puts direct pressure over the dorsal lunate facet, we have demonstrated successful reduction of ulnar dorsal corner fractures, including the sigmoid notch.

Reduction of the DRUJ is of paramount importance to obtain a superior outcome. Using the described surgical technique, a single volar approach to dorsal lunate components, and the ball-tipped reduction clamp we could achieve anatomic reduction with a satisfactory functional and radiographic outcome in almost all patients.

Level of Evidence: *Prognostic type III*

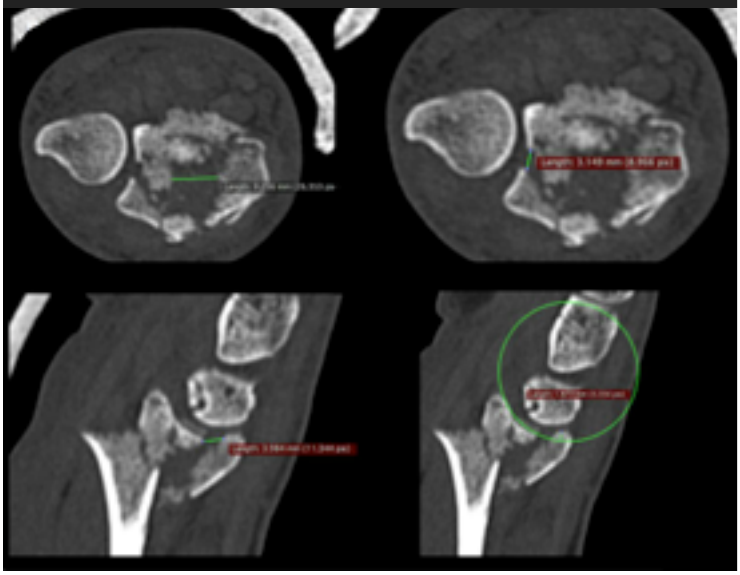
Keywords: *Distal Radius; Ulnar Dorsal Corner Fracture; Distal Radioulnar Joint; Fracture Gap; Fracture Step.*

All the cases used on this study are part of the ICUC® database; 32 are currently available in the ICUC® App and the rest will be uploaded soon. Click here to access the complete list of cases with their IDs.

Below, we include three examples, with their ICUC® App ID to enable access to the full documentation which is available in the ICUC® App.

23-DC-613	PRE Op.	POST Op.
Axial GAP (3)	10 mm	0
Sagital GAP (3)	4 mm	0
Axial STEP (4)	0	0
Sagital STEP (4)	2 mm	0
Ulnar Subluxation (5)	-20%	-20%
Screw into the joint	-	no

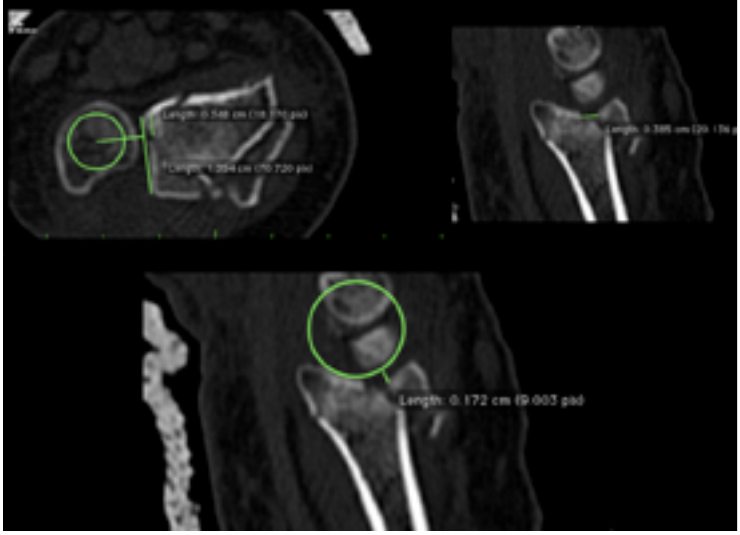
PRE



0w

23-DC-475	PRE Op.	POST Op.
Axial GAP (3)	0	0
Sagital GAP (3)	4 mm	0
Axial STEP (4)	0	0
Sagital STEP (4)	2 mm	0
Ulnar Subluxation (5)	-23%	-11%
Screw into the joint	-	no

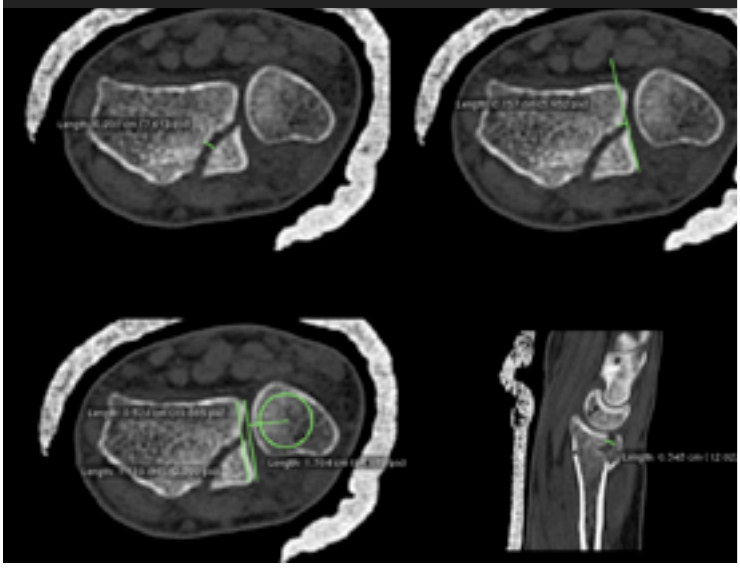
PRE



0w

23-DU-958	PRE Op.	POST Op.
Axial GAP (3)	2 mm	0
Sagital GAP (3)	3 mm	0
Axial STEP (4)	1.5 mm	1 mm
Sagital STEP (4)	3 mm	1 mm
Ulnar Subluxation (5)	-20%	0
Screw into the joint	-	no

PRE



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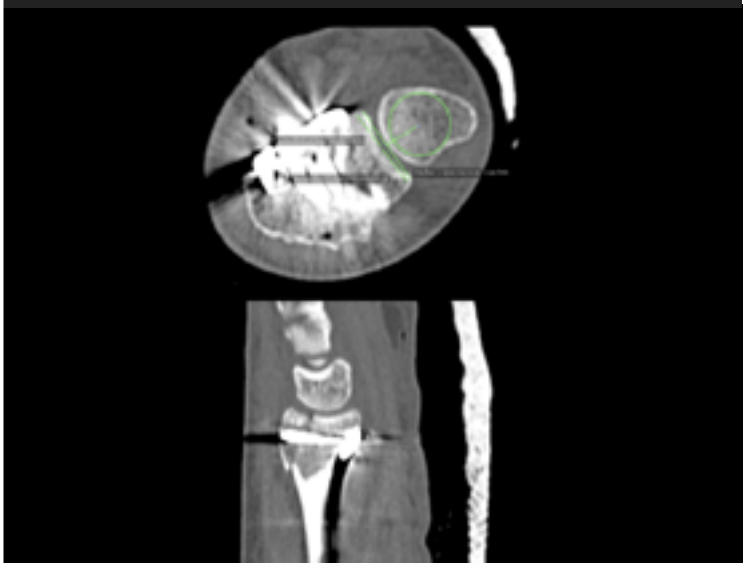

Further Readings:

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