



## Case report

Acute combined collateral ligaments injury of the elbow without any fracture or dislocation-a case report<sup>☆</sup>Marouane Bouloudhine<sup>\*</sup>, Mohamed Hamdi Elgawadi

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## ARTICLE INFO

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## ABSTRACT

**Introduction:** The combination of both collateral ligaments injury in the elbow without fractures or dislocations is not reported in the literature.

**Case presentation:** a case report of rare acute combined collateral ligaments injury of the elbow was treated surgically by repairing both collateral ligament complexes with two different approaches.

**Clinical discussion:** Clinical examination at 3 months showed a stable elbow with a flexion arc from 0 to 140. 10 degrees residual varus laxity was observed.

Pronation and supination were unrestricted. The patient experienced mild pain and was able to do push up and was completely satisfied with the result.

**Conclusion:** The case presented is the first case presented in the literature with acute combined and isolated collateral ligaments injury of the elbow. Based on the clinical result obtained. We propose acute surgical approach of both collateral ligaments for such types of injury.

Level of evidence: 4.

## 1. Introduction and importance

Stability of the elbow joint is provided by osseous as well as soft-tissue stabilizers, and injuries often involve several combinations of these structures. The lateral collateral ligament complex resists excessive varus and external rotational stress. The lateral ulnar collateral ligament is the primary restraint during full arc of elbow motion. The anterior band of the medial collateral ligament complex is the most important restraint against valgus and internal rotation stress. The elbow dislocations can be classified based on the direction of dislocation into posterior, posterolateral, posteromedial, lateral, medial, or divergent. Elbow dislocation can also be classified as simple, with no associated fractures, or complex, with an associated fracture. The radial head is usually fractured in adults with a complex elbow dislocation [1].

Several reconstructive techniques have been described to address each form of instability, including the medial collateral ligament or the lateral collateral ligament complex. However gross instability of the elbow requires reconstruction of both ligaments. A technique has been described by van Riet et al. [2,3] to reconstruct both collateral ligaments

using 1 graft. Another similar technique has been described by Patrick R. Finkbone et al. [4] where he used a “box-loop” design, whereby the donor tendon is passed through the humerus and ulna and tied back on itself,

We think the combination of both valgus and varus pure ligamentous instabilities in the elbow needs more description. The purpose of this case report was to aware orthopaedic surgeons to this rare combination of ligaments injury and to describe our findings.

## 2. Case presentation

A 39-year-old man was seen at the clinic 7 days following a fall from a ladder onto his hand after being treated conservatively in a posterior slab. He sustained a non-dominant left elbow injury with no past medical or surgical history and no drug allergies. Plain radiographs showed just a very small fragment avulsion adjacent to the lateral epicondyle without an obvious fracture (Fig. 1). He had mild pain and his elbow was grossly swollen with extensive bruising and oedema on both sides of the elbow, along with Hematoma on ulnar side.

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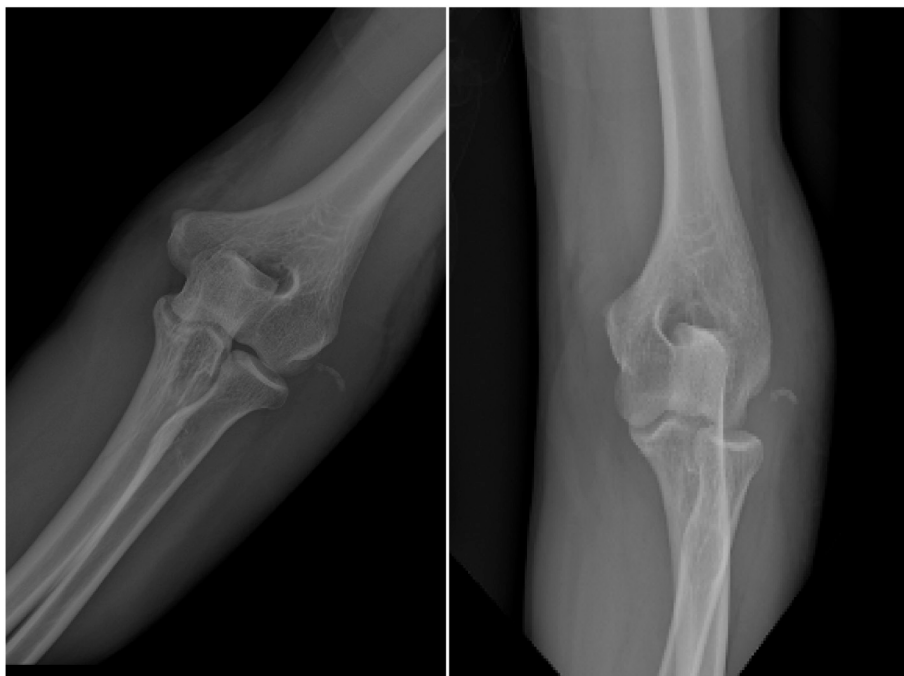


Fig. 1. Preoperative plain radiographs.

Subsequent computed tomography scanning confirmed the plain radiograph finding (Fig. 2).

Subsequent magnetic resonance imaging with contrast confirmed the incompetency of both the lateral and medial collateral ligaments complexes (Fig. 3).

In view of the concern for the extensive soft tissue injury, Patient gave informed consent for inclusion in the study, then an examination under general anesthesia was performed to further assess the level of laxity. This demonstrated both varus and valgus gross instability in which elbow simply dislocated. Fluoroscopic images confirmed these findings.

The patient was placed in the supine decubitus position with the left arm supported over the arm board. A combined lateral and medial incision was made sequentially. Full thickness fascio-cutaneous flaps were created to expose the lateral aspect of the elbow. There was a significant muscular rent which included avulsion of the tendon origins of the extensor carpi ulnaris, radialis brevis and radialis longus and a complete avulsion of the lateral capsule and ligament complex from the humerus. The lateral ligament complex was repaired to the humerus using two suture anchors (GII, Mitek, Mass, USA). The muscular rent was then repaired until there was no more laxity on the lateral side. Pronating the forearm while applying valgus stress, easily subluxed the ulnohumeral joint. The medial aspect of the elbow was exposed. The ulnar nerve was identified and protected throughout the procedure, as well as the cutaneous nerves. A small 3 mm osteochondral fragment was found. All the ulnar collateral ligament complex was avulsed from the medial epicondyle. The medial ligament complex was repaired to the humerus using two suture anchors (GII, Mitek, Mass, USA). The muscular rent was then repaired until there was no more laxity on the medial side. The sutures were tensioned. The elbow was moved through flexion and

extension.

Fluoroscopy imaging showed a congruent, stable elbow throughout the flexion-extension arc. Postoperatively, the elbow was placed in a posterior splint in 90 degrees flexion, which was removed the next day following surgery and active assisted mobilisation of the elbow was started immediately postoperative through a 40–70 range with support of the elbow throughout the whole range with weekly increase of 10 degrees in a hinged elbow brace (Fig. 4).

Radiographs at 6 weeks follow-up showed a congruent joint with good position of the suture anchors (Fig. 5).

Stress radiographs obtained 11 weeks after repair showing residual varus opening less than 10 degree (Fig. 6).

The patient achieved 80 out of 100 points on mayo elbow scoring done at 3 months follow up (Fig. 7).

Clinical examination showed a moderately stable elbow with residual varus opening with a flexion arc from 0 to 140. Pronation and supination were unrestricted. Grip strength was 26 kg, compared to 34 kg on the non-injured dominant side. The patient experienced occasional mild pain and was completely satisfied with the procedure.

This work has been reported in line with the SCARE 2020 criteria [5].

### 3. Clinical discussion

Most acute simple elbow dislocations can be treated conservatively and outcome is often satisfactory; however, this may not be the optimal care in patients with extensive ligamentous injury, as many patients will have residual instability.

Eyghendaal et al. reviewed 41 conservatively managed patients at an average 9 years following a posterolateral dislocation. Eighteen out of

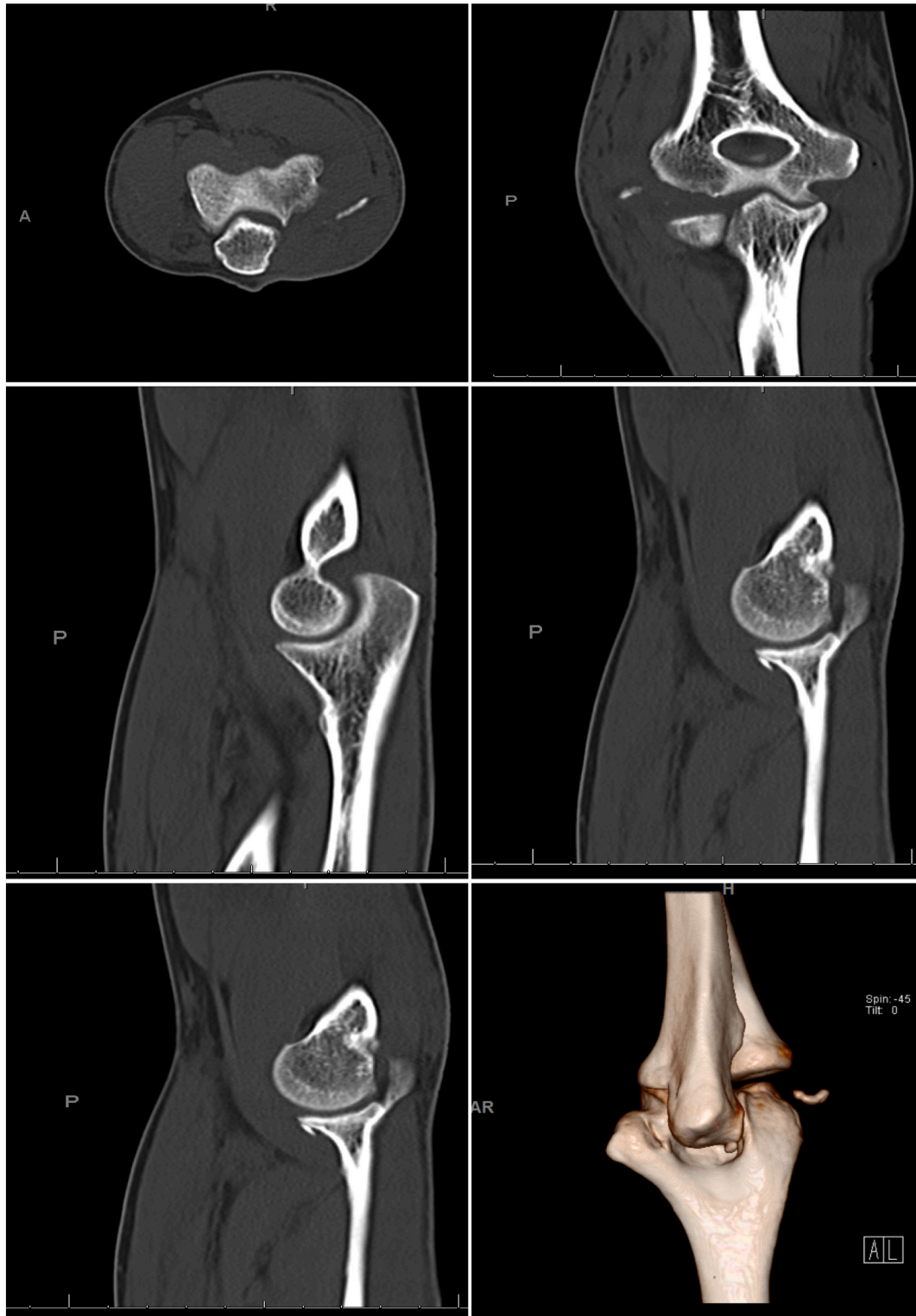


Fig. 2. Preoperative computed tomography scanning.

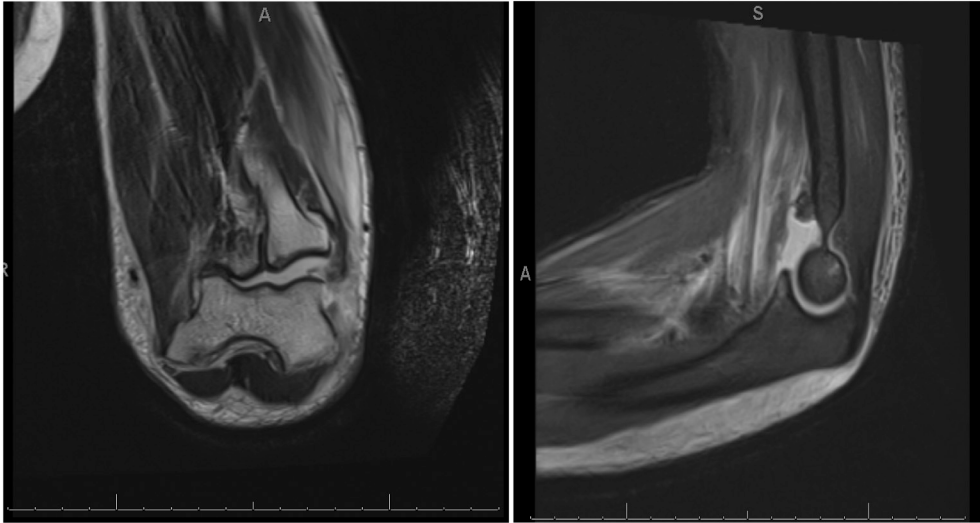


Fig. 3. Magnetic resonance imaging with contrast.

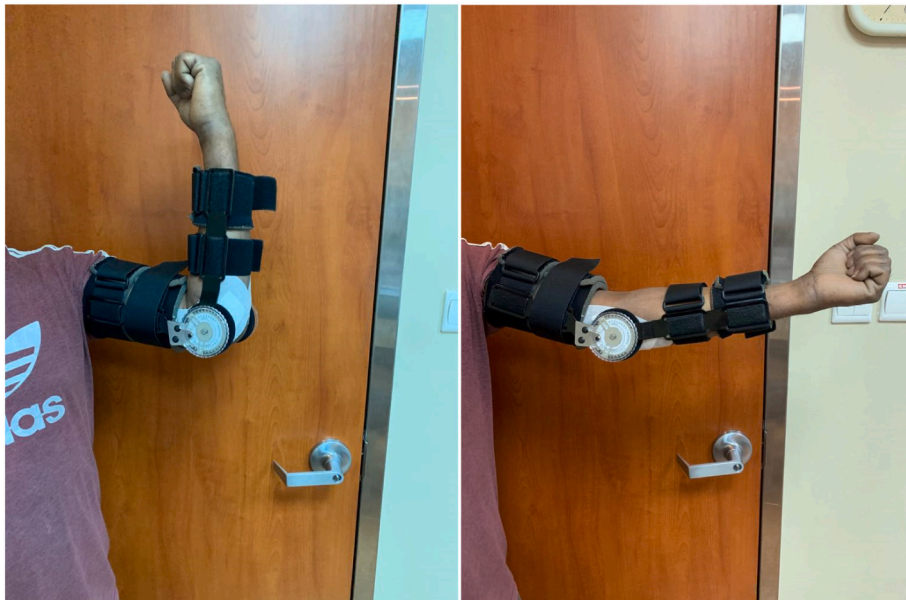


Fig. 4. Post-operative Elbow ROM in a hinged brace.

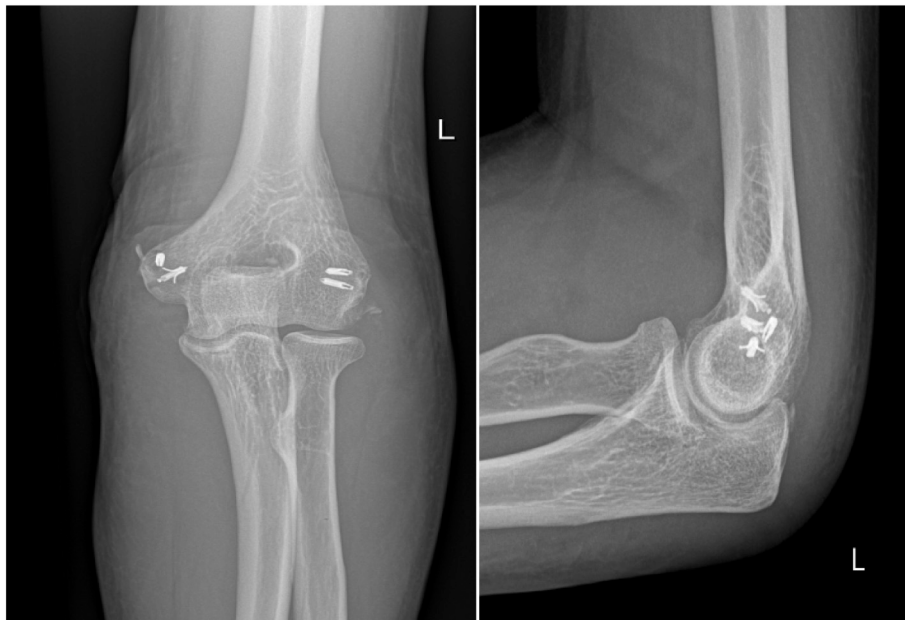


Fig. 5. Plain radiographs after repair.

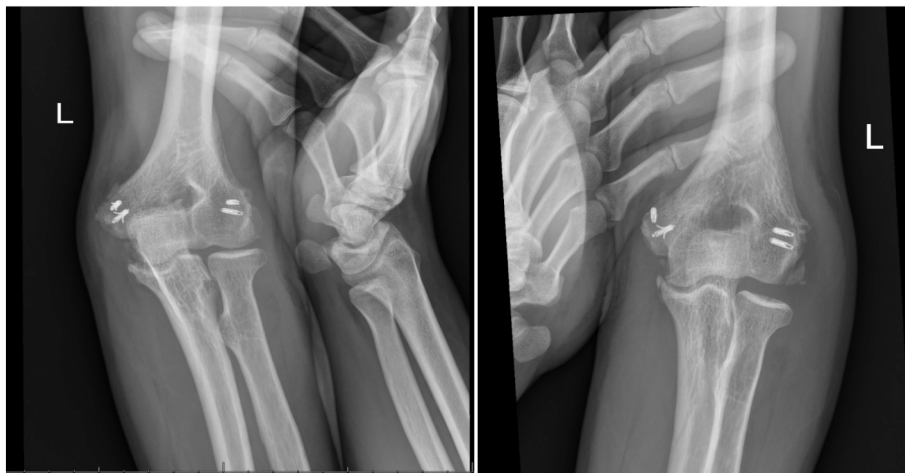


Fig. 6. Stress radiographs 11 weeks after repair showing residual varus opening.

41 (44 %) had moderate to severe residual valgus instability.

O'Driscoll et al. described lateral rotatory instability of the elbow as a spectrum of instability, starting from posterolateral instability to anterior and posterior capsular tears and finally rupture of the medial collateral ligament and muscular insertions.

Rupture of all the medial and lateral ligaments and other soft tissue attachments, without fracture of the bony constraints, has been classified as a (lateral) type IIIC injury [6].

The case presented may be a common, but easily missed combination of patterns of instability. Both directions of instability need to be addressed in order to restore stability of the elbow.

In the case presented, repairing the lateral complex only, failed to stabilize the elbow. However, it did change the principal direction of the

instability, and allowed the medial side of the elbow to pivot on the lateral structures. The medial collateral ligament has been shown to resist both valgus stress and internal rotation of the ulna.

#### 4. Conclusion

primary ligament repair followed by an early mobilisation programme to treat unstable elbow provided satisfactory functional results, range of motion and stability. Anatomical restoration of the soft tissue stabiliser of the elbow joint is important in such types of unstable elbow in order to avoid a complicated secondary reconstruction procedure. Further studies are required to validate our clinical results.

Mayo Elbow Score: 80 / 100

**Section 1 - Pain Intensity**

None (45)

Mild (30)

Moderate (15)

Severe (0)

**Section 2 - Motion**

Arc of motion greater than 100 degrees (20)

Arc of motion between 50 and 100 degrees (15)

Arc of motion less than 50 degrees (5)

**Section 3 - Stability**

Stable (10)

Moderate instability (5)

Grossly Unstable (0)

**Section 4 - Function (tick as many as able)**

Can comb hair (5)

Can eat (5)

Can perform hygiene (5)

Can put on shirt (5)

Can put on shoe (5)

Mayo Elbow Score: 80 / 100

Fig. 7. Mayo elbow scoring done at 3 months follow up.

#### Ethical approval

Not applicable.

#### Consent

Written informed consent was obtained from the patient for

publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Research registration (for case reports detailing a new surgical technique or new equipment/technology)

Not applicable.

#### Guarantor

Corresponding author.

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Full contribution from both the author and co-author.

#### Declaration of competing interest

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#### References

- [1] J. Acosta Batlle, L. Cerezal, M.D. López Parra, B. Alba, S. Resano, J. Blázquez Sánchez, The elbow: review of anatomy and common collateral ligament complex pathology using MRI, *Insights into Imaging* 10 (1) (2019) 1–25, <https://doi.org/10.1186/S13244-019-0725-7>, 101. 2019.
- [2] RP Van Riet YW Lim R Baird GI Bain n.d. Ligamentous reconstruction of the elbow in a 13-year old using a circumferential technique. doi:10.1016/j.injury.2008.02.037.
- [3] R.P. van R, Simultaneous reconstruction of medial and lateral elbow ligaments for instability using a circumferential graft, *Tech Hand Up Extrem Surg.* 10 (4) (2006) 239–244, <https://doi.org/10.1097/01.BTH.0000236985.66040.8E>.
- [4] P.R. Finkbone, O'driscoll SW., Box-loop ligament reconstruction of the elbow for medial and lateral instability, *J. Shoulder Elb. Surg.* 24 (2015) 647–654, <https://doi.org/10.1016/j.jse.2014.12.008>.
- [5] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, *Int J of S 84* (2020) 226–230. No Title.
- [6] R.P. van Riet, Y.W. Lim, G.I. Bain, Combined posterolateral and posteromedial rotatory instability of the elbow, *Inj. Extra* 38 (11) (2007) 400–404, <https://doi.org/10.1016/J.INJURY.2007.01.039>.