



(CASE REPORT)



Combined humerus capitulum and olecranon fractures: Surgical intervention in a saber-related injury

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Abstract

This report outlines the successful surgical management of a 30-year-old taxi driver with concurrent humerus capitulum and olecranon fractures due to a saber assault. The intervention involved decontamination, ulnar nerve exploration, and osteosynthesis, leading to a favorable outcome with restored joint function. This case underscores the significance of timely and comprehensive surgical approaches in complex fractures.

Keywords: Humerus; Capitulum; Olecranon; Open injury

1. Introduction

The fractures of the humeral capitulum, representing 1 to 2% of adult fractures, seldom coexist with an olecranon fracture. This association can be potentially detrimental to the functional prognosis of the elbow, given the significant risk of developing joint stiffness.

2. Observation

This concerns Y. R., a 30-year-old taxi driver, who presented at the emergency department with an open trauma to the left elbow following a saber assault. The clinical examination of the patient revealed a cutaneous opening with detachment from distal to proximal on the posterior aspect of the left elbow. There was an inability to extend the elbow, without sensory-motor or vascular impairment (Figure 1).

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Figure 1 Clinical examination of the wound caused by a saber strike

The patient underwent a standard elbow radiograph, revealing a fracture of the humeral capitulum associated with an olecranon fracture (Figure 2).



Figure 2 X-rays of the traumatized elbow (left)

In the operating room, after a plexus block, extensive lavage, decontamination of the wound, exploration of the ulnar nerve (Figure 3), and an osteosynthesis of the humeral capitulum with two cross-pinned Kirschner wires, along with tension band wiring of the olecranon were performed (Figure 4). An aspirating Redon drain was kept in place for 24 hours.



Figure 3 Ulnar nerve intact following neurolysis



Figure 4 Fixation of the humeral capitulum fracture with two Kirschner wires

The patient's progress was monitored, revealing a restoration of joint range of motion and muscular strength comparable to the contralateral side (Figure 5) and evidence of bone consolidation on follow-up radiographs (Figure 6).



Figure 5 Full resumption of elbow flexion/extension



Figure 6 Follow-up X-rays after the consolidation of fractures

3. Discussion

The combined occurrence of an open fracture of the humeral capitulum with an olecranon fracture is a relatively rare condition but carries significant clinical implications. The primary objective is the restoration of the articular surface as anatomically as possible, addressing the dual challenge in this case, with a stable fixation facilitating rehabilitation and functional recovery. (1,4,8)

The mechanism explaining this type of injury often involves an axial loading force acting directly on a substantially flexed elbow, initially leading to an olecranon fracture. Due to the olecranon's inability to absorb the entire force, there is subsequent propagation to the articular surface of the distal humerus, resulting in a coronal shear fracture. (3,7)

In the literature, these injuries are frequently open fractures, indicative of the force of the trauma, making them more challenging to treat. They cause both osseous and soft tissue damage, influencing surgical management and exposing patients to infectious complications in addition to consolidation defects. (2)

Neurological involvement represents another dimension of potential complications, arising from the direct mechanism of injury by the weapon used, the fracture itself, or iatrogenically, particularly concerning the ulnar nerve. Conducting a comprehensive neurological examination, supplemented by surgical exploration when necessary, remains imperative to appropriately assess and treat associated neurological impairments. (5,6,9)

The major risk associated with elbow fractures, especially in the context of the dual challenge presented by the humeral capitulum-olecranon association, lies in the potential development of joint stiffness. Therefore, the timing of rehabilitation, neither too early nor too late, is crucial to optimize long-term functional outcomes and minimize the sequelae of joint stiffness.

Stiffness is a common complication known in distal humerus fractures and can stem from various causes, including heterotopic ossification, articular incongruity, pseudarthrosis, malunion, or osteochondral lesions, hastening the development of elbow arthritis. (10,13,14)

In current literature, DASH functional scores from various cohort studies of patients with complex intra-articular fractures of the distal humerus range from 7 to 23. The heterotopic ossification rate can reach 49%, and the pseudarthrosis rate varies from 1% to 44%, with the majority of cases occurring in open fractures, prompting surgical intervention in over 60% of cases. (2,11,12,15,16).

4. Conclusion

The combined occurrence of an open fracture of the humeral capitulum with an olecranon fracture poses a complex clinical challenge. Accurate diagnostic approaches, appropriate therapeutic management, and close monitoring are essential to optimize clinical and functional outcomes in patients with these injuries.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Articular Fractures of the Distal Part of the Humerus : JBJS [Internet]. [Cité 19 janv 2024]. Disponible sur : https://journals.lww.com/jbjsjournal/fulltext/2003/02000/articular_fractures_of_the_distal_part_of_the.8.aspx
- [2] Cho E, Weber MB, Opel D, Lee A, Hoyer H, Bafus BT. Complications and functional outcomes after transolecranon distal humerus fracture. *Journal of Shoulder and Elbow Surgery*. 1 mars 2021;30(3):479-86.
- [3] Coronal shear fracture of distal humerus associated with olecranon fracture: A case report and pathomechanism - Yucheng Sun, Pachin Thanomsingh, In-Ho Jeon, 2019 [Internet]. [cité 19 janv 2024]. Disponible sur: <https://journals.sagepub.com/doi/full/10.1177/2309499019849707>
- [4] Gradl G, Jupiter JB. Current Concepts Review - Fractures in the Region of the Elbow. *ACHOT*. 1 juin 2012;79(3):203-12.
- [5] Vazquez O, Rutgers M, Ring DC, Walsh M, Egol KA. Fate of the Ulnar Nerve After Operative Fixation of Distal Humerus Fractures. *Journal of Orthopaedic Trauma*. juil 2010;24(7):395.
- [6] Fajolu O, Iyengar K, Litts CS. Distal Humerus Fractures: Handling of the Ulnar Nerve. *Journal of Hand Surgery*. 1 août 2012;37(8):1696-8.
- [7] Watts AC, Morris A, Robinson CM. Fractures of the distal humeral articular surface. *The Journal of Bone & Joint Surgery British Volume*. 1 avr 2007;89-B(4):510-5.
- [8] FRACTURES OF THE DISTAL HUMERUS - Orthopedic Clinics [Internet]. [cité 19 janv 2024]. Disponible sur: [https://www.orthopedic.theclinics.com/article/S0030-5898\(05\)70131-0/fulltext](https://www.orthopedic.theclinics.com/article/S0030-5898(05)70131-0/fulltext)

- [9] Tangtiphaiboontana J. In Situ Ulnar Nerve Decompression Alone for Distal Humerus Fractures Minimizes Iatrogenic Injury. *Journal of Orthopaedic Trauma*. mai 2023;37(5):e233.
- [10] Guitton TG, Zurakowski D, van Dijk NC, Ring D. Incidence and Risk Factors for the Development of Radiographic Arthritis After Traumatic Elbow Injuries. *The Journal of Hand Surgery*. 1 déc 2010;35(12):1976-80.
- [11] Greiner S, Haas NP, Bail HJ. Outcome after open reduction and angular stable internal fixation for supra-intercondylar fractures of the distal humerus: preliminary results with the LCP distal humerus system. *Arch Orthop Trauma Surg*. 1 juill 2008;128(7):723-9.
- [12] Surgical Treatment of Intra-Articular Fractures of the Dista... : JBJS [Internet]. [cité 19 janv 2024]. Disponible sur: https://journals.lww.com/jbjsjournal/abstract/2007/07000/surgical_treatment_of_intra_articular_fractures_of_f.17.aspx
- [13] Haller JM, Hulet DA, Hannay W, Cardon J, Tashjian R, Beingessner D. Patient Outcomes After Transolecranon Fracture-Dislocation. *JAAOS - Journal of the American Academy of Orthopaedic Surgeons*. 1 févr 2021;29(3):109.
- [14] Mellema JJ, Lindenhovius ALC, Jupiter JB. The posttraumatic stiff elbow: an update. *Curr Rev Musculoskelet Med*. 1 juin 2016;9(2):190-8.
- [15] Ducrot G, Bonnomet F, Adam P, Ehlinger M. Treatment of distal humerus fractures with LCP DHPTM locking plates in patients older than 65years. *Orthopaedics & Traumatology: Surgery & Research*. 1 avr 2013;99(2):145-54.
- [16] Kaiser T, Brunner A, Hohendorff B, Ulmar B, Babst R. Treatment of supra- and intra-articular fractures of the distal humerus with the LCP Distal Humerus Plate: a 2-year follow-up. *Journal of Shoulder and Elbow Surgery*. 1 mars 2011;20(2):206-12.