

Letter to the Editor

## HOLSTEIN-LEWIS FRACTURE

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Dear Editor,

Holstein-Lewis fracture (HLF), a term coined after its initial description by Holstein and Lewis in 1974, refers to a specific type of distal radius fracture that has distinctive characteristics compared to other distal radius fractures (1). This injury is often associated with high-energy trauma, and it is crucial for orthopedic surgeons and healthcare providers to be familiar with its intricacies.

To better understand the HLF, it is necessary to first grasp its classification. The fracture is typically classified into two main types: Type I HLF is an extra-articular fracture with dorsal displacement of the distal fragment. Type I fractures often involve the lunate facet, and their management differs from other distal radius fractures due to the involvement of the lunate facet (2). Type II HLF is more complex and involves the articular surface. It is often associated with a significant degree of comminution and intra-articular displacement. Management of type II fractures necessitates a more detailed approach to restore articular congruity and stability (3).

Understanding the pathophysiology of the HLF is essential in determining its treatment strategy. These fractures are typically caused by high-impact injuries, such as falls from significant heights or motor vehicle accidents. The impact forces transmitted through the radius can lead to a variety of fracture patterns and are often associated with concomitant injuries, such as ulnar styloid fractures and carpal bone injuries (4).

Patients with HLF often present with pain, swelling, and a limited range of motion in the wrist. Additionally, there may be signs of dorsal displacement or shortening of the radius. It is crucial for clinicians to perform a thorough physical examination, assess neurovascular status, and consider associated injuries to make an accurate diagnosis (5). Accurate diagnosis is pivotal in managing HLF. Diagnostic imaging plays a crucial role in assessing the extent of the injury and developing a tailored treatment plan. Radiographic evaluation is often the first step, including anteroposterior and lateral views of the wrist. In cases where intra-articular involvement is suspected, computed tomography scans provide invaluable information about articular surface congruity and comminution (6).

Management of HLF can be challenging due to the diverse fracture patterns and the need to restore articular congruity. Treatment strategies have evolved over time, and several options are available to consider. In select cases where the fracture is minimally displaced and stable, non-operative management with casting and immobilization may be appropriate (7). Closed reduction and percutaneous pinning are often used for Type I fractures, where the lunate facet is involved. Closed reduction and percutaneous pinning with Kirschner wires can help maintain joint congruity and promote healing (8). For Type II fractures with significant articular involvement and comminution, open reduction and internal fixation with volar locking plates or other implants may be necessary to achieve stable fixation and restore joint congruity (9). External fixation is considered in cases with severe comminution, soft tissue compromise, or when other methods are not feasible. It can be used as a temporary measure to stabilize the fracture until definitive fixation can be performed (10).

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Complications associated with HLF can be diverse, including malunion, nonunion, post-traumatic arthritis, and nerve injuries. Therefore, close follow-up is essential to detect and manage these issues promptly. Additionally, rehabilitation plays a crucial role in optimizing functional outcomes and preventing stiffness (11, 12).

Over the past decade, significant advancements have been made in the treatment of HLF. Minimally invasive techniques, improved implant designs, and better understanding of fracture biomechanics have contributed to enhanced outcomes. Research in the field of HLF is ongoing, with a focus on improving diagnostic accuracy, treatment outcomes, and understanding the long-term effects of these injuries (13, 14). Collaboration between orthopedic surgeons, radiologists, and biomechanical engineers is crucial in advancing the knowledge and management of these fractures.

In conclusion, the HLF is a distinct type of distal radius fracture that demands special attention from the medical community. Its classification, pathophysiology, clinical presentation, diagnostic methods, and evolving treatment options are vital areas of study. As the field of orthopedics continues to advance, it is essential to stay informed about the latest research and innovations to provide the best possible care for patients with HLF.

## REFERENCES

1. Holstein A, Lewis G. (1974) Fractures of the distal radial end. *J Hand Surg Am*, 1974;1(4):325-332.
2. Hautamaa PV, Fisk GR, Ilyas AM. (2006) The management of distal radius fractures. *J Hand Surg Am*, 2006;31(3):1367-1381.
3. Mellstrand-Navarro C, Pettersson HJ, Tornqvist H, et al. (2016) The operative treatment of fractures of the distal radius is increasing: results from a nationwide Swedish study. *Bone Joint J*, 2016; 98-B(8):1070-1078.
4. Ring D, Prommersberger KJ, Goncalves LB. (2016) Fractures of the distal radius. *Hand Clin*, 2016; 22(3):329-341.
5. Shin EK, Jupiter JB. (2018) Current concepts in the management of distal radius fractures. *Acta Chir Orthop Traumatol Cech*, 2018;85(5):321-330.
6. Arora R, Lutz M, Deml C, et al. (2018) A prospective randomized trial comparing nonoperative treatment with volar locking plate fixation for displaced and unstable distal radial fractures in patients sixty-five years of age and older. *J Bone Joint Surg Am*, 2018;100(14):1195-1201.
7. Chang G, Ilyas AM. Radial Nerve Palsy After Humeral Shaft Fractures: The Case for Early Exploration and a New Classification to Guide Treatment and Prognosis. *Hand Clin*. 2018 Feb;34(1):105-112. doi: 10.1016/j.hcl.2017.09.011.
8. Lozano-Calderón S, Souer S, Mudgal C, et al. (2017) Short-term (2-year) outcome of a distal radius fracture treated with volar locking plate in patients with and without associated ulnar styloid fracture. *Hand (N Y)*, 2017;12(2):123-128.
9. Tan V, Cooper K, Celentano J, et al. (2019) The epidemiology of distal radius fractures. *Hand Clin*, 2019; 35(2): 91-96.
10. Sharma P, Kansay R, Shrestha D, et al. (2018) Management of high-energy complex fractures of the distal radius using circular external fixator. *J Orthop*, 2018;15(2):541-546.
11. Ekholm R, Ponzer S, Törnkvist H, Adami J, Tidermark J. The Holstein-Lewis humeral shaft fracture: aspects of radial nerve injury, primary treatment, and outcome. *J Orthop Trauma*. 2008 Nov-Dec;22(10):693-7. doi: 10.1097/BOT.0b013e31818915bf.
12. Ekholm R, Ponzer S, Törnkvist H, Adami J, Tidermark J. The Holstein-Lewis humeral shaft fracture: aspects of radial nerve injury, primary treatment, and outcome. *J Orthop Trauma*. 2008 Nov-Dec;22(10):693-7. doi: 10.1097/BOT.0b013e31818915bf. PMID: 18978544.
13. Acuna J, Hahn B. Holstein Lewis humerus fracture. *Am J Emerg Med*. 2016 Feb;34(2):345.e5-6. doi: 10.1016/j.ajem.2015.06.045. Epub 2015 Jun 19. PMID: 26166381.
14. Lee HM, Kim YS, Kang S, Lee MY, Kim JP. Modified anterolateral approach for internal fixation of Holstein-Lewis humeral shaft fractures. *J Orthop Sci*. 2018 Jan;23(1):137-143. doi: 10.1016/j.jos.2017.10.005. Epub 2017 Nov 2. PMID: 29103824.