



Excision of Hook of Hamate Fractures in Elite Baseball Players: Outcomes and Surgical Technique

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Background:

Hook of hamate fractures are relatively rare wrist injuries in the general population (2-4% of carpal bone fractures).²⁻⁴ However, these fractures may be seen more commonly in elite athletes, particularly those participating in sports which utilize a bat, stick, club, or racket. Delay in diagnosis and treatment can lead to chronic ulnar hand pain, attritional rupture of the ulnar digital flexor tendons,⁵⁻⁹ or terminal ulnar nerve motor or sensory deficits.^{10,11}

Diagnosis can be elusive. Athletes typically present with volar ulnar sided hand/wrist pain, but a subset do present with more dorsal ulnar hand pain.

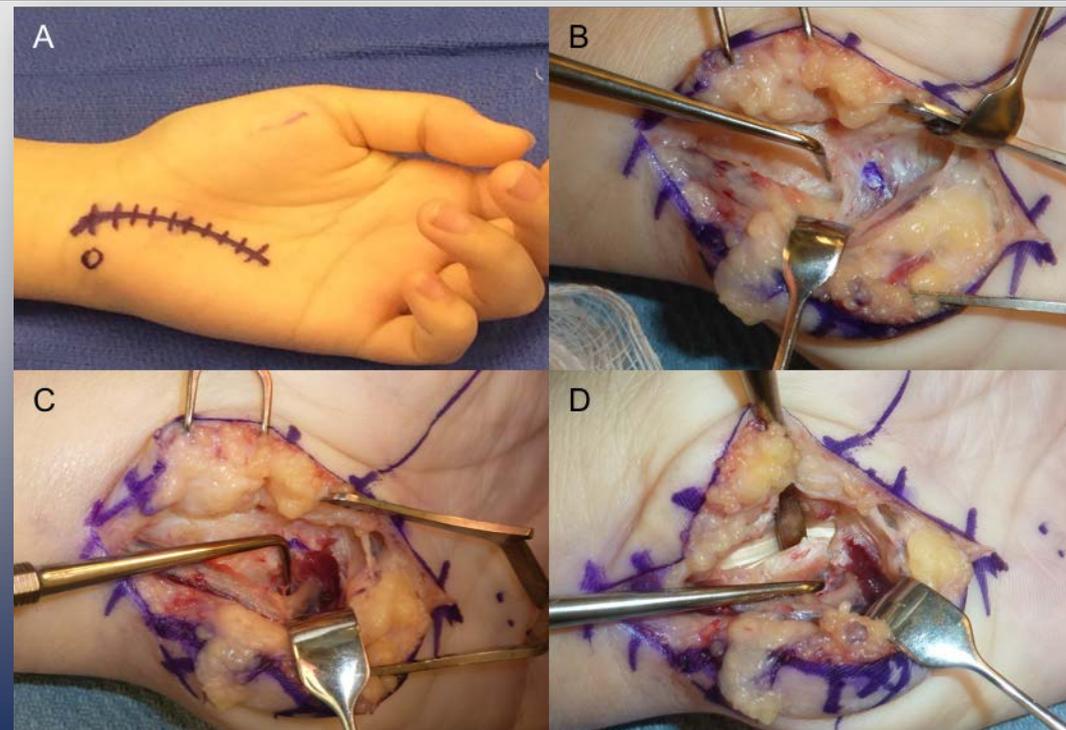
In the elite athlete with expectations of expedited return to play, early excision of hook of hamate fractures^{2,16,17,19,22-33} is favored over open reduction and internal fixation (ORIF)^{2,15-21}. The current study represents a large uniform consecutive cohort of elite baseball players competing at professional or varsity collegiate levels. Clinical and functional outcomes are reported and discrete anatomical and surgical steps that are critical to successful excision of a hook of hamate fracture are outlined.

Methods:

Retrospective review of 32 consecutive elite baseball players who underwent acute (<3 weeks), subacute (3-6 weeks) and delayed (>6 weeks) surgical excision of 32 hook of hamate fractures that were sustained while competing at professional (16) or varsity collegiate (16) baseball levels. Mean follow up was 10 months. The clinical history, timing of surgery, complications, and time to return to play are reported.

Technique (Figure 1): **A:** Curvilinear ulnar incision over Guyon's Canal just radial to the pisiform (Circle mark). **B:** Ulnar nerve decompression is completed in a step-wise fashion to expose the deep motor branch of the ulnar nerve beneath the leading edge of the fibrous arch of the hypothenar intrinsics (dental probe) **C:** The deep motor branch of ulnar nerve (dental probe) is fully decompressed so that it can be mobilized ulnarward away from the ulnar wall and protected during subperiosteal dissection of the hook of hamate. **D:** Subperiosteal exposure of the hook of hamate. The ulnar flexor tendons within the carpal tunnel are protected on the radial wall of the hook of hamate. The deep motor branch is seen ulnar to the dental probe safely translated away from the ulnar wall of the hook of hamate.

Results: Patients underwent excision of their hook of hamate fracture at a mean of 8 weeks (range 0.5 – 52 weeks) from the onset of symptoms. All patients were able to return to full pre-injury level of baseball participation on average 7 weeks from the date of surgery (range 4-30 weeks). Two patients returned to the operating room; one for cicatrix creating secondary ulnar nerve compression with motor weakness and one for residual bone fragment causing recurrent ulnar sided pain.



Discussion:

Standard AP, lateral and oblique wrist radiographs are usually insufficient for identifying hook of hamate fractures, with up to 39% of these fractures missed on plain radiographs.⁴¹ MRI or CT are often used to confirm the diagnosis of acute hook fracture or nonunion. Additionally, the “hook of hamate pull test”^{48,49}, has been reported to reliably diagnose hook of hamate pathology.

In the elite athlete where expedited return to play is expected, closed treatment of acute fractures does not reliably result in timely clinical union.^{12,16} Our experience is consistent with prior reports^{4,27} that: the incidence of hamate fractures may be increasing, that surgical excision is a reliable option, and that complication rates occur in approximately 3%-6% of players²⁵.

Limitations include those inherent to retrospective review. However, all fractures were confirmed by advanced imaging and were treated uniformly. While 23/32 had <3 months of direct clinical follow-up by the surgeon (professional athletes return to team trainers), return to full play was confirmed directly with the training staff at an average of 7 weeks.

Conclusion:

Surgical excision of hook of hamate fractures is a reliable option in elite athletes with acute or chronic nonunions and affords early functional rehabilitation and expedited return to play. Early or late excision obviates suboptimal fixation concerns. We recommend formal ulnar nerve decompression including the deep motor branch of the ulnar nerve in order to safely excise the hook of hamate.