

# Fractures of the hook of the hamate in athletes

## 8 cases followed for 6 years

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In 8 cases the fractured hook of the hamate was excised. Associated conditions included rupture of flexor tendons in 3 cases and ulnar nerve paresthesia

in 2 cases. In 5 cases tomography was required to establish the diagnosis. Postoperative results with 6 years follow-up were good.

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Fractures through the hook of the hamate have been previously thought to be uncommon (Andress and Pecker 1970). Recently, however, this injury appears more common with the increasing popularity of golf, baseball, tennis and other racquet sports (Stark et al. 1977, Parker et al. 1986, Smith et al. 1988). We describe our clinical experience and results of surgical treatment.

### Patients and methods

During the past 10 years, 8 fractures of the hook of the hamate in athletes have been surgically treated (Table 1). The clinical symptoms included pain in the palm, aggravated by gripping, and grip weakness in all cases. 5 patients with more than 6 months' delay from initial injury had associated conditions which included flexor

tendon injury (Figure 1) in 3 cases (little and ring fingers in 2 cases and little finger in 1 case) and ulnar nerve paresthesia in 2 cases. Routine radiographs were diagnostic in 1 case, carpal tunnel views in 2 cases, and lateral tomography in 5 cases (Figure 2). All patients were treated by surgical excision of the hook of the hamate (Figure 3). Free tendon grafting and nerve release were performed concomitantly with the excision procedure in the patients with complications. There were no postoperative complications.

The patients were reexamined after 6 (3-10) years.

### Results

In all cases, more than 80 percent of grip strength compared with the healthy hand was obtained within 3 months after surgery. All patients, except for 3 cases

Table 1. Fracture of the hook of the hamate in 8 cases

Case	Age	Sex	Side	Induced during	A	B	C	D	Follow-up years
1	18	M	R	Motocross	1		R	E	6
2	41	F	R	Tennis	6	F	T	E, G	10
3	30	M	L	Golf	1		L	E	6
4	52	M	L	Golf	2		L	E	8
5	67	M	L	Golf	9	F	L	E, G	3
6	42	F	R	Tennis	18	F	L	E, G	7
7	38	F	R	Tennis	11	U	T	E, N	4
8	41	M	R	Tennis	10	U	L	E, N	6

A Months from injury to diagnosis

B Associated condition

F loss of finger flexion

U ulnar nerve paresthesia

C Diagnostic radiographic technique

R routine view

T carpal tunnel view

L lateral tomography

D Treatment

E excision of hook of hamate

G tendon graft

N nerve release

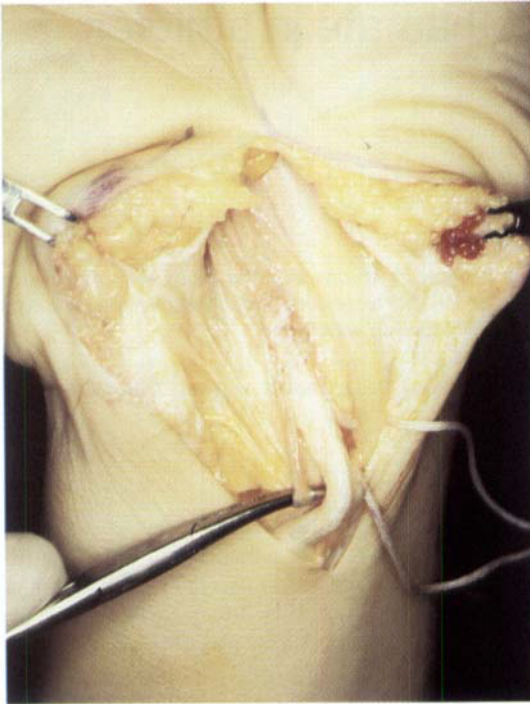


Figure 1. Flexor tendon rupture secondary to hook fracture (Case 2). Rupture of the flexor digitorum superficialis and profundus of the ring and little fingers were observed.



Figure 2. Lateral tomography (Case 5). Lateral tomography is superior to other radiographic methods for diagnosis.



Figure 3. Carpals tunnel view (Case 2) after excision of the hook of the hamate.

of tendon rupture, were able to return to their previous level of athletic activities within 2 months. In 3 patients with free tendon grafting, full range of finger and wrist motion was obtained, and they returned to their previous level of sports activities within 4 months after surgery. Ulnar nerve paresthesia disappeared completely in 2 patients with a nerve release procedure within 2 months after surgery.

## Discussion

Fracture at the base of the hook of the hamate may not be quite as rare as previously assumed (Carter et al. 1977, Stark et al. 1977, Parker et al. 1986, Smith et al. 1988). The diagnosis may often be delayed because the signs and symptoms are rather non-specific, and routine radiography is not always diagnostic (Norman et al. 1985, Polivy et al. 1985). In our series also, the diagnosis was delayed in 5 cases and routine radiography was diagnostic in only 1 case. Early diagnosis is extremely important because of the risk of associated conditions, such as rupture of flexor tendons and ulnar

nerve paresthesia. For establishing the diagnosis, one must pay attention to any salient features of the clinical history (usually, the hook is fractured by the butt of a racket, club or bat striking it during a poor swing, or by a fall on an outstretched hand), and precise physical signs (point tenderness directly over the hook of the hamate and/or gradual decrease of grip strength). Among the several radiographic methods for diagnosis, lateral tomography is superior. Carpals tunnel projection is not always possible since forced hyperextension of the wrist is limited by pain (Carter et al. 1977). Computerized tomography and bone scintigraphy may also be helpful. Surgical treatment is indicated as promptly as possible, particularly in patients who are eager to return to athletic activities and to prevent later

complications, such as tendon rupture and nerve palsy. The rough surface of the non-union might cause an attritional rupture of the flexor tendon, as described by Minami (1985), and instability of the fractured hook seemed to have caused repetitive compression to the adjacent ulnar nerve.

Some authors (Watson and Rogers 1989) have recommended bone grafting for the treatment of the non-union. However, we believe as other authors (Carter et al. 1977, Stark et al. 1977, Parker et al. 1986, Smith et al. 1988) that the entire hook should be resected at the base of the hamate as primary treatment.

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