Objectives

Diagnosis of acute hamate hook fracture is difficult and rarely made at the time of the initial injury. Hook excision remains the operation of choice. The effects of hamate hook excision lead to 4 to 5 mm of ulnar displacement of the little finger profundus tendon. Flexor tendon force decreases between 11% and 15%. However, alternatives are available, one of which is open reduction and internal fixation (ORIF). ORIF constitutes the logical treatment of hamate hook fracture, because it restores the native anatomy and function of the carpal bone. The purpose of this study was to analyze the grip strength and outcomes of ORIF in hamate hook fractures.

Methods

In a retrospective study over a period of 12 years (2003 to 2015), we identified 13 patients with a hamate hook fracture who were surgically treated with ORIF (Figure 1). All patients had a minimum follow-up of 1 year after surgery and completed the study follow-up examination. In eight patients (61%) the fracture was associated with ulnar nerve neuritis in Guyon’s canal. We assessed the following clinical data: age, sex, mechanism of injury, side of the injured hand and associated lesions, fracture classification, average time from injury to correct diagnosis, surgical technique and complications. A headless bone compression screw (Micro Acurak screw, Acumed, Hillsboro, OR) was used in all patients (Figure 2). Functional outcomes evaluated were pain, range of motion, grip strength, Disabilities of the arm, shoulder and hand (DASH) and Mayo wrist score. Data were analysed using SPSS computer software system, version 21 (Chicago, IL, USA). The paired “t” test was used to evaluate differences in grip strength between hands treated by ORIF and unaffected hands.

Results

There were 12 male and 1 female, with mean age of 32 years (range, 22 to 48 years). The mean follow-up was 36 months (range, 12 to 144 months). The etiology was 3 motorcycle accidents, 3 falls on the outstretched hand during a basketball game, 2 bicycle accidents, 2 direct hits by a golf club, 2 tennis racket traumas, and 1 unspecified accident while diving. The right hand was affected in eleven cases. All patients returned to their pre-injury level of functioning after 10-12 weeks and there were no complications. Analysis of grip strength revealed values comparable with the unaffected hand. Eight patients complained of numbness, tingling and/or paresthesia in the ulnar nerve in the finger pulp of the ring and little fingers, with a positive Tinel’s sign at Guyon’s canal, symptoms and signs that usually present in neuritis of the ulnar nerve. With regard to fracture classification, 3 cases fell into type II, and 10 into type III. The average time from injury to correct diagnosis was 3.2 weeks (ranging 2 days to 9 weeks). Mean VAS pain score was 5 preoperatively (4-9) and 1 (0-2) postoperatively. Postoperative average range of wrist motion was 76° in extension, 71° in flexion, 14° in ulnar deviation, and 21° in radial deviation. Mean grip strength in the hand with the hook fracture was 58 Kg, compared with 53 Kg in the unaffected hand. However, this difference was not statistically significant. Preoperative modified Mayo Wrist Score was 51 and the postoperative value was 94. The patients who participated in sports postoperatively were able to do so at or near pre-injury levels.

Conclusions

ORIF of hamate hook fractures is a safe and effective technique to restore normal grip strength and return to pre-injury level. In cases of ulnar nerve neuritis, neurolysis of the deep palmar branch is mandatory.

References