

A New Technique for Reduction of Metacarpal Neck Fracture

Atsuro Kawakita ¹⁾, Naoki Takada ^{1,2)}, Ayano Tanibuchi ¹⁾, Hiroshi Mizuochi ¹⁾, Wataru Inokuchi ¹⁾

¹⁾ Department of Orthopaedic Surgery, Nerima General Hospital, ²⁾ Takada Orthopaedic Clinic

Objectives

Most of the displaced metacarpal neck fractures are well treated by a traditional reduction method, traction distally or exerting the dorsally directed force through the MP joint at a right angle. However, it is sometimes irreducible especially in the case after several weeks of injury. We demonstrate here a new reduction technique to correct typical apex dorsal angulation extremely easily without opening fracture site during an operation even in the cases several weeks after the injuries.

Methods

Four cases of metacarpal neck fracture that were irreducible by the traditional reduction method during operations even under anaesthesia were investigated. Through a minimal skin incision, the dorsal capsule of the MP joint was punctured at its proximally attached portion along the extensor tendon. A surgical sound or a mosquito forcep were inserted into the joint close to the dorsal capsule not to injure the joint surface and then elevated dorsally to correct the angulation. (Figure 1) The fragment was fixed intramedullarily by Foucher's modification method. A knuckle cast was applied for four weeks and active IP joint motion was allowed soon postoperatively. Preoperative and postoperative angulation angle compared with non-injured side was measured radiographically.

Results

Operations were done average of 24.2 days after the injuries. Angulation angle compared with non-injured side was corrected from 38.8 to 1.0 degree without any difficulty in all cases. Fragments were united 5.4 weeks after the operations.

Case 2

52 years old man came to our hospital three weeks after the injury complaining persistent pain and swelling in his right hand. Radiographs showed the fifth metacarpal neck fracture which flexed 45° volarly (Fig. 2B). Operation was done 45 days after the

injury and the fragment was easily reduced and fixed with wires (Fig. 2C,D). The fracture has united without deformity nor loss of function.

Table 1. Results.

case	age	sex	finger	waiting period(day)	preoperative angle(degree)	postoperative angle(degree)
1	38	male	little	27	43	2
2	52	male	little	26	45	0
3	33	male	little	23	41	2
4	27	male	little	21	35	0

Discussions

Despite most of the displaced metacarpal neck fractures which need an operative therapy are well treated by traditional reduction method, it is sometimes irreducible thus leading to malunion in spite of operative treatment. Open reduction is needed for such cases, however, exposing the fracture site may damage blood supply and osteogenesis causing a delayed union, and grasping the bone directly may damage the local fragile bones.

By our new technique, the fracture can be reduced without opening the fracture site nor treating the bone directly. The negative effects of opening the joint seem to be minimum since the joint is only punctured and no damage is brought to articular cartilage by this procedure. The technique seems to depend on the attachment of the joint capsule to the distal fragment. Thus, we think there is no indication for subcapital fracture which may have no sufficient capsular attachment to reduce the fragment. Applying a dorsally elevating force at a right angle may help the reduction by increasing the dorsal tension of the MP joint capsule.

Conclusions

We recommend this technique for irreducible metacarpal neck fracture during an operation.



Figure 1. Operative view. A surgical sound is inserted into the MP joint through a minimal skin incision.

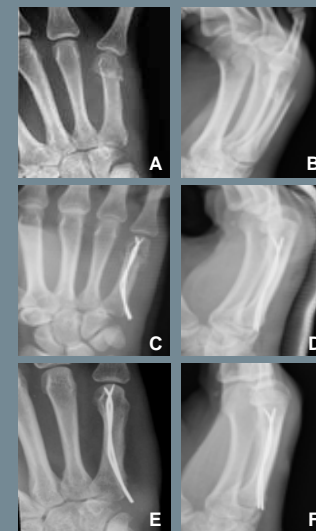


Figure 2. Radiograph of case 1 taken before operation(A, B), soon after operation (C, D) and five month postoperatively (E, F). Apex dorsal angulation was well corrected and united.