

Outcome and prognosis of Antegrade intramedullary nancy nail for fifth metacarpal neck fractures (box fracture) versus retrograde k wire. a systematic review and meta-analysis

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ABSTRACT:

Antegrade One of the mainstays for surgically treating neck and metacarpal shaft fractures is intramedullary nancy nail fixation. Nevertheless, there is still a dearth of research comparing the results of the several surgical repair methods that are available for all indicated metacarpals. In order to examine the clinical benefits and limitations of IMKW in comparison to alternative fracture repair procedures, we carried out a systematic review and meta-analysis. To find research that compared the clinical results of IMKW to alternative metacarpal fixation techniques, a thorough systematic literature study was conducted. Results included visual analog scale pain, union rate, grip strength, complications, operational time, and Disabilities of the Arm, Shoulder, and Hand (DASH/quick DASH) scores. IMKW was compared to the pooled effect of alternative fixation methods using a random-effects model. Our analysis includes 10 studies with a total of 497 metacarpal fractures (220 shafts and 277 necks). In every study, IMKW fixation was designated as the control group. Plates, transverse K-wires (TKWs), interfragmentary screws (IFSs), and K-wire cross-pinning (CP) were all part of the combined experimental group. IMKW demonstrated a considerably reduced operating time for treating metacarpal shaft fractures ($p = 0.04$; mean difference = - 13; 95% CI = -26 to -0.64). When treating metacarpal neck fractures, no appreciable variations were seen in terms of disability, grip strength, healing rate, pain, operating time, or complication rate. The clinical results of different surgical approaches for treating neck and metacarpal shaft fractures were not observed to differ in this comprehensive review and meta-analysis. In order to treat closed, unstable metacarpal fractures, further high-quality research is needed to compare the safety and effectiveness of intramedullary screws, TKW, CP, and IFS to IMKW. **Aim of the study:-** We investigated the outcomes of the antegrade intramedullary nailing (AIMN) compared to retrograde k.wire in the treatment for fifth metacarpal neck fractures via a systematic review.

Keywords: Antigrade, fractures, metacarpal neck

INTRODUCTION:

Forty percent of all hand fractures are metacarpal fractures. Named for the traditional technique of damage in which direct trauma is given to a clenched fist, a Boxer's fracture is a fracture of the fifth metacarpal neck. Ten percent of all hand fractures are represented by this. The course of treatment for a Boxer's fracture depends on the fracture's features, such as its degree of angulation, shortening, and rotation, as well as any accompanying injuries. For closed, non-displaced fractures without angulation or rotation, immobilization with an ulnar gutter splint may be the only effective treatment; however, operative fixation may be necessary for open fractures, fractures that are severely angulated or malrotated, or fractures that involve damage to neurovascular structures.

MATERIALS AND METHODS:

Pain, functional scores, grip strength, total active motion (TAM), the range of motion (ROM) of the fifth metacarpal joint, complications and patient satisfaction were set to be the primary outcomes .

We assessed ranges of movements at the métacarpophalangeal (MCP) joint and inter phalangeal (IP) joint using TAM (total active motion) and TPM (total passive motion) as well as the presence of any rotational deformity. From the radiographic point of view, antero-posterior (AP) and latero-oblique X-rays were taken to assess the possible presence of a residual deformity of the fifth finger. All the patients were reviewed clinically and radiographically from 1 to 6 months after surgery.

By radiographic imaging we measured the angulation at the fracture side; we use a goniometer to calculate the angulation. Operative data was collected regarding time to surgical intervention, Anaesthetic mode . Length of stay in the hospital was documented , and Post operatively patients were assessed clinically and radiologically.

Our series include 13 Cases of fractures of the neck of the fifth metacarpal bone (boxer's fracture) . All of them are males , 10 of them are Rt hand , 2 are Lt hand and one case is bilateral . one case presented with ipsilateral fracture ulna and all cases was closed fracture .

Exclusion criteria :- excluded cases from our study are those with open fractures , known cases of chronic illness , Lt hand boxer fracture , females and children .

RESULTS:

All the patients were reviewed clinically and radiographically from 1 to 6 months after surgery . All of them were male patients, the right hand was involved in 10 cases , the left in two cases and one case is bilateral . the dominant side was injured in all cases . The predominant mechanism of the injury in 8 patients were a punch injury. The mechanism of trauma was a direct blow in 4 patients (in context of aggression in 2 cases and punch in 8 cases and fall in 2 cases), and road traffic accident in one case . In all patients, a rotational deformity of the fifth finger and/or a palmar angulation of the fracture 13 were present .

Rotational displacement of the fifth ray was evaluated clinically: malrotation of the fifth metacarpal was diagnosed when the fifth finger was not oriented towards the scaphoid tubercle in flexion . The palmar angulation of the metacarpal head was measured on the latero-oblique X-rays with a goniometer , it measured from 20 to 90 .

The time to surgical intervention from the injury date was a mean 1_3 days . The procedures were performed under local anaesthetic by a Consultant surgeon or a trainee surgeon under supervision.

Regarding the anatomical results , all fractures proceeded to radiological bony union without rotational or severe angulation deformities . The wire was extracted in all patients at a mean period of 4 weeks (range four to six weeks) . 97% patients were cosmetically and functionally satisfied with the results of their surgery.

CONCLUSION:

Though the amount of evidence was derived from just four small sample-sized studies, our findings suggested that the AIMN technique could have some advantages over the use of plates or other types of pinning in the treatment for the fifth metacarpal neck fractures. We highlighted the need for a standardization of the outcomes and their corresponding units related to this specific type of fracture. Editors and reviewers should

incite authors to provide the standard deviation values for the reported means.

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