

## Case Report

# Comminuted Fractures of Trapezium Treated with Ligamentotaxis

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### Abstract

A 45 years old man had a road traffic accident and sustained injury to the right hand and presented to us with wound on the dorsum of the hand at the 2<sup>nd</sup> metacarpal and difficulty in moving the fingers. X-ray of the hand anterior posterior, lateral and oblique view showed fracture of the 2<sup>nd</sup> at the distal shaft, 3<sup>rd</sup> and 4<sup>th</sup> metacarpals at the base and comminuted fracture of the trapezium. Patient was posted for surgery for K-wire fixation of the metacarpal and external fixator for the trapezium. The patient was immobilized with volar slab till the wounds healed and suture removal and later immobilized in thumb spica for 4 weeks after which all the k wires were removed and mobilization was started with restriction of the heavy work. The fracture healed satisfactorily both clinically and radiologically. There was minimal restriction of flexion extension and abduction adduction of the carpometacarpal joint of the thumb as compared to the normal side. The patient was able to do his routine activity at the last follow up.

**Keywords :** fracture trapezium, comminuted, ligamentotaxis

### Introduction

Fractures of trapezium are uncommon, comprising between 3% to 5% of all carpal fractures. Inadequate treatment of trapezium fractures can lead to permanent impairment based on the substantial forces experienced at the trapeziometacarpal joint in pinch and grip<sup>1,2</sup>. There are literatures describing treatment of trapezium fracture with K wires, Herbert screws<sup>6</sup>.

We present a case report where trapezium fracture was treated with small external fixator using principals of ligamentotaxis which has given a good result.

### Case Report

A 45 year old man had a RTA (road traffic accident) and he sustained injury

to the right hand presented to us with wound on the dorsum of the hand at fracture of 2<sup>nd</sup> at distal shaft and exposing bone and tendons and not able to move the fingers and also the thumb X-rays were taken anterior posterior, lateral as well as oblique view which showed fracture of the 2<sup>nd</sup> metacarpal at the distal shaft and 3<sup>rd</sup> and 4<sup>th</sup> metacarpals at the base and comminuted fracture of the trapezium type v according to the Walker, Greene, and Lunseth<sup>9</sup>. (Fig. 1 and Fig. 2)

Patient was posted for the surgery after all the routine investigation under tourniquet and brachial block. K wire fixation of the 2<sup>nd</sup> metacarpal and external fixator of the fracture trapezium and exploration for any tendon injury was done. On exploration there was no tendon injury. (Fig. 3)

After surgery wrist was immobilized with volar slab till the wound healing

and suture removal till 2 weeks. Later it was converted into thumb spica for four weeks. After 4 weeks the K wires were removed and mobilization of the wrist and thumb was started gradually. Heavy work on the same side was avoided. Check X rays showed satisfactory healing.

There was minimal restriction of the movements of flexion extension and abduction and adduction of the carpometacarpal joint of the thumb as compared to the normal side at the period of one year.

### Discussion

Fracture of the trapezium is extremely rare according to the literature comprising between 3% to 5% of all carpal fractures and it is either isolated or in combination with other injuries. It

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Figure 1 : Pre-operative X-ray Trapezium fracture.

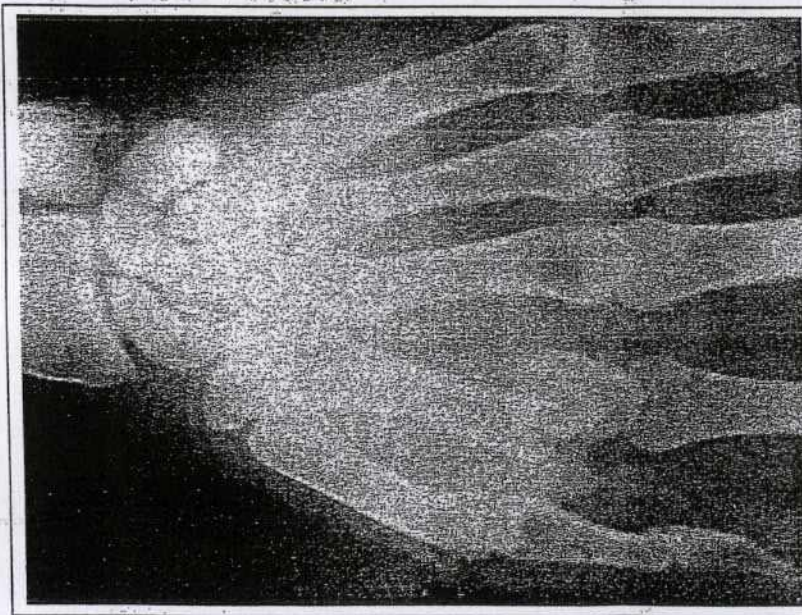


Figure 2 : Pre-operative X-ray showing trapezium fracture.

trapeziometacarpal ligament, causing avulsion of the trapezium. Subsequent contraction of the abductor pollicis longus which usually has an insertion on the trapezium would enhance a further displacement of the fracture of trapezium<sup>6,7,8</sup>.

Treatment of the trapezium fractures has varied in the past. Conservative treatment in a plaster cast is successful in most undisplaced fractures. However, conservative has had poor success in displaced fractures, and open reduction and internal fixation has been advocated. The techniques described include Kirschner wire fixation and the use of a single lag screw.<sup>5,6</sup>

Inston et al in 1997 described the use of Herbert screw with an achievement of full range of unrestricted, painless movements and full function at 6 months<sup>6</sup>.

Here in our case we had comminuted fracture of the trapezium which was treated with continuous traction with the mini external fixator using the principals of ligamentotaxis. We chose two pins which were used for this one at the distal radius and other at the 1<sup>st</sup> metacarpal the rod was positioned in abduction with an continuous longitudinal distraction was maintained with the connecting rod and clamps. This allowed distraction and unloading of the joint of the entire first row. Good anatomic rebuilding of the trapezium was noticed in the post op X rays. The functional outcome was minimal restriction of the movements of flexion, extension and abduction and adduction of the carpometacarpal joint of the thumb as compared to the normal side at one year of follow up.

Till now closed reduction and fixation with K wire was treatment of choice which is good for minimally displaced fractures but not in comminuted fractures. Based on the results of the case, however surgical restoration of the articular surface and ligament relationships maximizes

should not be underestimated as they can be responsible for prolonged morbidity if inadequately treated. Accurate reduction of the fracture or near anatomic is necessary to avoid late arthritic changes.<sup>1,3,5,6</sup>

The combination of the leverage

applied to dorsum of the metacarpal and an axial load transmitted along the shaft would result in increasing joint compressive forces on the palmar aspect of the articular surface leading to Bennets fracture, with the distracting forces on the dorsoradial



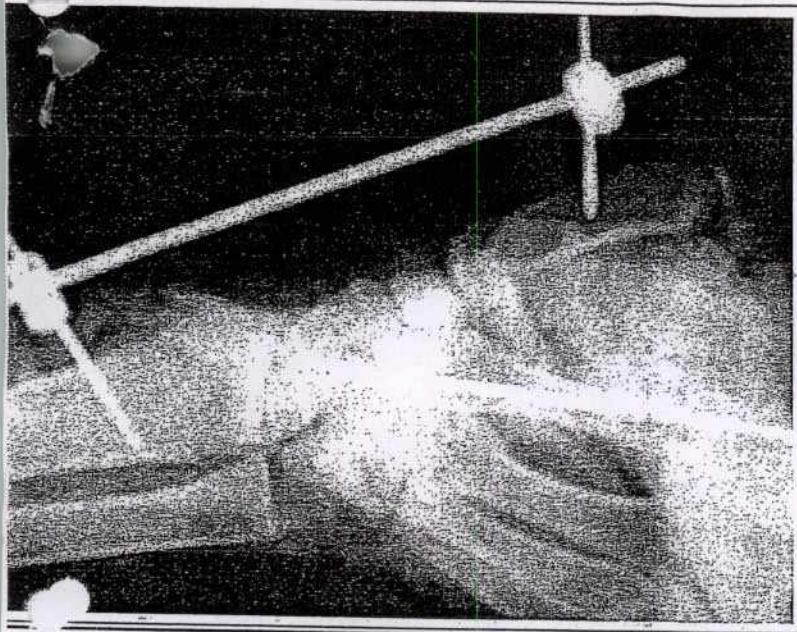


Figure 3 : Post-operative X-ray stabilised by ligamentotaxis.

tional results even in the presence  
vere comminution.

We recommend this method of  
mentotaxis as one of the alternative  
od in treating the communitated  
ure in the trapezium.

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