

# Surgical management of Trapezium fractures – A Case Report

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**ABSTRACT:** We report a case of a 27 year old male patient who presented with a painful wrist following history of trauma 1 month back. Imaging (Radiograph and Computerized Tomographic Scan with 3D Reconstruction) revealed an un-united fracture of left trapezium Palmer classification type 5.

Trapezium fractures are rare injuries and account for about 3-5% of all carpal injuries. Palmer Type 5 Trapezium fractures are rarer still. Patient underwent Open Reduction and Internal Fixation with Herbert screw and followed up for a period of about 3 years. Patient had an excellent functional outcome following the procedure.

**Keywords:** Trapezium fractures, Palmer classification, Carpal bone

## Introduction:

Fractures of the trapezium comprise approximately 3% to 5% of all carpal bone fractures. About 60% of the reported cases have an unsatisfactory outcome. It's difficult to diagnose. However, they are very important fractures to detect and treat early given the importance of the trapezium in the carpometacarpal joint in actions such as grip and pinch. It is usually a result of a high energy trauma injury and can be classified into ridge and body fractures. Most are usually vertical body split fractures. Occasionally there may also be associated ligament damage (anterior oblique ligament, dorsoradial ligament, intermetacarpal ligament, posterior oblique ligament).<sup>1</sup>If left undetected it can lead to secondary OA of the carpo-metacarpal joint-weakness of the thumb and hence the functions of hand. Displaced Trapezium fracture is an indication for open reduction and internal fixation.

We report a case of displaced trapezium fracture treated with ORIF with screw fixation. Patient was followed up and assessed radiologically and functionally.

## Case report:

A 27 year old man presented with pain in the right thumb following fall on an outstretched hand.

On examination diffuse swelling was noted in the hand. There was tenderness over the trapezium and carpo-metacarpal joint. Movements were painfully restricted. Paresthesia elicited over the distribution of the median nerve. Phalen's test was positive. Antero-posterior and oblique hand radiographs revealed comminuted fracture of the trapezium with volar displacement.

Open reduction and internal fixation (Herbert screw) along with carpal tunnel decompression.

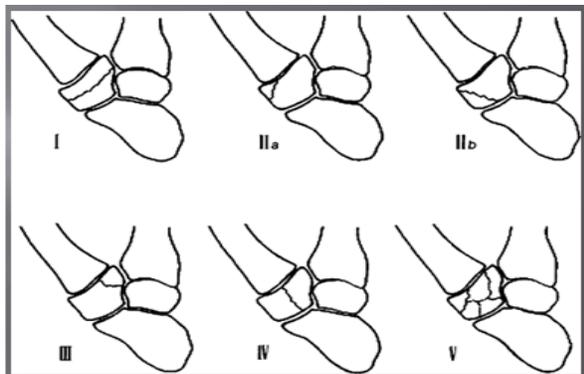
Post op immobilization done with below elbow POP cast application which was continued for 6 weeks. Following cast removal patient was started on physiotherapy. By the end of the physiotherapy course, patient had attained full range of motion which was painless. Patient was able to carry out his daily routine activities.

1 year later, the implant was removed and patient followed up for a further 2 years. Patient is able to carry out his daily routine activities without any restriction.

## Discussion:

Trapezium fractures, with or without other associated injuries, are a rare but important diagnosis. The mechanism of injury usually involves either direct dorsoradial impaction or indirect axial loading. Though there are various types (ridge, body, vertical, transverse, comminuted), it is the indirect force mechanism that has been attributed to fractures of the trapezium body. The clinical presentation can be quite variable depending on the displacement of the fracture and the involvement of the carpometacarpal joint. Some patients only complain of minor pain at the base of the thumb without any gross swelling or deformity, whereas others, have swelling and severe restriction of movement. Thus, it is important to have a high clinical suspicion based on history and mechanism of injury. Imaging for this injury consists of plain radiographs, but often undisplaced fractures can be missed on these. A Robert's AP view, with the hand in full pronation, is a good way of visualising the trapezium on plain radiographs. If the diagnosis

is still in question Computerised Tomography or bone scintigraphy is recommended.<sup>2</sup>



**Fig 8:** Palmar classified ridge fractures based on Location.

**Type I:** body of the trapezium. Type II: fractures involve the base of the ridge. Type III: fractures involve the tip of the ridge. Type IV: vertical fracture line through the body. Type V: Communitetrapezium. Several treatment methods are reported in the literature, ranging from closed reduction and cast immobilization to open reduction and ligamentous reconstruction.

Usually, the dislocation can be reduced easily by thumb traction and abduction while gently pushing the metacarpal base medially. Nevertheless, the major factor affecting treatment outcome is reduction adequacy and maintenance. In this combination of injury, the RCL remains intact; therefore, if the joint is stable and reduction quality is good after closed manipulation, a thumb spica cast may be chosen. Thumb extension and slight pronation in the cast allows approximation of the stripped AOL and may enable ligamentous healing while contributing the joint stability. If conservative treatment is preferred, the patient should be checked for any radiological signs of reduction loss, particularly during the first 2 weeks after the injury. Serial radiographic follow-up is advocated to monitor the reduction quality

achieved at initial reduction.<sup>3,4,5</sup> Radiographic evaluation of these patients should be done carefully to prevent missed diagnosis.

### Conclusion:

Trapezium fractures have a low incidence rate of about 3%-5% of all carpal bone fractures. They are difficult to diagnose. And if undetected, can lead to secondary OA of the carpo-metacarpal joint-weakness of the thumb and hence compromise functions of the hand.

Most of the cases are associated with carpal tunnel syndrome.

**Conflict of interest:** None Declared

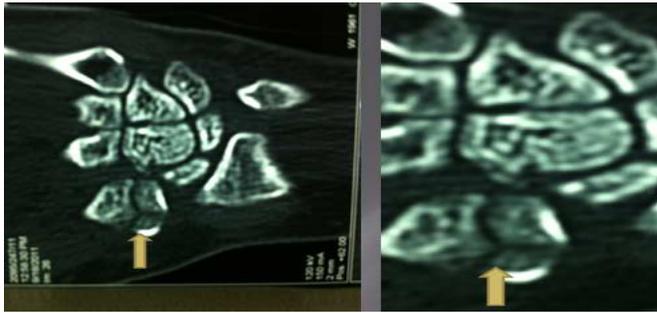
Ethical standards The patient gave informed consent for publication of his medical records prior being included into this case study.

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**Fig 1:** X ray: left wrist with hand :AP/Oblique the hand :reveals fracture of the trapezium with volar displacement.



**Fig 2:** CT scan showing Fracture of the trapezium extending and involving the inferior ridge.



**Fig 3:** Image intensifier images showing guide wire through the body passed across the body followed by introduction of Herbert screw



**Fig 4:** Immediate post op x-ray showing reduced fracture trapezium with Herbert screw in-situ



**Fig 5:** 1 year post op X-ray shows united fracture Trapezium



**Fig 6:** 1 year after implant removal showing united fracture trapezium



**Fig 7:** 2 years post implant removal. Showing healed fracture of Trapezium

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