

Case Report

Percutaneous screw fixation for trapezium fracture

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ABSTRACT

Isolated trapezium fracture is a rare diagnosis which can lead to long term symptoms if missed. We report a case of vertical intra-articular displaced trapezium fracture treated with percutaneous cancellous screw fixation with good functional outcome.

Keywords: Trapezium, Percutaneous, Screw fixation

INTRODUCTION

Trapezium is a carpal bone which can be injured due to high energy trauma. Trapezium fracture is usually associated with fracture of other carpal bones (80%) and isolated trapezium fractures account for only 3-5% of all carpal fractures.^{1,2} Trapezium fracture could easily be mistaken for an incorrect radiological diagnosis which can lead to crippled hand function when untreated.³ The Trapezium is an important component of thumb carpometacarpal joint, participating in the actions of grip and pinch, which stresses the importance of early treatment for an optimal outcome.⁴ The usual pattern is a vertical fracture line and occasionally may be associated with carpal ligaments injury. Several methods have been described in the literature for the treatment of this fracture, which include plaster treatment, k-wire fixation and open reduction. We report a case of isolated trapezium fracture treated by percutaneous screw fixation with good functional outcome during 1 year follow-up.

CASE REPORT

21 years old male presented in the casualty after a road traffic accident which occurred while riding a two wheeler when the patient skidded and fell on his outstretched hand.

Clinical examination revealed swelling over the thenar eminence (Figure 1). Radiograph revealed vertical split # of the Trapezium with intra-articular extension (Figure 2). He was taken to the theatre for fracture fixation.



Figure 1 (a and b): Clinical picture of left hand showing swelling over thenar region.

Per operatively, patient was placed in a fracture table with arm supported and thumb traction was given by an assistant. Under c-arm guidance, a guide wire was drilled

across the fracture fragments percutaneously (Figure 3). After confirming the position, 4.0mm cannulated cancellous screw was applied through the guide wire using lag principle (Figure 4).

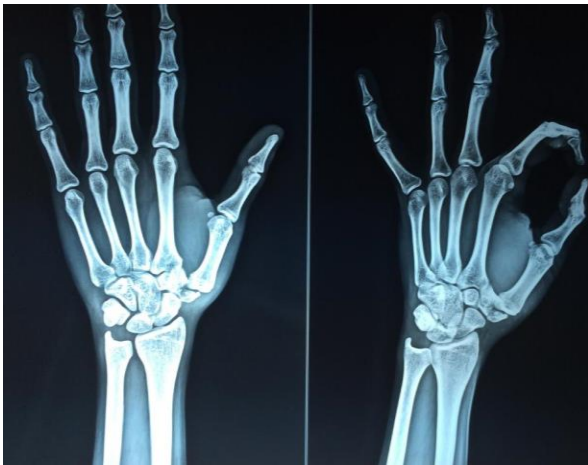


Figure 2: Vertical split fracture of trapezium.

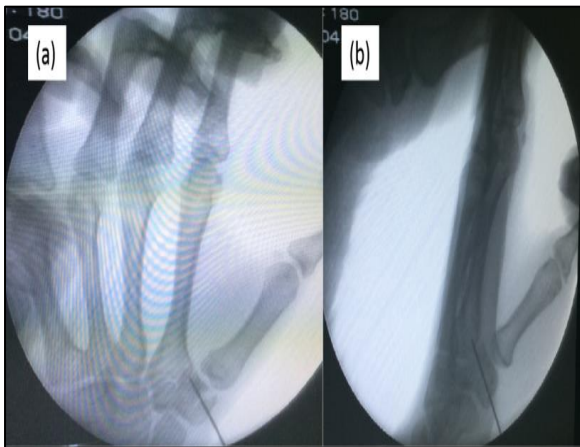


Figure 3 (a and b): AP and lateral C-arm pictures after guide wire insertion.

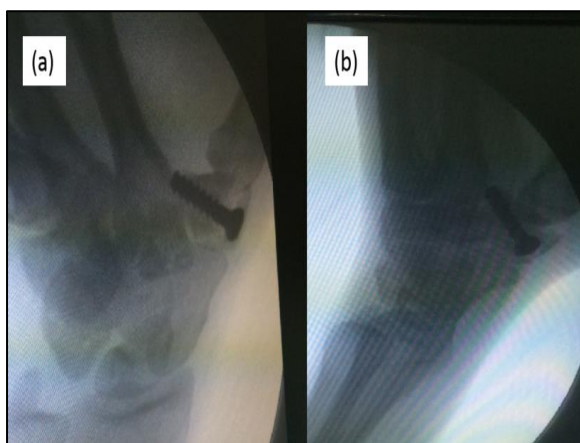


Figure 4 (a and b): AP and lateral C-arm pictures after screw fixation.

The patient was placed in a wrist splint for 3 weeks to allow for soft tissue healing and then thumb mobilisation was started.

The fracture was healed and consolidated in 3 months and at 1 year followup the patient had regained complete movement in the carpo-metacarpal joint (Figure 5 and 6).



Figure 5: Radiograph taken at 1 year follow-up.



Figure 6: 1 year follow-up clinical picture of the patient showing normal thumb movements.

DISCUSSION

Isolated trapezium fractures are not very common. If not diagnosed and treated properly, can lead to significant functional impairment of the thumb.⁵ It constitutes <1% of all fractures and accounts for 1-5% of carpal fractures.⁶ These are often a result of axial compression to the wrist and diagnosis are confirmed by orthogonal radiographs of the wrist. The thumb carpo-metacarpal joint is a biconcave saddle joint and is stabilised by anterior oblique ligament and dorsoradial ligament.⁷

Trapezium fractures are classified based on the involvement of ridge, body or fracture-dislocation. Walker classification is used to classify body fractures. It comprises vertical intra-articular type, horizontal shear type, vertical shear of dorsal radial tuberosity, anterior

medial ridge type resulting in avulsion of transverse carpal ligament and comminuted type.⁷ Among them the vertical intra-articular type is the most common which is the result of axial compression injury.⁷

The clinical presentation may vary widely from minor pain without gross swelling or distortion to swelling with restricted movements.⁵ The clinical presentation varies depending on the fracture displacement and the involvement of the carpometacarpal joint. Thus, a strong clinical suspicion is required to diagnose this injury. Special views during radiograph like Robert's view or Bett's view is required to diagnose these injuries when undisplaced. If still doubtful of the diagnosis, then CT will be required.⁵

Several methods of treatment are reported in the literature for trapezium fractures. Beekhuizen et al have reported four cases of trapezium fractures treated conservatively with navicular cast for 4 to 6 weeks.⁸ Schil et al have reported successful treatment of most undisplaced fractures in plaster casts.⁹ However, when there is articular step off or displacement of >2 mm, all authors suggest internal fixation. Jones et al has highlighted this poor results from conservative treatment for three comminuted fractures.¹⁰ Initially open reduction with internal fixation using k-wires was advocated for displaced intraarticular fractures.¹¹ Foster and Hastings recommended either open or closed reduction and pinning with k-wires.¹² Sabri et al and Inston et al have described excellent results with the use of a Herbert screw, which gave dynamic compression of the fragments.^{5,13} One of the largest series with 11 patients documented by Mcguigan and Culp showed good results with some form of surgical intervention for intra articular trapezium fractures.¹⁴ It also must be noted that five out of the eleven patients in their study showed carpo-metacarpal joint arthritis in long term followup (mean 47 months) but these patients had good functional outcome.

In our patient, there was a vertical intra-articular fracture which was displaced and required internal fixation. We had used percutaneous technique for screw fixation to reduce this fracture, which resulted in good functional outcome.

CONCLUSION

To conclude we report a case of isolated trapezium fracture treated by percutaneous fixation using cancellous screw with good functional outcome. The knowledge about diagnosing and treating this fracture is necessary to prevent complications arising from mistreating these injuries.

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REFERENCES

1. Hey HW, Chong AK, Murphy D. Prevalence of carpal fracture in Singapore. *J Hand Surg Am.* 2011;36(2):278-83.
2. Borgeskov S, Christiansen B, Kjaer A, Balslev I. Fractures of the carpal bones. *Acta Orthop Scand.* 1966;37:276-87.
3. Suh N, Ek ET, Wolfe SW. Carpal fractures. *J Hand Surg Am.* 2014;39(4):785-91.
4. Ramoutar DN, Katevu C, Titchener AG, Patel A. Trapezium fracture - a common technique to fix a rare injury: a case report. *Cases Journal.* 2009;2:8304.
5. Sabri EM, Lazrek O, Boufetal M, Allah BR, Lamrani MO. Trapezium Fracture: Percutaneous Screwing Treatment. *J Orthop Ther.* 2018;1121.
6. Walker JL, Greene TL, Lunseth PA. Fractures of the body of the Trapezium. *J Orthop Trauma.* 1998;2(1):22-8.
7. Pitcher A. Trapezium fracture. 2021. Available at: <https://www.orthobullets.com/hand/422908/trapezium-fracture>. Accessed on 1 February 2022.
8. Beekhuizen SR, Quispel CR, Jasper J, Deijkers RLM. The uncommon trapezium fracture: A case series. *J wrist Surg.* 2020;9(1):063-070.
9. Van Schil P, De Smet C. Simultaneous fracture of carpal scaphoid and trapezium. *Br J Hand Surg.* 1986;11:112-114.
10. Jones WA, Ghorbal MS. Fractures of the trapezium. A report on three cases. *J Hand Surg.* 1985;10B:227-30.
11. Cordrey LJ, Ferrer-Torrells M. Management of fractures of the greater multangular. *J Bone Joint Surg.* 1960;42A:1111-8.
12. Foster RJ, Hastings H II. Treatment of Bennett, Rolando and vertical intraarticular trapezium fractures. *Clin Orthop.* 1987;214:121-9.
13. Inston N, Pimpalnekhar AL, Arafa MA. Isolated fracture of the trapezium: and easily missed injury. *Injury.* 1997;28:485-8.
14. McGuigan FX, Culp RW. Surgical treatment of intraarticular fractures of the trapezium. *J Hand Surg.* 2002;27:697-703.

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