Case Report

A Case Report of Carpometacarpal Joint Arthroscopy in the Treatment of the Comminuted Fracture of the Trapezium

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ABSTRACT

Fractures of the trapezium are rare and are usually treated by open reduction and internal fixation. The trapeziometacarpal joint is difficult to visualize with standard radiographic techniques; proper visualization of the joint surface of the scaphometacarpal and trapeziometacarpal joints is paramount. A 26-year-old male patient complained of isolated left radial sided wrist pain and had limitation of wrist function after a motor vehicle accident. The injury was closed without obvious deformity. Radiographs showed a comminuted intra-articular fracture of trapezium.

On the 2nd day, the patient was taken to surgery, and with standard wrist arthroscopy, a 1.9 mm arthroscope was inserted through the radial carpometacarpal (CMC) portal into the CMC joint. A probe was inserted through the ulnar CMC to manipulate and reduce the fragment. A bone clamp achieved reduction, and 0.5 mm K-wires, augmented with mini external fixator spanning CMC joint to achieve reduction of fragments. Fixator was removed after 3 weeks and K-wires by 6 weeks, subsequently, progressive mobilization and strengthening were provided. At 10 weeks, union, normal range of motion, and full strength were present, and the patient returned to his previous level of activity with an excellent outcome. Arthroscopy provides direct visualization and accurate restoration of articular congruity, yielding excellent results.

Key words: Arthroscopy hand, carpometacarpal joint, endoscopy hand, trapezium

INTRODUCTION

Trapezium fractures are uncommon, accounting for only about 3–5% of carpal fractures. The carpometacarpal (CMC) joint of the thumb plays an important role in the functioning of the hand. Any trauma in this region causes pain and swelling at the base of the thumb, affecting prehension, opposition, circumduction, and pinch strength. Trapezium fractures are very difficult to be diagnosed on plain radiographs, they are likely to be missed in the emergency department setting with symptoms being misattributed to a soft-tissue injury.[1,2] Trapezium fractures are usually treated by open reduction and internal fixation, however, novel arthroscopic methods prove to be more effective in the diagnosis and treatment due to difficult visualization on plain radiographs.[3]

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CASE

A 26-year-old male came to the casualty with alleged history of road traffic accident. The patient complained of isolated left radial sided wrist pain with limitation of wrist function. On examination, there was no obvious deformity of the left wrist. It was a closed injury with tenderness at the base of the thumb. Sensations over the tip of thumb and first web space were intact

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Investigations

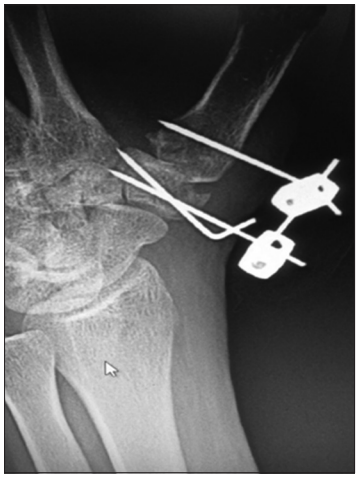
A plain X-ray of the wrist was taken that was suggestive of comminuted intra-articular longitudinal fracture of trapezium.

Computed tomography [Figures 1 and 2] was done to confirm the fracture pattern.

Treatment

Plan – To restore articular congruity, prevent post-traumatic arthritis and anatomic restoration of the articular surfaces.

Operative procedure – The patient was taken to surgery, and with standard wrist arthroscopy, a 1.9 mm arthroscope was inserted through the radial CMC portal into the CMC joint. A probe was inserted through the ulnar CMC to manipulate and reduce the fragment. A bone clamp achieved reduction, and 0.5 mm K-wires, augmented with mini external fixator spanning CMC joint to achieve reduction of fragments.

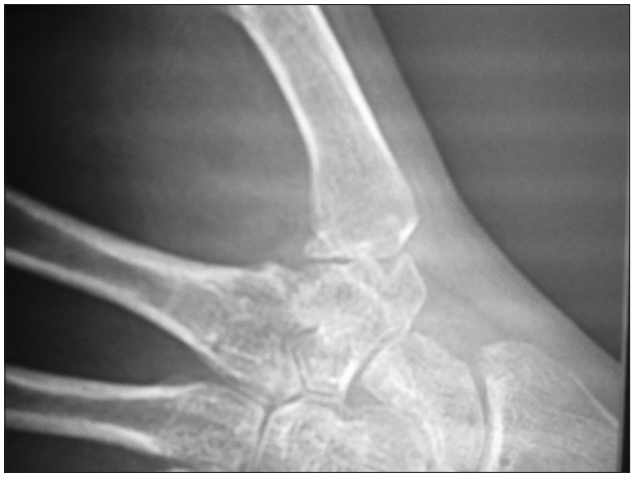


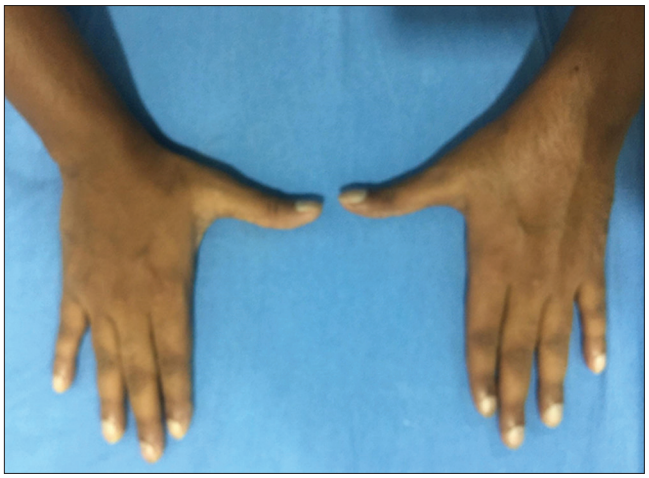
Post-operative radiograph with 0.5 mm K-wires used for fracture reduction

Outcome

Fixator was removed after 3 weeks and K-wires by 6 weeks, subsequently, progressive mobilization and strengthening were provided. At 10 weeks – union, normal range of motion, and full strength were present, and the patient returned to his previous level of activity with an excellent outcome. Arthroscopy provides direct visualization and accurate restoration of articular congruity, yielding excellent results.

Outcome normal and symmetric to uninjured side at 18 months.





DISCUSSION

The thumb is responsible for a wide array of hand functions such as writing, grasping an object, and

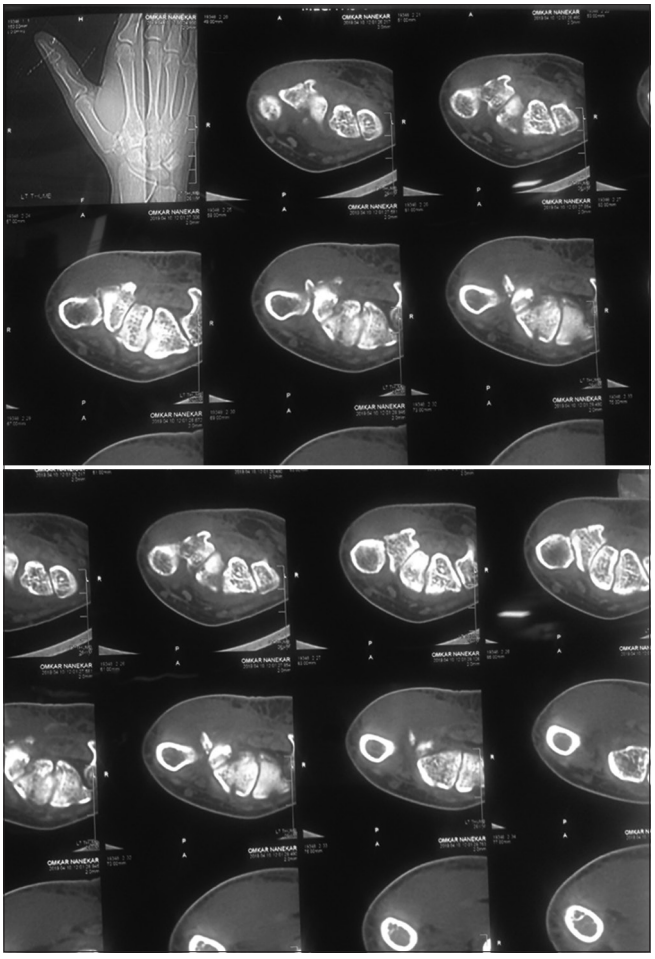


Figure 1: Magnetic resonance imaging on presentation showing a lobulated lesion of the distal humerus with multiple fluid levels

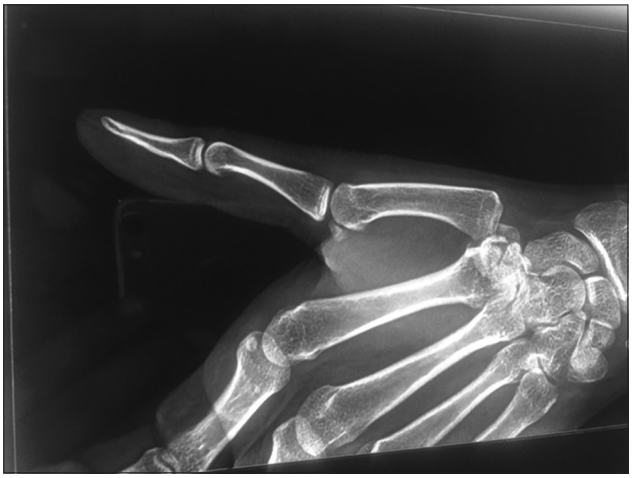


Figure 2: X-ray on presentation showing an eccentric, expansile, lytic lesion in the distal humerus

drawing. The trapeziometacarpal joint is saddle shaped and it has ligaments like the anterior oblique ligament, posterior oblique ligament, intermetacarpal ligament, and dorsoradial ligament that provide the required stability.[4,5]

Among the various carpal bones, the bones in the proximal row, especially scaphoid, are more prone to fracture. However, the bones in the distal row are less prone to fractures.[6] Trapezium fractures account for 4% of carpal bone fractures.[7,8] It generally occurs after either a high-energy trauma like a road traffic accident or a low-energy trauma like falling on an outstretched hand. Trapezium fracture may be accompanied with other simultaneous upper extremity injuries (i.e., distal radial fracture, Bennett's, or Rolando fracture) in 80% of cases.[9] Isolated trapezium fracture is rare. Due to the low prevalence and difficulty in diagnosing, the isolated trapezium fracture by routine imaging, high clinical suspicion, careful history taking, physical examination, and imaging interpretation are needed to avoid missing a trapezium fracture. Delay in the diagnosis may result in degeneration at trapeziometacarpal joint, thumb weakness, and limitation in pinching or grasping.[10] This case reports a 26-year-old male patient with isolated left radial sided wrist pain and had limitation of wrist function after a motor vehicle accident. The injury was closed without obvious deformity. Radiographs showed a comminuted intra-articular fracture of trapezium.

On the 2nd day, the patient was taken to surgery, and with standard wrist arthroscopy, a 1.9 mm arthroscope was inserted through the radial CMC portal into the CMC joint. A probe was inserted through the ulnar CMC to manipulate and reduce the fragment. A bone clamp achieved reduction, and 0.5 mm K-wires, augmented with mini external fixator spanning CMC joint to achieve reduction of fragments. Fixator was removed after 3 weeks and K-wires by 6 weeks, subsequently, progressive mobilization and strengthening were provided. At 10 weeks, union, normal range of motion, and full strength were present, and the patient returned to his previous level of activity with an excellent outcome. Arthroscopy provides direct visualization and accurate restoration of articular congruity, yielding excellent results.

CONCLUSION

Fractures of the trapezium are rare. Additionally, visualisation of these fractures using standard radiographic methods are not as effective. Carpometacarpal joint

arthroscopy is a more effective alternative for both the diagnosis and treatment of such a rare fracture. It provides direct visualisation of the fracture and accurate restoration of articular congruity. In this case, the patient had full mobilisation and returned to complete pre - injury range of motion at the end of 10 weeks itself.

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