



FUNCTIONAL OUTCOME OF PERCUTANEOUS K-WIRE FIXATION IN DISTAL END RADIUS FRACTURES IN ADULTS

Dr. Patel Ishani D	Assistant Professor, Department of Orthopaedics, SMT. NHL Municipal Medical College, Ahmedabad.
Dr. Amin Tarkik K	Associate Professor, Department of Orthopaedics, SMT. NHL Municipal Medical College, Ahmedabad.
Dr. Mansi J Patel*	Senior Resident, Department of Orthopaedics, SMT. NHL municipal medical college, Ahmedabad. *Corresponding Author
Dr. Senta Ajay	Junior Resident (2 nd Year), Department of Orthopaedics, SMT. NHL municipal medical college, Ahmedabad.
Dr. Patel Kishan M	Junior Resident (2 nd Year), Department of Orthopaedics, SMT. NHL municipal medical college, Ahmedabad.
Dr. Patel Amit V	Junior Resident (2 nd Year), Department of Orthopaedics, SMT. NHL municipal medical college, Ahmedabad.
Dr. Modi Dhaval R	Professor and Head of the Department, Department of Orthopaedics, SMT. NHL municipal medical college, Ahmedabad.

ABSTRACT **Introduction :** Distal radius fracture is one of the common injuries seen in casualty often managed by closed reduction and percutaneous pinning.

Aim: The purpose of this prospective study is to determine the functional outcome following percutaneous wire fixation of distal radius fractures.

Materials and Methods: We studied 38 cases of closed distal end radius fractures managed with closed reduction and percutaneous Kirschner wires (K-wires) fixation.

Results: Out of the 38 cases included in the study, 32 patients had excellent outcome and 6 patients had good outcome.

KEYWORDS : k-wire , distal radius , percutaneous , adult

INTRODUCTION

A distal radius fracture is one of the most common fractures representing 16% of all fractures seen in casualty.^[1] The treatment of distal radius fractures is an important topic in light of the aging population in whom it is frequently seen and that these patients may have significant associated co-morbidities to consider before a treatment plan is formulated. The management of the distal radius fractures has undergone tremendous changes in the recent past due to better understanding of pathological anatomy, mechanism of injury and development of newer implants. The objective of treatment of distal radius fracture is to restore the anatomy of the wrist in order to obtain early painless function. Closed reduction and cast immobilization, percutaneous pin fixation, external fixator, volar locking plate, intramedullary nail fixation were been used as single or combined procedures in the management of distal radius fractures.^{[2],[3]} Closed reduction and percutaneous K-wire fixation with plaster immobilisation is one of the commonest modes of treatment employed in the management of distal radius fracture.^[4]

MATERIALS AND METHODS

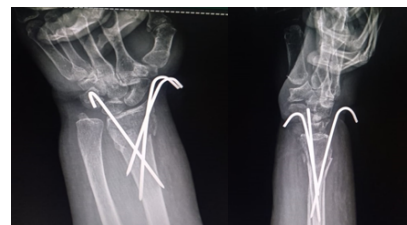
All the 38 patients included in the study were admitted as in-patients. Preoperative anaesthetic evaluation was carried out. Procedure was carried out under general anaesthesia, regional block. Aseptic precaution was carried out. Closed reduction of the fracture was performed. Extreme flexion extension manipulation of the wrist was avoided for achieving reduction. Once an acceptable reduction was achieved and confirmed with C-arm, 1.5 mm to 2 mm thick K-wire (2 or 3 in numbers) were passed across the fracture site from the radial styloid process and dorsomedial aspect of radius after making a stab incision at the entry point. K-wire were engaged in the opposite cortex of the proximal fragment to achieve maximum stability of fixation. The K-wire were bent and cut off outside the skin. K-wire ends were cleaned and covered with antiseptic soaked sponge pieces. Dorsolateral slab/cast was applied keeping wrist in neutral position.

Post-operative check X-rays were taken. Post-operatively the limb was kept elevated and discharge was planned on the next day after initiating shoulder, elbow, and finger mobilizations. Check X-rays were repeated at 3rd and 6th week to rule out displacement of fragments.

physiotherapy was initiated. Check X-rays were done at 3, 6, and 12 months follow up evaluation. Longest follow up was 12 months. No patients were lost during the follow up.



Pre-operative radiograph



Post-operative radiograph

DISCUSSION AND RESULTS

The final assessments of results were based on Castings' modification of the method devised by Gartland and Werley.^[6]

In 32 cases of percutaneous K-wire fixation, average range of motion was 58 degree in flexion, 65 degree in extension, 23 in ulnar deviation, 10 degree in radial deviation, 75 degree of pronation and 70 of supination. The grip strength compared to normal side was 85 percent. The mean radial length, volar tilt, and radial inclination were 9.7 mm, -2.3 degree, and 18.4 degree respectively.

In six cases of percutaneous K-wire fixation the average range of

Slab and K-wires were removed on outpatient basis at 6 weeks. and

motion was 45 degree in flexion, 20 degree in extension, 10 degree in ulnar deviation, 15 degree in radial deviation, 45 degree of pronation and 40 of supination. The grip strength compared to normal side was 40 percent. The mean radial length, volar tilt, and radial inclination were 3.9 mm, -15 degree, and 21 degree respectively.

Fracture of the distal end of radius is an injury that Orthopaedic surgeons deal with frequently, accounting for 1/6 of all the injuries seen in emergency department.^[1] Early scholars managed these cases with conservative non-operative methods and achieved reasonable results.^[2] With better understanding of the disrupted anatomy, biomechanics of injury pattern and improved imaging techniques, surgeons today have opportunity to improve maximal functional outcome and reduce the possibility of posttraumatic arthritis. Percutaneous K-wire fixation of the reduced distal end of radius fracture is one of the commonest treatment modality followed.^{[1],[2],[3]} It is one of the simplest procedures in the management of the distal radius fractures which commonly happens in elderly patients who may not be fit candidates to tolerate other long surgical procedures and the anaesthetic effects due to other associated medical co-morbidities.

CONCLUSION

Percutaneous K-wire fixation of the distal radius fractures is one of the simplest and most commonly performed procedures. Most of the patients achieve excellent functional outcome at 3 months. Hence it is an acceptable modality of treatment for the fracture of distal end of radius in adults.

REFERENCES

1. Cui Z, Pan J, Yu B, Zhang K, Xiong X. Internal versus external fixation for distal radius fractures. An up-to-date meta-analysis. *Int Orthop* 2011;35:1333-41. Back to cited text no. 1
2. Cooney WP 3rd, Dobyns JH, Linscheid RL. Complications of Colles' fracture. *J Bone Joint Surg Am* 1980;62:613-9. Back to cited text no. 2
3. Krukhaug Y, Gjerdet NR, Lundberg OJ, Lilleng PK, Hove LM. Different osteosynthesis for colles fracture: A mechanical study in 42 cadaver bones. *Acta Orthop* 2009;80:239-44. Back to cited text no. 3
4. Clancey GJ. Percutaneous Kirschner-wire fixation of Colles fractures. A prospective study of thirty cases. *J Bone Joint Surg Am* 1984;66:1008-14. Back to cited text no. 4
5. Lakshmanan P, Dixit V, Reed MR, Sher JL. Infection rate of Kirschner wire fixation for distal radius fracture. *J Orthop Surg (Hong Kong)* 2010;18:85-6. Back to cited text no. 5
6. Gartland JJ Jr, Werley CW. Evaluation of healed Colles' fractures. *J Bone Joint Surg Am* 1951;33:895-907. Back to cited text no. 6
7. Blakeney WG. Stabilisations and treatment of colles fractures in elderly patients. *Clin Interv Aging* 2010;5:337-44. Back to cited text no. 7
8. Botte MJ, Davis JL, Rose BA, von Schroeder HP, Gellman H, Zinberg EM, et al. Complications of smooth pin fixation of fractures and dislocations in the hand and wrist. *Clin Orthop Relat Res* 1992;276:194-201. Back to cited text no. 8
9. Fernandez DL. Radial osteotomy and Bowers arthroplasty for malunited distal radius fractures. *J Bone Joint Surg Am* 1988;70:1538-51. Back to cited text no. 9