ORIGINAL RESEARCH PAPER

Orthopaedics

# EXTRA ARTICULAR FRACTURE OF DISTAL END RADIUS MANAGED BY MULTIPLE K WIRE AND TRANSFIXATION OF DISTAL RADIOULNAR JOINT

KEY WORDS:

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ABSTRACT

**Purpsose -**Distal end radius comprise of 17% fracture in adults. No other fracture has a greater potential to devastate hand function. A thorough understanding of the pathophysiology and treatment of distal end radius is important as high energy trauma to distal end radius in adults is becoming more common and long term functional results are unclear, these common injuries. The causes of injury are fall on outstretched hand, work related accidents, car accidents, sport injuries. Extraarticular fracture of distal end radius can be managed by multiple k wire and transfixation to prevent proximal migration of the fracture fragments.

**Methods-** Total 30 cases were included in the study. the cases were treated by multiple k wire and transfixation of distal radioulnar joint and all cases were given above elbow cast after transfixation for 3 weeks. Patients were reviewed for removal of wire and cast. Anatomical and functional outcomes were then evaluated in all the patients.

**Results-** This study achieved excellent results in 24 patients ,good in 4 patients,fair in 1 patients,poor in 1 patients evaluated as per the criteria suggested by Green and Obrein score (cooney`s modification). in this study , 8 pts had wrist pain and stiffness and 6 pts had finger stiffness as their post operative complication. pain and stiffness in wrist and finger stiffness significantly improved after physiotherapy. Our case series attributes to 93% of excellent to good results and 4% of fair 3%of poor results.

**Conclusion-**1.Treatment of comminuted fractures of the distal end of the radius by transfixation with Kirschner wires is an effective method of maintaining reduction

2.This is simple for fracture fixation with preservation of fracture haematoma.

3.Shorter period of surgery with minimal exposure no need of torniquet

4. Minimum invasive surgery with minimum expertise.

## INTRODUCTION

Distal radius fractures represents most common fractures of all fractures[1]. There is an increase in incidence of fracture of distal radius in postmenopausal females which has been linked to estrogen withdrawal. Distal radius fractures in the elderly may represent an insufficiency fracture associated with all of the risk factors for osteoporosis[2]. Distal radius fractures were historically thought of as dislocations of the wrist, from Hippocrates' time until the 18th century, when Petit first posed the possibility that they may be fractures[3]. A thorough understanding of the pathophysiology and treatment of distal end radius is important as high energy trauma to distal end radius in adults is becoming more common and long term functional results are unclear, these common injuries. The causes of injury are fall on outstretched hand, work related accidents, car accidents, sport injuries. Extraarticular fracture of distal end radius can be managed by multiple k wire and transfixation to prevent proximal migration of the fracture fragments.

## MATERIALS AND METHOD

A total number of 30 cases of complex extraarticular distal end radius fracture managed by multiple k wire and transfixation of distoradioulna joint. Patients were reviewed for removal of wire and cast. Anatomical and functional outcomes were then evaluated in all the patients.

## INCLUSION CRITERIA

1. Patient who gave consent for this procedure.
2. Extra articular fractures
3. AO classification a

## EXCLUSION CRITERIA

1) Fracture of the scaphoid or scapho-lunate dissociation of the same wrist
2) Pre existing inflammatory or degenerative arthritis of the injured wrist, ipsilateral elbow, or shoulder (which would affect the functional outcome).
3) Pathological fracture

## OPERATIVE PROCEDURE

The patient is positioned supine on the operating room table. Anesthesia can be either regional or general. Complete muscle relaxation of the patient is achieved. Dose of prophylactic antibiotic. A preliminary reduction done to align the grossly displaced fracture fragments. Then the fracture fragments are fixed by multiple k wire retrograde insertion through the radial styloid and insertion of k wire above the fracture fragments. A transfix k wire is inserted from subchondral portion of the lower end of radius to the ulna head. This acts by cantilever action,when subjected to a load the cantilever carries the load to the support where it is forced against by a momentum or stress as an when movement occurs at the wrist joint, it is then maintained by A/E pop slab for 21 days ,after which the transfix k wire is removed and wrist mobilization is started .

## GREEN AND O'BRIEN SCORE (COONEY'S MODIFICATION)[4]

Table 1: Clinical scoring system of Green and O'Brien (1978) modified by Cooney *et al.* (1980) score

| Score | Findings |
|---|---|
| **Pain** | |
| 25 | None |
| 20 | Mild, occasional |
| 15 | Moderate, tolerable |
| 0 | Severe or intolerable |
| **Functional status** | |
| 25 | Returned to regular employment |
| 20 | Restricted employment |
| 15 | Able to work but unemployed |
| 0 | Unable to work because of pain |
| **Range of motion** | |
| 25 | Full |
| 15 | 75-99% of normal |
| 10 | 50-74% of normal |
| 5 | 25-49% of normal |
| 0 | Less than 25% of normal |
| **Grip strength** | |
| 25 | 120° or more |
| 15 | 91-119° |
| 10 | 61-90° |
| 5 | 31-60° |
| 0 | 30° or less |
| Or evaluating dorsiflexion-palmar flexion arc of injured hand | |
| 25 | |
| 15 | 75-99% of normal |
| 10 | 50-74% of normal |
| 5 | 25-49% of normal |
| 0 | 0-24% of normal |
| **Final result** | |
| 90-100 | Excellent |
| 80-89 | Good |
| 65-79 | Fair |
| <65 | Poor |

**X - RAYS**



PRE OP POST OP AFTER 21 DAYS AFTER 45 DAYS

## RESULT

All fractures were classified according to AO classification a . Baseline demographics and injury characteristics were recorded. In this study of 30 patients, all sustained type a fracture. In the present study, 30 cases were followed up for average of 10 months. 53% i.e. 16 were male and 47 % i.e 14 were females. The right wrist was involved in 66% i.e. 20 of our cases and left 10 33% of our cases. The dominant hand in 16 ie 53% of cases. The patients in young working age group 20-40yrs were 20 cases representing 66% of our cases. The number of cases in complex extraarticular fractures i.e. Type23 b 63.33% of our cases and 27 % of type 23c .. Number of cases due to road traffic accident constituted 60% and fall on outstretched hand constituted 40% ..

This study achieved excellent results in 24 patients, good in 4 patients, fair in 1 patients, poor in 1 patients evaluated as per the criteria suggested by Green and O'Brien Score (Cooney modification). (fig1)In this study, 8 pt had wrist pain and stiffness and 6 pt had finger stiffness as their post operative complication. Pain and stiffness in wrist and finger stiffness significantly improved after physiotherapy.

Our case series attributes to 93% of excellent to good results and 4% of fair and 3% poor results. Thus, it suggests that multiple k wire with transfixation plays a good role in anatomic restoration in stable extraarticular fractures.

## CONCLUSION

1. Treatment of comminuted fractures of the distal end of the radius by transfixation with Kirschner wires is an effective method of maintaining reduction
2. This is simple for fracture fixation with preservation of fracture haematoma.
3. Shorter period of surgery with minimal exposure no need of torniquet
4. Minimum invasive surgery with minimum expertise.

## DISCUSSION

The injuries to the lower end of radius are not only encountered in the emergency department setting, but the mobility and delicate functional requirements of the hand make accurate diagnosis and treatment crucial to avoiding long-term loss of function and disability.[5]

Number of studies have proved that there is a strong relationship between the quality of anatomical reconstruction and long term functional outcome[6-12] The most common traditional method is closed reduction and cast immobilization, but this often fails to prevent early radial collapse and is associated with a high risk of malunion, joint stiffness and painful wrist. Hence, this method is for low-demand elderly patients[13]. External fixators can maintain radial length and radial inclination by ligamentotaxis, but cannot effectively maintain palmar tilt. Also complication rates as high as 60% have been reported with the use of external fixators. These mainly include pin loosening, pin tract infection, reflex sympathetic dystrophy, radial sensory neuritis and delayed union.[14] Distal end radius managed by multiple k wire and transfixation of distal radio ulna joint prevent the collapse of the fracture fragments als it is easy,minimally invasive procedure,post operative wound care is less. Hence in extraarticular fracture of the distal end radius multiple k wire and transfixation of distal radioulnar joint is recommended.

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