



EXTRA-ARTICULAR DISTAL END RADIUS FRACTURES IN ELDERLY TREATED FUNCTIONAL OUTCOME

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ABSTRACT **Introduction:** An ageing population is associated with an increase in the frequency of distal radius fractures, an orthopaedic problem that affects many people. Orthopaedic surgeons have special concerns while treating some types of fractures, including those involving the distal end of the radius that is extraarticular. For this reason, we set out to compare the efficacy of conventional cast methods with that of percutaneous pinning in a sample of older adults. **Material And Methods:** From June 2021 to June 2023, conducted a retrospective, randomised trial. Thirty patients underwent cast immobilisation and closure reduction. thirtyone patients underwent closed reduction with percutaneous K wires. The patients underwent a clinical examination and X-rays at each subsequent follow-up. **Results:** The results showed that the group which had closed reduction K-wire fixation had greater range of motion, VAS scores, and less loss of radial length compared to the other group. When looking at the Saito chart and Lindstrom's criterion findings for both groups, it was also evident. In 13% of patients, a pin tract infection developed following K-wire fixation but went away after the wires were removed. This was the sole serious side effect of the procedure. **Conclusion:** When treating displaced, distal end radius fractures, the best, safest, and most complication-free method is closed reduction with percutaneous K-wire fixation. But in fitness compromised patients, close reduction and cast is the valuable alternative.

KEYWORDS : *Extra-Articular Distal Radius, Radiographic, Plaster Cast, Immobilization, Elderly. Fitness compromised*

INTRODUCTION

An ever-shifting tendency towards conservative methods, prioritising functional results above surgical measures, has emerged in the ongoing debate over the management of these fractures. Fractures caused by osteoporosis and age-related deterioration and fitness compromised patients are becoming more common as the world's old population keeps growing (Shauver, 2021). Distal end radius fractures make up a large percentage of these fractures and provide major obstacles to treatment methods and functional results in the long run. There has been an upsurge in interest in conservative treatment methods for extra-articular fractures, which are defined as those that do not involve the joint surface.

Cast immobilisation, physical therapy, and close observation are examples of non-surgical treatments for extra-articular distal end radius fractures. This method is designed to help older patients who may have other health conditions that make surgery more risky. The fracture union and functional independence as soon as possible with as few problems as possible. Considerations such as fracture features, patient age, co-morbidities, and functional demands have a role in the choice to conservatively treat extra-articular distal end radius fractures. Orthopaedic practitioners must have a thorough understanding of the specific difficulties associated with these fractures as well as the effects of conservative treatment on functional results in order to make well-informed judgements that are specific to their senior patients' requirements (Polinder, 2013). In these elderly patients left untreated, they have good function of hand though there is deformity at fracture site, and wrist movement are slightly limited. The elderly patients are not worried about the cosmetic results.

Epidemiology Of Distal End Radius Fractures

It is critical to understand the epidemiology of distal end radius fractures in order to guide public health efforts and clinical care options. Distal end radius fractures are becoming more common, especially in the older population (Altissimi, 2021). The tendency can be explained by the natural decline in bone density that occurs with age, which makes people more prone to fractures like these due to falls. Distal end radius fractures, which often occur in falls from standing height or below, are more common in those over the age of 60, according to studies. Furthermore, there is an increased occurrence in females, which may be associated with the decline in bone mineral density that occurs after menopause.

Distal end radius fractures cause more than just physical harm; cause

them chronic discomfort. It is crucial to prioritise bone health in the elderly as a preventive step, as these fractures are frequently signs of osteoporosis (Earnshaw, 2022).

Current Treatment Approaches In The Elderly

Surgical procedures and conservative therapy have been the subject of increasing discussion in recent years as potential treatments for these fractures in the elderly (Rikli, 2018). With the goal of giving a thorough review of the current approaches used to treat elderly patients with extra-articular distal end radius fractures, this section aims to shed light on the current therapeutic landscape.

Fractures are more common in the elderly because of changes in bone architecture, decreased bone density, and an increased risk of falls. This highlights the critical need of individualising treatment plans with a focus on achieving a happy medium between clinical effectiveness and patient-centered outcomes (Kulej, 2017). When it comes to treating distal end radius fractures in people of all ages, surgical procedures like percutaneous pinning and open reduction and internal fixation (ORIF) have traditionally been the gold standard. The focus, however, has shifted in recent years to investigating the possible advantages of conservative methods for the elderly.

Functional Outcomes In Extra-articular Fractures

An important issue for treatment plans and functional recovery after a fracture is whether the injury was extraarticular. There has to be a thorough investigation into the best ways to treat distal end radius fractures in the elderly in order to keep them mobile and improve their quality of life, since this condition is becoming more common as the population ages (Mackenney, 2016).

The effectiveness of various treatment approaches may be assessed by looking at functional outcomes in the case of extra-articular distal end radius fractures. An individual's capacity to carry out ADLs, retain autonomy, and participate in social responsibilities is directly impacted by the functional state of their wrist and hand (Jordan, 2019). Thus, it is critical for researchers and physicians to have a thorough grasp of the factors affecting functional outcomes.

Significance Of The Study

To optimise patient care, it is essential to evaluate the functional results of conservative therapy for distal radius fractures, which are more common in the elderly. To help doctors in their decision-making processes, this research adds to the medical community by giving

important insights into the efficacy of non-surgical methods. By looking at functional outcomes, healthcare providers can learn about the long-term effects on patients' life and the pros and downsides of conservative treatment options. In the end, this study helps enhance the treatment that older adults with distal radius fractures receive, which leads to better results for patients and overall health. When we see elderly patients which are untreated, they have good function in hand and little reduced wrist movement and deformity which is acceptable to patients. This conservative treatment with close reduction and cast is useful treatment with good results in patients view.

Research Methodology

From December 2021 through June 2023, researchers from the Orthopaedics Department Medical College carried out a retrospective, randomised study. The local ethics committee gave its blessing, and sixty patients (all 50 and up) with a distal end radius extra articular fracture that was displaced but stable, gave their informed consent. In addition to patients having a history of wrist or forearm fractures, we did not include individuals with open fractures, dorsal comminution fractures, congenital or other forearm abnormalities, dorsal tilts more than 20 degrees, or intra-articular distal end radius fractures. Cast immobilisation and closure reduction were performed on thirty individuals. Thirty-one patients had percutaneous K wires placed for closed reduction.

Closed reduction with conventional cast immobilisation was performed on patients under local anaesthesia with C-arm guidance in the operating room. Under the influence of anaesthetic, Agee's manoeuvre was used to accomplish reduction. A cast was placed below the elbow, beginning at the metacarpophalangeal joints and finishing at the proximal portion of the forearm (while sparing the thumb), after a soft roll was wrapped around the patient. Other group patient had to be painted and draped before two crossed K wires could be introduced under C arm guidance to cross fracture lines in both planes, allowing for closed reduction with percutaneous pinning. Dressing the patient followed the cutting and bending of both K wires.

The patient's hands were raised for 24 hours after the procedure, and intravenous antibiotics and analgesics were given to the patients having K. Wire fixation. After that, antibiotics, pain relievers, and calcium supplements were taken orally. The group that had closure reduction and cast immobilisation, in contrast, did not receive antibiotics. Patients were then discharged and re-evaluated at the end of the first, second, fourth, sixth, and twelfth weeks. At every checkup, we took AP and lateral X-rays in addition to taking notes and doing a clinical evaluation. A Visual Analogue Scale was used to evaluate each group. Saito charts for pain and deformity were used to evaluate both groups. The success of each fracture was evaluated using Lindstrom's Criteria for Anatomical End Result (LCAER) and Lindstrom's Criteria for Functional End Result (LCFER). We used XLSTAT, an unpaired student's t-test.

RESULTS

Thirty patients underwent cast immobilisation and closure reduction. Thirty patients underwent closed reduction with percutaneous K wires. The gender breakdown of the patients who were part of the K-wire group and the cast group is presented in Table No. 1.

Table 1: Gender Frequency

	Cast group	K-wire group	Total	Percentage
Male	12	07	19	31.66%
Female	18	23	41	68.33%

Both the group that utilised casts and the group that employed K-wires were able to demonstrate a wide range of mobility, as documented in Table 2. Among the members of the cast, the average age was 63.43 years old altogether. It was found that the K-wire group had an average age of 62.16 years, and the p-value for this group was just 0.6097.

Table 2: Range Of Motion

Motion	Cast group (in degrees)	K-wire group (in degrees)	P value
Dorsiflexion	63.34	69.66	$P \leq 0.0001$
Palmar flexion	55.84	64.83	$P \leq 0.0001$
Pronation	63	64.83	$P = 0.1$
Supination	66.5	69.33	$P = 0.007$

The Visual Analogue Scale (VAS) was utilised in order to assess both of the populations. According to the VAS, the K-wire group had a score

of 4.7, whereas the cast group had a score of 5.6 ($P = 0.007$).

Table 3: Complications

Complication	Cast group	K-wire group
Finger Stiffness	04 (13%)	02 (07%)
Sudeck's Dystrophy	04 (13%)	03 (10%)
Osteoarthritis	06 (20%)	03 (10%)
Pin Tract Infection	0 (0%)	04 (13%)

A breakdown of the Saito scores for both the cast and K-wire groups can be found in Table 4. For the purpose of drawing conclusions, the data from both groups are presented in Table No. 4, which makes use of the four levels of Lindstrom's Criteria for Anatomical End Result (LCAER). The average amount of radial length that was lost in patients who had closed reduction and cast measures 6.83 millimetres. It was shown that patients who had closed reduction with a K-wire experienced an average radial length loss of 3.8 millimetres, with a p-value that was lower than 0.0003.

Table 4: Lindstrom's Criteria

	Cast group	Percentage (%)	K-wire group	Percentage (%)
Excellent	07	23%	21	70%
Good	23	77%	09	30%

DISCUSSION

When treating elderly individuals, it is important to keep in mind the unique challenges posed by distal end radius fractures that develop outside of the joint. Recent research has shown that conservative therapy, an alternative to surgical treatment, may be an option for these fractures. Common elements of this approach include applying a cast and prescribing pain medication, and participating in physical therapy. The decision to choose for conservative therapy is influenced by factors such as the patient's age, co-morbidities, fracture stability, and functional requirements. Research demonstrating promising functional outcomes with conservative therapy in the elderly has brought attention to the importance of personalised treatment. Stabilising a fracture by immobilisation helps the healing process along more smoothly.

An increased incidence of distal end radius fractures, a condition associated with all of the risk factors for osteoporosis, is seen in the elderly. Distal end radius fractures treated with K-wire pinning fixation are heal more quickly and with less technical difficulty than those treated with more complex fixation procedures. It is less invasive than open reduction, which means less harm to soft tissues, and it works well with cast immobilisation.

Problems with this approach include the potential for pin tract infection, incorrect reduction of fractures, and unstable fixation as compared to plating procedures. The research conducted by "Rosenthal" et al. shown that intrafocal pinning worked better than both closed reduction and cast. Stiffness in the fingers and wrists is a very unusual side effect of external treatment for Colles' fractures.

In terms of radial length loss, range of motion, and VAS ratings, our study indicated that the group that had closed reduction K-wire fixation had improved results. A statistical analysis revealed these disparities to be substantial. This was also clearly shown when comparing the two groups using Lindstrom's criteria results and the Saito chart. After the removal of the K-wires, a pin tract infection that had developed in 13% of patients resolved itself. The operation had no other major adverse effects than this.

Results in function can be positive for older individuals with extra-articular distal end radius fractures when conservative treatment is tailored to their specific needs. Thanks to a wellrounded assessment of fracture characteristics, patient concerns, and careful monitoring, this approach is effective in providing an alternative to surgical methods in some cases. The results are accepted by patients who are fitness compromised.

CONCLUSION

Functional results are favourable when older patients with extra-articular distal end radius fractures are treated conservatively. Successful outcomes can be achieved without the dangers of surhealthy and anesthesia by utilising this method, which focuses on non-invasive treatments including casting, bracing, and rehabilitation. The study highlights the significance of tailoring treatment approaches

to each patient by taking their age, comorbidities, and fracture characteristics into account. A cautiously supervised conservative strategy can enhance function and quality of life for older adults with distal end radius fractures, despite the limitations provided by aging-related variables such as osteoporosis. Compared to closed reduction and cast immobilisation, closed reduction with percutaneous K-wire fixation is a safer, better, and simpler approach to maintain reduction in displaced, distal end radius fractures with few sequelae. The results stress the need of individualised rehabilitation plans to maximise functional outcomes.

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