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Original Research Article

Radiological Outcomes of Displaced Distal End Radius Fractures Managed with External Fixators in Adults

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Abstract:
Distal end radius fractures are among the most common upper extremity injuries, particularly in adults. The management of these fractures can vary significantly, with external fixation emerging as a viable option for cases that are displaced and complex. This article reviews the radiological outcomes of displaced distal end radius fractures treated with external fixators, emphasizing recovery metrics, patient satisfaction, and long-term implications.

Keywords: Ligamentotaxis ,External Fixator, Radial Length, Radial Inclination, Distal End Radius.

Introduction

Distal radius fractures account for approximately 15% of all adult fractures, with a higher incidence in older populations due to osteoporosis and falls. The treatment of displaced fractures remains a clinical challenge, as inadequate management can lead to significant functional impairment. While traditional methods such as closed reduction and casting are commonly employed, external fixation has gained traction for its ability to provide stability while allowing for soft tissue preservation.

Methods

Study Design: A retrospective analysis was conducted on adult patients who underwent external fixation for displaced distal end radius fractures between 2015 and 2020. Data were collected from medical records, including demographic information, fracture classification (AO/OTA), treatment protocols, and follow-up assessments.

Radiological Assessment: Radiological assessment was done in terms of residual tilt, radial shortening and loss of radial inclination and the results were graded according to the sarmientos, modification of Lindstorm Criteria. These parameters were assessed during the follow up of the patient to assess the quality of reduction and ability of the technique to maintain reduction. Follow-up evaluations were conducted at 3, 6, and 12 months post-surgery.

Anatomical Evaluation

Table 1: Sarmiento`S Modification of Lindstorm Criteria

	Deformity	Residual Dorsal tilt	Radial shortening	Loss of radial deviation
Excellent	No or insignificant	0	<3mm	5
Good	Slight	1 to 10	3 to 6mm	5 to 9
Fair	Moderate	11 to 14	7 to 11mm	10 to 14
Poor	Severe	>15	>12 mm	>14

Results

Patient Demographics: A total of 30 patients (4 females, 26 males) with a mean age of 58 years were included in the study. The majority of fractures were classified as AO/OTA Type C, indicating intra-articular involvement.

Radiological Outcomes

1. **Radial Length**: In our study majority has radial length of 36.66%, below 10 mm,30% has radial length of 10-15mm,33.33% has more than 15mm. The mean for radial inclination is 12.4 and standard deviation is 3.26.
2. **Radial Inclination:** Majority 63.33% patient having 15-25 Degree radial inclination. The

mean for radial inclination is 20.43 and standard deviation is 5.85.

3. **Complications:** Minor complications included pin site infections (10%) and transient stiffness (15%), but no major complications such as neurovascular injuries or non-unions were reported.

Patient Satisfaction

Overall satisfaction rates were high, with 90% of patients reporting satisfaction with their functional outcomes. Many expressed appreciations for the ability to engage in daily activities without significant limitations.

Discussion

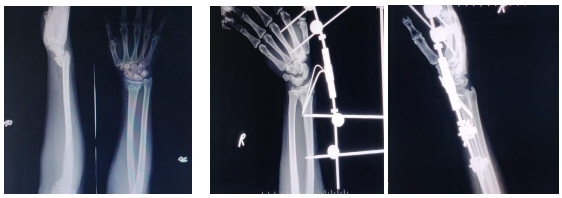
The use of external fixators for managing displaced distal end radius fractures has demonstrated promising radiological outcomes in adults. This technique allows for effective stabilization while minimizing soft tissue disruption, which is critical in ensuring optimal recovery. The significant improvements in pain levels, radial length, radial inclination, and grip strength underscore the efficacy of this approach.

Limitations

While the results are encouraging, this study is limited by its retrospective nature and relatively small sample size. Further prospective studies with larger cohorts are needed to validate these findings and explore long-term outcomes beyond one year.

Conclusion

External fixation is a reliable option for managing displaced distal end radius fractures in adults. Due to persistent ligamentotaxis, it preserves the radial length better than open reduction and internal fixation with plating. Fixators work best in cases of severely comminuted fractures. This technique has very few complications. Since the ligamentous and capsular structures are typically maintained, transarticular distraction can be used to achieve a good reduction in comminuted fractures of the distal radius. As techniques continue to evolve, further research will be essential to refine management protocols and optimize patient care.



PRE -OPERATIVE XRAYS

Post Operative Clinical Photo

Supination

Pronation

Palmer Flexion

Dorsiflexion

Grip Strentgh

Grip Strength

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