

Clinical and Functional Outcome of Distal Radioulnar Joint Instability in Galeazzi Fractures Treated by Open Reduction and Internal Fixation**Bhargava Teja Naik¹, Manoj Kumar. C.V.², Khayas Omer Kunheen³, Nithin Karun⁴**¹Resident, Department of Orthopaedics, Government Medical College, Kozhikode, Kerala, India²Associate Professor, Department of Orthopaedics, Government Medical College, Kozhikode, Kerala, India³Associate Professor, Department of Orthopaedics, Government Medical College, Kozhikode, Kerala, India⁴Associate Professor, Department of Orthopaedics, Government Medical College, Kozhikode, Kerala, India

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Corresponding author: Dr. Nithin Karun

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Abstract**Background:** Galeazzi fracture–dislocation is a complex forearm injury involving a fracture of the distal third of the radius associated with distal radioulnar joint (DRUJ) instability. If inadequately managed, it can result in persistent pain, reduced grip strength, and long-term functional impairment.**Aim:** To evaluate the clinical and functional outcomes of Galeazzi fractures treated with open reduction and internal fixation (ORIF) with DRUJ stabilization.**Materials and Methods:** This prospective observational study included 40 adult patients with Galeazzi fracture–dislocations managed surgically with ORIF of the radius and stabilization of the DRUJ. Patients were followed up at 2 weeks, 6 weeks, 12 weeks, 6 months, and 1 year. Functional outcomes were assessed using Visual Analog Scale (VAS) for pain, QuickDASH score, grip strength percentage, and range of motion (ROM). Statistical analysis was performed using paired t-test, with $p < 0.05$ considered significant.**Results:** The mean VAS score showed a significant increase in the immediate postoperative period followed by a progressive decline over time ($p < 0.001$). QuickDASH scores worsened initially but demonstrated significant improvement by 6 months and 1 year ($p < 0.001$). Grip strength and ROM showed continuous improvement throughout the follow-up period. Persistent DRUJ instability was observed in 10% of patients, and secondary procedures were required in 5%.**Conclusion:** ORIF with DRUJ stabilization in Galeazzi fracture–dislocations results in significant improvement in pain, functional status, grip strength, and range of motion, with low complication rates. Early surgical intervention combined with appropriate stabilization and rehabilitation is essential for optimal functional recovery.**Keywords:** Galeazzi Fracture, Distal Radioulnar Joint, ORIF, Quick DASH, Functional Outcome.**DOI:** 10.25258/ijcpr.18.6.71

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Introduction

Galeazzi fracture–dislocation is a complex injury of the forearm characterized by a fracture of the distal third of the radial shaft associated with disruption or instability of the distal radioulnar joint (DRUJ). This injury pattern, though relatively uncommon, is clinically significant due to its high potential for functional impairment if not accurately diagnosed and appropriately managed.

The distal radioulnar joint plays a crucial role in forearm rotation and load transmission across the wrist. Instability of this joint can lead to chronic pain, reduced grip strength, limitation of pronation

and supination, and long-term disability affecting activities of daily living. Inadequate treatment or missed diagnosis of DRUJ instability is a major cause of poor functional outcomes in Galeazzi fractures.

Historically, non-operative management of Galeazzi fractures in adults has been associated with unsatisfactory results, leading to the recognition of this injury as a “fracture of necessity” requiring surgical intervention. With advances in surgical techniques, open reduction and internal fixation (ORIF) of the radius using

compression plating has become the standard of care. However, restoration of radial anatomy alone may not ensure stability of the DRUJ, particularly in cases with associated ligamentous injury.

Persistent or unrecognized DRUJ instability remains a key determinant of suboptimal outcomes. Therefore, intraoperative assessment and appropriate stabilization of the DRUJ, such as transfixation with Kirschner wires or immobilization, are essential to achieve satisfactory functional recovery. Despite these measures, there remains variability in clinical practice and limited consensus regarding the optimal management of DRUJ instability.

In the Indian context, the burden of trauma due to road traffic accidents is increasing, and Galeazzi fractures are commonly encountered in young and active individuals. Delayed presentation and limited access to specialized care may further compromise outcomes, highlighting the need for effective and standardized treatment strategies.

Therefore, the present study was undertaken to evaluate the clinical and functional outcomes of Galeazzi fracture–dislocations treated with ORIF of the radius and stabilization of the distal radioulnar joint.

The study also aims to assess postoperative complications and the need for secondary procedures, thereby contributing to improved management protocols and better functional outcomes.

Materials and Methods:

Study Design and Setting: This prospective observational study was conducted in the Department of Orthopaedics at Government Medical College, Kozhikode.

Study Population: A total of 40 adult patients diagnosed with Galeazzi fracture–dislocations were included in the study.

Inclusion Criteria:

- Adult patients with Galeazzi fracture–dislocation
- Patients willing to undergo surgical management and follow-up

Exclusion Criteria:

- Pathological fractures

- Previous fractures or deformities of the forearm
- Patients unwilling to participate or lost to follow-up

Study Duration: The study was conducted over a defined period with follow-up extending up to one year.

Surgical Procedure: All patients underwent open reduction and internal fixation (ORIF) of the radial shaft using dynamic compression plating. Following fixation, the distal radioulnar joint (DRUJ) was assessed intraoperatively for stability. In cases where instability persisted, stabilization of the DRUJ was performed using transfixing Kirschner wire (K-wire), followed by immobilization using a long arm splint.

Postoperative Protocol and Follow-up:

Patients were followed up at regular intervals of 2 weeks, 6 weeks, 12 weeks, 6 months, and 1 year. At each follow-up visit, clinical and functional assessments were performed.

Outcome Measures:

Functional outcomes were evaluated using:

- Visual Analog Scale (VAS) for pain
- Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) score
- Grip strength (expressed as percentage compared to the contralateral side)
- Range of motion (ROM) of the wrist and forearm

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Continuous variables were expressed as mean \pm standard deviation. Comparison of outcomes at different follow-up intervals with baseline values was performed using paired t-test. A p-value of <0.05 was considered statistically significant.

Results

A total of 40 patients with Galeazzi fracture–dislocations were included in the study.

The majority of patients were in the 30–39 years and 41–49 years age groups (25% each). Males constituted 67.5%, and road traffic accidents were the most common mode of injury (72.5%).

Demographic profile

Table 1: Demographic characteristics (n=40)

Variable	Category	Number(n)	Percentage (%)
Age group	< 20	2	5.0
	20-29	9	22.5
	30-39	10	25.0
	41-49	10	25.0
	51-59	9	22.5
Sex	Male	27	67.5
	Female	13	32.5
Side	Right	24	60.0
	Left	16	40.0
Mode of injury	RTA	29	72.5
	Fall	11	27.5

Pain Outcome (VAS Score): VAS score increased in the early postoperative period and progressively decreased over time. Significant improvement was observed up to 6 months ($p < 0.001$).

Table 2: VAS score at follow-up intervals

Follow-up	Mean \pm SD
Baseline	2.14 \pm 1.31
2 weeks	6.67 \pm 1.28
6 months	3.42 \pm 1.22
1 year	2.18 \pm 1.36

Table 3: Quick DASH score at follow-up intervals

Follow-up	Mean \pm SD
Baseline	25.99 \pm 10.44
2 weeks	73.89 \pm 12.98
6 weeks	60.86 \pm 10.36
12 weeks	52.31 \pm 9.62
6 months	38.13 \pm 9.30
1 year	26.29 \pm 10.54

Grip strength: Grip strength improved progressively during follow-up, indicating functional recovery.

Table 4: Grip strength (%) at follow-up intervals

Follow-up	Mean \pm SD
Baseline	77.35 \pm 8.76
2 weeks	36.95 \pm 7.86
6 months	67.65 \pm 7.29
1 year	77.10 \pm 8.44

Range of motion (ROM): Range of motion showed significant improvement across follow-up intervals ($p < 0.001$)

Follow-up	Mean \pm SD
2 weeks	28.88 \pm 8.92
1 year	77.95 \pm 8.47

DRUJ Instability & Procedure

- Intraoperative DRUJ instability: 80% (n = 32)
- DRUJ K-wire stabilization: 100% (n = 40)

Complications

- Persistent DRUJ instability: 10%
- Secondary procedure: 5%

Functional outcome categories

Table 6: Functional outcome distribution

Outcome	Baseline	12 weeks	6 months	1 year
Good	57.5%	0%	5%	37.5%
Fair	35%	35%	80%	60%
Poor	7.5%	65%	15%	2.5%

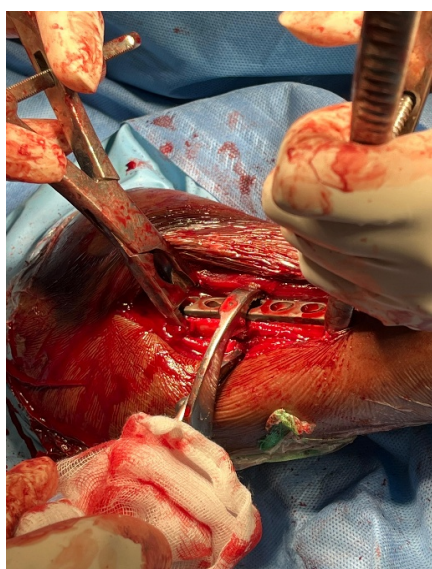
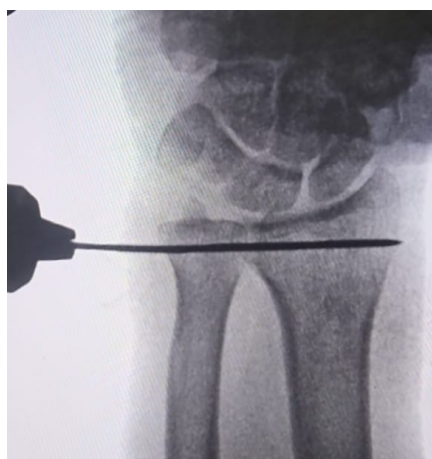
**Fig 1: Pre-Operative X- Ray****Fig 2: Intra- Operative image of fixation of Galeazzi Fracture with DCP****Fig 3: Transfixation of DRUJ with K Wire**



Fig 4: Clinical photo of K Wire fixation for DRUJ

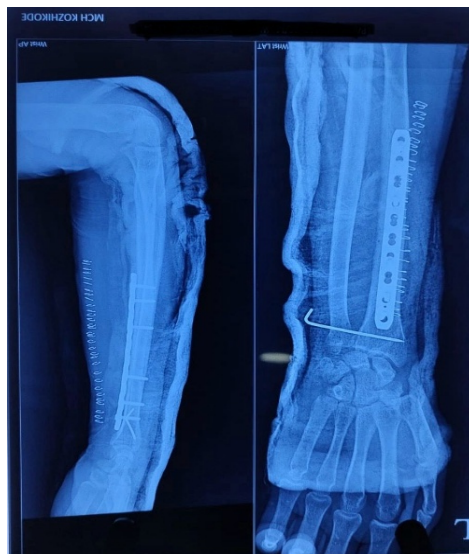


Fig 5: Post- Operative X- Ray



Fig 6: Follow Up Clinical Photos

Discussion

Galeazzi fracture–dislocation is a complex injury requiring both anatomical reduction of the radius and stabilization of the distal radioulnar joint (DRUJ) to achieve optimal functional outcomes. In the present study, a characteristic pattern of early postoperative morbidity followed by progressive recovery was observed.

The majority of patients were young adult males, with road traffic accidents being the most common cause of injury, consistent with the high-energy

mechanism typically associated with this fracture pattern. Pain and functional scores (VAS and QuickDASH) showed significant early worsening followed by steady improvement over time, with most recovery occurring by 6 months. Grip strength and range of motion also improved progressively, reflecting restoration of forearm mechanics and effective rehabilitation. A high incidence of intraoperative DRUJ instability (80%) highlights the importance of routine assessment and stabilization. The use of K-wire fixation in all cases contributed to a low rate of persistent instability

(10%), although early stiffness and disability were observed. Overall, the study demonstrates that ORIF with DRUJ stabilization provides satisfactory clinical and functional outcomes in Galeazzi fractures. Early postoperative disability should be considered a transient phase, with significant improvement expected over time.

Summary

The present study demonstrates that ORIF with DRUJ stabilization in Galeazzi fracture–dislocations result in favourable clinical and functional outcomes.

Although early postoperative disability is common, significant improvement occurs over time, with most patients achieving satisfactory functional recovery.

Conclusion

Open reduction and internal fixation (ORIF) with distal radioulnar joint (DRUJ) stabilization in Galeazzi fracture–dislocations result in significant improvement in pain, functional outcome, grip strength, and range of motion.

Although early postoperative disability is commonly observed, progressive recovery occurs over time, with most patients achieving satisfactory functional outcomes by 6 months to 1 year. Routine assessment and stabilization of the DRUJ are essential to prevent persistent instability and ensure optimal recovery.

Recommendations

- Early surgical intervention should be performed for all Galeazzi fractures in adults
- Routine intraoperative assessment of DRUJ stability is essential
- DRUJ stabilization should be considered in unstable cases
- Structured postoperative rehabilitation should be followed
- Long-term follow-up is recommended to assess functional outcomes

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