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Research Article

# A COMPARATIVE STUDY EVALUATING OUTCOMES OF CONSERVATIVE VERSUS VOLAR LOCKING PLATE OSTEOSYNTHESIS FOR UNSTABLE DISTAL RADIUS FRACTURES

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## ABSTRACT

This comparative study aimed to evaluate and compare the outcomes of conservative treatment and volar locking plate osteosynthesis in patients with unstable distal radius fractures.

## KEYWORDS

Distal radius fractures, unstable fractures, conservative treatment, volar locking plate osteosynthesis, functional outcomes, radiographic parameters, complications.

## INTRODUCTION

Unstable distal radius fractures are a common injury that can significantly impact wrist function and quality of life. The management of these fractures remains a topic of debate, with conservative treatment and volar locking plate osteosynthesis being two commonly employed approaches. Conservative treatment involves closed reduction, immobilization, and early mobilization, while volar locking plate osteosynthesis involves surgical fixation with a specialized plate. The aim of this comparative study is to evaluate and compare the outcomes of conservative treatment and volar locking plate osteosynthesis in patients with unstable distal radius fractures.

Unstable distal radius fractures are characterized by significant displacement, intra-articular involvement, or associated instability. These fractures pose a challenge due to the risk of malunion, loss of function, and persistent pain. Conservative treatment aims to manage these fractures non-operatively, allowing

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natural healing and functional recovery. On the other hand, volar locking plate osteosynthesis provides stable fixation, restores alignment, and allows early mobilization.

While both treatment approaches have their advantages and disadvantages, there is a need for evidence-based comparisons to guide clinical decision-making. Previous studies have shown conflicting results, and the optimal treatment approach for unstable distal radius fractures remains uncertain. Therefore, this comparative study aims to contribute to the existing literature by evaluating functional outcomes, radiographic parameters, and complications associated with conservative treatment and volar locking plate osteosynthesis.

The outcomes of interest include functional assessment using validated scoring systems, such as the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Modified Mayo Wrist Score. Radiographic parameters, including fracture reduction, alignment, and joint congruity, will also be evaluated. Complications such as hardware-related issues, infection, and non-union will be assessed to determine the safety and efficacy of each treatment approach.

By comparing the outcomes of conservative treatment and volar locking plate osteosynthesis, this study aims to provide valuable insights into the optimal management strategy for unstable distal radius fractures. The results of this study will help clinicians make informed decisions and tailor treatment plans based on the individual patient's characteristics and fracture pattern. Ultimately, the goal is to improve patient outcomes and optimize functional recovery in this challenging fracture population.

## METHOD

**Study Design:** This study is a retrospective comparative analysis of patients diagnosed with unstable distal radius fractures who received either conservative treatment or volar locking plate osteosynthesis.

**Patient Selection:** A comprehensive review of medical records and radiographic images was conducted to identify eligible patients. Inclusion criteria consisted of patients diagnosed with unstable distal radius fractures, defined as fractures with significant displacement, intra-articular involvement, or associated instability. Exclusion criteria included open fractures, pathologic fractures, and patients with incomplete medical records or lost to follow-up.

**Treatment Groups:** The identified patients were divided into two groups based on the treatment received. The conservative treatment group consisted of patients who underwent non-surgical management, which typically included closed reduction, immobilization with a cast or splint, and early mobilization or physiotherapy. The volar locking plate osteosynthesis group comprised patients who underwent surgical intervention using volar locking plates for fracture fixation.

**Outcome Measures:** The primary outcome measures included functional outcomes, radiographic parameters, and complications. Functional outcomes were assessed using validated scoring systems, such as the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Modified Mayo Wrist Score. Radiographic parameters included fracture reduction, alignment, and maintenance of joint congruity. Complications, such as hardware-related complications, infection, and non-union, were documented. Secondary outcome measures included range of motion, grip strength, and patient satisfaction.

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**Data Analysis:** Descriptive statistics were used to summarize patient demographics, fracture characteristics, and treatment modalities. The two treatment groups were compared using appropriate statistical tests, such as chi-square tests or Fisher's exact tests for categorical variables and t-tests or Mann-Whitney U tests for continuous variables. A p-value less than 0.05 was considered statistically significant.

**Ethical Considerations:** This study adhered to ethical guidelines and obtained approval from the relevant institutional review board. Patient confidentiality and privacy were ensured throughout the study.

By conducting a comparative analysis of conservative treatment and volar locking plate osteosynthesis for unstable distal radius fractures, this study aims to provide valuable insights into the optimal management approach for these challenging fractures. The results of this study will help inform clinical decision-making and improve patient outcomes in the treatment of unstable distal radius fractures.

## RESULTS

A total of 100 patients were included in the study, with 50 patients in the conservative treatment group and 50 patients in the volar locking plate osteosynthesis group. The mean age of the patients was 45 years, with a similar gender distribution in both groups. The functional outcomes, as assessed by the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Modified Mayo Wrist Score, were significantly better in the volar locking plate group compared to the conservative treatment group ($p < 0.001$). Range of motion and grip strength were also significantly improved in the volar locking plate group ($p < 0.001$). Radiographic evaluation showed better fracture reduction and alignment in the volar locking plate group compared to the conservative treatment group ($p < 0.001$). However, the volar locking plate group had a higher incidence of complications, including hardware-related issues (18%) and infection (10%), compared to the conservative treatment group (4% and 2%, respectively).

## DISCUSSION

The results of this study support the superiority of volar locking plate osteosynthesis over conservative treatment for unstable distal radius fractures. The volar locking plate group showed better functional outcomes, including improved wrist function, range of motion, and grip strength, which can significantly impact the patient's quality of life. The superior fracture reduction and alignment achieved with volar locking plate osteosynthesis contribute to improved functional outcomes. However, the higher incidence of complications in the volar locking plate group raises concerns about the potential risks associated with this surgical approach.

The complications observed in the volar locking plate group, such as hardware-related issues and infection, emphasize the importance of careful patient selection and meticulous surgical technique. Factors such as patient age, bone quality, fracture pattern, and surgeon experience should be considered when deciding between conservative treatment and volar locking plate osteosynthesis. Additionally, postoperative management and close follow-up are crucial to detect and manage complications promptly.

## CONCLUSION

In patients with unstable distal radius fractures, volar locking plate osteosynthesis offers superior functional outcomes and improved fracture reduction and alignment compared to conservative treatment.

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However, the increased risk of complications associated with volar locking plate osteosynthesis should be carefully considered, and a balanced approach should be taken when selecting the optimal treatment modality. Individualized treatment plans, taking into account patient factors and surgeon expertise, are crucial to achieving favorable outcomes while minimizing complications. Further prospective studies with longer follow-up periods are warranted to validate these findings and provide more comprehensive evidence for guiding clinical decision-making in the management of unstable distal radius fractures.

## REFERENCES

1. Stewart HD, Innes AR, Burke FD. Factors affecting the out-come of Colles' fracture: an anatomical and functional study.Injury 1985;16:289-95.
2. Gartland JJ Jr, Werley CW. Evaluation of healed Colles'fractures. J Bone Joint Surg Am 1951;33-A:895-907
3. Pogue DJ, Vegas SF, Patterson RM, Peterson PD, Jenkins DK, Sweo TD, et al. Effects of distal radius malunion on wrist joint mechanics. J Hand Surg Am 1990;15:721-7.
4. Koval KJ, Zuckerman JD, Kenneth E. Handbook of Fractures. 2nd ed. Lippincott williams and Wilkins:Philadelphia, USA p. 133-8.
5. Fernández DL. Fractures of the distal radius: operative treatment.Instr ;42:73–88.
6. Melone CP Jr. Articular fractures of the distal radius. Orthop Clin North Am. 1984;15(2):217-236.
7. Knirk JL, Jupiter JB. Intra-articular fractures of the distal end of the radius in young adults. J Bone Joint Surg Am. 1986;68(5):647-659.
8. Kapoor, Harish & Agarwal, Ashoo & Dhaon, B. (2000). Displaced intra-articular fractures of distal radius: A comparative evaluation of results following closed reduction, external ⍰xation and open reduction with internal ⍰xation. Injury. 31. 75-9. 10.1016/S0020-1383(99)00207-7.
9. Schuind F, Donkerwolcke M, Rasquin C, Bumy F. External ⍰xation of fractures of the distal radius: A study of 225 cases. J Hand Surg 1989; 14A (2): 404-7.
10. Cassebaum WH. Colles' fracture: a study of end results. JAMA1950;143:963-5.
11. Colles A. On the fracture of the carpal extremity of the radius.N Engl J Med 1814;3(4):368–372.
12. Short WH, Palmer AK, Werner FW, Murphy DJ. A biomechanical study of distal radial fractures. J Hand Surg Am. 1987;12(4):529-534. doi:10.1016/s0363-5023(87)80202-2
13. Taleisnik J, Watson HK. Midcarpal instability caused by malunited fractures of the distal radius. J Hand Surg Am. 1984;9(3):350-357. doi:10.1016/s0363-5023(84)80222-1
14. ARO, H. T. and KOIVUNEN, T. (1991). Minor axial shortening of the radius affects outcome of Colles' fracture treatment. Journal of Hand Surgery, 16A : 3: 392-398.
15. Trumble TE, Schmitt SR, Vedder NB. Factors affecting functional outcome of displaced intra-articular distal radius fractures. J Hand Surg Am. 1994;19(2):325-340. doi:10.1016/0363-5023(94)90028-0
16. Hagert CG. Distal radius fracture and the distal radioulnar joint—anatomical considerations. Handchir Mikrochir Plast Chir. 1994;26(1):22-26