

A Comparative Study of Management of Colles Fracture by Closed Reduction with Cast versus Closed Reduction with Internal Fixation

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Abstract

Background: In this study we did a prospective study in 40 patients with extra articular distal radius fracture treated by both closed reduction with cast and closed reduction internal fixation (PKW/CC screws).

Methods: There were 30 patients with Colles fractures treated by closed reduction with cast and 30 patients treated with closed reduction internal fixation (PKW/CC screws). We compared both the managements together. The functional outcomes and radiological results were compared between the two groups.

Results: Functionally, for CRIF 11 patients had excellent hand function; 4 patients had good results; 11 patients had a fair outcome, and 4 patients had poor outcome. Functionally, for cast immobilization patients 13 patients had poor outcome, 10 patients had fair outcome, 4 patients had good outcome and 3 patients had excellent outcome.

Conclusions: The percutaneous pinning/cc screws and immobilization in neutral position for 3 weeks followed by physiotherapy proved to be better and simple procedure for extra articular non comminuted distal radius fractures.

Keywords: Fracture radius distal 1/3rd, Cast, Pinning, CC screws, Immobilization

Introduction

The purpose of this study is to evaluate functional, clinical and radiological effectiveness and drawbacks after closed reduction percutaneous fixation of acute, displaced extra articular and unstable fracture of the distal radius by using a standard 4.0 mm diameter long threaded cannulated screw in indian population.¹⁻³ Percutaneous 4 mm cannulated cancellous screw, a new method of fracture fixation with 4 mm cannulated screw applied percutaneously after closed reduction. The screws/k wires gives good purchase to the bone and fixes the fragments. Early mobilization reduces the chance of joint stiffness.⁴ It is an inexpensive technique.

Closed reduction and percutaneous application reduces the operative risk to the minimum level. With 4 mm diameter it is possible to put two screws instead of one. Hypothesis being the fixation with cannulated screw/K wire would allow immediate range of motion of the wrist while maintaining alignment, resulting in a rapid and comfortable functional recovery.⁵ Although a variety of surgical treatments exist for treating distal radial fractures, closed reduction and the insertion of percutaneous Kirschner wires/CC screws to help maintain fracture reduction is still the popular method.

Methods

Design: Prospective clinical study.

Inclusion criteria

- Acute and displaced fractures,
- All patients between 20 and 70 years,
- Dorsal-angulated fractures (Colles' fractures).
- Good bone quality,
- Extra articular fractures requiring surgical fixation

Exclusion criteria

- Previous fractures or nonunions of the wrist,
- Bilateral fractures,
- Open fractures,

d. Severe systemic disease with the American society of anaesthesiologists (ASA) physical status grade 3 or more,

- Volar-angulated fractures (smith fractures),
- Ipsilateral limb injuries, and
- Patients who needed help with daily living activities or who were living in nursing homes,
- Late injury more than a week,
- Associated nerve injury.

There were 60 patients who met the inclusion criteria and were treated by closed reduction with cast and closed reduction (PKW/CC screws). We compared outcomes of both management. The type of fracture was classified according to the AO and Frykman classification.

Results

Table 1: General characteristics

Variable	CAST	CRIF	p-value
Mean age	51.30±15.02	51.01±15.06	>0.05
Male : Female	12 : 18	13 : 17	>0.05
Frykman classification(Type 1 :2)	13 : 17	15 : 15	>0.05

Both groups were comparable.

Table 2: Outcome

Variable	CAST	CRIF	p-value
Outcome(excellent : good : fair : poor)	0:6:9:15	11:4:10:13	0.001
Complication present	19	12	0.001

Functionally, for CRIF 11 patients had excellent hand function; 4 patients had good results; 11 patients had a fair outcome, and 4 patients had poor outcome. Functionally, for cast immobilization patients 13 patients had poor outcome, 10 patients had fair outcome, 4 patients had good outcome and 3 patients had excellent outcome.

Discussion

Distal radius fracture is one of the most common injury. Various clinical studies as well as laboratory assessment of force and stress have demonstrated the importance of anatomic reduction.⁶

In fractures with articular displacement greater than 2 mm, radial shortening greater than 5 mm or dorsal angulation greater than 20°, suboptimal results have been reported in previously published studies.⁷

First step in distal radius fracture is reduction and immobilization. The 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 mode of treatment is used for low-demand elderly patients.⁸

Radial length and radial inclination can be maintained by ligamentotaxis using external fixators, but palmar tilt is difficult to maintain.¹¹

With the use of external fixators complication rates are high as 60%.¹² These mainly include pin tract infection, pin loosening, sympathetic dystrophy and delayed union. Thus, external fixators are not an option in noncomminuted extra-articular distal radial fractures.⁹

Conclusion

Percutaneous K wire/CC screw is an effective means of treatment of extra articular distal radius fracture with early to immediate range of motion of the wrist, resulting in a fast early and comfortable functional recovery with anatomical alignment and bone healing. CC screws has good purchase when treating extra articular distal radius with poor bone quality. Early physiotherapy with immobilization for nearly 3 weeks has good outcomes. Being minimally invasive with minimal soft tissue dissection, less operative time, cost effective. Cannulated screws/percutaneous K wire is a good option for both young and elderly patients with extra articular distal radius fracture.

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