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Current Strategy of Management of Distal Radius Fractures in Geriatric Populations

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Abstract

The distal radius fractures in geriatric population is one of common emergency admission in hospitals. In view of increasing life expectancy, requirement of continuation of work for having independent life, expectation of better outcome in active elderly population is changed. Non-operatively treated undisplaced and extra-articular fractures give good functional outcome. Intra-articular fractures or grossly displaced fractures in active geriatric patients are treated by open reduction and volar locking plate osteosynthesis. This article described factors to consider for treatment, methodology of treatment for various fracture patterns depending upon physical fitness of patient and radiological parameters.

Keywords: distal radius, geriatric, management

Introduction

The distal radius fracture is the second most common fracture after hip fractures that occur in the geriatric population due to either trivial falls or low-velocity trauma. With the current aging population who is independent and involved in many physical activities, having normal hand and wrist function is considered an important criterion for elderly people.

The challenge of considering operative or non-operative treatment for distal radius fracture remains controversial in the world. But by defining who is "old" and the fragility of fracture, the functional outcome can be predicted. This article gives guidelines for approaching distal radius fracture in elderly patients.

The factors which contribute to the decision-making of treatment of distal radius fractures are as follows.

Patient-related Factors

- Actual chronological age: It is necessary to note the actual age of the patient. For anyone more than 85 years of age group, the functional demand of using the hand is limited to performing activities of daily living. Therefore, irrespective of distal radius fracture status, non-operative treatment is considered effective.
- Associated medical comorbidities: Life-threatening medical issues such as malignancies and uncontrolled diabetes, hypertension or serious cardiac conditions, and any type of distal radius fracture will be conserved.
- Level of fitness in performing both activities of daily living and outdoor activities

A healthy elderly subject who is independent in doing all activities would like to return to function early with fewer complications.

Fracture-related Factors

- As per the AO classification system, the distal radius fractures are classified as A. Extra-articular, B. Partially articular, and C. Intra-articular fractures.
- Most of the stable extra-articular fractures are treated non-operatively. Displaced fractures with potential risk of collapse and malunion, partly involved and intra-articular fractures are recommended to be treated by open reduction and volar locking plate fixation.

Methodology to Treat Distal Radius Fractures in the Geriatric Population (Chart 1)

1. Cock up splint: More than 80 years old with multiple medical comorbidities who have a fragile skin condition and extra-articular fractures are treated in cock up splint for 3 weeks. The possibility of malunion and collapse leading to functional compromise has to be explained to the patient and family.
2. Closed reduction and cast: It can be performed under suitable anesthesia preferably hematoma block for displaced extra-articular fractures. The cast

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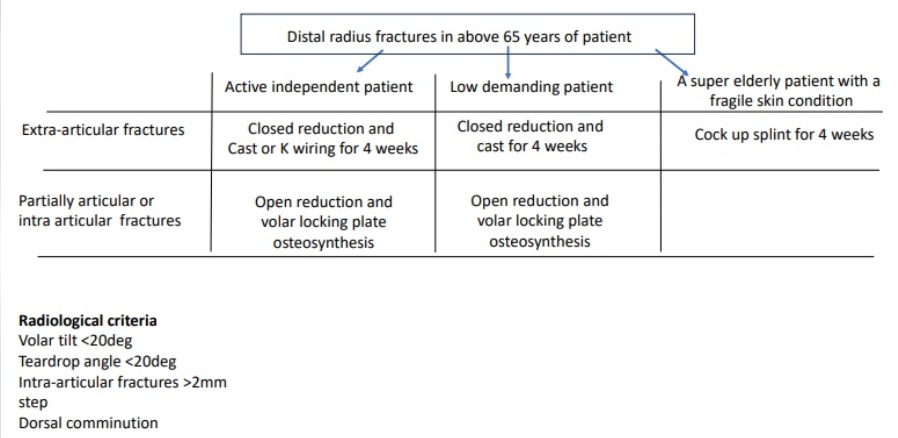

Chart 1: Algorithm to treat distal radius fractures in elderly patients

remains for 4 weeks then converted to cock up splint.

3. Stabilization of fracture by K wiring or open reduction and volar locking plate osteosynthesis: High-demanding elderly patients who are active and independent are considered to be treated with surgery for early return to function. Intra-articular fractures or fractures with lower volar tilt (VT) and teardrop angles (TDA) are considered for surgical intervention.

Discussion

The radiological parameters of better fracture reduction give good functional outcomes in young patients. This may not hold true while treating elderly subjects [1].

The various factors are counted for having increased incidence of these fractures in older populations such as increased activity levels, decreased bone mineral density, and various metabolic bone diseases [2-4].

Lafontaine has published five criteria for judging instability and the possibility of secondary displacement in distal radius fractures [3].

- Dorsal angulation of more than 20°
- Dorsal comminution
- Intra-articular radiocarpal fracture
- Associated ulnar fracture
- Age over 60 years.

In the geriatric population, radiographic parameters are not correlated with disability and function [5-7]. Non-operatively treated fractures do result in clinical deformity in most elderly patients who have low demands in activity. But, it is generally well tolerated [8].

However, with rising demands of activity levels in elderly subjects, increasing life expectancy of an aging population, and because of availability of good quality implants, trends to choose surgical methods to achieve accurate reduction and stabilization with internal fixation is high in the world, though it remains controversial [9].

Fracture severity is a strong driver in the decision to pursue operating management in patients aged >65 years, whereas increasing the Charlson comorbidity index (CCI) predicts non-operative treatment [10]. Other factors such as chronic smokers, patients with low body mass index or CCI, and fragile bones favor non-surgical treatment and have proven to be effective for such patients.

The studies have compared the surgical outcome between the elderly (65–74 years) and super elderly age group (more than 75 years) of patients with high levels of independence and better activity levels. The final outcome based on radiological criteria, Quick DASH and visual analog score (VAS) for pain, and comorbidities was similar in both groups [11].

Cooper et al. [12] group have published results of non-surgical treatment in geriatric patients who were low demanding and had fewer activity levels. The study showed that malunion of extra-articular fracture in the wrist also had an efficient functional outcome. The delayed carpal tunnel syndrome in the elderly population was seen in cases where radiologically the VT and TDA were reduced. These were also important radiological parameters to correct the deformity in geriatric patients [13].

The meta-analysis of a comparative study of surgical and conservative treatment by Gutiérrez-Espinoza et al. [14] proved the fact that extra-articular fractures had good functional outcomes with non-operative treatment and surgical treatment with volar locking plates in displaced and partial articular or intra-articular fractures had better outcome and early returned to function. The randomized trial by Olech et al. [15] to compare functional and radiological criteria in fractures treated in cast at 4 weeks and 6 weeks showed no significant difference by keeping for 6 weeks except an increase in VT angle. The VAS for pain, radial inclination, radial height, and union rate were similar even in patients whose cast was removed at 4 weeks.

Conclusion

The treatment with closed reduction and casting for 4 weeks in non-active elderly patients with extra-articular distal radius fractures gives better and more efficient functional outcome.

The intra-articular fractures, reduced VT and TDA, are prone to complications such as arthritis of the radiocarpal joint and delayed carpal tunnel syndrome. So, in active elderly patients, volar locking plate osteosynthesis can help with early mobilization and early return to function.

Malunion or improper radiological parameter post-treatment in extra-articular fractures do not necessarily give a bad outcome.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

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