Original Article

A study of assessment of various methods of immobilization in acute fractures of lower end of radius

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Abstract

Introduction: Fractures of the distal radius are common injuries in young and elderly patients and are associated with a significant incidence or morbidity. It has been estimated that they account for one sixth and all fractures seen in the accident and emergency department. **Aims and Objectives:** To Study Various Methods of Immobilization in Acute fractures of lower end of Radius. **Methodology:** For the present study 103 followed cases of colles' fractures were studied. Out of these 87 cases were treated by below elbow plaster cast in pronation with wrist in either of following positions. 1. Dorsiflexion, 2. Neutral,3. Palmarflexion. These cases formed the man bulk of the study and were studied in detail. The cases coming to general hospital, Sangli from march 1993 to December 1993 were collected for the O.P.D hours and some as an emergency in casualty. **Result:** The various methods used for treatment were above elbow cast-8, Percutaneous 'k' Wire fixation -4, External fixator -4.51.76% patients approached for medical help within 24 hours of injuryIn 76.47% cases, GA was used for fracture reduction. majority of cases (75.86%) had 4 weeks of plaster immobilization. various wrist position like Dorsiflexion, Neutral, Palmarflexion were almost equally tried in the study. **Conclusion:** Among these positionsthe probable choice would depend on the stability of the fracture after reduction. The stable may be treated in dorsiflexion of wrist while the unstable one would be better stabilized in neutral position of the wrist.

Keywords: Various Methods of Immobilization, Acute fractures of lower end of Radius.

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INTRODUCTION

Fractures of the distal radius are common injuries in young and elderly patients and are associated with a significant incidence or morbidity. It has been estimated that they account for one sixth and all fractures seen in the accident and emergency department. In the era of civilization, the frequency of fractures of the lower end and radius seems to be increasing. The probable causes for increased frequency of fractures are rapidly increasing rate of road traffic accidents, growing industrialization and lazyfair attitude in the patients. The incidence of comminuted intraarticular fractures in younger patients is the resultant of high energy trauma whereas in the elderly patients the fracture occurs with the low energy. Many methods have been recommended for the treatment of the distal radius fracture which includes plaster cast immobilization, 'k' wire fixation, nails external fixators and so on. Ford and key[12] in 1955.Drew attention to the diversity or treatment when they stated. "There are as many methods of treatment as there are fracture surgeons". There is cloudiness in the particular type of fracture. there is plethora of the treatment without specifications hence the present study was undertaken at General Hospital, Sangli to try and find out which method of treatment will give better functional and cosmetic result and is best suited for General Hospital set up. Distal radius fractures are one of the most common injuries encountered in orthopedic practice. They make up 8%−15% of all bony injuries in adults.[10] Abraham Colles is credited with description of the most common fracture

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pattern affecting distal end radius in 1814, and is classically named after him.[11]The width of this angle influences the localization of the fracture. Pronation, supination and abduction determine the direction of the force and the compression of carpus and different appearances of ligamentary injuries.[12] The radius initially fails in tension on the volar aspect, with the fracture progressing dorsally where bending forces induce compressive stresses, resulting in dorsal comminution. Cancellous impaction of the metaphysis further compromises dorsal stability. Additional shearing forces influence the injury pattern, resulting in articular surface involvement.[13]

MATERIAL AND METHODS

For the present study 103 followed cases of colles' fractures were studied. Out of these 87 cases were treated by below elbow plaster cast in pronation with wrist in either of following positions. 1. Dorsiflexion, 2. Neutral, 3.Palmarflexion. These cases formed the man bulk of the study and were studied in detail. Remaining 16 cases were treated by various methods like above elbow plaster cast, external fixator and 'k' wire fixation. These cases were studied in short. The cases coming to general hospital, Sangli from March 1993 to December 1993 were collected for the O.P.D hours and some as an emergency in casualty. General condition of the patient was assessed and associated injuries were excluded. Detailed history of the patient was taken with emphasis on the time since injury, history or massage etc. x-rays of the injured wrist were taken. The clinical examination of the injured wrist was done. Oedema at the fracture site was compared with the normal side by measuring the circumference at the fracture site. X-rays of the normal wrists could not be done due to shortage of x-ray films at general hospital, Sangli. Most of the reductions were done under short general anesthesia though at times sedation with for twin and calmpose was used. GA has the advantage of muscle relaxation Reduction was done by the method of traction for few minutes to disimpact the fragments followed by manual pressure on the distal fragment so as to achieve alignment. The pre-reduction, post-reduction and last available follow up x-rays were studied in detail.

RESULT

Table 1: Distribution of the Patients as per the Various Methods of Treatment

Methods of treatment	No.
Above elbow cast	08
Percutaneous 'k'Wire fixation	04
External fixator	04
Total	**16**

The various methods used for treatment were Above elbow cast-8, Percutaneous 'k' Wire fixation -4, External fixator -4.

Table 2: Time interval between injury and treatment

Time	No. Of Cases
< 1 Day	44
2-7 Days	31
>8 Days	10
Total	**85**

51.76% patients approached for medical help within 24 hours of injury

Table 3: Anesthesia used for reduction of fracture

Anasthesia	No. of cases
General Anasthesia	65
Sedation	10
Local Anasthesia	10
Total	85

In 76.47% cases, GA was used for fracture reduction.

Table 4: Period of immobilization

Duration in weeks	No. of patients
3	09
4	64
5	06
6 and more	06
Total	**85**

From the table, it is evident that majority of cases (75.86%) had 4 weeks of plaster immobilization.

Table 5: position of wrist Patients were treated by below elbow cast with forearm in pronation and various wrist positions

Position of wrist	No. of cases
Dorsiflexion	30
Neutral	28
Palmarflexion	29
Total	**87**

The various wrist position were almost equally tried in the study.

DISCUSSION

He differentiated it from the wrist dislocation. However in 1814, a young Irish surgeon Abraham Colles[1]of Dublin published an article" on the fracture of the carpal extremity of the radius" in the Edinburgh medical and surgical journal. He reduced the fracture by traction and maintained the position with the help of malleable tin splints and narrow wooden splint. In the beginning of this century, wooden carr's splints were used to immobilize the fracture. In the year 1925, plaster immobilization was started for colles' fracture.Bohler[2] in 1929, was using traction followed by manual pressure on the distal fragment to obtain the reduction. Chinese finger traps were used to give traction and reduction was maintained in the plaster by incorporating kirchner wires or

pins.Hammond[4] in 1949, treated 25 cases with wires in the metacarpals and cast fixation. Rush L. v. and rush H.L.[5] used intramedullary nail in 1949 to achieve fracture fixation. Cassebaum[6] in 1950, used anterior and posterior or only posterior splints to treat colles' fracture. In the following year 1951, addison[1] used above elbow cast for certain ustable fractures. De palma[7] in 1952, described a method of ulnar pinning to fix the reduced distal radius to the intact ulna. Green and Gay[17] in 1956, advocated treatment of the colles' fracture with the help of sugar tong splint which restricted supination and pronation strain at the fracture site while elbow enjoying some degree of movements. In 1964, Hudson and rusnack[3] recommended primary resection of the lower end of ulna to achieve perfect reduction. In 1975, sarmiento[8] coined a totally new concept of fracture treatment. He devised a functional brace which permitted early volar flexion and ulnar deviation preventing dorsal flextion and radial deviation of the wrist. Forgon[9] in 1981, applied a mini external fixator fixing the distal radial fragment to the proximal fragment avoiding wrist immobilization. In the present series, period of immobilization of 75.86% patients was 4 weeks. Only patients with intra-particular extension of the colle's fractures were immobilized for more than 4 weeks either 5 or 6. Some of the patients changes of union were delayed. Even though literatures advises change of plaster cast after 7 or 10 days. This was not possible in this study which was conducted in general hospital, as it can put lot of strain on the hospital resources. Also patients it difficult to visit frequently for change of case. In some cases, patients developed post-reduction oedema due to tight plaster cast or continuous dependent position. To avoid this, all patients were given pillow cover elevation of the forearm and hand. This oedema formation must be avoided otherwise, if it remains for longer time, it results in fibrosis and stiff fingers. The small joints of the hands are particularly affected and the process becomes irreversible within few days resulting in the frozen hand which is a one of the major complication of fracture of the lower end of radius. In the present study, 3.44% patient developed post - operative oedema which needed splitting of the cast. The cast was split throughout its length and a cotton gauge bandage wrapped around it lightly. The elevation was continued for few days and later on the cast was re-enforced. As shown in the table all patients were treated with below elbow cast with forearm in pronation and wrist in either Dorsiflexion, neutral or palmarflexion. The cast was molded on ulnar side to give ulnar deviation.

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