



FUNCTIONAL OUTCOME OF CONSERVATIVE VERSUS OPERATIVE MANAGEMENT OF DISTAL RADIUS FRACTURES.

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ABSTRACT

Aim: To compare the functional outcome of extraarticular fracture of distal radius treated by conservative measures as compared to those that were operated at our hospital. **Methods:** We did a quasi-experimental study to look into the functional outcome of operative versus non operative management of distal radius fractures on a total of 185 patients during a time period of one year from January 2016-2017. **Results:** The patients who underwent operative procedure fared better at each follow up as compared to the non-operative group. Functional outcome was much better for the operated patients with early return to daily activities and getting a good range of movement in the wrist as compared to the contralateral wrist. Radiological parameters were significantly better in the operated group at successive follow up. **Conclusion:** This study showed that operatively managed displaced extra-articular distal radius fractures showed better functional results and better patient satisfaction than conservatively treated ones irrespective of age.

KEYWORDS : traumatic fractures, extra-articular distal radius, functional outcome

INTRODUCTION

Fractures of the lower end of the radius occur very frequently, more in the elderly female community. They are usually low velocity trauma occurring in adults of increased physiological age at the cortico-cancellous region of the bone thereby being extra-articular. These fractures may occur in any age group and may also be associated with multiple injuries in high velocity trauma. Even with an occurrence rate of 20 to 32 per 10000 persons-yr. (1, 2), there is still no optimal treatment protocol for these fractures. They can be treated operatively or non-operatively with good results. Both modalities have many literatures favouring each respectively. They all agree however that the treatment of choice with acceptably reduced distal radius fracture is by means of immobilization (3, 4). Fracture redisplacement was noted in more than 60% of the patients (6, 7) Abraham Colles described the dorsally displaced extra articular fracture (9). He stated that even an unreduced Colles' fracture would result in a pain free malunion with good movement range (8, 9). However recent studies show that pain and reduced movement resulted from malunion (10). Open reduction allows for early mobilization and therefore lead to improved functional recovery (11).

MATERIALS AND METHODS

This study was conducted at the Department of Orthopedics, Travancore Medical college, Kollam, from January 2016 to January 2017.

This is a quasi-experimental study to look into the functional outcome of operative versus non operative extra-articular distal radius fractures.

A total number of 567 patients presented to us in the Casualty or orthopaedic OPD with lower end of radius fracture. After excluding those which did not meet our inclusion criteria we had a total number of 185 patients.

Detailed clinical and radiological examination and assessment was done. All fractures were initially reduced under sedation or haematoma block and a dorsal below elbow splint applied. Patients then were sent for posteroanterior and lateral views of the wrist. Acceptable reductions on the views was delineated by the values of radial inclination of $> 15^\circ$, dorsal angulation $< 15^\circ$, volar

angulation $< 20^\circ$ and loss of radial height $< 5\text{mm}$ as compared to the contralateral wrist (3). Patients were given the option of conservative and operative treatment with their own consent. Patients opting for conservative treatment were continued in the dorsal slab for 5-7 days.

Follow up radiographs were taken and on finding no displacements converted to a circular cast for 4-8 weeks. If displacement was noted then patients were given the option of surgery or re-manipulations. 3 patients from the non-operative group opted for surgery following re-displacement at fracture site. For conservatively treated patients the pop cast remained on to a maximum 8 weeks depending on radiological and clinical signs of union. All patients whether operated or managed with Plaster Of Paris were followed up at 1, 3 and 6 weeks followed by 3, 6 and 12 months. 5 patients were lost in follow up. Each group was advised to exercise fingers by movement and squeezing an exercise ball from an early part of the treatment protocol.

Range of movement was measured with a hand held goniometer at 3, 6 and 12 months along with the grip strength using a dynamometer. Both range and grip were compared to the contralateral wrist. Follow up radiographs were taken and analysed. The DASH score and the VAS was used for analysis. Baseline characteristics were analysed with chi-square test. All analysis was performed with SPSS (2015)

Inclusion criteria::

1. Traumatic fractures
2. Skeletally mature adults more than 20 yrs.
3. Extra-articular closed fractures of distal radius
4. Displaced fractures
5. Un-acceptably reduced fractures.

Exclusion criteria:

1. Intra-articular fractures
2. Undisplaced extra-articular fracture

Observations and results

A total of 185 patients were treated for distal radius extraarticular fractures at our hospital either through Orthopedic OPD or emergency department. The mean age was 59 yrs. and 75% of them were females. Base line

characteristics were well balance for both the groups.

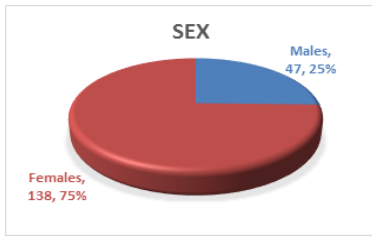


Fig 01 – Sex ratio

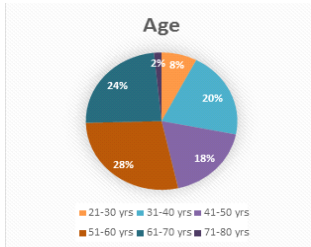


Fig 02 – Age distribution

Operative intervention was undertaken at a median time of 3 days depending upon condition of the limb and general status of the patient to undergo anaesthesia for the procedure. At all follow ups operated patients fared better. They even had a significantly better range of movement as early as three months post operative, by this time most had returned to acceptable level of activities of daily living.

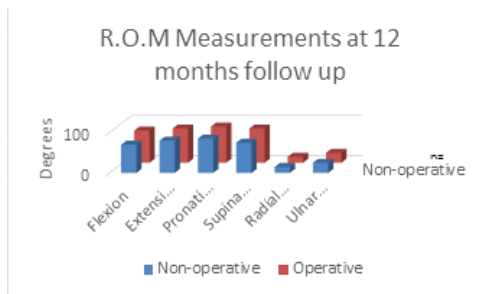


Fig 03- Range of movements (ROM) Measurements at 12 months follow up

At 12 month flexion, extension and supination was far better than the non-operative group. (p value = 0.001) Grip strength improved from 1 month onwards in the operative group and returned to almost pre injury status as per some patients. Overall grip strength was better than the non-operative group.

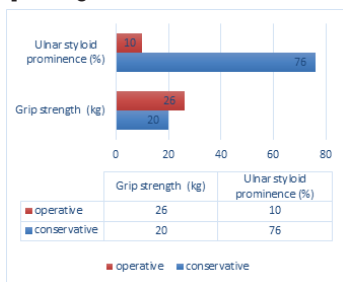


Fig 04-Grip strength and ulnar styloid prominence

Lower number of complications were noted with the operatively treated patients and their radiographic parameters were better with less collapse and shortening or malunion as compared to the non-operative group.

Table 01-Complications

	Conservative	Operative
Wound infection	1	13
Carpal Tunnel Syndrome	13	1

Plaster irritation	14	0
De Quervain tenosynovitis	12	0
EPL tendon rupture	0	2
Implant failure/screw breakage	0	2
Implant removal	0	2
Fracture re-displacement	12	0
Mal union	26	3
Non-union	3	1
Total no. of complications	81	24

Majority of the patients opted for conservative treatment either because of financial status or inability to undergo anaesthesia, either regional block or GA. Younger patients and those with fracture in their dominant wrist were easily convinced to undergo surgical intervention. Elderly patients especially females were reluctant to think about surgery as plaster immobilization was a cheaper modality of treatment. However it is this group which had more complaints of radial deviation of the hand with ulnar styloid prominence and restriction in wrist and hand function.

DISCUSSION

Over the last 2 decades, open reduction and internal fixation has been increasingly used (12). Although the exact reason for this increase is not known, it has been suggested that functional outcomes are positively related to adequate reduction, especially in younger patients (9, 13). Furthermore immobilization of more than 6 weeks lead to stiffness (11). Operative complications like hardware related tendon problems and wound infections to an extent may be avoidable with proper care and surgical techniques. These complications outweigh the high proportion of non-operative patients requiring secondary surgery or the worse functional outcome overall.

In previous studies Arora et al and Bartl et al compared ORIF with plaster immobilization (5, 14). Both showed significant functional improvement in the groups managed with open reduction and fixation at 3 and 6 month follow up. These are consistent with other previous retrospective studies (4, 15). Moreover we found better results at 12 months follow up also especially in younger patients. In 2009 Koenig et al. evaluated whether ORIF was preferable to non-operative treatment especially in young patients and reported a long-term gain in quality-adjusted life (16). These conclusions are consistent with the present study, in which we found better functional outcomes and significantly better quality of life in operated extra-articular distal radius fracture at 6 and 12 months follow up. Currently, the initial management with closed reduction and plaster immobilization is followed at our institute and this is evaluated with radiographic examinations. Surgical intervention is instituted if the fracture is unreduced or re-displaced. However the patients and relatives have the option to undergo primary ORIF if willing.

We found that younger patients and those who underwent ORIF had clinically relevant better functional outcomes than those who took the plaster immobilization route. Moreover at 12 months conservatively treated patients complained of stiffness in wrist and finger due to immobilization and hand deviation and ulnar styloid prominence due to radial length collapse in the long run. The cost of surgical intervention was a big hindrance in convincing patients to undergo surgery. Majority of the patients opted for conservative treatment. A few patient though willing could not undergo ORIF as they were anaesthetically unfit for the same. We think that an evaluation of the cost-effectiveness and cost-utility of operative versus non-operative should be conducted to study whether surgery is cost effective in the long term functional outcome of extra-articular distal radius fracture.

CONCLUSIONS

This study showed that operatively managed displaced extra-

articular distal radius fractures showed better functional results and better patient satisfaction than conservatively treated ones irrespective of age. However the thought of surgery and the cost to be incurred is still a deterrent in convincing the patient for operative procedure in the Indian scenario.

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