

Original Research Article

Short term outcome of radial head arthroplasty in Mason type 3 and 4 fractures

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ABSTRACT

Background: Radial head arthroplasty provides a suitable treatment in Mason type 3 and 4 fractures. Arthroplasty produces consistent results with a shorter learning curve than ORIF and prevents the late complications associated with radial head excision.

Methods: After seeking approval from local institutional ethical committee 30 patients with Mason type 3 and 4 radial head fractures were admitted from outpatient department (OPD) of SKIMS MC and Hospital Bemina, Srinagar. The study was conducted from February 2019 to June 2020 in department of Orthopaedics SKIMS MC and Hospital Bemina, Srinagar. 30 patients with mean age of 25 years comprising of 9 females and 21 males underwent radial head arthroplasty and were followed up to a minimum of 1 year post-operatively.

Results: Outcome was evaluated by assessing elbow functional performance using Mayo elbow performance (MEPI). No revisions were performed during the study. Two patients had implant backout and 6 patients had elbow stiffness.

Conclusions: Radial head arthroplasty can be used successfully with most of excellent results for treatment of comminuted radial head fracture (Mason type III and IV radial head fractures). Over all radial head arthroplasty is a demanding option in type 3 and type 4 fractures which are not amenable to reconstruction.

Keywords: Mason classification, Radial head arthroplasty, Mayo elbow performance

INTRODUCTION

Fractures of the radial head first were described in 1905 and were generally treated by immobilization.^{1,2} Radial head and neck fractures are estimated to account for 1.7% to 5.4% of all fractures seen today.

Depending on the fracture pattern and associated soft-tissue injury several types of treatment exist for fractured radial heads. Radial head arthroplasty provides a suitable treatment in Mason type 3 and 4 fractures.³ Arthroplasty produces consistent results with a shorter learning curve than ORIF and prevents the late complications associated with radial head excision.⁴

METHODS

This prospective interventional study was conducted in SKIMS medical college hospital, Bemina Srinagar from February 2019 to June 2020. 30 patients meeting the inclusion criteria were admitted to SKIMS MC hospital. All the patients were operated after pre-operative workup by the same surgeon via the same approach (Kocher approach) after getting approval from institutional ethical committee. The implant used was same in all patients. A modular radial head implant system was used. Postoperative management included intra-venous antibiotics. Patients with stable elbow were started with active flexion and extension exercises throughout a full arc of motion 3 days after surgery. Radiographs were taken in

immediate postoperative period, 6 month and 1 year follow up. 5 Follow up was done at 2 weeks, 3 months, 6 months and final follow up at 1 year. Elbow functional performance was assessed by Mayo Elbow performance (MEPI). 6.7

Inclusion criteria

Age- 20 years or more; all sexes; Morrey modified Mason’s type-III and type-IV; closed fractures, patients who can attend OPD for atleast 1 year.

Exclusion criteria

Age less than 20 years; Morrey modified Mason’s type-I and type-II; open fractures; pathological fractures; associated neurovascular injury; presence of any infection.

Statistical analysis

Data was entered on microsoft excel software and analysis was done with Statistical package for social sciences (SPSS) version 20.0 software.



Figure 1: Surgical landmarks.



Figure 2: Surgical scar.



Figure 3: Elbow extension.

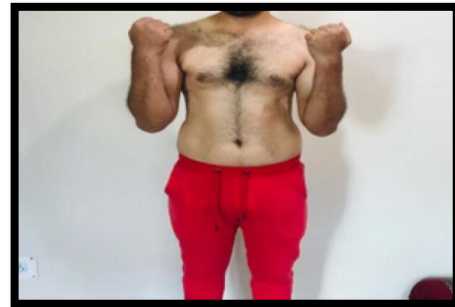


Figure 4: Elbow flexion.

RESULTS

The study patients were in the age group of 20 to 30 years with mean age of 25 years. 9 females and 21 males were studied. 13 patients had left elbow involvement and 17 patients had right elbow involvement. In our study, 80% of patients presented with type III fracture while the rest 20% with Mason type IV fracture. In our study, radial head fractures were associated with LCL injury in 20% patients, MCL injury in 7% cases and elbow dislocation in 30% of patients.



Figure 5: Pre-operating radiograph.

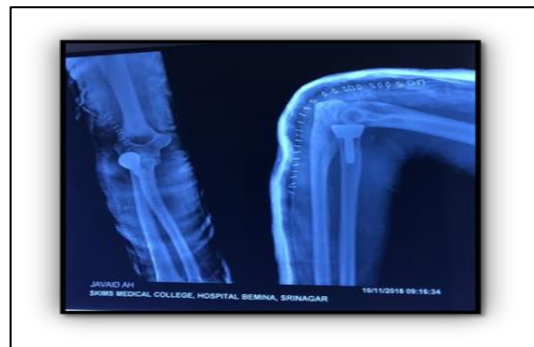


Figure 6: Post-operative radiograph.

Out of 30 patients, 73% patients at the end of follow up showed excellent outcomes. 20 % showed good results while the rest 7% showed poor functional outcomes.

In our study, 6 patients had elbow stiffness and 2 patients had implant backout.

Table 1: Results.

Parameters	Results
Mean age	25 years
Gender ratio	9:21 (females : males)
Side involvement	17:13 (right : left)

Table 2: Complications.

Complication	No. of patients	Percentage
Implant backout	2	7
Elbow stiffness	6	20
Not applicable	22	73
Total	30	100

Table 3: Associated injuries.

Associated injuries	No. of patients
LCL Injury	6
MCL Injury	2
Elbow Dislocation	9
No associated Injury	13

Table 4: Mayo elbow performance.

Results	No. of patients	Percentage
Excellent	22	73
Good	6	20
Fair	0	0
Poor	2	7
Total	30	100

DISCUSSION

In our study 60% patients were in the 20-30 age group. Male predominance was found in our study. 67% patients were males and the rest were females. Majority of patients (65%) had history of accidental fall. Right side involved in 70% of patients and left side involved in 30% of patients. The results of the study were compared with the studies of Morrey et al 1985, Judet et al 2005 and Choudhary et al 2019.⁸⁻¹¹

In our study, type III Mason fracture was found in 80% of patients while 20% had type IV Mason radial head fracture. The results were compared with the studies of Ikeda et al 2003, Dotzis et al 2006 and Businger et al 2010.¹²⁻¹⁴

At the end of this study, 73% patients at the end of 6 month follow up showed excellent outcomes. 20% showed good results while the rest 7% showed poor functional outcomes. These results were comparable with few other studies conducted by Goldberg et al 1986, Fuchs et al 1999, Iftimie et al 2011 and Yalcinkaya et al 2013.¹⁵⁻¹⁸

Prolonged immobilization of elbow is attributable to elbow stiffness as mentioned by King et al and early mobilization had been advised to prevent this complication.¹⁹⁻²¹ Likewise we started early mobilization of the patients from POD 7 onwards, 15 patients had stiffness. None of the studied patients had any evidence of heterotopic ossification at final follow-up.

CONCLUSION

The prosthetic replacement of non reconstructable radial head fracture provides the platform for effective longterm function of the affected limb. Radial head arthroplasty can be used successfully with most of excellent results for treatment of Comminuted radial head fracture (The Modified Mason classification type III and IV radial head fractures). Over all radial head arthroplasty is a demanding option in type 3 and type 4 fractures which are not amenable to reconstruction.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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