

**Original Article****Fracture Radial Head Excision in Adult with More Than 2mm Displacement**

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**Abstract**

**Background:** Fracture radial head is less common in adult but more in children. Radial head are more common 3% all fractures and 33% of all adult fractures with associated intra-articular fracture which leads to joint stiffness, movement restriction and mechanical block of elbow joint movement and soft tissue injury.

**Purpose:** To describe the treatment modalities and complications in fracture radial head excision.

**Materials & methods:** The Study was made based over 26 patients in the time period of May 2018-May 2022, 4-year period at Jahurul Islam Medical College Hospital.

**Keywords:** Radial head fracture, Fracture, Nonunion, Surgical approaches, Operative management

**Introduction**

Fracture radial head is less common in adult but more in children. Radial head are more common 3% all fractures and 33% of all adult fractures with associated intra-articular fracture which leads to joint stiffness, movement restriction and mechanical block of elbow joint movement and soft tissue injury.<sup>1,2</sup> Diagnosis made up by the plain radiography and MRI. Treatment may be nonoperative for non-displaced fractures without a mechanical block to motion but operative management is indicated for displaced fractures, or fractures associated with mechanical block to motion or elbow/forearm instability.

**Material and Methods**

The Study was made based over 26 patients in the time period of May 2018-May 2022, 4-year period at Jahurul Islam Medical College Hospital.

**Selection Criteria:** We selected trials based on following inclusion criteria: 1) randomized controlled trials; 2) a target population of adults over 35 years of age with radial head fracture. 3) trials only the surgical procedures, with excision of the radial head and removal of the intra articular part.

Excluded from the Study 1) non-randomised controlled trials; 2) Excluded the linear fracture or non-displaced (<2mm) fractures without a mechanical block to

motion.<sup>3</sup> Retrospective case series with long follow up have reported high levels of satisfaction.<sup>4</sup> Comminuted and displaced with mechanical block 4) Radial head fracture associated with other injuries.

**Study Selection & data extraction:**

Radial head fracture is more common in children than adults. And very common fractures in adults makes up

the 1-4% of the all fractures.<sup>5,6</sup> Makes up about 35-45% of all the elbow fractures. Occurs about 85% in between age 30-60 years, mean age about 45 years. According to the Mason Classification criteria we choose the Type II & III, Displaced>2mm or angulated, possible mechanical block to rotation cases.<sup>7</sup> Study class has 26 cases in this criteria. Among them male 17 (73.07%) and female 9 (34.61%) in number.

MANOS CLASSIFICATION	
TYPE- I	Undisplaced fracture, Marginal fracture Intra-articular fracture <2mm
TYPE- II	Displaced fracture with segmental Intra articular displacement >2mm
TYPE- III	Comminuted fracture
TYPE- IV	Fracture associated with posterior dislocation

With the OTA Classification,<sup>4</sup> the case study are made to choose some criteria of Extra-articular pattern 7(26.92%), 5 male 2 female; Partial articular pattern 6 (23.07%) 4 male 2 female ; Complete articular pattern 13(50%), 8 male 5 female are choose for the operative procedure.

**Surgical Management**

**Decision Making:**

In case of Mason Type II & III the plane of operative procedure can be choose screws only or plate screws sometimes. The outcome in type II >90% good - excellent but variable outcomes in type Mason III fracture. >50% cases has the unsatisfactory outcomes.



Fig (a)



Fig: (b)

Fig: Fracture radial head with displacement more than 2 mm. Comminuted fracture(a). Excision of head of radius Fig(b).

## Opérative management

In this case the decision are made for the excision of the head with following criteria: 1) Older patient 2) fragment more than 25% of the surface area. 3) Low demand, sedentary patient 4) in delayed setting continued pain of an isolated radial head fracture. 5) Non Union

Approaches to the radial head is Kocher approaches and Kaplan approach , the most reliable approaches we perform is Kocher approach, less risk of PIN injury, PIN crosses the proximal radius from anterior to posterior within the supinator muscles 4 cm distal to the radial head.<sup>8</sup> Surgical exposure is typically achieved through either the Kocher interval between anconeus and extensor carpi ulnaris<sup>9</sup> or the Kaplan interval between the extensor carpi radialis longus and extensor digitorumcommunis.<sup>10</sup> The mean distance from radiocapitellar joint to the PIN ranges from 40 to 48mm and is dependent on arm position. Maintaining the forearm in pronation will move the nerve away from the surgical field and reduce risk of injury.<sup>11</sup>

In this approach the forearm should be pronated to protect PIN. Capsular incision is made short as much as we can so that it may not cause the risk of destabilizing elbow. Excision of the head above the radial tuberosity, in the neck.

### Technique:

Remove enough head to fully remove comminuted aspects of radial head, attempt to keep annular ligament intact. Excision of the radial head in older patient with an excellent outcome according to the Mayo Elbow Performance Score.<sup>12</sup>

## Results

Most common complication are muscle weakness (0%), wrist pain in 2 male (7.69%), valgus elbow instability (0%), heterotopic ossification in 1 female (3.84%), elbow arthritis in 1 male (3.84%); proximal radial migration (0%) ; decreased strength 2 male 1 female (11.53%) ,cubitus values (0%) and no complication (73.07 %) in male and female.

### Non-Union:

Most common complication of the Radial head fractures if not treated is nonunion seen during the study, non-union observed 4 cases over 8 weeks observation.

### PIN injury:

No pin injuries occurs in all of the cases done

Ligaments injury or destabilizing of elbow:

No associated ligament injuries occurs in all of the cases done which may causes the destabilizing of elbow specially the cons (capsular ligaments) and LUCL.

## Discussion

Radial head fracture is very common fractures in adults makes up the 1-4% of the all fractures makes up about 35-45% of all the elbow fractures<sup>5,6</sup>. Occurs about 85% in between age 30-60 years, mean age about 45 years. management of the radial head fracture has a versatile option, among them the rigid fixation of plate screw to excision of the head, has the good outcome depend upon the patient factors are receiving greater consideration and leading to doctor-patient discussions weighing the benefits of early full motion, rapid return to therapy and work, and pain control versus the risks of iatrogenic PIN injury, stiffness of the joint and the arthritis. In case of Mason Type II & III the plane of operative procedure can be choose screws only or plate screws sometimes. The outcome in type II >90% good - excellent but variable outcomes in type Mason III fracture. >50% cases has the unsatisfactory outcomes<sup>2</sup>.

Approaches to the radial head is Kocher approaches and Kaplan approach , the most reliable approaches we perform is Kocher approach, less risk of PIN injury<sup>8</sup>. Most common complication are muscle weakness (0%),wrist pain in 2 male (7.69%), valgus elbow instability (0%), heterotopic ossification in 1 female (3.84%), elbow arthritis in 1 male (3.84%); proximal radial migration (0%) ; decreased strength 2 male 1 female (11.53%), cubitus values (0%) and no complication (73.07 %) in male and female. Most common complication of the Radial head fractures if

not treated is nonunion seen during the study, non-union observed 4 cases over 8 weeks observation. No pin injuries occurs in all of the cases done. No associated ligament injuries occurs in all of the cases done which may causes the destabilizing of elbow specially the cons (capsular ligaments) and LUCL.

### Conclusion

In conclusion of the study, management of the radial head fracture has a versatile option, among them the rigid fixation of plate screw to excision of the head, has the good outcome depend upon the patient factors are receiving greater consideration and leading to doctor-patient discussions weighing the benefits of early full motion, rapid return to therapy and work, and pain control versus the risks of iatrogenic PIN injury, stiffness of the joint and the arthritis. But in the circumstances of Bangladesh the large under economy privilege, excision is the best choice patient on demand .the outcome is excellent with some minor degree of complication mention earlier.

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