

Case Report

Management and outcome of a variant of posadas fracture in an adolescent patient: A case report

Deepak Kumar, Praveen Sodavarapu*, Deepak Neradi, Sharad Prabhakar

Department of Orthopaedics, Post Graduate Institute of Medical Education and Research, Sector 12, Chandigarh 160012, India

ARTICLE INFO

Keywords:

Posadas
Fracture
Humerus
Elbow
Adolescent
Plating

ABSTRACT

Fractures of the distal humerus in younger age group commonly involve the supracondylar extra articular area and do not have any associated dislocation. We present a rare variant of transcondylar fracture dislocation (posadas fracture) with articular extension and ipsilateral forearm fracture in an adolescent. A 16 year old male fell down while cycling and was brought to the trauma centre after 4 h. Anatomical reduction of articular fragments was achieved and stabilised with bicolumnar plating. Medial and lateral ulnar collateral ligaments were repaired and anterior capsule was reattached for stability after reduction of elbow. Forearm fractures were reduced and internally fixed with limited contact dynamic compression plating. ROM (range of motion) brace was applied with 30 degree extension block and active ROM exercises were advised for 4 weeks, followed by active assisted exercises for next 6 weeks under the supervision of a therapist. Patient was serially followed up for up to 1 year and after one year, the patient was pain free with ROM of 0 degree to 120 degree flexion and has resumed his previous activity levels. Displacement of transcondylar fragment due to pull of extensor and flexor muscles and articular involvement necessitates open reduction and adequate stabilization of both columns especially in older children and adolescents. Concurrent collateral ligament repair is essential in order to restore elbow stability and earlier commencement of ROM. Early restoration of joint anatomy can lead to good functional outcome.

Introduction

Fractures of the distal humerus in younger age group commonly involve the supracondylar extra-articular area [1]. They are commonly of extension type and dislocations rarely coexist. Here we report a rare variant of transcondylar fracture dislocation (posadas fracture) with articular extension and ipsilateral forearm fracture in an adolescent patient treated with open reduction and internal fixation and primary repair of the collateral ligaments resulting in excellent result.

Case report

A 16 year old male fell down while cycling and was brought to the trauma centre after 4 h with closed injury to his left upper limb. On clinical examination, there was abnormal mobility and crepitus in his left forearm and elbow appeared dislocated. Radial pulse was palpable and there was no neurological deficit. Radiographs showed a transcondylar fracture dislocation (posadas fracture) with fracture line extending into the articular surface of lateral condyle and associated radius fracture and segmental ulna fracture (Figs. 1-

* Corresponding author.

E-mail address: praveen.omc.2k8@gmail.com (P. Sodavarapu).



Fig. 1. Preoperative anteroposterior radiograph of elbow showing transcondylar fracture dislocation of elbow with associated forearm fracture.

2). Patient was taken to operating room and the fracture site was exposed through posterior triceps elevating approach. Anatomical reduction of articular fragments was achieved and stabilised with bicolunar plating. Elbow was grossly unstable with avulsion of both medial and lateral collateral ligaments from the humeral side and avulsion of anterior capsule from the coronoid. Both medial and lateral collateral ligaments were repaired with transosseous suturing technique and anterior capsule was reattached with the help of lasso sutures. No.2 non absorbable sutures were used for the repair of both collateral ligaments and anterior capsule. After the repair of ligaments and capsule, elbow was stable and wound was closed in layers. Posterior splint was given with elbow in 90 degree of flexion and mid prone position. After subsidence of swelling, the forearm fractures were reduced and internally fixed with limited contact dynamic compression plating (Figs. 3-4). Postoperative period was uneventful and patient was discharged after one week. Posterior splint was removed after one week and ROM brace was applied with 30 degree extension block. Patient was encouraged to do active ROM exercises for 4 weeks, followed by active assisted exercises for next 6 weeks under the supervision of a therapist. Patient was serially followed up for upto 1 year and after 1 year, the patient was pain free with ROM of 0 degree to 120 degree flexion and has resumed his previous activity levels (Figs. 5-8).

Discussion & conclusion

Traumatic fracture dislocations of elbow are less common in paediatric population with incidence of 3 to 6% of all elbow injuries in children [1]. Transcondylar fracture dislocation of elbow is an even rarer entity with only two reports in orthopaedic literature mentioning this injury, apart from the original description [2-4]. This type of fracture passes through both medial and lateral condyles with the distal segment present as a single unit, associated with dislocation of both radius and ulna from the transcondylar segment, which is noteworthy [4]. Originally, Chutro described this pattern of injury in his publication, with due credit given to Posadas for the description, hence the name of the fracture [4]. He detailed six children who were treated with closed reduction and immobilisation in extension. Grantham et al. reported this type of case where the patient had an open injury which required debridement and hence open reduction and kirschner wire fixation was done [2]. Sameer et al. reported this type of fracture which was associated with vascular injury, which required brachial artery exploration and open reduction and fixation with Kirschner wires [3].

Elbow dislocations can be associated with fractures in case of open physis and collateral ligament is likely to occur when the



Fig. 2. Preoperative lateral radiograph of elbow showing transcondylar fracture dislocation with associated forearm fracture.



Fig. 3. Immediate postoperative anteroposterior radiographs with bicolumnar plating of distal humerus and compression plating of forearm fractures.

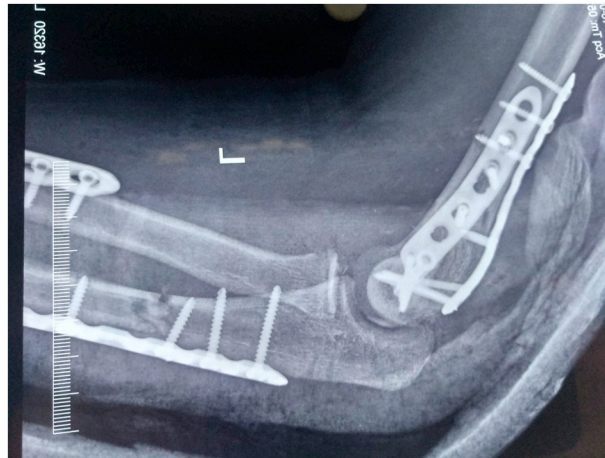


Fig. 4. Immediate postoperative lateral radiograph of elbow.



Fig. 5. 1 year postoperative anteroposterior radiograph of elbow.

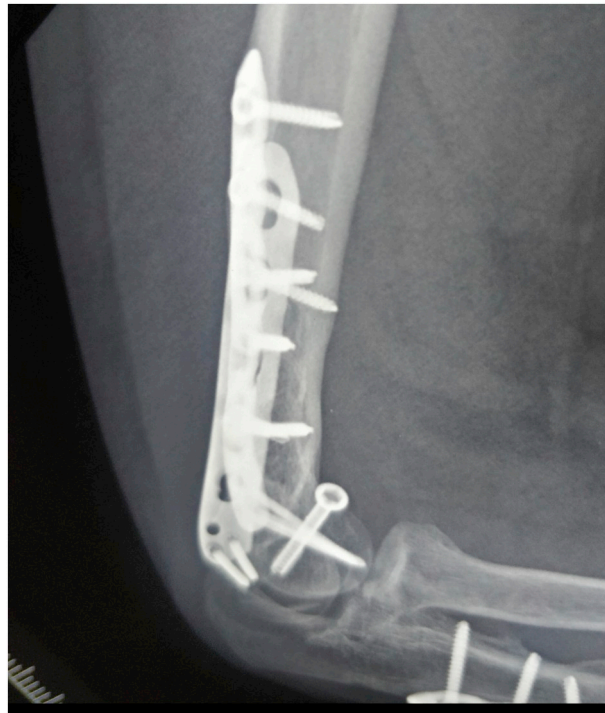


Fig. 6. 1 year postoperative lateral radiograph of elbow.



Fig. 7. Clinical photo showing extension of elbow comparable to normal limb.

physis is closed, as in our current case [1,5]. Atypical articular extension of fracture through lateral condyle and associated radius and segmental ulnar fractures makes it a variant of Posadas fracture which required urgent open reduction with restoration of articular congruity of distal humerus and repair of both medial and lateral ulnar collateral ligaments in order to re-establish the normal elbow biomechanics. As the patient required urgent fixation, CT scan could not be performed.

As this type of complex injury pattern is of rare occurrence, there is paucity of literature regarding their management. The treating surgeon has to be vigilant and proper preoperative planning and execution of plan is a prerequisite for better functional outcome. Displacement of transcondylar fragment due to pull of extensor and flexor muscles and articular involvement necessitates open reduction and adequate stabilization of both columns especially in older children and adolescents. Concurrent collateral ligament repair is essential in order to restore elbow stability and earlier commencement of ROM.

To conclude, this type of injury is rare but can occur and early restoration of joint anatomy can lead to good functional outcome.



Fig. 8. Clinical photo showing flexion of elbow upto 120 degrees.

Declaration of competing interest

None.

Acknowledgements

None.

Patient consent

Obtained.

References

- [1] K.E. Wilkins, Fractures and dislocations of the elbow region, in: C.A. Rockwood, K.E. Wilkins, R.E. King (Eds.), *Fractures in Children*, 4th ed., Lipponcott-Raven, Philadelphia, 1996, pp. 653–887.
- [2] S.A. Grantham, R. Tietjen, Transcondylar fracture-dislocation of the elbow. A case report, *J. Bone Joint Surg. Am.* 58 (7) (1976) 1030–1031 Oct.
- [3] M.M. Sameer, K.C. Bassetty, V. Singaravadelu, Transcondylar fracture dislocation of the elbow: a case report, *JBJS Case Connector* 6 (3) (2016) e61.
- [4] P. Chutro, *Fractures of the Lower Extremity of the Humerus in Children*, J. Peuser, Buenos Aires, 1904.
- [5] L. Von Laer, *Pediatric Fractures and Dislocations*, Thieme, Stuttgart, Germany, 2004, p. 528.