High T intercondylar fracture of the distal humerus in a 5 year old child: Case report

Mohammed Saif Niyazi, Goutham Doddanna Veeranna and Anand Mishra

DOI: https://doi.org/10.22271/ortho.2019.v5.i2.c.21

Abstract

Introduction: Intercondylar fracture of distal humerus is a rare paediatric orthopaedic entity. Only 55 cases of such fracture pattern have been reported. The aim is to add data to the scarce pre-existing literature and to discuss management guidelines.

Case summary: We hereby present a case report of a 5 year old child who sustained a road traffic accident, injuring his right elbow. The X-ray revealed intercondylar fracture of distal humerus (High T type) with comminution of the olecranon fossa, the fractured medial and the lateral columns were rotated. Open reduction and internal fixation was performed using posterior approach. The medial and the lateral columns were reduced to the shaft and fixed with K-wires. The condyles were then fixed to each other using a transversely placed threaded K-wire. Above elbow slab was given to the patient for 4 weeks. The slab was then removed and elbow range of motion exercise started.

Results: After one year of follow up, the Range of motion of elbow was 10 degrees to 130 degrees and no deficit in supination or pronation as compared to the contralateral side.

Conclusion: Intercondylar fracture humerus is a rare injury in children. Proper radiograph including oblique views should be taken to prevent misdiagnosis. These fractured are to be managed by open reduction and internal fixation using K-wires for better results.

Keywords: Child, Distal Humerus, intercondylar fracture

Introduction

Intercondylar fracture of distal humerus is a rare paediatric orthopaedic entity [1-15]. This injury usually affects the adolescent or older children and constitutes only 2% of all the elbow injuries in paediatric age group [6]. Only 55 cases of such fracture pattern have been reported [16]. Owing to the scarcity of the literature on such a rare fracture type in children, a well established management guideline is yet to laid down. After the review of existing literature it is found that such fracture type are to be openly reduced and fixed internally. Conservative management of displaced fracture have lead to malunion, growth arrest, necrosis, stiffness of elbow [1].

We hereby present a case report of a 5 year old child who sustained intercondylar of distal fracture humerus, high T type. The purpose is to add data to the scarce pre-existing literature and to discuss management guidelines.

Case presentation

A 5 year old boy sustained a road traffic accident, injuring his right elbow. He was brought to our centre two days later with complaint of swelling, pain, abrasion and deformity of right elbow. On examination the patient had blisters over the lateral aspect of elbow. There was no neurovascular deficit. The limb was splinted and elevated. Analgesics and antibiotics were given for 5 days. The X-ray revealed intercondylar fracture of distal humerus with comminution of the olecranon fossa, the fractured medial and the lateral columns were rotated.

Correspondence

Mohammed Saif Niyazi
Senior Resident Doctor,
Department of Orthopaedics
Post Graduate Institute of Medical Education & Research and Dr.Ram Manohar Lohia Hospital (PGIMER & Dr.RML Hospital) New Delhi, India
Intercondylar fracture is an uncommon injury in skeletally immature children. It is caused by heavy impact to the elbow flexed to an angle more than 90 degrees. As a result the wedge shaped olecranon is forced against the condyles of distal humerus, prying them apart and this gives the vertical and horizontal fracture lines [12, 13]. This flexion mechanism of injury add to the rarity of intercondylar humerus fracture in paediatric age group as elbow injury in children is commonly hyperextension type.

Beghin et al. [16] suggested that such injuries might be missed because the distal humerus is not ossified in skeletally immature children. Moulton and Carmichael [17] suggests an oblique radiograph for better visualization of such injury. Regarding the surgical approach, Tomori et al. [18] in their review of literature found out that of the of the 37 cases operated, posterior approach was used in 32 cases. It has the advantage of better visualization of intraarticular extension of fracture line and bone fragment, and also aids in achieving adequate reduction. The disadvantage of this approach is restricted elbow extension [3], elbow contracture [18], aseptic necrosis of capitellum and lateral aspect of trochlea due to possible vascular damage [19] and growth disturbance of distal humerus. The fixation is done using K-wires, however Kanellopoulos et al. and Karmani et al. [2] used titanium nails and partially threaded screws.

Discussion
Intercondylar fracture is an uncommon injury in skeletally immature children. It is caused by heavy impact to the elbow flexed to an angle more than 90 degrees. As a result the wedge shaped olecranon is forced against the condyles of distal humerus, prying them apart and this gives the vertical and horizontal fracture lines [12, 13]. This flexion mechanism of injury add to the rarity of intercondylar humerus fracture in paediatric age group as elbow injury in children is commonly hyperextension type.

Or the surgical approach, Tomori et al. [18] in their review of literature found out that of the of the 37 cases operated, posterior approach was used in 32 cases. It has the advantage of better visualization of intraarticular extension of fracture line and bone fragment, and also aids in achieving adequate reduction. The disadvantage of this approach is restricted elbow extension [3], elbow contracture [18], aseptic necrosis of capitellum and lateral aspect of trochlea due to possible vascular damage [19] and growth disturbance of distal humerus. The fixation is done using K-wires, however Kanellopoulos et al. and Karmani et al. [2] used titanium nails and partially threaded screws.

Conclusion
Intercondylar fracture humerus is a rare injury in children. Proper radiograph including oblique views should be taken to prevent misdiagnosis. These fractured are to be managed by open reduction and internal fixation using K-wires for better results. However a significant amount of data and long term follow up is still needed to evaluate the efficacy of ORIF using posterior approach and clinical outcome of such injuries.

References
1. Beaty JH, Kasser JR, Beaty JH, Kasser JR. The elbow physeal fractures, apophyseal injuries of the distal humerus, avascular necrosis of the trochlea, and T-condylar fractures. Rockwood & Wilkins Fractures in Children Lippincott Williams & Wilkins, Philadelphia, 2001, 623-703.
2. Evans EM. Supracondylar-Y fractures of the humerus. J Bone Joint Surg Br. 1953; 35:381-5.
3. Beghin JL, Bucholz RW, Wenger DR. Intercondylar fractures of the humerus in young children. J Bone Joint Surg Am. 1982; 64:1083-6.
4. Javis JG, D’Astous JL. The pediatric T-supracondylar fracture. J Pediatr Orthop. 1984; 4:697-9.
5. Papavasiliou VA, Beslikas TA. T-condylar fractures of the distal humeral condyles during childhood: an analysis of six cases. J PediatrOrthop. 1986; 6:302-5.
6. Maylahn DJ, Fahey JJ. Fractures of the elbow in children. JAMA. 1958; 166:220-8.
7. Kasser JR, Richards K, Millis M. The triceps-dividing approach to open reduction of complex distal humeral fractures in adolescents. J Pediatr Orthop. 1990; 10:93-6.
8. Sanders RA, Raney EM, Pipkin S. Operative treatment of bicondylar intraarticular fractures of the distal humerus. Orthop. 1992; 15:159-63.
9. Re PR, Waters PM, Hresko T. T-condylar fractures of the distal humerus in children and adolescents. J Pediatr Orthop. 1999; 19:313-8.
10. Ruiz AL, Kealey WDC, Cowie HG. Percutaneous pin fixation of intercondylar fractures in young children. J Pediatr Orthop. 2001; 10: 211-3.
11. Osada D, Tamai K, Saotome K. T-condylar fracture of the distal humerus in a three-year-old child. Hand Surg. 2005; 10:125-9.
12. Kanellopoulos AD, Yiannakopoulos CK. Closed reduction and percutaneous stabilization of pediatric T-condylar fractures of the humerus. J Pediatr Orthop. 2004; 24:13-6.
13. Abraham E, Gordon A, Abdul-Hadi O. Management of supracondylar fractures of humerus with condylar involvement in children. J Pediatr Orthop. 2005; 25:709-16.
14. Sharma H, Wilson N. T-condylar distal humeral fracture associated with irreducible anterior radial head dislocation in an 11-year-old child. A case report. J Trauma. 2007; 63:202-4.
15. Kantharajanna SB, Goni V, Sudesh P et al. T-condylar fracture delayed for 10 days in a 5-year-old boy: a case report and review of the literature. Chin J Traumatol. 2013; 16:58-6.
16. Yuji Tomori, Yoshihiro Sudo, Norishige Iizawa, Mitsuhiko Nanno, Shinro Takai. Intercondylar fracture of the distal humerus in a 7-year-old child: a case report and a review of the literature.
17. Moulton DL, Carmichael KD. Combined medial and lateral condyle fracture elbow in a 3 year old boy. Am J Orthop (Belle Mead NJ). 2010; 39(4):E33-5.
18. Gruber MA, Hudson OC. Supracondylar fracture of the humerus in children. End-result study of open reduction. J Bone Joint Surg Am. 1964; 46:1245-52.
19. Yamaguchi K, Sweet FA, Bindra R et al. The extraosseous and intraosseous arterial anatomy of the adult elbow. J Bone Joint Surg Am. 1997; 79:1653-62.