International Journal of
Recent Innovations in Medicine and Clinical Research
Open Access, Peer Reviewed, Abstracted and Indexed Journal

ISSN: 2582-1075
https://ijrimcr.com/
Volume-4, Issue-4, 2022: 39-43

Case Report

Neglected Fracture Lateral Condyle of Humerus Surgical Treatment and the Result: A Case Report after 18 Months Follow Up

Respati Suryanto Dradjat[1*], Panji Sananta[2], Ade Yahya Nasution[3], Galuh Ayu Ratna Savitri[4]

[1,2,3&4]Orthopaedic and Traumatology Department, Faculty of Medicine, Universitas Brawijaya–Dr. Saiful Anwar General Hospital, Malang, East Java
*Corresponding Author Email: respatisdradjat@ub.ac.id

Received: September 21, 2022 **Accepted:** October 23, 2022 **Published:** November 05, 2022

Abstract: Introduction: Neglected humeral lateral condylar fracture in children is a surgical dilemma and debatable. Displaced lateral condyle humeral fractures are usually treated surgically to avoid nonunion, malunion, growth abnormalities, and eventual arthritis. In children, the late appearance of humeral lateral condylar fracture presents a surgical problem. Lateral condylar fractures account for between 10% and 20% of fractures involving the elbow in children. Those displaced by >2 mm are generally thought to require operative treatment. There is currently no agreement about the ideal treatment method of undisplaced fractures concerning open or closed reduction, the use of Kirschner wires (K-wires), or fixation with a screw. **Presentation of Case:** A 6-year-old boy with a neglected fracture lateral condyle of humerus experienced pain and swelling in his right elbow after a fall when playing. He referred to our hospital and got elbow reconstruction, showed an excellent recovery on eighteen months follow-up. **Discussion:** Neglected fracture lateral condyle of humerus after fixation with good functional elbow motion, measurement of Baumann's angle and carrying angle, then with mild varus, but whether it significantly correlated or not, it still could not be concluded. A quick diagnosis with prompt treatment makes a better outcome. Displaced fractures of the lateral condyle of the humerus are frequently managed surgically to avoid nonunion, malunion, disturbances of growth, and later arthritis. **Conclusion:** There is a better outcome after elbow reconstruction in late presenting the lateral condyle of humerus fracture. Meanwhile, additional issues are strongly associated or not require further investigation.
Keywords: Late presentation, lateral condyle humerus, malunion.

Introduction

Malunion is a bone that unites in an abnormal position or alignment.[1] The management of late presented displaced lateral condyle fractures of the humerus in children is debatable; many advocates for conservative management due to concerns about complications such as avascular necrosis, but recently, many have advocated for operative management with favorable results; thus, we studied the outcome of operative management in late presented displaced lateral condyle fractures of the humerus in children.[2] Displaced lateral condyle fractures of humerus are frequently handled surgically to minimize nonunion, malunion, growth abnormalities, and later arthritis. Lateral condylar fractures account for between 10% and 20% of elbow fractures in kids. Those who are displaced by more than 2 mm are generally considered to require surgical treatment. There is no consensus regarding the optimal approach to treating undisplaced fractures, whether open or closed reduction, Kirschner wires (K-wires), or screw fixation. Numerous outcome metrics, including the radiographic carrying angle, Baumann's angle, and clinical outcome, have been employed to evaluate the outcome of fixation.[3] In children, the likelihood of developing valgus deformity increases with

age. It is believed that osteosynthesis should be undertaken early to avoid deformation and allow the condyle to participate in lower humeral growth. Late presentation of humeral lateral condylar fracture in kids presents a surgical difficulty.[4] Following surgery, malunion, cubitus varus, avascular necrosis, and post-operative infection are recognized consequences.[5]

Presentation of Case

A 6-year-old male arrived at the polyclinic room on 12 Agustus 2019 with a chief complaint of limited motion with elbow flexion in his right elbow. The patient was felt onto an outstretched hand with the forearm supinate and the elbow extended when played one month ago and compliant pain and swelling on the right elbow. A bonesetter treated the patient upon arrival at the polyclinic room with normal vital signs. There was limited motion at the right elbow with flexion and cubitus valgus deformity (Figure 1). The examination showed limited range of motion (ROM) flexion at $0\text{-}10^0$, supination, and pronation at the 0^0. The patient had a relatively normal laboratory result preoperatively. From the X-ray elbow, Baumann's angle was measured at 79^0 and carrying angle at $17{,}8^0$. From the CT scan, elbow expertise was nonunion displace fracture condyles lateral humerus with involved intraarticular and subluxation of the ulna-humeral joint.

Figure 1. Clinical pictures showed a limited range of motion on the right elbow (a) X-ray elbow AP and Lateral showed fracture line in the distal humerus (b) CT Scan elbow showed nonunion displaced fracture condyles lateral os humerus (c).

We diagnosed the patient with a neglected fracture lateral condyle of the right humerus. Elbow reconstruction was performed with K-wire insertion and suture wire after five months (Figure 2), with difficulty restoring rotational anatomy and removing callus when operating, and measurement

Baumann's angle 80^0 and carrying angle $16,5^0$. Evaluation after surgery with ROM exercise continuously until six months and was released the K-wire and suture wire after six months. Measurement Baumann's angle 81^0 and carrying angle $16,2^0$. The patient's outcome is good with can move the elbow motion in the 10^0-90^0 (Figure 3) and supination and pronation in the 70^0 with eighteen months increasingly follow up (Figure 4).

Figure 2. X-ray elbow AP & Lateral post elbow reconstruction.

Figure 3. Picture shows the patient can get flexion and extension of an elbow in a limited range of motion.

Figure 4. Picture shows the patient can get supination and of an elbow in a limited range of motion.

Discussion

Malunion is a bone that unites in an abnormal position or alignment.[1] Displaced lateral condyle fractures are frequently handled surgically to minimize nonunion, malunion, growth abnormalities, and later arthritis. Operative fixation of displaced lateral condylar fractures is a widely established treatment method because it significantly minimizes the risk of delayed or nonunion, malunion, disrupted growth, and avascular necrosis.[3] Surgical management options include closed reduction with fixation or ORIF. Because the primary goal of surgical treatment is to restore the articular surface anatomically, the approach chosen should ideally minimize the scope of surgery while maintaining adequate fracture reduction.[6]

Ganeshalingam et al. stated that a retrospective investigation found that the commonly used K-wire and screw fixation procedures had comparable outcomes and rates of serious problems. Only three of these patients developed issues, two of whom had prolonged restriction of movement and one of whom had malunion. Wires or screws crossing the ossific nucleus were not related to difficulties in the near term.[3] Li and Xu observed cubitus valgus in four individuals who retained their screws. Three of these screws penetrated through the capitellar ossific nucleus. They concluded that screw fixation across the physis should be avoided unless additional research is undertaken, and we concur.[7]

In children, the likelihood of developing valgus deformity increases with age. It is believed that osteosynthesis should be undertaken early to avoid deformation and allow the condyle to participate in lower humeral growth. Late presentation of humeral lateral condylar fracture in kids presents a surgical difficulty. Agarwal et al. described their practice of internally repairing these injuries in consenting patients due to the risk of future valgus deformities and neurological symptoms in children. An earlier fixation is desired because it allows the physis to participate in the distal humerus's development process. Pain and stiffness are frequently linked with delayed presentation, cubitus valgus, tardy ulnar nerve palsy, and instability.[4]

Agarwal et al. stated that they prefer to do surgical treatments utilizing the traditional Kocher incision. In cases where the condylar fragment was high riding, the Bryan and Morrey[8] extensile technique to the elbow was adopted. We prefer to fix fracture fragments with 2-3 Kirschner wires. Numerous Kirschner wires provide a stable fixing method since they can be run through the physis in multiple directions. Their study is limited by the small sample size, heterogeneity, and the brief follow-up of several of our series' cases. Due to the difficulty in obtaining optimum radiographs due to preoperative restriction of elbow motion, no association to the degree of fracture displacement could be made. Correlations between rotating and/or movable high-riding pieces and radiography measures were low. Following osteosynthesis, there is a high incidence of union and good elbow function in children with late-presenting lateral condyle fractures. Using a meticulously sliced soft tissue pedicle, mobilize the rotated condylar fragment. Utilize a more straightforward implant, such as a Kirschner wire or screw, and always bone graft the fixation. Their investigation discovered a lack of a link between the patient's age, the duration of late presentation, the Milch types, and final elbow function.[4]

Cubitus varus/cubitus valgus-Healing of a lateral condyle fracture frequently results in a broader distal humerus. Cubitus varus occurs in over 20% of patients, while valgus deformity occurs in over 10%. These defects typically modify the physiological carrying angle (5 to 15 degrees). A varus deformity appears to be caused by healing in a slightly displaced position relative to the starting position. Occasionally, a bony protrusion can be felt clinically or seen radiographically, but it is irrelevant.[5]

Around 22 kids were varying ages from four to eleven years and presented three to sixteen weeks post-injury. All patients had open reduction and internal fixation with Kirschner wires, either alone or combined with an extra screw, and were followed for 18.05 months. They concluded that surgery's

outcome without bone grafting on lateral condyle fractures of the humerus in children who present late up to 5 weeks is excellent; however, the outcome of delayed surgery up to 16 weeks also results in remarkable functional recovery and union.[2]

Conclusion

From our case in this study and all other reports presenting similar cases, it can be said that the lateral condyle of humerus fracture in a late case with fixation with good functional elbow motion, measurement of Baumann's angle and carrying angle, then with mild valgus after 18 months follow up. Our study only presents one case and reviews two other cases. Our limitation in this study is the rarity of the case of lateral condyle fracture in late with elbow reconstruction. A future study with more subjects presented still needs to be conducted.

Conflicts of interest: The authors declare no conflicts of interest.

References

1. Nelson FRT, Baluvelt CT. A Manual of Orthopaedic Terminology. Philadelphia: Elsevier;2015.
2. Chhetri RS, Dhakal I, Gnawali G. Operative Management of Late Presented Displaced Lateral Condyle Fracture of Humerus in Children. J Nepal Med Assoc. 2018;56(209):527-30.
3. Ganeshalingam R, Donnan A, Evans O, Hoq M, Camp M, Donnan L. Lateral condylar fractures of the humerus in children: does the type of fixation matter?. Bone Joint J. 2018;100-B(3):387-95.
4. Agarwal A, Qureshi NA, Gupta N, Verma I, Pandey DK. Management of neglected lateral condyle fractures of humerus in children: a retrospective study. Indian J Orthop. 2012;46(6):698-704.
5. Martins T, Marappa-Ganeshan R. Pediatric Lateral Humeral Condyle Fractures. InStatPearls [Internet] 2021 Jul 26. StatPearls Publishing.
6. Abzug JM, Dua K, Kozin SH, Herman MJ. Current concepts in the treatment of lateral condyle fractures in children. J Am Acad Orthop Surg. 2020;28(1):e9-19.
7. Li WC, Xu RJ. Comparison of Kirschner wires and AO cannulated screw internal fixation for displaced lateral humeral condyle fracture in children. Int Orthop. 2012;36(6):1261-6.
8. Bryan RS, Morrey BF. Extensive posterior exposure of the elbow. A triceps-sparing approach. Clin Orthopa Relat Res. 1982;(166):188-92.

Citation: Dradjat RS, Sananta P, Nasution AY, Savitri GAR. Neglected Fracture Lateral Condyle of Humerus Surgical Treatment and the Result: A Case Report after 18 Months Follow Up. Int J Rec Innov Med Clin Res. 2022;4(4):39-43.