


The concomitant lateral condyle and olecranon fracture in a six-year-old child:**A case report**Kapil Mani KC¹, Raju GC¹, Samir Acharya², Gopal Prasad Gnawali¹¹Affiliation Department of Orthopedics, Mercy City Hospital, butwal, Rupandehi, Nepal.²Department of Anesthesia, Mercy City Hospital, Butwal, Rupandehi, Nepal*Corresponding Author: Dr. Kapil Mani KC; Email/Contact: drkapil2007@yahoo.com
+9779851114502, Orcid number: 0000-0001-6122-0232**ABSTRACT**

The concomitant lateral condyle and olecranon fractures in the same elbow occur very rarely. It is essential to do the needful clinical examination and appropriate anteroposterior and lateral radiographic views with a high index of suspicion so as not to miss either of these fractures which otherwise lead to malunion, nonunion, tardy ulnar nerve palsy, and secondary osteoarthritis of elbow joint in adult age. We report a six-year-old male child with concomitant lateral condyle and olecranon fractures which were correctly diagnosed with a second standard radiograph and managed by open reduction and internal fixation with Kirschner wires with reasonable functional outcomes after surgical intervention.

Keywords: Children; Elbow; Lateral condyle fracture; Olecranon fracture.

ARTICLE INFORMATION	Source of Support: Self	Conflict of Interest: None
Received: 3 January 2022	Accepted: 15 April 2022	Published Online: 20 April 2022
<p>Copyright: © 2022 by the author(s) in which author(s) are the sole owners of the copyright of the content published.</p> <p>Licensing: The Journal follows open access publishing policy, and available free on the website of the Journal and is distributed under the terms of the Creative Commons Attribution International License 4.0 under the CC-BY 4.0  license, and the author(s) retain the ownership of the copyrights and publishing rights without restrictions for their content and allow others to copy, use, print, share, modify, and distribute the content of the article even in commercial purpose as long as the original authors and the journal are properly cited.</p> <p>Disclaimer: The statements, opinions, and data contained in this publication are solely those of the individual author(s) and contributor(s). Neither the publisher, editor nor reviewers are responsible for errors in the contents nor any consequences arising from the use of the information contained in it. The Journal, as well as publisher, remain neutral with regards to any jurisdictional claims in any published articles, their contents, and the institutional affiliations of the authors.</p>		

INTRODUCTION

Incidence of lateral condyle fracture of distal humerus in children is around 17 to 34 % while that for olecranon fracture is about 5 to 7% individually.^{1,2} Combination of lateral condyle fracture and olecranon fracture in same elbow occurs more infrequently.³ Pediatric lateral condyle fracture are infrequently associated with dislocation of elbow, radial head fractures and olecranon fractures.⁴ There are very few articles describing the concomitant lateral condyle fractures and olecranon fractures in children.^{4,5,6} It is justified to report this case report because combination of this fracture pattern is not only

uncommon but also is easily missed and if any one of these fractures is missed in early standard radiograph, functional outcomes will be disastrous.

This case report aims to mention the concomitant lateral condyle and olecranon fractures which is otherwise easily missed resulting into the unacceptable deformities of elbow joint with significant loss of functional outcomes unless close clinical examination, standard radiographic views were performed with high index of suspicion.

CASE REPORT

A six year male child was brought to our hospital with history of pain, swelling and inability to move the

right elbow as a result of injury while playing with his friends. On examination, elbow was swollen, tender, restricted range of motion without open wound around elbow region and normal distal neurovascular status. There were no features of compartment syndrome on close observation of limb and no injuries on other parts of body as well. Patient was suggested for X-ray of elbow joint antero-posterior (AP) and lateral view. Radiographer was not able to perform the AP and Lateral views because of uncooperative child even though X-ray showed doubtful lateral condyle fracture. X-ray was again repeated for standard AP and Lateral view which showed the displaced lateral condyle fracture and displaced olecranon fracture (Fig 1).

Child was posted for surgery after doing all necessary investigation and proper anesthetic evaluation. Painting and draping was done in supine position of patient. At first, incision was given around the olecranon and proximal ulna after lifting the elbow positioning in 90 degree. Fracture was exposed, reduced and fixed with two percutaneous Kirschner (K wires) from olecranon to anterior cortex of ulna in parallel fashion. After closing the skin, another incision was given on lateral side of elbow for lateral condyle fracture on supine position. Fracture site was exposed after proper soft tissue dissection. Lateral condyle fracture was found to be Milch type III which was reduced and temporarily hold with pointed small bone clamp. After proper reduction, fracture was fixed with three K wires in parallel fashion with wide separation at fracture site (Fig 2). I am aware that lateral condyle fractures are usually fixed by two parallel K wires, however I used three instead of two K wires to further enhance the fracture construct with presence of two unstable fractures simultaneously. Skin incision was closed and after proper dressing, posterior slab was applied.

First dressing was performed 48 hours after surgery and every fifth day until suture was removed in two weeks. Standard X-ray of elbow joint AP and Lateral views was performed two weeks after surgery to reassess the fracture displacement. K wires and posterior slab were continued for six weeks (Fig 3 and 4) when K wires were removed and range of movement of elbow joint was started with special precaution of not to massage the elbow. Last follow

up was made six months after index surgery when there was complete union of both lateral condyle and olecranon fracture with full flexion, extension, supination and pronation movement without any complications. Intraoperative picture could not be get because we fix the fracture in emergency operation theatre and no extra persons were available to get photo at that time. We are not also able to get the elbow picture at six month period because of technical problem.

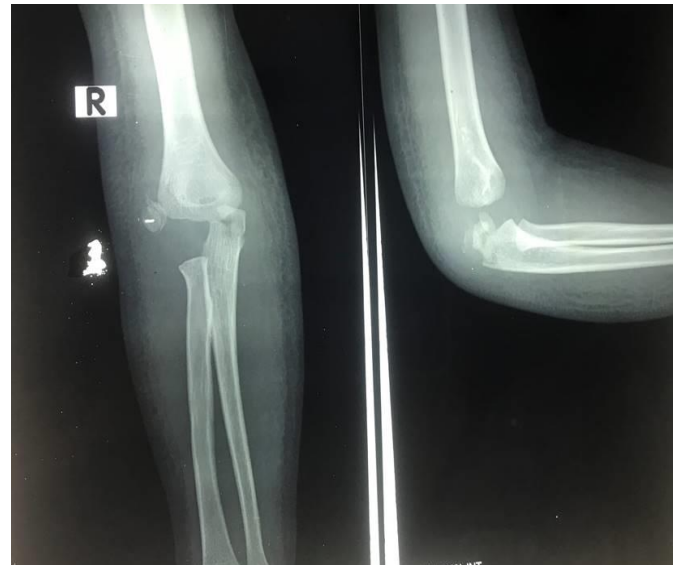


Fig 1: Concomitant displaced lateral condyle and olecranon fractures of right elbow joint.



Fig 2 Immediate postoperative X-ray of elbow joint with K wires in situ.



Fig 3: Six week postoperative X-ray showing union of both lateral condyle and olecranon fractures.



Fig 4: Right elbow joint of six year old child six weeks after surgery showing percutaneous K wires.

DISCUSSION

The concomitant lateral condyle and olecranon fractures is very rare injuries either of which is easily missed unless proper clinical examination eliciting the tenderness in lateral condyle and olecranon and standard radiographic AP and lateral views are performed with heightened index of suspicion by physician.³ If either of fractures is missed by the primary physician and not treated in early stage it is almost difficult to get the anatomical reduction of fractures in late stage leading to elbow subluxation and secondary osteoarthritis.

Regarding the mechanism of injury, there are push-off and pull-off mechanisms for lateral condyle fractures.⁷ Farooq et al mentioned that probable mechanism of

injury for lateral condyle fracture is push-off of the lateral condyle by radial head during falling on outstretched hand creating the valgus force on elbow while fracture of olecranon is due to the direct impact of olecranon on hard object during injury.^{5,7,8} Since lateral condyle fractures in children are physal injuries, displaced fractures which are either Milch type II or III need anatomical reduction and fixation otherwise inadequately treated or untreated fractures lead to either nonunion, malunion, carrying angle abnormalities, late onset ulnar nerve palsy and secondary osteoarthritis of elbow in early adult age.^{7, 9,10} In case of olecranon fracture, Graves and Canale recommended the surgical treatment when displacement of fracture fragments is more than 5mm.¹¹

In our case both lateral condyle and olecranon fractures were significantly displaced, hence both of these fractures were managed by open reduction and internal fixation with K wires. In case of lateral condyle fracture, K wires were parallel with wide separation at fracture site to enhance the fracture strength, while olecranon fractures were fixed by two K wires engaging the anterior cortex of proximal ulna without using the tension band wiring which otherwise causes the inhibition of physal growth of proximal ulna. The main issue in our case is difficulty in identifying the olecranon fractures with first radiograph which was inadequate. Standard AP and Lateral views were able to diagnose ulna fracture with careful observation in second proper radiograph.

Since both of these fractures involve physis, it is not uncommon to miss these fractures. Therefore proper examination especially swelling and tenderness on both olecranon and lateral condyle guide us to find the fracture at both sites. Standard AP and Lateral radiographs are necessary to avoid the missing of either fracture, especially internal rotation view of elbow joint to properly view the lateral condyle fractures.

CONCLUSION

Concomitant lateral condyle and olecranon fractures in children is not only uncommon but also is easily missed and if any one of these fractures is missed in early standard radiograph, functional outcomes will be disastrous. Therefore proper clinical examination,

standard radiographic views and high index of suspicion were needed to early detect the fractures.

Acknowledgment: I acknowledged to the patient who participated in this case report

REFERENCES

1. Landin LA. Fracture patterns in children: analysis of 8,682 fractures with special reference to incidence, etiology and secular changes in a Swedish urban population 1950–1979. *Acta Orthop Scan Suppl* 1983; 202: 1–109. <https://doi.org/10.3109/17453678309155630>
2. Blount WP, Schulz I and Cassidy RH. Fractures of the elbow in children. *J Am Med Assoc* 1951; 146: 699–704. <https://doi.org/10.1001/jama.1951.03670080007002>
3. Lam KY, Mahadev A. Combined lateral condyle mass and olecranon fractures: A proposed treatment algorithm and surgical technique. *Journal of Orthopaedic Surgery*. 2019 20;27(2):23–32. <https://doi.org/10.1177/2F2309499019837146>
4. Pace A, Gibson A, Al-Mousawi A, Matthews SJ. Distal humerus lateral condyle mass fracture and olecranon fracture in a 4-year-old female—review of literature. *Injury Extra*. 2005;36(9):368–72. <https://doi.org/10.1016/j.injury.2005.01.022>
5. Farooq M, Kamal Y, Khan HA, Gani N, Shah AB, Khan MA, Bhat S. Concurrent lateral condyle mass fracture with olecranon fracture: a case report and brief review of literature. *Archives of trauma research*. 2016 Sep;5(3). <http://eprints.kaums.ac.ir/id/eprint/1184>
6. Pace A, Gibson A, Al-Mousawi A, Matthews SJ. Distal humerus lateral condyle mass fracture and olecranon fracture in a 4-year-old female—review of literature. *Injury Extra*. 2005;36(9):368–72. <https://doi.org/10.1016/j.injury.2005.01.022>
7. Jakob R, Fowles JV, Rang M, et al. Observations concerning fractures of the lateral humeral condyles in children. *J Bone Joint Surg Br*. 1975;57(4):430–436. <https://doi.org/10.1302/0301-620X.57B4.430>
8. Dharmshaktu GS, Bhandari SS. Concomitant ipsilateral metaphyseal fracture of olecranon and lateral condyle in a child—A rare case report and literature. *Prog Orthop Sci* 2016;2(1):8–9. <https://doi.org/10.5455/20151230062532>
9. Ippolito E, Tudisco C, Farsetti P, Caterini R. Fracture of the humeral condyles in children: 49 cases evaluated after 18–45 years. *Acta Orthop Scand*. 1996;67(2):173–8. <https://doi.org/10.3109/17453679608994666>
10. Milch H. Fractures and Fracture Dislocations of the Humeral Condyles. *J Trauma*. 1964;4:592–607. [\[Full Text\]](#)
11. Graves SC, Canale ST. Fractures of the olecranon in children: longterm follow-up. *J Pediatr Orthop*. 1993;13(2):239–41. [\[Full Text\]](#)