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ORIGINAL ARTICLE

Outcome of Chronic Monteggia Fracture Treated with Ulna Lengthening and Angulation with and without open reduction of radial head.

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Authorship and Contribution Declaration
Each author of this article has encountered all 04 criterions of authorship:

1. Commencement and design of the study, attainment of data, or analysis and interpretation of information.
2. Drafting the manuscript or rewriting it censoriously for important intellectual content.
3. Providing concluding endorsement of the version for publication.
4. All authors have settled to be answerable for all aspects of their research work

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ABSTRACT

Objective: To evaluate the outcome of chronic Monteggia fracture treated with ulna lengthening and angulation with or without open reduction of radial head.

Methodology: A descriptive study comprising of total 11 cases were included in this study presented to Hayatabad medical complex Peshawar from January 2020 to june 2021. Patients presented with chronic monteggia fracture after 4 weeks of injury were included in the study. All the cases were done by same surgeon in same setup and environment by lengthening and angulation of ulna with z osteotomy and plating with and without open reduction of radial head. Patients were evaluated at 2 weeks, 6 weeks, 3 months, 06 months and 1 year follow ups.

Result: Out of 11 cases 63.63% (n=07) were boys and 36.36% (n= 04) were girls. Mean age of 07±2.32 years (range, 04 to 11 years). The mean duration of time between initial injury and presentation is 12.3 ± 6.3 weeks (range, 4 weeks to 24 weeks). Radial head reduction was achieved in all cases by doing ulnar lengthening and angulation with z osteotomy and plating including 03 cases which needed further open reduction and annular ligament reconstruction for radial head reduction. On follow ups out of 11, 10 patients had excellent range of movement and good functional outcomes while, 01 case had sublaxated radial head.

Conclusion: Lengthening and angulation of ulna with z osteotomy and plating is best procedure for chronic Monteggia fracture, with low complication rate and excellent functional outcome.

Keywords: Radial head dislocation, chronic Monteggia fracture, ulnar lengthening, open reduction.

This article may be cited as: Ahmad S, Qasim, Kashif S, Saeed M. Outcome of Chronic Monteggia Fracture Treated with Ulna Lengthening and Angulation with and without Open Reduction of Radial Head. J. Pak. Orthop. Assoc. 2024; Vol. 36 (4):196-199.

INTRODUCTION

A Monteggia lesion is a dislocation of radial head with ulna fracture. A chronic Monteggia fracture is an unreduced dislocation of the radiocapitallar joint that is still there after 4 weeks of initial injury by definition.[1] while recent studies showed inclusion of olecranon fracture with less than 2% incidence of forearm injuries in peadriatic age group. This rare combination injury lead ultimately to Forearm deformities. If not diagnosed timely will eventually result in neglected Monteggia Fracture.[2, 3, 4, 5]

Bado described a classification system for Monteggia injury. Which is based on the mechanism of injury and associated with the direction of radial head dislocation.[6] Patient may developed loss of supination and pronation, pain, instability and early arthritis. They may late develop cubitus valgus. Untreated neglected Monteggia fractures can present as a complex reconstructive task and demand a reconstructive surgery with random results.[7]

The treatment of radial head dislocation is controversial and has high tendency of complications with redislocation have been reported in literature.[8,10] Some indication for surgery reported, included limitation of forearm rotation, pain and progressive valgus deformity at elbow.[10, 11]

Numerous operative methods have been suggested in such injuries treatment, like corrective ulnar osteotomy, open reduction and reconstruction of annular ligament or doing both in combination.[7, 12, 13]

In our institution, we are doing this study to evaluate the clinical and radiological outcomes of chronic Monteggia fracture treated with ulna lengthening and angulation with or without open reduction of radial head.

METHODOLOGY

A descriptive study comprising of total 11 cases were included in this study presented to Hayatabad medical complex Peshawar from January 2020 to June 2021. Patients presented with chronic Monteggia fracture after 4 weeks of injury were included in the study. The mean duration of time between initial injury and presentation is 12.3 ± 6.3 weeks (range, 4 weeks to 24 weeks).

We collected pre and post-operative radiographs, recorded all ranges of motions and administered the Mayo Elbow Performance Index (MEPI) questionnaires including pain, motion, stability, and function.

Surgical procedure

All procedures were performed by a pediatrics orthopaedic surgeon. In all case ulna Z osteotomy with lengthening and angulation were performed to correct malalignment and accomplish radial head reduction. In all cases plating of ulna done.

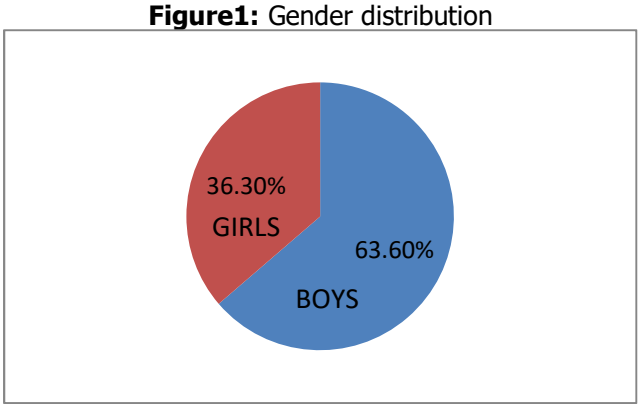
Intraoperative assessment of radial head reduction done and in 03 cases need further open reduction by posteriolateral approach, by using forearm fascia and annular ligament was reconstructed. A strip of forearm fascia 1 cm wide was harvested from the extensor aspect and passed around the radial neck and then sutured to itself. The elbow was immobilized with an above elbow back slab given in 90 degree flexion and neutral forearm position for 3 weeks.

Patients were evaluated at 2 weeks, 6 weeks, 3 months, 06 months and 1 year follow ups. The data was analysed through SPSS version 23.

RESULTS

Out of 11 cases 63.63% (n=07) were boys and 36.36% (n= 04) were girls. Mean age of 07±2.32 years (range, 04 to 11 years). The mean duration of time between initial injury and presentation is 12.3 ± 6.3 weeks (range, 4 weeks to 24 weeks). Radial head reduction was achieved in all cases by doing ulnar lengthening with z osteotomy and plating including 03 cases which needed further open reduction and annular ligament reconstruction for radial head reduction. On follow ups out of 11, 10 patients had excellent range of movement and good functional outcomes while, 01 case had sublaxated radial head. Preoperative and post-operative MEPI score (Mayo elbow performance score) shown in table 01.

Figure1: Gender distribution



X-rays of patient

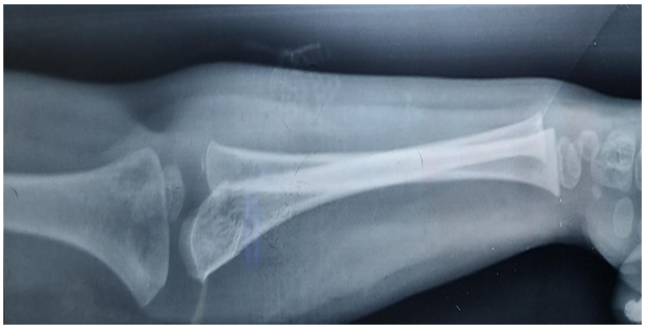
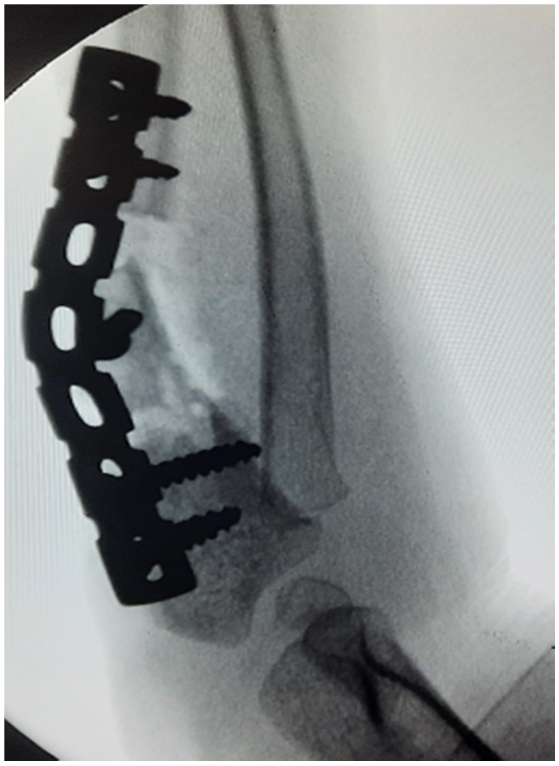


Table 1: preoperative and post-operative MEPI score(Mayo elbow performance score)

	Mean	SD
Preoperative score	64.4	2.09
Postoperative score	82.54	4.30



DISCUSSION

Treatment of chronic Monteggia fracture dislocation poses a unique therapeutic challenge. There are several surgical methods, reported by many authors to relocate the dislocated radial head. Some suggest open reduction[15,16,18] and interposition scar tissues to facilitate reduction. Conversely some case reports showed reduction achieved without opening the radiocapitaller joint.[17,19] We believe in close relocation of dislocated radial head by lengthening ulna.

In acute cases majority, can be managed by only anatomical reduction of ulna fracture, conversely in chronic cases there were other changes and in peadriatic patients the bones, joints and all other structures are constantly growing and remodeling, so other challenges like radial head aplasia and loss of anatomical contour are there.

Various authors support open reduction and annular ligament reconstruction with or without ulna osteotomy.[9,11,20,21] Conversely some recent data showed reports of closed reduction of radial head using external fixator.[22,23] Emphasizing need of correction of ulna misalignment and pull of interossous membrane to achieve and maintain radial head reduction. As in our study we achieve effective radial head reduction in 09 patients, in whom we did lengthening and angulation of ulna with z osteotomy and plating and in 03 cases we need to perform open reduction of radial head and annular ligament reconstruction, deciding on intraoperative stability and reduction of radial head after doing ulna lengthening and osteotomy, checked through c arm.

Nakamura et al. showed good long term clinical and radiological outcome in patients aged less than 12 years with lesser complications or those treated within three years since time of injury.[14] In our study the mean duration of time between initial injury and presentation is 12.3 ± 6.3 weeks (range, 4 weeks to 24 weeks) and Mean age of 07±2.32 years (range, 04 to 11 years).

CONCLUSION

Lengthening and angulation of ulna with z osteotomy and plating is best procedure for chronic Monteggia fracture, with low complication rate and excellent functional outcome.

Conflict of Interest: None

Grants/Funding: None

Disclaimer: None

REFERENCES

1. Stoll TM, Willis RB, Paterson DC. Treatment of the missed Monteggia fracture in the child. J Bone Joint Surg Br. 1992;74:436–440.
2. Soni JF, Valenza WR, Pavelec AC. Chronic Monteggia. *Current Opinion in Pediatrics* 2019 31 54–60.
3. Miller TC, Fishman FG. Management of Monteggia injuries in the pediatric patient. *Hand Clinics* 2020 36 469–478.
4. Hubbard J, Chauhan A, Fitzgerald R, Abrams R, Mubarak S, Sangimino M. Missed pediatric Monteggia fractures. *JBJS Reviews* 2018 6 e2.
5. Delpont M, Louahem D, Cottalorda J. Monteggia injuries. *Orthopaedics and* Traumatology, Surgery and Research 2018 104 S113–S
6. Bado JL. The Monteggia lesion. *Clin Orthop* 1967;50:71-86.

7. Rodgers WB, Waters PM, Hall JE (1996) Chronic Monteggia lesions in children. Complications and results of reconstruction. J Bone Joint Surg Am 78(9):1322–1329
8. Cappellino A, Wolfe SW, Marsh JS. Use of a modified Bell Tawse procedure for chronic acquired dislocation of the radial head. J Pediatr Orthop. 1998;18:410–414.
9. Devnani AS. Missed Monteggia fracture dislocation in children. Injury. 1997;28:131–133.
10. Best TN. Management of old unreduced Monteggia fracture dislocations of the elbow in children. J Pediatr Orthop. 1994;14:193–199.
11. Bhaskar A. Missed Monteggia fracture in children: is annular ligament reconstruction always required? J Child Orthop. 2010;4:479.
12. Kim HT et al (2002) Chronic radial head dislocation in children, part 2: results of open treatment and factors affecting final outcome. J Pediatr Orthop 22(5):591–597
13. Wang MN, Chang WN (2006) Chronic posttraumatic anterior dislocation of the radial head in children: thirteen cases treated by open reduction, ulnar osteotomy, and annular ligament reconstruction through a Boyd incision. J Orthop Trauma 20(1):1–5.
14. Nakamura K et al (2009) Long-term clinical and radiographic outcomes after open reduction for missed Monteggia fracture dislocations in children. J Bone Joint Surg Am 91(6):1394–1404.
15. Gyr BM, Stevens PM, Smith JT (2004) Chronic Monteggia fractures in children: outcome after treatment with the Bell-Tawse procedure. J Pediatr Orthop B 13(6):402–406
16. Lloyd-Roberts GC, Bucknill TM (1977) Anterior dislocation of the radial head in children: aetiology, natural history and management. J Bone Joint Surg (Br) 59-B(4):402–407
17. Koslowsky TC et al (2006) Operative treatment of chronic Monteggia lesion in younger children: a report of three cases. J Shoulder Elb Surg 15(1):119–121
18. Tan JWet al (2008) Pathology of the annular ligament in paediatric Monteggia fractures. Injury 39(4):451–455
19. Kawoosa AA et al (2010) Stable relocation of the radial head without annular ligament reconstruction using the Ilizarov technique to treat neglected Monteggia fracture: two case reports. J Med Case Rep 4:344
20. Hui JH, Sulaiman AR, Lee HC, et al. Open reduction and annular ligament reconstruction with fascia of the forearm in chronic Monteggia lesions in children. J Pediatr Orthop. 2005;25:501–506.
21. Hasler CC, Von Laer L, Hell AK. Open reduction, ulnar osteotomy and external fixation for chronic anterior dislocation of the head of the radius. J Bone Joint Surg Br. 2005;87:88–94.
22. Slongo TF. Correction osteotomy of neglected "Monteggia" lesion with an external fixator. Oper Orthop Traumatol. 2008;20: 435–449.
23. Exner GU. Missed chronic anterior Monteggia lesion. Closed reduction by gradual lengthening and angulation of the ulna. J Bone Joint Surg Br. 2001;83:547–545.