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Conservative Management of a Posterior Elbow Dislocation in an Adolescent with an Incomplete Olecranon Fracture: A Case Report

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ABSTRACT

Introduction: Elbow dislocation if accompanied by a fracture may increase risk of unstable joint and other structure damage, therefore requires surgical treatment. For the cases of simple stable elbow fracture dislocation including Mayo Type 1A olecranon fractures, guidelines still pointed for non-operative management even after years it has never been changed or updated it is used all over the world. This study aims to prove that guidelines for this type of case is still recommended to be used after years of its release.

Case report: A 15 years old Male with main complaint of pain on his left elbow following a fell in his house, neurovascular exam result is good. Physical exam and X-ray showed a posterior elbow dislocation with incomplete olecranon fracture, treatment were opted for nonoperative management starting with reduction maneuver, then home care with an arm cast and arm sling and active range of motion exercise immediately. After 7 days, his pain has reduced, X-ray showed good alignment and still has visible incomplete fracture. By three weeks, pain had been subsided, X-rays indicated good alignment and much less visible olecranon fracture, then removed his arm fixation and educate the patient to try active range of motion gradually and also educate him to to come back if there's any complaint.

Discussion: Managing simple stable posterior elbow fracture dislocation is always closed reduction due to good outcomes and simple relatively an easy option. A 15-year-old student with an Elbow Dislocation accompanied with Mayo Type 1A undisplaced olecranon fracture still managed by using nonoperative method. He showed significant improvement after three weeks.

Conclusion: Conservative management is a success with this case of a Teenage Posterior Elbow Dislocation with Incomplete Olecranon Fracture. Even after all these years, this method remains the best and the easiest for this common cases.

Keywords: Elbow fracture dislocation, posterior elbow dislocation, Mayo olecranon fracture classification, Mayo type 1A, conservative treatment

INTRODUCTION

Elbow fracture-dislocations are complex injuries that involve both bony structures, ligamentous and or soft tissue disruption, usually caused by high-energy trauma. Among all these, posterior elbow dislocations accompanied by fractures particularly of the radial head, coronoid process, or olecranon were the most frequent pattern to be encountered. This injury usually

occurs following a fall onto an outstretched hand with the elbow in extension, that leads to posterior displacement of the forearm bones relative to the distal humerus. (Josefsson and Nilsson, 1986, Waymack & An, 2023)

The combination of dislocation and fracture may significantly increase the risk of unstable joint, Simple dislocations of the elbow can be treated with early, active range of motion exercises. Since dislocations associated with any kind of fracture may cause other damages that can be considered a complex type, it requires more effort for the diagnosis and treatment. Fracture of the proximal radius or ulna often require operative treatment and are associated with numerous complications. Many of these injuries particularly for those that involves a fracture of the proximal ulna can be seen complex enough at first, however after careful evaluation it might yield a different conclusion, thus Identification of the injury pattern will surely help determine optimal treatment and prognosis (Ring, Jupiter and Zilberfarb, 2002; Morrey, 2009)

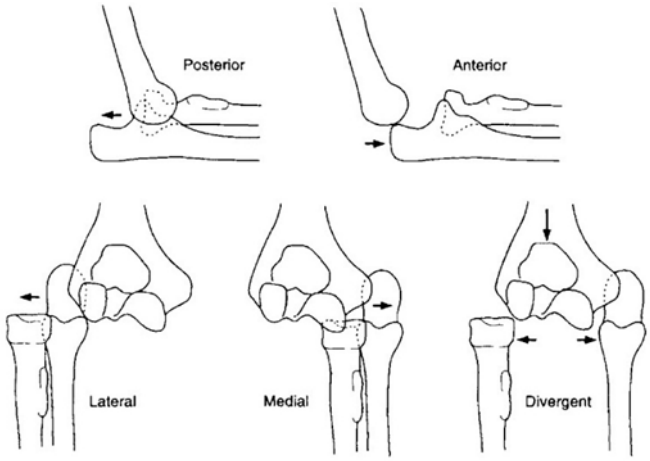

Figure 1 Classification of elbow dislocations.

The elbow dislocation classification is based on the direction (there were 5 possible dislocation directions) and the injury complexity of the dislocation. The most common dislocation direction of the radius ulna relative to distal humerus is to the posterior, it accounts around 90% of all elbow dislocation cases. (DeLee, J.C et.al 2015; Morrey, 2009) For the complexity of injury stand point, it only categorizes if the dislocation is associated with a fracture or if it just ligamentous and soft tissue injury only. (O'Driscoll et al., 2003; Pugh et al., 2004)

The elbow joint is considered stable enough due to its bony structure, this means that it requires a significant force to disrupt the joint. Therefore, an associated fracture or other surrounding structure damage may be found in conjunction with the elbow dislocation and that will classify the dislocation as complex therefore operative treatment will be the better option. Neurovascular complications are rare from a simple, closed, posterior dislocation. A dislocated elbow should be given immediate attention by closed reduction to prevent complications. Recurrent elbow dislocations suggest chronic joint instability and may require operative fixation. (Waymack & an, 2023)

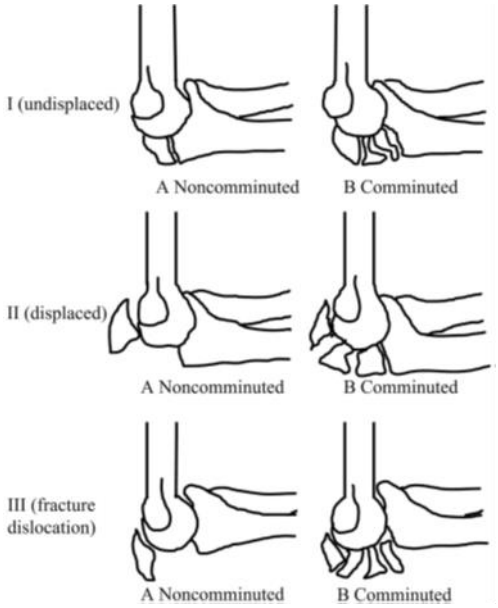

Figure 2 Illustration of the Mayo classification for olecranon fractures.

The Mayo classification by Cabanela and Morrey is the most appropriate to assess olecranon fracture severity. The system is based on displacement, fracture comminution and stability of the ulnohumeral joint. It is a widely used system for categorizing olecranon fractures. Olecranon fractures accounted for 10 % of all elbow fractures. Fracture management is based on the patient's functional demand and radiological examination. Since fracture patterns can be more complex, a CT scan can be performed in clinical practice. All types of Mayo classification have 2 subtypes; noncomminuted and comminuted. The only difference is the 3 main types; type 1 is the rarest, only accounts 5% or less, then type 3 about 10% and finally Type 2 is the most common about 80-85%. Type 1 is undisplaced meaning the bone is fractured but it is stable with no separation or less than 2 millimetres of separation, for the type 2, fracture fragment is displaced and has separated with distance of more than 2 millimetres, while it might not as bad as type 3, some still recommends to choose operative method as it will yield better results, and lastly type 3 is displaced more than 2 millimetres with elbow instability findings or dislocation. For the management options is typically non operative treatment is selected if the extensor mechanism is relatively intact and joint stability is preserved, since type 3 is unstable and more complex, it is recommended to choose operative method. (Harbrecht et al., 2024; Sullivan & Desai, 2018)

For closed reduction option in which able to do in simple and stable posterior elbow dislocation cases or a Mayo type 1A can be done with the patient in supine position using "*Traction-Countertraction Technique*", first step is determining the types: acute anterior, posterior, lateral, medial, or divergent dislocation, second step is determining if there is neurovascular compromise which can occur 15% to 22% in posterior elbow dislocations, observe clinical signs for vascular injury and also disruption of anatomical alignment between the olecranon tip and distal humeral epicondyles, then comparing with the unaffected elbow is essential, and then finally maybe the most important, radiographic confirmation is then required. Contraindications for closed reduction is an open dislocation in which requires emergent orthopaedic consultation, multiple failed reduction attempts even with adequate sedation, Irreducible dislocations as it may need operative management, chronic unreduced dislocations for those who had been dislocated for more than 7 days typically require open reduction. The risks for reduction attempts include soft tissue

injury, can cause further damage or even new additional fractures and lastly neurovascular injury can occur. Pre-reduction protocols include neurovascular check, radiographic imaging in which also consider to include distal and proximal images to determine if there's any associated injuries, but if neurovascular compromise is detected, it is better to have immediate reduction attempt even if radiographic imaging is not present yet. But if complex dislocation and or after multiple failed reduction attempts, it is required to be done surgically. (Wolfson et al., 2015)

Figure 3 Traction-Countertraction Technique (above), an alternative Maneuver (below)

Steps for supine reduction technique for posterior elbow dislocation is first patient Positioned lay down supine on a stretcher or bed. An assistant's role is stabilizing the humerus by wrapping both hands around the upper arm just below the axilla. And then the physician's grips one hand grasps the wrist while the other hand is placed just above the antecubital fossa, with the thumb on the olecranon. Traction and Countertraction done slowly, steady in-line traction to the forearm, Assistant provides steady countertraction to the upper arm, as for the joint positioning during reduction is keep hold the elbow in slight flexion and keep the wrist in supination to protect the coronoid process, also avoid hyperextension which then can prevent potential injury to the median nerve or brachial artery. If done correctly, a "clunk" may be heard or felt, indicating successful reduction. An alternative Maneuver can be used by performing a gentle flexion of the forearm, this may also facilitate reduction. This technique is widely used in emergency settings and is effective for simple posterior dislocations. (Wolfson et al., 2015)

Since guidelines for simple stable elbow fracture dislocation and Mayo type 1A has many similarities and already been used in many years, this study aims to prove that current management guidelines is still the best choice for the simple elbow fracture dislocation management.

CASE REPORT

A 15 years old Male student came to hospital emergency unit with chief complaint of pain on his left elbow. Pain started since about more or less 1 hour ago when he tripped then

fell in his house yard while reflexively trying to straightening his arms to absorb the impact. He described the pain was continuous and also aggravated by any elbow movement, he cannot make any active elbow movement as it also causes pain. He denied any other injuries, right after he fell, he was taken to the hospital emergency unit. He also mentioned that his family mentioned that his arm had slightly shortened, responders at emergency unit found different left and right arm overall length also were held in flexion position, unclear olecranon prominence and movement pain, they then quickly administered him with analgesics and put on an arm fixation so as not to worsen the condition.

Examination of the elbow showed minor bruises, small swelling, asymmetrical length when compared to the opposing side and slight posterior elbow bony prominence, but no open wound and no active bleeding. He mentioned the pain was continuous but very slowly fades away by analgesics and also immobilizing his left arm, he mentioned even a little passive movement triggered his pain. He was found to be distally neurovascularly intact; no numbness, and still able to move his fingers.

Figure 4: First hour X-ray examination, posterior shoulder dislocation with incomplete olecranon fracture (white arrow)

Patient's left elbow joint plain Antero-posterior X-ray [Figure 4] revealed that there was obvious dislocation between distal end of left humerus in conjunction with left radius and ulna to the posterior and also can be seen an incomplete fracture line on the olecranon with some surrounding soft tissue swelling. Treatment options, operative and nonoperative, were discussed. Since there's no sign of elbow instability and no neurovascular damage and any other contraindication for non-operative treatment, the non-operative treatment was chosen.

The first step after patient preparation is to administer anesthesia and then perform a closed elbow reposition using Supine Traction-Countertraction Technique. Then after the elbow dislocation is corrected and confirmed by flexion and extension movement that it is stable, the elbow is

immobilized using long arm cast and an arm sling. The patient is educated to restrict any movement on his left upper extremity as much as possible while still provide comfort and avoid water exposure including excess sweat. Post repositioning and immobilization, the patient was allowed to go home without any medicine except analgesic only if necessary and was told to come back for a check-up next week and then sometime after that to monitor and control the progress of the therapy.

Figure 5: 1st Week X-ray examination. Lateral View (left), Posterior-Anterior view (Right)

At the first week on conservative treatment, patient already felt better but still felt a mild pain, some stiffness and since he's still on arm cast, he's hasn't tried to move his arm. X-ray follow-up was performed. [Figure 5] It shows that repositioning method was successful, the trochlea is inside the semilunar notch of the olecranon and the radial head is on the right position relative to humeral capitulum and also no sign of abnormalities that leads to unsuccessful treatment. The olecranon fracture line is still visible. The patient was still advised to keep his left arm immobilized. He was still sent home with a long arm cast but no medicine this time. The patient was told to come back 2 weeks later for a follow-up.

Figure 6: 3rd Week X-ray examination. Lateral View (left), Posterior-Anterior view (Right)

At the third week on conservative treatment, the patient has already felt better, no pain was experienced after removing his arm cast, physical exam showed he's still had some mild stiffness but nothing to complain about, physical examination results also found no crepitation, room of movement still somewhat limited by the patient's stiffness but nearly perfect when passive motion, from the 3rd week X-ray examination [Figure 6] mainly has no major difference compared to the 1st week X-ray examination other than the olecranon fracture line is more difficult to see, overall after all examinations the treatment is considered successful. The patient was advised to start mobilizing his left arm but still at reduced functionality and mainly limited force and limited weight lifting. The patient is sent home without any arm fixation, also before that, the patient is not required to return for further follow-up unless necessary, educate to be more careful in the future in relation about the undeniable fact that joint dislocation recurrence can happen as any joint with history of dislocation has high rate of recurrence. In the end, the patient management was considered successful as the patient had been told to return if there were any complaints but instead, he was never returned and the last time he returned for a routine follow-up, he has no complaints and also showed successful treatment.

DISCUSSION

Elbow dislocations in the pediatric and adolescents are relatively common, with posterior dislocations being the most frequent subtype. These injuries often result from a fall on an outstretched hand, transmitting axial force to the extended elbow and leading to posterior displacement of the ulna and radius relative to the humerus (Josefsson and Nilsson, 1986; AAOS, 2024), which is in line with this adolescent patient that was fell on an outstretched hand in attempt to absorb his fall momentum.

In adolescents, the presence of increased ligamentous laxity may influence both the injury pattern and healing potential. In this case, a 15-year-old patient sustained a posterior elbow dislocation with an associated incomplete olecranon fracture. After thorough anamnesis, physical and radiologic examination the patient showed simple dislocated but stable elbow joint. The integrity of the triceps mechanism and the absence of significant displacement or comminution are key factors that support conservative management. Incomplete fractures of the olecranon are particularly rare in adolescents and may be underdiagnosed due to subtle radiographic findings. Therefore, high clinical suspicion and appropriate imaging, including lateral elbow radiographs or CT-Scan if necessary, are essential for accurate diagnosis (Morrey, 2009; Lustosa, 2022) which in this case the incomplete fracture was already visible enough.

The management of simple posterior elbow dislocations typically involves quick closed reduction under sedation, followed by a short period of immobilization and early mobilization to prevent stiffness (Josefsson and Nilsson, 1986; Morrey, 2009). In the presence of a stable, incomplete olecranon fracture, as in this case, non-operative treatment is generally favoured (Lustosa, 2022; AAOS, 2024). The decision to avoid surgical intervention is further supported by the patient's age, bone remodelling capacity, and the absence of neurovascular compromise or mechanical block to motion (Gross, 2020). This was in line with the patient presented in this case which was advised to be treated non-operatively as there's no contraindications present.

After reduction attempts and then allowed to be treated at home, the patient's elbow joint was kept immobilized for some time more by keeping his arm cast and then he was required to go back for future follow up and possibly slowly try some range of movement exercises. This was on track with the literatures in which post-reduction care should focus on maintaining joint stability while minimizing immobilization duration. After some time, patient will be advised to try gradual range-of-motion exercises (Pugh

et al., 2004). Close radiographic follow-up is necessary to monitor for a secondary displacement or in case if any signs of instability occurred. In this case, the patient demonstrated satisfactory healing and progressive functional recovery without complications, highlighting the effectiveness of conservative management in select cases of pediatric elbow fracture-dislocations (Morrey, 2009; Gross, 2020).

This case underscores the importance of individualized treatment planning based on fracture classification, patient age, and joint stability. While complex elbow dislocations often require surgical intervention, simple dislocations with stable, and may also accompanied with incomplete fractures particularly in young patients can be managed successfully with non-operative approaches (O'Driscoll et al., 2003; Ring, Jupiter and Zilberfarb, 2002). Early diagnosis, appropriate immobilization, and timely initiation of physiotherapy are critical to achieving optimal outcomes (Pugh et al., 2004; Orthobullets, 2025).

CONCLUSION

We present a successful conservative (non-operative) treatment on Teenage Posterior Elbow Dislocation with Incomplete Olecranon Fracture in functional outcome with specific timeline for return to functional activity. Even after all these years, this guideline is still the best and the easiest for managing this type of case.

Recommendation

The conclusion of this study is in line with current management for the simple elbow fracture dislocation in which has no contraindication to be managed non-operatively. Therefore, current management guidelines are still the best choice to follow.

Declaration by Authors

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REFERENCES

1. American Academy of Orthopaedic Surgeons (AAOS) OrthoInfo, 2024. *Elbow fractures in children*. Available at: https://orthoinfo.aaos.org/en/diseases--conditions/elbow-fractures-in-children/ (Accessed: 29 October 2025).
2. DeLee, J.C., Drez, D. and Miller, M.D. (2015). DeLee & Drez's Orthopaedic Sports Medicine. 4th ed. Elsevier.
3. Gross, J.M., 2020. Olecranon Fractures – A Case Based Approach to Understanding Management. Orthopaedic Trauma Association. Available at: https://ota.org/sites/files/2021-06/UE%208%20Olecranon%20Fractures.pdf [Accessed 20 Oct. 2025]
4. Harbrecht, A. et al. (2024) 'Mayo classification of Olecranon Fractures Revisited – assessment of intra- and interobserver reliability based on CT scans', Journal of Orthopaedics, 52, pp. 102–106. doi: 10.1016/j.jor.2024.02.026.
5. Josefsson, P.O. and Nilsson, B.E., 1986. Incidence of elbow dislocation. Acta Orthopaedica Scandinavica, 57(6), pp.537–538.
6. Lustosa, L., 2022. Mayo classification of olecranon fractures. Radiopaedia.org. Available at: https://radiopaedia.org/articles/mayo-classification-of-olecranon-fractures [Accessed 20 Oct. 2025].
7. Morrey, B.F., 2009. The elbow and its disorders. 4th ed. Philadelphia: Saunders.
8. O'Driscoll, S.W., Jupiter, J.B., Cohen, M.S., Ring, D. and McKee, M.D., 2003. Difficult elbow fractures: Pearls and pitfalls. Instructional Course Lectures, 52, pp.113–134.
9. Orthobullets, 2025. Olecranon Fractures. [online] Available at: https://www.orthobullets.com/trauma/1022/olecranon-fractures [Accessed 20 Oct. 2025]
10. Pugh, D.M., Wild, L.M., Schemitsch, E.H., King, G.J. and McKee, M.D., 2004. Standard surgical protocol to treat elbow dislocations with radial head and coronoid fractures. Journal of Bone and Joint Surgery - American Volume, 86(6), pp.1122–1130
11. Ring, D., Jupiter, J.B. and Zilberfarb, J., 2002. Posterior dislocation of the elbow with fractures of the radial head and coronoid. Journal of Bone and Joint Surgery - American Volume, 84(4), pp.547–551.

12. Sullivan, C.W. and Desai, K. (2018) 'Classifications in brief: Mayo classification of Olecranon fractures', Clinical Orthopaedics & Related Research, 477(4), pp. 908–910. doi:10.1097/corr.0000000000000614.
13. Waymack JR, An J. Posterior Elbow Dislocation. 2023 Jul 17. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. PMID: 29262045.
14. Wolfson, A. B., Cloutier, R. L., Hendey, G. W., Ling, L. J., Rosen, C. L., & Schaider, J. J. (2015). Harwood-nuss' clinical practice of emergency medicine. Lippincott Williams &. Wilkins. https://emergency.lwwhealthlibrary.com/book.aspx?bookid=1292&sectionid=0

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