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Interposition Arthroplasty and Hinged Bar External Fixation for Neglected Fracture Dislocation Elbow: A Case Report

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ABSTRACT

Introduction: Chronic elbow dislocations present significant challenges due to fibrous tissue formation and joint contractures. Early and effective intervention is critical to restore function and prevent long-term disability.

Case report: We report the case of a 52-year-old female with a neglected left elbow dislocation for six months, accompanied by tingling in the left fingers. Initial injury occurred after a fall from a palm tree, leading to a diagnosis of neglected fracture dislocation of the left elbow with associated osteolytic changes and radial head dislocation. The patient underwent surgical intervention, including open reduction, internal fixation, interposition arthroplasty, and the application of a hinged external fixator. The surgery involved a posterior approach, extensive dissection to remove fibrous tissue, reduction of the fracture, fixation with screws and K-wire, and grafting with fascia lata. A hinged external fixator was applied to maintain joint stability and allow early mobilization. Post-surgery, the patient received antibiotics, analgesics, and instructions for active range of motion exercises while maintaining elbow immobilization at 90 degrees. Follow-up indicated stable fixation, controlled pain, and good distal limb function.

Discussion: This case illustrates the complexities of treating chronic elbow dislocations, emphasizing the need for extensive surgical release and reconstruction. The use of a hinged external fixator facilitated early mobilization and contributed to a positive functional outcome. Early diagnosis and intervention are crucial to prevent complications and ensure successful recovery.

Conclusion: Comprehensive surgical management, combined with diligent post-operative care, is essential in treating neglected elbow dislocations, underscoring the importance of early treatment to restore function and improve patient quality of life.

Keywords: neglected fracture dislocation elbow, hinged external fixator, interposition arthroplasty, early mobilization, case report

INTRODUCTION

In both children and adults, elbow dislocations occur at 6.1 per 100,000 each year, the second most commonly dislocated joint in adults.[1] A simple elbow dislocation

does not involve fractures, whereas a complex elbow dislocation involves fractures of the radial head, olecranon, or coronoid process. A fracture of the radial head occurs in 36% of elbow dislocation cases, a fracture of the coronoid process in 13%, and an olecranon fracture in 4%.[2,3] The coronoid process and the radial head serve as critical elbow stabilizers, necessitating their restoration in order to manage complex elbow dislocations. Typically, this involves open reduction and internal fixation (ORIF) or primary arthroplasty when the radial head fracture is unreconstructable.[4]

A stability assessment after ORIF is crucial, as instability—evidenced by a re-dislocation, a pivot shift test, and valgus and varus stress tests—is often indicative of further intervention. Standard treatments for instability include primary ligament repair and a period of plaster immobilization, which can result in limited range of motion and elbow stiffness.[5] Alternatively, a hinged external elbow fixator can provide the necessary stability to allow early mobilization, potentially preventing residual instability and stiffness. Due to the rarity of patients with complex elbow dislocations who experience instability after ORIF or arthroplasty, there are few randomized controlled trials comparing hinged external fixation to plaster immobilization. The existing evidence is primarily based on small observational studies.[6]

Traumatic elbow injuries, particularly those that are complex and involve multiple structures, present significant challenges in both decision-making and surgical techniques. Surgeons must judiciously determine which structures require repair or reconstruction and navigate the complexities of post-operative management to avoid persistent instability, pain, and joint degeneration.[6,7] The management of chronic elbow fracture-dislocations is particularly challenging due to the altered anatomy, scarring, and the necessity for extensive reconstructive procedures to restore elbow function. These procedures, historically, have had poor outcomes due to prolonged immobilization leading to joint contracture and loss of function. However, the use of hinged external fixators has shown promise in reestablishing the anatomic axis of the ulnohumeral joint and enabling early concentric range of motion (ROM), thus maintaining stability.[8]

This case report discusses the application of interposition arthroplasty and hinged bar external fixation in the treatment of a neglected fracture-dislocation of the elbow. This approach aims to provide insights into the management of such complex cases, emphasizing the importance of early mobilization and joint stability in achieving favorable functional outcomes. This case report has been reported in line with the Surgical Case Report (SCARE) 2020 Criteria.[9]

CASE REPORT

Mrs. K, a 52-year-old female, a right-hand dominant individual, presented with a chief complaint of an inability to bend the left elbow, which had persisted for six months following a fall at home in September 2023. This incident resulted in the left elbow impacting the ground, leading to a noticeable deformity. The patient also experienced a tingling sensation in the fingers of the left hand, particularly affecting the ring and little fingers. Initial evaluation at peripheral general hospital by an orthopedic specialist led to a diagnosis of a neglected old fracture of the lateral condyle of the left humerus, along with osteolytic lesions in the left humerus, radius, and ulna, and a dislocation of the left radial head.

The patient's history of trauma included a significant fall from a palm tree, with the left elbow striking the ground. Despite this, the patient did not seek treatment from a bonesetter but did undergo 12 sessions of massage therapy. There was no history of systemic illnesses, medical medication, or prior surgeries. The patient's family history revealed no similar signs or symptoms. Upon physical examination of the left

elbow, there was an observable angulation deformity without swelling or bruising. The radial artery was palpable, and the capillary refill time was less than 2 seconds. Active range of motion was notably limited, with significant restrictions observed in the elbow and wrist, specifically an active wrist range of motion of 20/50 degrees and metacarpophalangeal-interphalangeal range of 0-90 degrees. The clinical picture showed in Figure 1. The radiological examination, the X-ray and 3D CT-scan reconstruction elaborated the fracture dislocation of left elbow associated with malunion fracture of head radius, ulna, and condyles of humerus (Figure 2.A-D)

Figure 1. The pre-operative clinical picture. (Source: internal documentation)

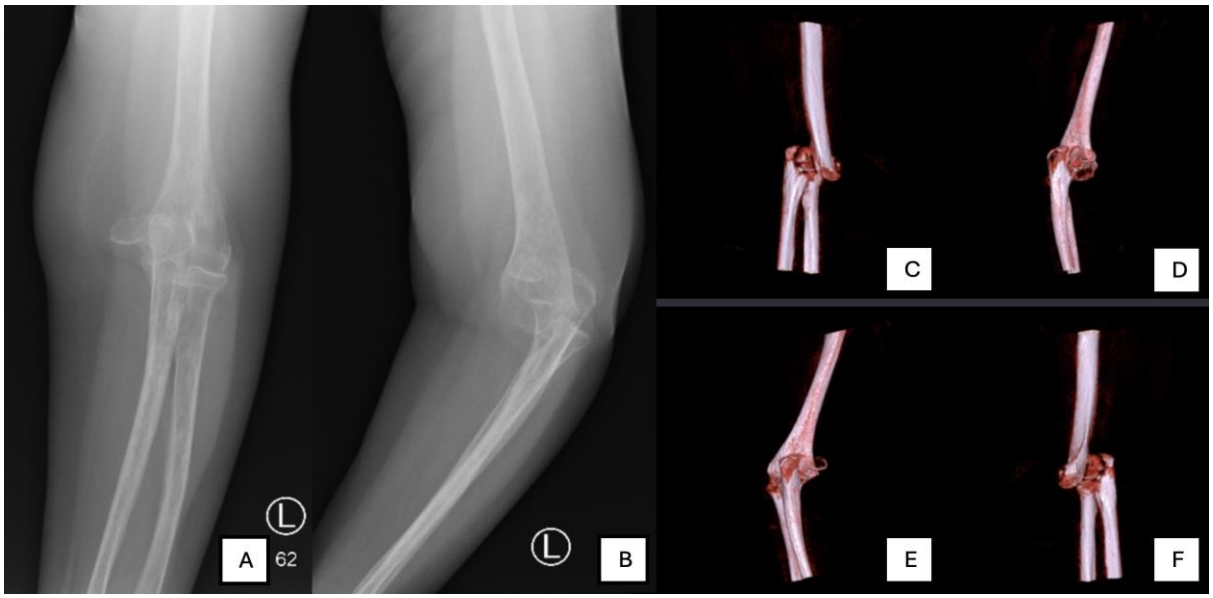

Figure 2. The radiological examination of (A-B) X-ray and (C-F) 3D CT-scan reconstruction of left elbow. (Source: internal documentation)

Arthroscopic reconstruction of the ACL with excision of the tibial eminence avulsion fragment was performed on the patient. The surgery was performed with a double bundle autograft from the peroneus longus. An arthroscopic examination confirmed a complete rupture of the ACL, and the fragment was excised and secured to its anatomical position with bioabsorbable screws. There were no complications during the procedure.

Surgical Procedure

The patient was positioned supine for the surgical procedure. A posterior incision was made, and a tongue-shaped incision on the triceps was performed to expose the fracture. The medial condyle of the humerus was found to be fractured and surrounded by sclerotic tissue. The fracture site was refreshed, and a soft tissue release was conducted to facilitate reduction and fixation. This involved the use of a 4.0 mm cancellous lag screw and a K-wire to stabilize the fracture. Additionally, a fascia lata graft was harvested from the patient's ipsilateral thigh. This graft was used to cover the cartilage and was secured with Ethibond sutures. Subsequently, four Schanz screws were inserted, and the elbow was immobilized with an external fixation hinge bar set at a 90-degree angle. The procedure concluded with an assessment of stability, which confirmed that the fixation was stable. Intraoperative blood loss was estimated at 400 cc. (Figure 3.A-F)

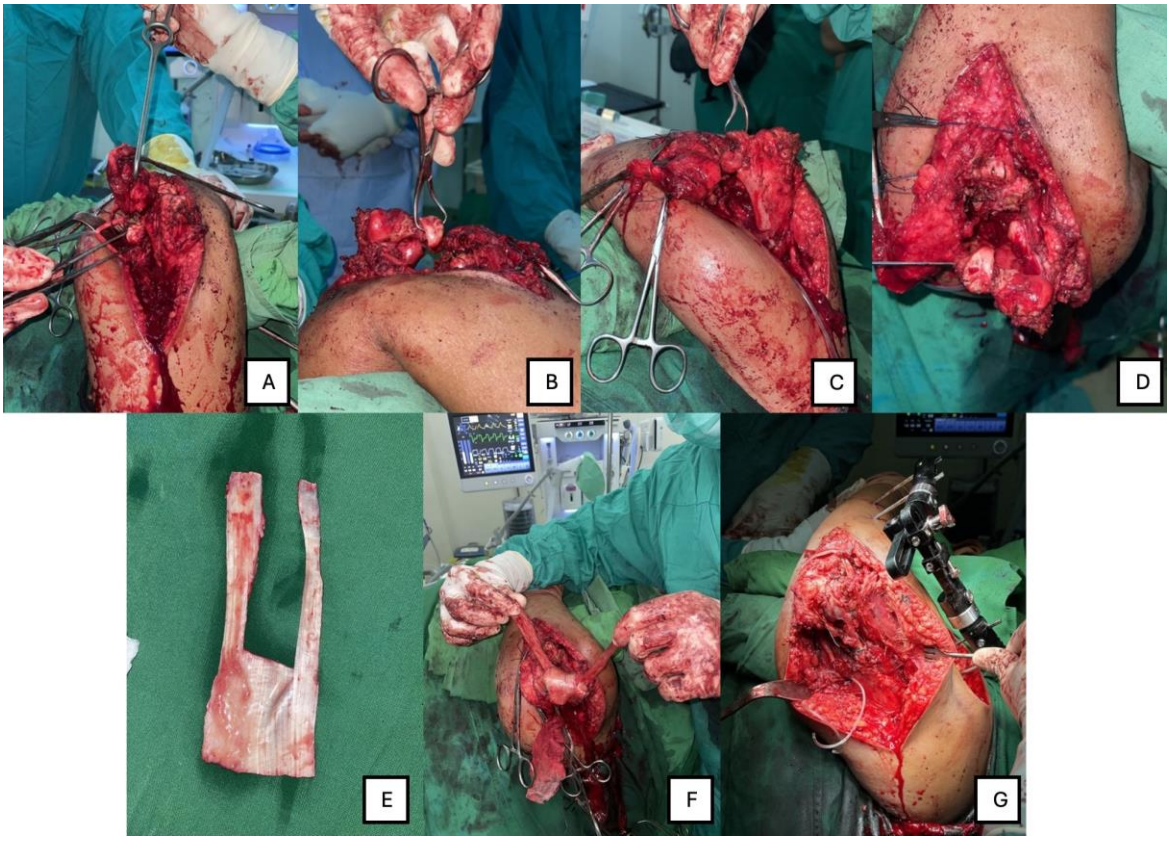

Figure 3. The intraoperative documentation showed the (A-D) Reduction and fixation medial condyle and (E-F) Fascia Lata graft with interposition arthroplasty. (Source: internal documentation)

Post-operative

Following the surgery, the patient was conscious and in good condition. Pain management was effective, with pain levels controlled at 2-3 on the Visual Analog Scale (VAS). However, the patient continued to experience tingling sensations in the fingers, especially the ring and little fingers. Examination of the left elbow post-operatively showed dry dressings with no seepage, and the external fixation hinge bar was functioning correctly. A drain was in

place, producing 20 cc of hemorrhagic fluid every 6 hours. Distal arterial and venous circulation were assessed to be good, with the active range of motion in the distal joints being satisfactory. The patient exhibited positive extension in both the thumb and wrist. (Figure 4)

The post-operative treatment plan included administering ceftriaxone 1 gram intravenously twice daily for the first day, alongside analgesics as per the Acute Pain Service (APS) protocol. The elbow was kept immobilized at a 90-degree angle using the hinge bar external fixator. Wound care was provided as needed, with instructions for active distal range of motion exercises. A follow-up dressing change was scheduled for the first post-operative day. For anesthesia management, the patient received a fentanyl infusion at a rate of 2.1 cc per hour, along with oral paracetamol 500 mg every six hours for pain relief. The patient's recovery was closely monitored to ensure stability and functionality of the elbow joint. (Figure 5)

Figure 4. The range of motion evaluation in (A-D) flexion to extension and back to prior position. (Source: internal documentation)

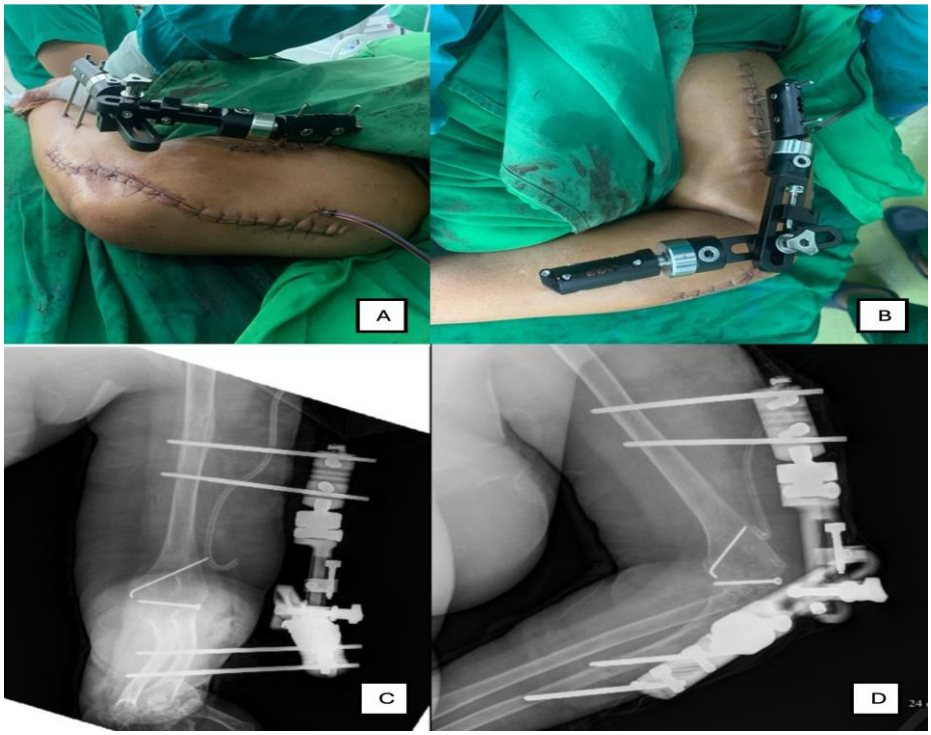

Figure 5. The post operative (A-B) clinical and (C-D) radiological evaluation. (Source: internal documentation)

DISCUSSION

The elbow is the second most commonly dislocated major joint in adults, and complex dislocations often involve concomitant fractures of the radial head, coronoid process, or olecranon, complicating the management and prognosis.[1] Neglected fracture-dislocation of the elbow presents a complex and challenging clinical scenario due to the intricate anatomy and essential functional role of the elbow joint. Chronic dislocation, defined as dislocation persisting for more than two weeks, results in significant alterations to the joint's bony and soft tissue structures, including fibrosis, contractures, and ossification within the joint capsule and surrounding tissues.[10] This makes closed reduction impossible after three weeks and necessitates extensive surgical intervention. The primary challenges include the excision of interposed fibrous tissue, release of contracted soft tissues, and restoration of joint congruity and stability.[11] This case involves a chronic left elbow dislocation persisting untreated for over two weeks. The patient exhibited severe deformity, limited range of motion, and significant soft tissue contractures, classic complications of neglected dislocations. Delayed orthopedic intervention, following various ineffective treatments like multiple massage sessions, compounded the case's complexity, requiring a multifaceted surgical approach to restore function and alleviate symptoms.

The diagnosis included a neglected fracture dislocation of the left elbow with an associated fracture of the medial condyle of the humerus, osteolytic changes in the humerus, radius, and ulna, and a dislocation of the radial head. These findings are consistent with those described in literature, where chronic dislocations often require extensive surgical intervention due to the presence of massive fibrous tissue and joint capsule contractures.[12] This fibrosis necessitates significant dissection and excision to achieve reduction. Volkov and Oganesian's hinge-distraction device for chronic elbow dislocations offers a less invasive option, but open reduction remains the standard due to the complexity and chronicity of such injuries.[12,13]

Open reduction and internal fixation (ORIF) have traditionally been the standard for treating complex elbow dislocations, aiming to restore joint stability. However, this method often leads to significant stiffness due to prolonged immobilization and extensive surgical dissection. The introduction of hinged external fixation has improved treatment for neglected elbow dislocations by providing stable fixation while allowing early range of motion (ROM) exercises, which prevent stiffness and promote functional recovery.[7,8] This technique leverages the elbow's natural hinge mechanism to maintain reduction and stability without the need for trans-articular pins, which are associated with increased stiffness. During surgery, a posterior approach incision revealed a humeral medial condyle fracture surrounded by sclerotic tissue. The fracture site was refreshed, and soft tissue released before fixation with a lag screw and K-wire. A fascia lata graft provided cartilage coverage, secured with Ethibond sutures. Elbow stabilization was achieved using an external fixator hinge bar, promoting early mobilization while safeguarding soft tissues. This approach aligns with Arafiles' concept of an intra-articular "cruciate" ligament and Jupiter and Ring's successful use of the Compass Hinged Fixator in similar cases. Studies have shown promising results with the use of hinged external fixators.[14,15] Jupiter and Ring reported good to excellent outcomes in patients treated with the Compass Hinged Fixator, achieving stable reduction without ligament reconstruction. Pennig's use of a unilateral elbow fixator and the versatility of the Ilizarov fixator further support the efficacy of this approach.[7] However, achieving the correct alignment of the fixator hinge with the elbow joint axis is critical for optimal outcomes. Despite the advantages, the use of hinged external fixators is not without complications. The most common issues

include pin tract infections, which can escalate to deep infections requiring multiple debridement. Additionally, the thin soft tissue envelope around the elbow increases the risk of skin breakdown and wound complications, particularly when early ROM is initiated.

Post-operatively, the patient showed stable vital signs and controlled pain levels, though persistent tingling in the fingers indicated ongoing nerve involvement. The external fixator was functioning correctly, and the surgical site was clean with minimal drainage. Early mobilization was encouraged to prevent stiffness, a common complication in chronic elbow dislocations treated surgically. Literature suggests that while achieving concentric reduction without direct ligament repair can suffice in acute cases, chronic cases often require comprehensive soft tissue management to ensure stability and functional recovery.[16,17]

This case demonstrates the complexity and challenges involved in treating such injuries. The surgical approach, involving open reduction, internal fixation, grafting, and the use of a hinged external fixator, highlights the necessity of a multi-faceted strategy to address the extensive fibrous tissue and contracted joint structures. Post-operative care, including pain management, immobilization, and active range of motion exercises, is essential for ensuring successful recovery and functional outcomes. The use of a hinged external fixator proved to be effective in maintaining joint stability while allowing for early mobilization, aligning with current best practices.[18] Timely and appropriate intervention remains paramount in achieving optimal results and restoring the patient's quality of life. This case emphasizes the importance of early diagnosis and treatment in preventing the complications associated with chronic joint dislocations.

This case report has several limitations. It focuses on a single patient, limiting generalizability. The retrospective nature introduces potential bias, and the short follow-up period restricts insight into long-term outcomes. The lack of comparative analysis with other treatments hinders conclusions about the approach's superiority. Additionally, it lacks detailed information about the patient's pre-injury health and functional status, which can influence recovery. Observer bias is possible as the authors were involved in the treatment. The report also does not provide detailed statistical data on complications associated with hinged external fixators, limiting assessment of the procedure's risk-benefit ratio. Further research, including larger controlled studies, is needed to validate these findings and improve the management of neglected elbow fracture-dislocations.

CONCLUSION

Neglected fracture-dislocations of the elbow are challenging to treat due to the extensive fibrosis and contractures that develop over time. Hinged external fixation, combined with interposition arthroplasty, offers a viable solution that allows for early mobilization and functional recovery. While the technique shows promising outcomes, careful surgical planning and meticulous postoperative care are essential to minimize complications and enhance patient outcomes. Further research and larger clinical trials are needed to establish standardized protocols and improve the overall success rates of these complex procedures.

Declaration by Authors

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REFERENCES

1. Pal CP, Mittal V, Dinkar KS, Kapoor R, Gupta M. Neglected posterior dislocation of elbow: A review. *J Clin Orthop Trauma*. 2021;18:100-104. doi:10.1016/j.jcot.2021.04.016
2. Pai SN, Jeyaraman N, Jayakumar T, Jeyaraman M. Neglected Elbow Dislocation

leading to Ankylosis of Elbow: A Case Report. *J Orthop Case Reports*. 2023;13(12): 133-136. doi:10.13107/jocr.2023.v13.i12.4108
3. Fahsi M, Benameur H, Hiba O, et al. Neglected Dislocation of the Elbow: About 8 Cases and Review of Literature. *OALib*. 2015;02(11):1-5. doi:10.4236/oalib.1102066
4. El Mouloua A, Aghoutane EM, El Khassoui A, Salama T, El Fezzazi R. Open reduction in treatment of neglected elbow dislocation in children. *Acta Orthop Belg*. 2022;88(2):263-268. doi:10.52628/88.2.9599
5. Islam S, Jahangir J, Manzur RM, Chowdury AAA, Tripura N, das A. Management of neglected elbow dislocations in a setting with low clinical resources. *Orthop Surg*. 2012;4(3):177-181. doi:10.1111/j.1757-7861.2012.00190.x
6. Sanchez-Sotelo J, Morrey M. Complex elbow instability: Surgical management of elbow fracture dislocations. *EFORT Open Rev*. 2016;1(5):183-190. doi:10.1302/2058-5241.1.000036
7. Javier JS. Management of neglected elbow dislocation using a hinged Ilizarov fixator. *Tech Orthop*. 2006;21(2):121-126. doi:10.1097/01.bto.0000225123.06223.fa
8. Faqih E, sawan H, Alfadhel SF, AlAbbasi K, Alrawi M. Chronic Complex elbow fracture dislocation: Restoration of elbow function with ORIF and radial head replacement, a case report with long term follow up. *Int J Surg Case Rep*. 2023;112(September):108912. doi:10.1016/j.ijscr.2023.108912
9. Agha RA, Franchi T, Sohrabi C, et al. The SCARE 2020 Guideline: Updating Consensus Surgical CAse REport (SCARE) Guidelines. *Int J Surg*. 2020;84:226-230. doi:10.1016/j.ijsu.2020.10.034
10. Salazar LM, Kanawade V, Prabhakar G, et al. The internal joint stabilizer for chronic elbow dislocation: a surgical technique. *JSES Rev Reports, Tech*. 2022;2(2):219-229. doi:10.1016/j.xrrt.2022.02.001
11. Bae JY, Kim TW, Kwak SH, Suh KT. Chronic Unreduced Elbow Dislocation Treated with Hinged External Fixator and Transarticular Pin Fixation. *J Korean Orthop Assoc*. 2016;51(6):521. doi:10.4055/jkoa.2016.51.6.521
12. Schep NWL, De Haan J, Iordens GIT, et al. A hinged external fixator for complex elbow dislocations: A multicenter prospective cohort study. *BMC Musculoskelet Disord*. 2011;12(1):130. doi:10.1186/1471-2474-12-130
13. Kim B-K, Kim K-C, Park J-Y, Shin H-D. Neglected Elbow Dislocation Occurred 3 Years Ago: Open Reduction and Hinged External Fixation - A Case Report -. *J Korean Shoulder Elb Soc*. 2010;13(2):266-269. doi:10.5397/cise.2010.13.2.266
14. Kachnerkar DNI, Lakde DN, Salokhe DS. Neglected old posterior dislocation of elbow: Treatment and results of open reduction. *Int J Orthop Sci*. 2017;3(3o):1062-1066. doi:10.22271/ortho.2017.v3.i3o.154
15. Coulibaly NF, Tiemdjo H, Sane AD, Sarr YF, Ndiaye A, Seye S. Posterior approach for surgical treatment of neglected elbow dislocation. *Orthop Traumatol Surg Res*. 2012;98(5):552-558. doi:10.1016/j.otsr.2012.03.006
16. Rawal M, Rokaya PK, Karki DB, Bhandari KK, Thakur AK. Outcome of Neglected Elbow Dislocation Treated with Open Reduction at Rural Tertiary Care Hospital in Nepal. *J Nepal Health Res Counc*. 2020;18(3):525-528. doi:10.33314/jnhrc.v18i3.3093
17. M Bhavsar N, G Patel J, R Patel P, B Chhapan J. Results of Posterior Dislocation of Elbow Associated with Bony and Soft Tissue Injury. *Malaysian Orthop J*. 2013;7(1):13-18. doi:10.5704/moj.1303.010
18. Anderson DR, Haller JM, Anderson LA, Hailu S, Chala A, O'Driscoll SW. Surgical treatment of chronic elbow dislocation allowing for early range of motion: Operative technique and clinical results. *J Orthop Trauma*. 2018;32(4):196-203. doi:10.1097/BOT.0000000000001097

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