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Research Paper

3 MONTHS OLD POST-TRAUMATIC STIFF ELBOW FOLLOWING TERRIBLE TRIAD INJURY- A CASE REPORT

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ABSTRACT

A post-traumatic stiff elbow is a dreaded complication that occurs following a terrible triad injury and has to be managed with prompt management. We report a similar case of the 3 months old post-traumatic stiff elbow following a terrible triad injury which was mismanaged by a quack with traditional treatment. Our aim of treatment was to improve the range of motion along with providing proper vocational needs for the patient. We performed the column's procedure and did anterior & posterior arthrolysis along with ulnar nerve decompression to prevent chances of ulnar nerve neuritis in the future. There was a significant improvement in the range of motion with the help of rigorous physiotherapy and dynamic bracing which helped in quicker rehabilitation of the patient.

KEYWORDS

Post-Traumatic, Stiff Elbow, Terrible Triad Injury, Arthrolysis, Ulnar Nerve Decompression

INTRODUCTION-

Terrible triad injuries are a group of the rare and severely unstable fracture-dislocations following which the chance of recurrent instability, elbow stiffness, and functional limitations increases coherently.[1]

To perform normal daily activities, painless motion at the elbow joint is very much necessary and critical[2]. Following a traumatic insult, a cascade of events can lead to a decrease in the normal arc of motion and also cause stiffness of the elbow joint[2]. Over the last two decades, there has been a lot of speculation revolving around the management of terrible triad injuries[3]. Van Riet et al had documented that the majority of the terrible triad injuries need to be managed surgically whereas the non-operative treatment is reserved for a few selected cases[4]. The ones which were not managed adequately had higher chances of turning up into stiff elbow. Post-traumatic elbow stiffness is one of the dreaded complications following terrible triad injuries[3].

The aim of managing the case of the post-traumatic stiff elbow is to have a painless, near-normal range of motion which can help the patient to do daily activities by himself. We are presenting a case of post-traumatic type- 4 stiff elbow (kay's classification) and how prompt management has to lead to satisfactory results.

CASE REPORT-

A 30-year-old male patient presented to the orthopedic OPD with the complaints of not able to do his daily activities and unable to bend his left elbow following trauma which he had suffered 3 months back. The patient gives a history of injury to the elbow following which he developed pain, swelling, and was not able to move his left elbow. The patient after 25 days of negligence took indigenous treatment like compression bandaging by traditional medicine and massaging for 1 month following which he was allowed to move his elbow. On examination, the patient has a fixed flexion deformity of the left elbow at 90 degrees with the forearm fixed at the mid prone position. (Figure-1) There was unusual bony swelling along with deep tenderness present over the lateral aspect of the left elbow. The patient was able to flex 70 degrees to 90 degrees along with restriction of Pronation and Supination movements. The patient was able to do dorsiflexion of the wrist. There were no signs of ulnar nerve entrapment. A 3-point bony relationship was maintained.

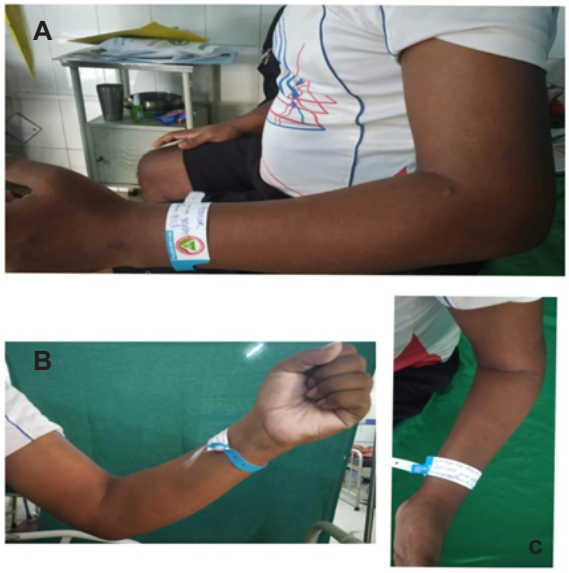

Figure-1-(A, B, C) Preoperative clinical picture showing fixed flexion deformity(90 degrees) of the left elbow and restricted movements (restricted supination and pronation).

Radiographic evaluation was done with digital radiographs and

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computed tomographic scans. (Figure-2 and 3) Heterotrophic ossification was ruled out with the help of radiographs along with normal Alkaline Phosphatase and CRP Levels. The patient was operated by the column's procedure with both anterior and posterior arthrolysis being done by the same posterolateral incision. The fractured Radial head was found to be fibrosed to the lateral aspect of the shaft of radius and it was excised. Intraoperatively, there was evidence of both extrinsic and intrinsic causes for the stiff elbow. Bony ingrowths and fibrous tissue were removed from the articular surfaces and stability& movements were checked, which significantly improved as compared to the preoperative assessment. Prophylactically ulnar nerve decompression was done at the level of the cubital tunnel and arcade of Struthers near medial intermuscular septum of the distal humerus, to relieve the pressure over the nerve and to prevent delayed onset ulnar nerve neuritis. (Figure-4)

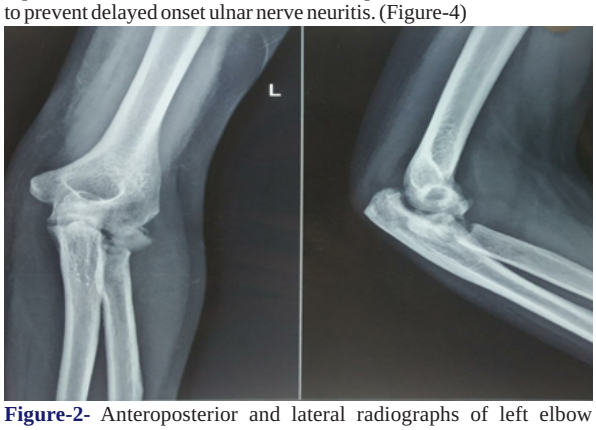


Figure-2- Anteroposterior and lateral radiographs of left elbow showing radial head fracture, coronoid fracture with no evidence of heterotrophic ossification anteriorly and posteriorly to the elbow joint.

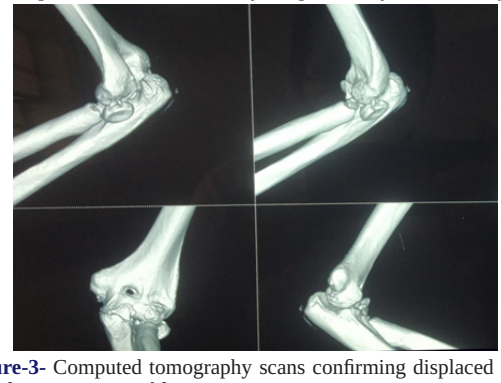
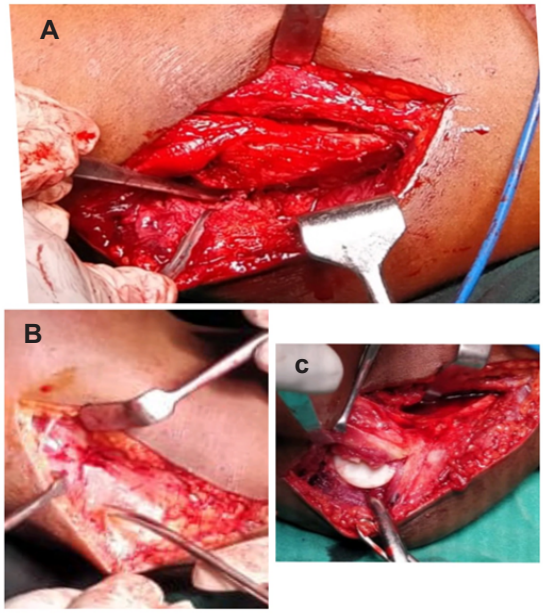


Figure-3- Computed tomography scans confirming displaced radial head fracture, coronoid fracture.



A**Figure-4 (A, B, C)** Intraoperative pics showing anterior and posterior arthrolysis (A) done along with excision of fractured radial head lying over the lateral border of the radial shaft with fibrosis ©. Medially, Ulnar nerve decompression was done at cubital tunnel (B).

Figure-5(A, B, C)- Depicting an intraoperative improved range of motion with improved flexion from 10 degrees to 120 degrees (A and C) along with improvement in pronation and supination (B) under anesthesia.

Coronoid process fractured was identified and it was fixed with pull-through suture technique from posterior to anterior direction. Before the fixation of the coronoid process, the movement had significantly improved from 10 degrees to 120 degrees but after the fixation range was from 20 degrees to 120 degrees. (Figure-5) Surgery was uneventful and the patient didn't suffer from any early post-op complications. The operative wound was healthy and timely suture removal was done on the 12th post-operative day. Postoperatively the patient was started on broad-spectrum antibiotic along with Tab Indomethacin 75 mg for 6 weeks and was allowed dynamic stability exercises with hinge elbow brace applied over the operated elbow. The patient was allowed active movement till the bearable limit of the pain threshold of the patient. Sequential follow-up was done at 2 weeks, 4 weeks, 6 weeks, and 3 months. (Figure-6) Subsequently, the range of motion and DASH scoring was done which showed considerable improvement as compared to preoperative levels.

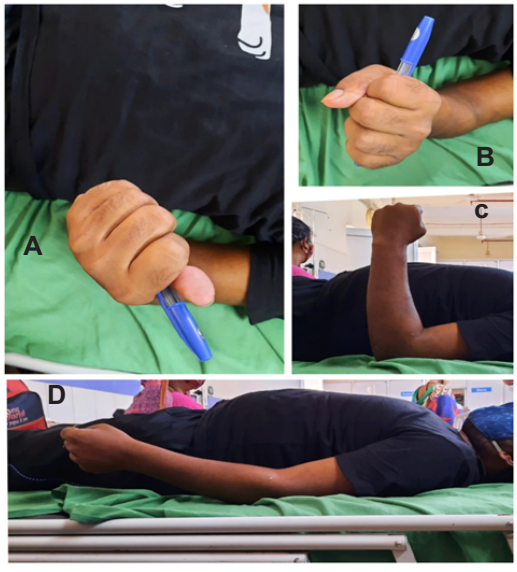


FIGURE-6 (A, B, C, D) - Showing an increased range of motion in 3rd-month follow-up (20 degrees to 90 degrees-flexion and increased supination & pronation)

DISCUSSION-

Terrible triad injuries are a group of complex types of fracture-dislocations which if not managed properly can lead to a stiff elbow, heterotrophic ossification, arthritis, and nerve symptoms. Hotchkiss was the first one to describe this complex type of fracture-dislocation in 1996.[5]

Zhang et al had reported only 2 % chances of recurrent dislocations and no subluxation when the surgery is performed within 2 weeks of injury. The highest complications that were recorded in the review were heterotrophic ossification and arthritis[6]. According to Yang et al's meta-analysis, various risk factors lead to heterotrophic ossification such as male gender, combined radius, and ulna fractures, overall fracture-dislocation, ulno-humeral fracture-dislocations, terrible triad, floating elbow, and delay from injury to surgery.[7]

Various prophylactic approaches have been described for delaying the onset of heterotrophic ossification such as advocating the use of NSAIDs and using low-dose radiation therapy.

Wysocki et al had documented that post-traumatic arthritis is mainly a result of the initial injury probably due to intra-articular fracture or due to the malunion of the fracture. This in turn leads to pain, loss of motion, and function.[8] Previous studies by Murray et al, Morrey et al and Lindenhovius et al discussed the improvement of the range of motion following open arthrolysis in the cases of post-traumatic stiff elbow along with the improvement in the functional scores which corroborated with our case. But they also contemplated that the final pain levels are an important predictor for general health status and disability scores in this section of patients. In our scenario patient had better postoperative pain control which helped in attaining a near-normal range of motion which is important in carrying out his vocational needs.[9,10,11]

There have been reports of complications following open arthrolysis ranging from 0-44 % which includes wound infection, dehiscence, hematoma, and seroma formation in complex cases but in our case, we didn't encounter any of these complications. The idea of performing prophylactic ulnar nerve decompression was procured from the fact that there remains a chance of ulnar nerve neuritis which may occur as a late-onset complication following the procedure of open arthrolysis. To decrease this chance of late complication and second surgery needed following this hitch, it is deemed better to decompress the ulnar nerve at the junction of the cubital tunnel with or without its anterior transposition.[12,13]

CONCLUSION-

Terrible triad injuries remain one of the complicated fracture-dislocations that needs to be managed with the utmost care and management but if the unforeseen complication of the post-traumatic stiff elbow occurs, then we recommend open arthrolysis with prophylactic ulnar nerve decompression along with rigorous physiotherapy including dynamic splinting with hinge elbow bracing depending upon the duration of the pathology and vocational needs of the patient.

Author's note-

The present case report has not been published before nor has been submitted in any other journal.

Ethical concern and conflicts of interest-

Proper ethical consent was taken into consideration and the principle of anonymity was followed. No conflict of interest was reported related to this article.

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