

3 Months Old Post-Traumatic Stiff Elbow Following Terrible Triad Injury - A Case Report and Review of Literature

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INTRODUCTION

Stiff elbow is a common problem associated with terrible triad injuries which if not managed properly can lead to significant functional limitations. Here we are describing a case of post-traumatic stiff elbow following terrible triad who presented to us after taking native treatment primarily. He was treated with open arthrolysis and prophylactic ulnar nerve decompression along with rigorous physiotherapy including dynamic splinting with hinge elbow bracing. The results were satisfactory in achieving a functional range of movement according to the patient's vocational need. This study aims to present the prompt management of post-traumatic stiff elbow case along with functional improvement postoperatively in a decisive way.

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. 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 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 following native bandage treatment and how prompt management has led to satisfactory results.

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PRESENTATION OF CASE

A 30-year-old patient presented to orthopaedic 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 the 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 treatments like compression bandaging and massaging for 1 month following which he was allowed to move his elbow. On examination, the patient has fixed flexion deformity of the left elbow at 90 degrees, forearm at the mid prone position. There is an unusual bony swelling along with deep tenderness present over the lateral aspect of the left elbow.

Patient has only jog of movements in flexion and extension arc restriction of Pronation and Supination movements. On valgus and Varus test elbow was stable. The patient can do dorsiflexion of the wrist. There were no signs of ulnar nerve entrapment. A 3-point bony relationship was maintained.



Radiographic evaluation was done with radiographs and computed tomographic scans. The patient was operated by column 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 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. The 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 at the arcade of Struthers near the medial intermuscular septum of the distal humerus, to relieve the pressure over the nerve and to prevent delayed onset ulnar nerve neuritis.

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 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



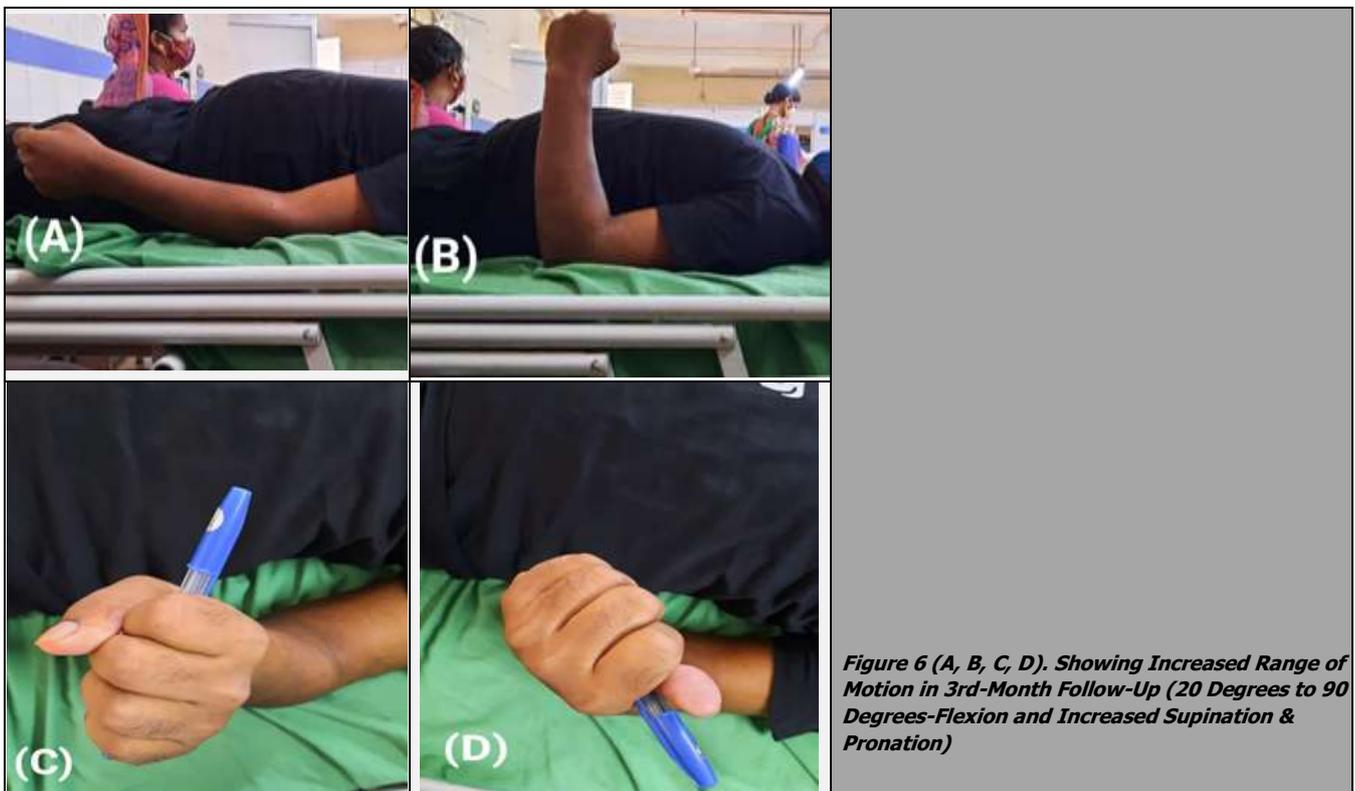
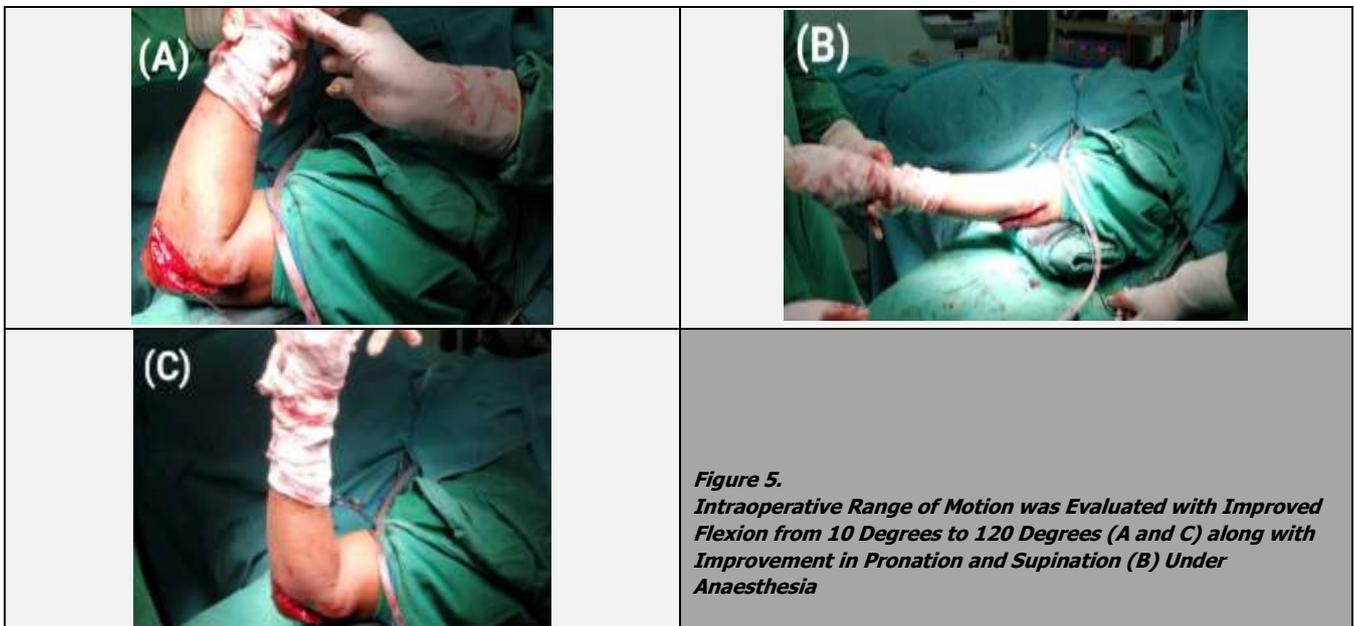
Figure 4a. Intraoperative Pics Showing Anterior and Posterior Arthrolysis



Figure 4b. Medially, Ulnar Nerve Decompression was Done at Cubital Tunnel



Figure 4c. Done along with Excision of Fractured Radial Head Lying Over the Lateral Border of the Radial Shaft with Fibrosis



Intraoperatively the stability was assessed. The elbow was stable in throughout flexion and extension range of movement however on valgus stress test there was mild opening of Ulnohumeral joint. The surgery was non-eventful 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. Subsequently, the range of motion and DASH scoring was done which showed considerable improvement as compared to preoperative levels.

DISCUSSION

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

complex type of fracture 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. 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.⁶ 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.^{7,8,9} In our scenario patient had better postoperative pain control which helped in attaining a near-normal range of motion which is important carrying his vocational needs.

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.¹⁰ The highest complications that were recorded in the review were heterotrophic ossification and arthritis.¹¹ 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.

There have been reports of complications that have been reported 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 remain chances of ulnar 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}

CONCLUSIONS

Terrible triad injuries remain one of the complicated fracture-dislocations that need to be managed with utmost care and management but if the unforeseen complication of the post-traumatic stiff elbow occurs, we managed a case of the post-traumatic stiff elbow following fracture-dislocation of the elbow by open arthrolysis with prophylactic ulnar

nerve decompression along with rigorous physiotherapy including dynamic splinting with hinge elbow bracing. The results are satisfactory in achieving a functional range of movement according to the patient's vocational need.

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Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

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