

ULNAR NEURITIS ASSOCIATED WITH GUN STOCK DEFORMITY FOLLOWING SUPRACONDYLAR FRACTURE OF HUMERUS.

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ABSTRACT

Background: This case report describes a patient who was referred to physiotherapist from a hand surgeon. Among the fractures around the elbow joint, radial head fracture and fracture of distal end of radius are common among adults. The occurrence of Supracondylar fractures are more commonly seen in children when compared to adults. One of the complications of this fracture is malunion resulting in Gun stock deformity. The main Purpose of this case report is to explore, 1. The complication associated with gunstock deformity 2. Chances of iatrogenic nerve injury after manipulation under anesthesia. 3. Long term supervised rehabilitation approach

Case Description: A 40 years old male patient referred to our Physiotherapy department by a hand surgeon. After the initial evaluation, findings revealed limitation in right elbow movement and tingling and numbness sensation in little and half of ring fingers in his right side. This patient underwent ulnar nerve transposition surgery followed by rehabilitation. His physiotherapy session includes electrotherapeutic agents for pain relief, passive mobilization of elbow and strengthening program for his flexors and extensors of elbow for a period of one year.

Outcome: The outcome of the long term rehabilitation approach for a patient with ulnar neuropathy secondary to gunstock deformity after ulnar nerve transposition surgery is good. The patients tingling and numbness decreased and the range of elbow movement improved significantly.

Discussion: Most common complications of fracture of distal end of humerus include malunion, ischemic contracture and nerve injuries. The relative incidence of iatrogenic nerve injuries associated with this fracture has been reported as being 2% - 6%. Nerve injuries after Supracondylar humeral fractures occur primarily due to tenting or entrapment of the nerve on the sharp proximal humeral fragment, while iatrogenic injuries occur either during closed manipulation or percutaneous fixation of the fracture fragments or occasionally during open procedures. Long term Supervised rehabilitation is significant in minimizing the symptoms of the patient.

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BACKGROUND:

Distal humerus fractures in adults are relatively uncommon injuries, representing only 3% of all fractures in adults. In young adults, most distal humerus fractures occur from high-energy trauma, sideswipe injuries, motor vehicle accidents, falls from heights, and gunshot wounds. The occurrence of Supracondylar fractures are more commonly seen in children when compared to adults. Supracondylar fractures result from a fall on an outstretched arm in up to 70 percent of patients¹. The presence of associated injuries may result in greater risk of malunion and decrease in the average flexion-extension range of motion². The main complications of this fracture are mal-union resulting in cubitus varus deformity, ischemic contracture. Damage to ulnar, median, or radial nerves. Cubitus varus deformity stems from malreduction of fracture, with medial displacement, internal rotation, and extension of the distal fragment, deformity is more cosmetic than limiting of any function³, however internal rotation of the radius over the ulna may be limited due to the overgrowth of the humerus. This may be noticeable during an activity such as using a computer mouse. Ulnar neuropathy may develop from irritation to the ulnar nerve from the post traumatic osteoarthritic changes at the elbow joint⁴, or from manipulation under anesthesia for improving dysfunctional range of motion⁵. Physiotherapy plays an important role in restoring the lost range of motion and improving the functional activities. The main Purpose of this case report is to explore, 1. The complication associated with gunstock deformity 2. Possibilities of iatrogenic nerve injury after manipulation under anesthesia. 3. Long term supervised rehabilitation approach.

CASE DESCRIPTION:

A 40 years old male patient referred to our Physiotherapy department by a hand surgeon. After the initial evaluation, findings revealed limitation in right elbow movement and tingling and numbness sensation in little and half of ring fingers in his right side.

His Medical report shows that he met with motor vehicle accident (fall down on outstretched hand from his motor bike) in December 2012. He was taken to a nearby hospital where the local doctor took X-ray and diagnosed as undisplaced Supracondylar fracture which was treated by closed reduction and POP Casting. After 5 days as he is still having pain he went to another Hand specialist center for second opinion, there the surgeon reviewed the X-ray and found undisplaced Supracondylar fracture associated with head of radius fracture. An urgent open reduction and internal fixation surgery is done using plate and screw. After surgery he is referred for physiotherapy, he underwent physiotherapy weekly 3 times for about 2 months. After 2 months he saw the surgeon for follow up and as the range of motion is not improved as expected surgeon suggested him the option of Manipulation under Anesthesia (MUA). He underwent MUA in March 2012 and continued physiotherapy, after few days of MUA he noticed swelling over his elbow and tingling and numbness over his little finger and half of the ring finger. He consulted the hand surgeon and on advice of the surgeon he did Nerve conduction study. NCV studies revealed latency in the ulnar nerve conduction velocity. As the tingling and numbness is increasing he underwent ulnar nerve transposition surgery on January 2013(Fig. 1).



Fig. 1



Fig. 2

He is regularly attending physiotherapy since February 2013. Initial examination revealed limitation of flexion and extension movements of elbow, supination and pronation movements of forearm, decrease in grip strength, biceps and triceps muscles strength, tingling and numbness sensation in his little and half of ring fingers, he developed Gun stock deformity (Fig. 2), all the above affected his activity level. Physiotherapy session includes electrotherapeutic agents for pain relief, passive manual mobilization of elbow for improving the lost range of motion and strengthening program for his flexors and extensors of elbow and intrinsic muscles of hand by using Theraband, free weights, squeezing balls and hand gripper. He attended Physiotherapy 3 times a week for 12 weeks later reduced to 2 sessions per week.

OUTCOME:

The long term supervised rehabilitation approach proved to be beneficial for this patient. Overall his functional activities improved. Elbow Range of motion improved significantly, grip strength, biceps and triceps strength improved, tingling and numbness reduced.

DISCUSSION:

The occurrence of Supracondylar fractures in adults is relatively rare. The specific cause of ulnar neuropathy in this case is not clear. According to the patient in this case, symptoms of ulnar neuritis

appeared after the MUA procedure. So the possibilities of ulnar neuritis after manipulation under Anesthesia can be considered, however osteoarthritic changes due to gunstock deformity should not be overseen. The relative incidence of iatrogenic nerve injuries associated with this fracture have been reported as being 2% - 6%⁶. The radial and anterior interosseous nerves are thought to be those most commonly involved by the fracture itself; iatrogenic damage most commonly affects the ulnar nerve⁷. Studies suggest that iatrogenic injuries in case of Supracondylar fractures occur either during closed manipulation or percutaneous fixation of the fracture fragments or occasionally during open procedures⁸. Symptoms of ulnar neuritis decreased significantly after the ulnar transposition surgery, addition of Physiotherapy enhanced the recovery process.

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