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# Case Report on Isolated Musculocutaneous Nerve Injury Following a Wrestling Match

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***Abstract:*** *Case Report: We describe a rare case of a 27 year old man with a 7 days history of inability to actively flex his right elbow joint and loss of sensation over lateral surface of right forearm following a wrestling match .Clinical, radiological and nerve conduction studies showed it to be an isolated musculocutaneous nerve injury. The patient responded to conservative measures. An extensive search of the literature indicated the rarity of this type of injury.*

***Conclusion :*** *Isolated musculocutaneous nerve injury is very rare. Available literature does not reveal any case following wrestling.*

***Keywords -*** *musculocutaneous nerve injury, nerve conduction studies, wrestling.*

## I. Introduction

The common cause of inability to actively flex the elbow following trauma are either a rupture of the tendon of biceps brachii muscle or of lesions of the brachial plexus (which gives rise to the musculocutaneous nerve which supplies the main flexors of the elbow, namely the biceps brachii and brachialis muscle). Isolated musculocutaneous nerve injury in which there is significant loss of power of flexion of the elbow without the accompanying signs of injury to the biceps brachii and brachial plexus injuries is very uncommon, as seen by an extensive review of the available literature.

Although this is not the first case of musculocutaneous injury following sports mentioned in the literature, our aim is to draw attention to an uncommon condition which has to be kept in mind while examining a patient with loss of power of active elbow flexion following trauma.

## II. Case Report

A 27 year old right dominant employee of a paramilitary organization who indulges in competitive wrestling presented with a 7 days history of difficulty in flexing the right elbow joint. He reported that after a wrestling match in which his elbow was pulled against the knee of the opponent player, he noticed inability to flex the right elbow joint and decreased sensation over the lateral surface of right forearm. He also had laxity of muscles of the arm on the flexor surface. No history of any significant pre-existing medical conditions was elicited.

Clinically on inspection muscles over the anterior aspect of arm were lax, on palpation they showed decreased tone. Active elbow flexion from the fully extended position of the forearm was not possible, but was possible when the forearm was first flexed passively about 20 degrees when the common forearm flexors and extensors helped in the movement, though at greatly reduced power. There was also a decreased sensation on the radial aspect of the right forearm. Passive elbow range of motion was normal. Biceps jerk was absent.

Signs of biceps muscle rupture such as tenderness at its attachments and bunching up of the belly on attempted active flexion were absent. Also, signs of brachial plexus lesions such as weakness of the deltoid and brachioradialis (upper plexus lesions) and short muscles of the hand (lower plexus lesions), sensory loss of other parts of the arm and forearm, and the typical attitude of internal rotation and pronation of the limb were absent. Acute Brachial plexus neuritis, which can also follow trauma, was also excluded from the diagnosis by the absence of significant pain in the shoulder region or radiating pain or paraesthesias. There was also no history of neck pain or radiculopathy.

X-ray of elbow, arm and shoulder and cervical spine showed no abnormality. CT of shoulder joint and MRI showed normal biceps belly and insertions and no brachial plexus injury was noted. Nerve conduction study showed right sided musculocutaneous neuropathy without injury to other neighboring nerves or brachial plexus. Routine blood parameters were within normal limits.

The patient was treated conservatively with initial rest and neurotropic drugs, followed by graduated resisted movements. Follow-up at two, four, eight weeks and 6mnths showed gradual improvement of elbow flexion power. The patient gradually improved fully on conservative management.

**Figure 1 :** shows decreased contraction of right side flexors of arm following injury.

**Figure 2** showing nerve conduction study – isolated musculocutaneous nerve injury( right side)

**Figure 3** showing normal shoulder abductors bilaterally.

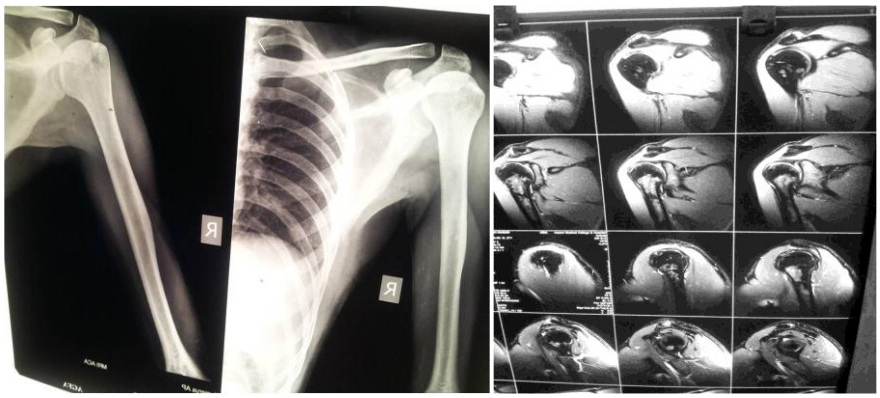

**Figure** shows normal x rays and MRI of right shoulder.

## III. Discussion

The musculocutaneous nerve, a mixed nerve as its name implies, originates from the lateral cord of the brachial plexus and receives fibres predominantly from the $5^{th}$ and $6^{th}$ cervical segments, passing obliquely though the coracobrachialis to enter the arm where it supplies motor branches to this muscle as well as the primary flexors of the elbow, that is the biceps brachii and brachialis muscles. It then enters the forearm and continues as the lateral antebrachial nerve of the forearm, supplying sensory fibres to its lateral aspect.

Injuries of this nerve are rather infrequent. When they do occur they do so as part of a partial or complete brachial plexus injury. Isolated musculocutaneous nerve injuries are even rarer occurrences. These are sometimes seen as a complication of major shoulder joint surgery. Rarer still are isolated musculocutaneous nerve injuries as a result of sporting activities. A review of the literature reveals mention of few such cases

reports. Though rare, the musculocutaneous nerve is prone to injury in its upper course, as it lies on the subscapularis muscle, its entry point into the coracobrachialis muscle is variable, and also because the nerve occasionally bifurcates[1]. The nerve here is prone to injury in anterior shoulder surgery and careless retraction of the coracobrachialis, in arthroscopic procedures, and positioning for anesthesia or operation[2]. Most of the mentions in the literature, though they themselves are rare, are due to such surgical procedures. As far as sports and the injury are concerned, the nerve may be stretched across the humeral head and coracoids process in the throwing athlete[3,4], and a few cases have been reported of such injuries. Engorgement of the coracobrachialis muscle, as in weightlifters and rowers, may also affect the nerve[5]. The nerve is also prone to stretch and damage in forceful hyperextension of the elbow[3], a definite possibility in a wrestling match. Our case probably sustained this last-mentioned type of injury as he gives a history of his elbow being pulled against his opponent's knee, though it is difficult to be entirely certain as the patient is unable to recall the exact entire chain of events.

**Anatomy:**

Branch of lateral cord of brachial plexus arising at lower border of pectoralis minor. Root value : ventral rami of C5 –C7 segments of spinal cord. Main nerve of the front of the arm and continues below the elbow as lateral Cutaneous nerveof forearm. Motor supply corachobrachialis, biceps (long and short heads) and brachialis.

**Cutaneous** – skin of lateral surface of forearm from elbow to wrist, articular braches: elbow joint. Communicating branches with radial and posterior cutaneous branch of Median Nerve.

**Mechanism of injury:**

Musculocutaneous injury is generally associated with brachial plexus injuries, anterior shoulder dislocation [6] and shoulder surgeries[1,2], it is also seen in sports injuries like weight lifting and rowing due to engorgement of coracobrachialis muscle, musculocutaneous is vulnerable to injury proximally where it lies on subscapularis . Because the entry point of coracobrachialis is unpridictable and it bifurcates.The distace between the coracoid and the entry point of nerve into coracobrachialis is around 3 to 8.2 $cm^7$ so any anterior shoulder surgery like modified bristows procedure and arthrocopy can damage the nerve[8,9,10]**.** Dissection of subcapularis can damage the nerve as it enters the muscle as close as 1 cm medial to the border of glenoid . Forceful hyperextension of elbow is also attributed to nerve injury, its variable position of penetration in coracobrachialis muscle make it susceptible to injury during surgical procedures about the shoulder.

**Clinical presentation:**

Musculocutaneous nerve injury leads to severe weakness of elbow flexion. very weak flexion possible due to minor flexors, some weakness of forearm supination, loss of biceps reflex, sensory loss in distribution of lateral cutaneous nerve of forearm.

**Differential diagnosis:** biceps tendon injury and brachial plexus injury.

## IV. Conclusion

- Isolated musculocutaneous nerve injury is very rare.
- Available literature did not reveal any case following wrestling.
- Our case recovered fully on conservative treatment.

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