

Isolated traction injury to the suprascapular nerve

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Abstract: Isolated injury to the suprascapular nerve as a result of traction force is a rare occurrence. We report the case of a 26 year male patient who presented with wasting of supraspinatus and infraspinatus muscles and restricted shoulder abduction and external rotation following a road traffic accident. He had associated fractures in the clavicle and humerus. At operation neuroma in the suprascapular nerve was resected and nerve repair done with an interposed sural nerve graft. Patient restored full range of shoulder abduction after 8 months of nerve grafting. This report highlights an isolated involvement of the suprascapular nerve in a traction injury and an excellent outcome following microneural reconstruction.

Keywords: shoulder injury, suprascapular nerve

INTRODUCTION

The suprascapular nerve is a mixed nerve (mainly motor) that arises from the upper trunk of brachial plexus formed by the C5 and C6 roots. Lee et al identified a contribution from the C4 root in 22 percent of 152 brachial plexus dissections¹. From its origin it courses through the posterior triangle of the neck and then laterally, deep to the trapezius muscle, towards the suprascapular notch, where it passes under the suprascapular ligament. Just proximal or distal to the notch it gives off one to three motor branches to the suprascapular muscle. Then the main nerve continues inferiorly towards the spinoglenoid notch. Here it passes through a fibro-osseous tunnel formed by the spinoglenoid ligament and the spine of the scapula, and finally ending in 2 to 4 motor branches to the infraspinatus muscle.

Suprascapular neuropathy can occur as a result of traction, direct trauma, or extrinsic compression or as part of a more generalized brachial plexus lesion. In the traumatic aetiology, scapular and clavicular fractures and shoulder dislocation are accounting for the majority of cases². Overuse of the nerve as occurs in extremes of overhead motion is another cause of neuropathy. Ferretti et al identified asymptomatic atrophy of the infraspinatus muscle in twelve of ninety six top level volleyball players³. Compression by a ganglion cyst or tumor is also a cause of suprascapular neuropathy, particularly at the level of the spinoglenoid notch⁴.

Suprascapular nerve is commonly injured in brachial plexus lesions, either at its origin from the upper trunk or distally near the suprascapular notch. These are the two fixed points during traction injury. However, isolated injury to the suprascapular nerve as a part of traction injury and without involvement of rest of brachial plexus is a rarity. We report a case of isolated injury to the suprascapular nerve repaired with a nerve graft.

CASE REPORT

A 26 year old male patient sustained a motorbike accident resulting in displaced fracture in the middle third of clavicle and fracture in the shaft of humerus. Clavicular fracture was managed conservatively in a peripheral hospital. Humeral fracture was managed by open reduction and internal fixation (Fig 1). After 3 month of injury patient suffered limited abduction (Fig 2) and absent external rotation. He was subjected to intensive

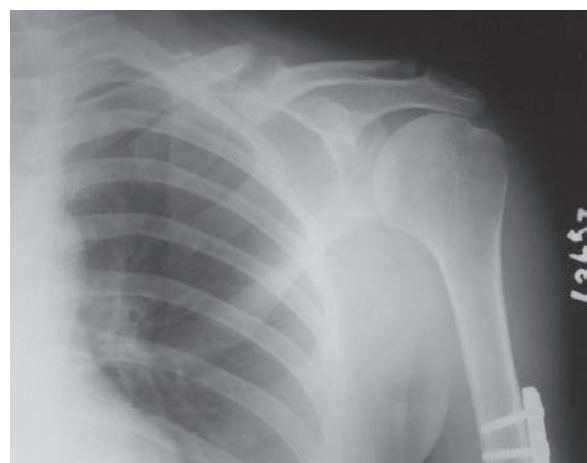


Fig 1 : Fractures in clavicle and humerus

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Fig 2 : Limited shoulder abduction and absent external rotation

physiotherapy for 2 months. At 5 months post injury there was no recovery in movements. Examination revealed wasting of supraspinatus and infraspinatus muscles (Fig 3). Electromyography demonstrated fibrillation potentials in the affected muscles.

He was explored through a transverse supraclavicular incision with partial detachment of trapezius muscle from the clavicle (Fig 4). The suprascapular nerve was found

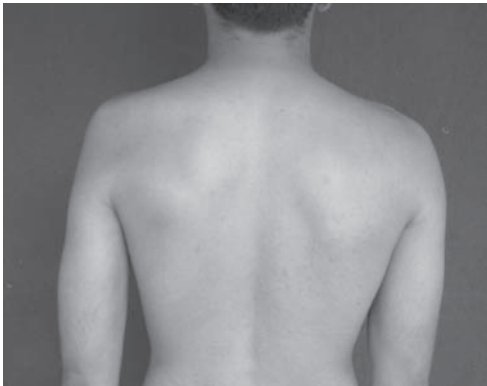


Fig 3 : Wasting of supraspinatus and infraspinatus muscles



Fig 4 : Supraclavicular incision

to be injured about 8 mm distal to its take off point in the upper trunk of brachial plexus. At the site of injury there was a 2 cm long neuroma (Fig 5). Distal to the neuroma 3 cm segment of the nerve was scarred. Exploration of the rest of brachial plexus was normal. Neuroma was dissected under operating microscope. One of the fascicle was intact and preserved (Fig 6). After resection of the neuroma and scarred segment of the suprascapular nerve, a 5.5 cm long sural nerve graft was interposed (Fig 7). Postoperatively arm was strapped

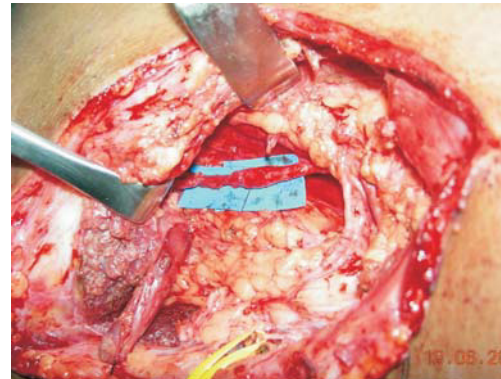


Fig 5 : Neuroma in the suprascapular nerve (SSN)

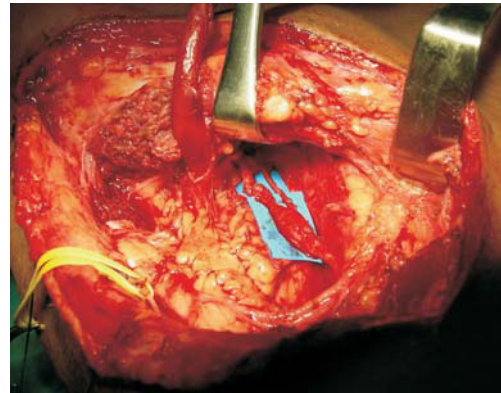


Fig 6 : Neuroma resected, one fascicle was intact, distal to neuroma a segment of SSN was scarred

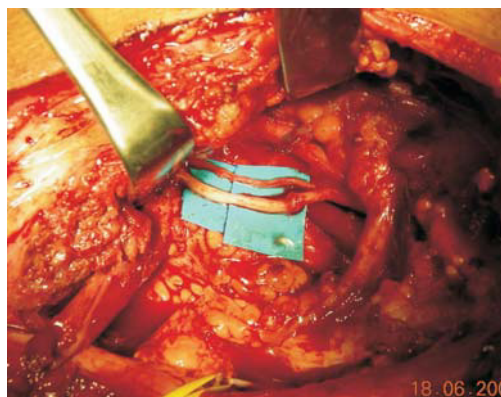


Fig 7: Nerve defect reconstructed with sural nerve graft

to the chest for 4 weeks. Then gradually increasing passive movements were started. At 8 months follow up patient had restored full range of active shoulder abduction (Fig 8) and 40° of external rotation.



Fig 8 : Full range of abduction at 8 months follow up

DISCUSSION

Suprascapular nerve is commonly injured in devastating brachial plexus lesions and is most often treated by nerve transfer; the spinal accessory nerve being the commonest motor donor. Isolated injury to the suprascapular nerve occurs with fractures of scapula, clavicle and in shoulder dislocations. The nerve in such cases is most commonly injured near the suprascapular notch. Huang et al report a case of suprascapular neuropathy complicating a Neer type I distal clavicular fracture⁵. The suprascapular nerve was found entrapped in scar tissue located proximal to the suprascapular notch. Patient was treated with release of transverse scapular ligament and external neurolysis. One month later, patient could effectively elevate his arm to 180° and externally rotate his shoulder to 75°.

Traction injury to the suprascapular nerve can occur at the suprascapular or spinoglenoid notch secondary to repetitive microtrauma, primarily from overhead activities (playing volleyball³, tennis, weight lifting etc).

Repetitive microtrauma may lead to direct injury to the nerve or to indirect injury by affecting the vascular supply to the nerve^{6,7}. Intimal damage to the axillary or suprascapular artery may lead to microemboli that become trapped in the vasa nervorum, leading to ischaemic injury to the suprascapular nerve.

In the case reported here the suprascapular nerve was injured in its proximal part (well above the clavicle), with no injury to the other parts of brachial plexus. We attribute this to a traction injury rather than a local trauma caused by an associated clavicular fracture. Patient had sustained a high velocity motor-cycle accident and the supraclavicular area was relatively scar free as is evident in the clinical photographs. Repair of nerve with an intervening sural nerve graft produced good clinical results. To the best of our knowledge, so far no such injury to the suprascapular nerve has been reported in the literature.

REFERENCES

1. Lee HY, Chung IH, Sir WS, et al. Variations of the ventral rami of the brachial plexus. *J Korean Med Sci* 1992; 7: 19-24.
2. Cummins CA, Terry TM, Nuber GW. Suprascapular nerve entrapment. *J Bone Joint Surg* 2000; 82A: 415-24.
3. Ferretti A, Cerullo G, Russo G. Suprascapular neuropathy in volleyball players. *J Bone Joint Surg* 1987; 69A: 260-63.
4. Inokuchii W, Ogawa K, Horicuchi Y. Magnetic resonance imaging of suprascapular nerve palsy. *J Shoulder Elbow Surg* 1998; 7: 223-7.
5. Huang KC, Tu YK, Huang TJ, Hsu RWW. Suprascapular neuropathy complicating a Neer type I distal clavicular fracture: A case report. *J Orthop Trauma* 2005; 19: 343-5.
6. Romeo AA, Rotenberg D, Bach BR. Suprascapular neuropathy. *J American Acad Orthop Surgeons* 1999; 7: 358-67.
7. Ringel SP, Treihaff M, Cary M, Fisher R, Jacobs P. Suprascapular neuropathy in pitchers. *Am J Sports Med* 1990; 18: 80-86.