

## Coincidental Spinal Accessory Nerve Injury In Patient With Spinal Cord Injury : A CASE REPORT

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### Introduction

The spinal accessory nerve (SAN) is the pure motor innervation to the trapezius and sternocleidomastoid (SCM) muscles. The trapezius muscle is a major stabilizer of the scapula. The SAN injury causes weakness of the trapezius, which leads to scapular winging. Most of the reported cases of SAN injury are associated with iatrogenic injury caused during various surgical procedures in the posterior triangle of the neck, such as tumor resection, cervical lymph node biopsy, and radical neck dissection. It can hardly find a case which has SAN injury in a patient with a spinal cord injury (SCI).

### Case Presentation

A 46-year-old man with thoracic spinal cord compression due to subluxation of T3-4 and T11-12 by pedestrian traffic accident admitted for rehabilitation after surgery. His motor power was grade 3/5 in the shoulder, grade 4/5 to 5/5 in the distal upper extremity and grade 0/5 in the lower extremities. Neurological examination revealed atrophy of the left SCM (Sternocleidomastoid muscle) and trapezius, and scapular winging of the same side was also observed (Figure1). There was no definite evidence to suspect left winged scapular on Brain MRI or C-spine MRI. The MRI shows the left SCM atrophy (Figure2). In electrodiagnostic study, the amplitude of CMAPs (compound muscle action potential) in both trapezius was low, and denervation potentials was found in left trapezius, left SCM, left supraspinatus, left pronator teres, left flexor carpi radialis and neuropathic potential in Right trapezius, right SCM and the Result of this test suggested a bilateral spinal accessory nerve injury(Left dominant) and left C6 radiculopathy. In order for the patient to perform the wheelchair-bed, wheelchair-toilet transfer independently, the patient performed shoulder girdle muscle strengthening and transfer training. After 2 months of rehabilitation therapy, the patient's shoulder muscle power was improved from grade 3/5 to 4/5, but the independent wheelchair transfer, which was our rehabilitation goal, was not achieved.

### Conclusion

The Accessory nerve has a cranial and spinal portion. The cranial portion arises from the medulla, and passes through the jugular foramen (see Figure 3.). The cranial portion contributes fibers to pharynx and intrinsic laryngeal muscles. The spinal portion from the spinal cord enter the posterior fossa through the foramen magnum, and then leave the skull through the jugular foramen to innervate the sternocleidomastoid and trapezius muscles. We assumed that the injury would be caused by some forces at the cervical level when he got accident because he has no dysfunction relating cranial portion of the

accessory nerve, and no definite Injury around jugular foramen seen in the brain MRI. Although it is rare, the SAN injury in SCI patients is a debilitating condition that limits functional development.

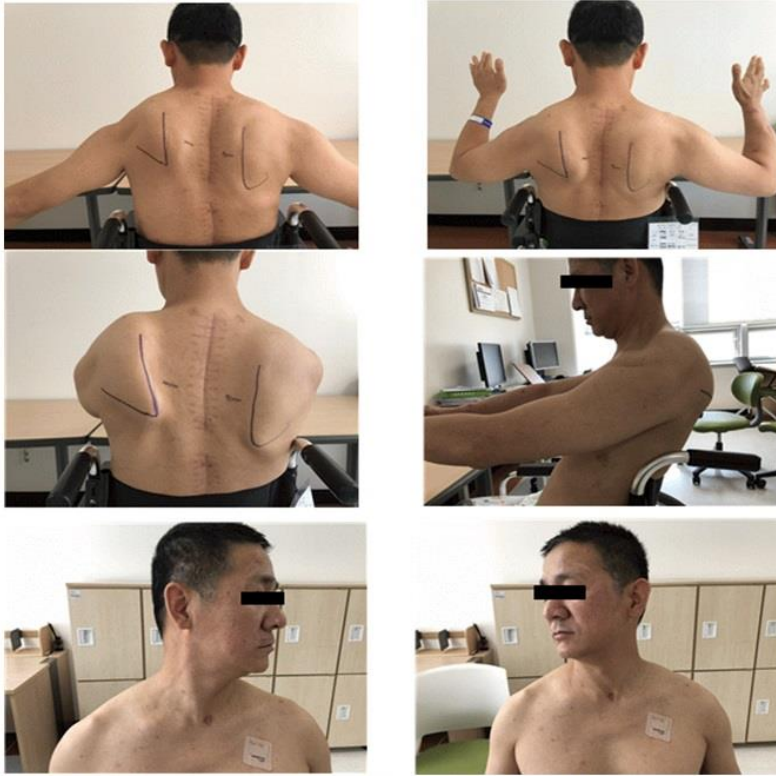


Figure 1. Winged scapular and atrophy of left sternocleidomastoid muscle.

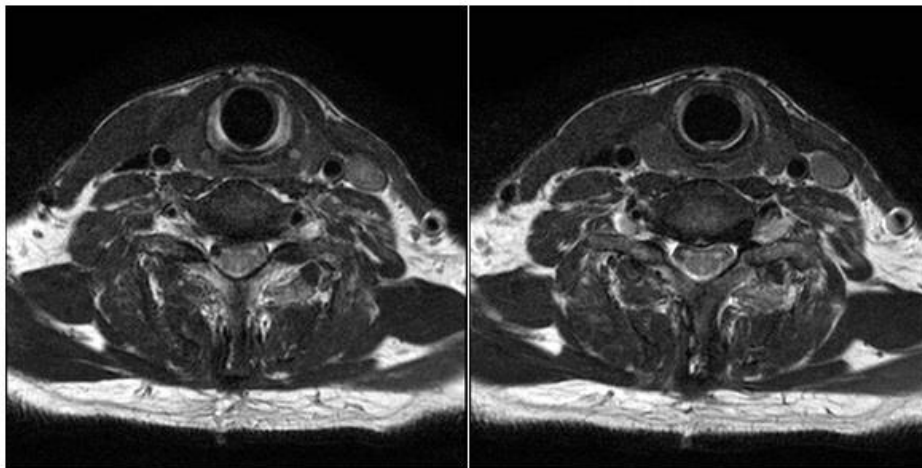


Figure 2. The MRI shows atrophy of left sternocleidomastoid muscle.

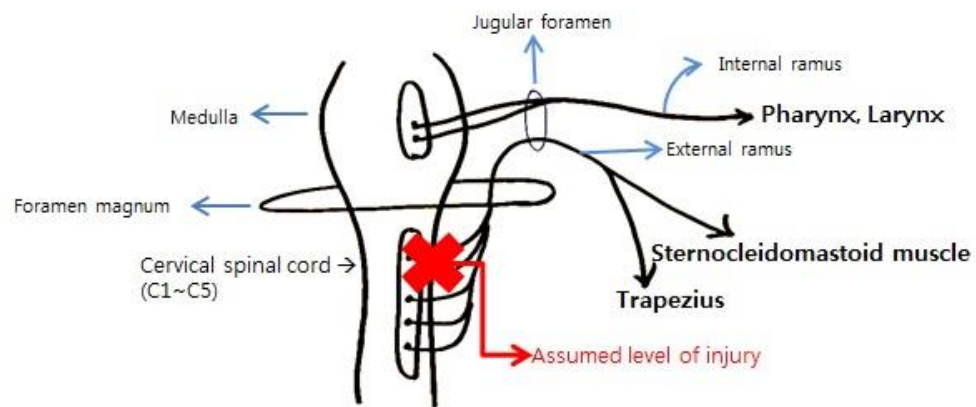


Figure 3. Anatomy of the accessory nerve