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Concomitant trigeminal nerve and hypoglossal nerve injury after anterior surgery to cervical spine

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Introduction

The anterior surgical approach to the cervical spine has been commonly used for the treatment of cervical discopathies and it has been associated with complications such as dysphagia, dysphonia and airway compromises. The hypoglossal nerve arises from the hypoglossal nucleus and passes through the hypoglossal canal. The hypoglossal nerve reforms and descends through the neck to the angle of the mandible and travels underneath the tongue to innervate the tongue muscles. The cervical segment of hypoglossal nerve can be exposed during various surgical interventions in the cervical spine and neck area. The trigeminal nerve has three sensory and one motor nuclei. The spinal trigeminal tract emerges from the sensory root in the pons and descends as low as the C3 or C4 segments of the spinal cord. This is the first report to present a case of concomitant trigeminal nerve and hypoglossal nerve injury confirmed by an electrodiagnostic study after anterior surgery to the cervical spine.

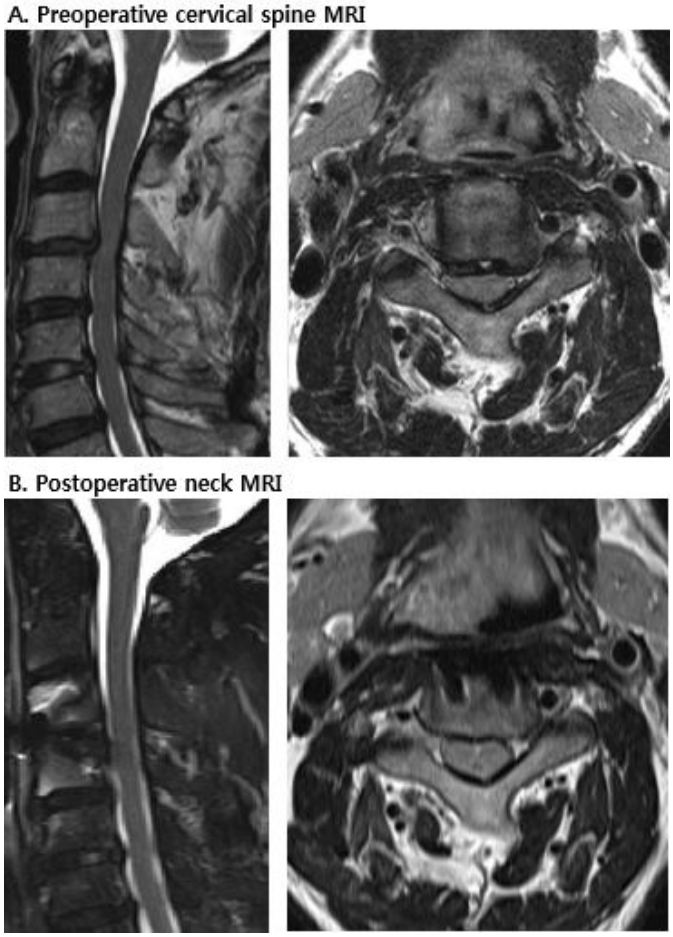
Case presentation

A 59-year-old man with no past medical history had complained of 1-year old weakness of both upper and lower extremities, tingling sensation on both upper extremity, difficulty of voiding and defecation. MRI had revealed herniated intervertebral disc on the C3-C4 level and direct cord compression with cord signal change on the same level. He had received anterior cervical disc fusion through the right side approach on the C3-C4 level. Following the surgery, he complained of difficulty of tongue movement, dysarthria, hypophonia, mastication and swallowing. He had hypesthesia along the lower margin of right mandible, weakness and atrophy of right tongue with deviation to the right side whereas his facial motor was intact. The strength of trapezius and sternocleidomastoid muscle was intact. Both vocal cord mobility and airway was intact. Neck MRI showed atrophy and signal change of right tongue suggesting secondary deformity related with right hypoglossal nerve palsy. The video fluoroscopic swallowing

study showed impaired oral phase of swallowing. The articulation test revealed he had mild dysarthria. The abnormal spontaneous activities such as complex repetitive discharge and decreased recruitment pattern in right tongue muscle were presented in the needle electromyography. Also, trigeminal somatosensory evoked potential study revealed delayed response on the right side. Even though he received rehabilitation therapy regarding impaired tongue movement for more than 2 years, his condition maintained without recovery.

Conclusions

We report a case of concomitant trigeminal and hypoglossal nerve injury after anterior surgery to the cervical spine. It is necessary to remind the complexity of the anatomy of hypoglossal nerve and trigeminal nerve system and to be cautious to avoid severe morbidity caused by damage on those neural structures during the surgical procedure.



Preoperative images of cervical spine MRI (A) showing diffuse disc bulging on the C3-C4 level and direct compression of spinal cord with internal cord signal change and postoperative images of neck MRI (B) showing central canal decompression of spinal cord after anterior cervical disc fusion at the C3-4 level.

Fig. 1 Photograph showing deviated and atrophied tongue toward the right side.

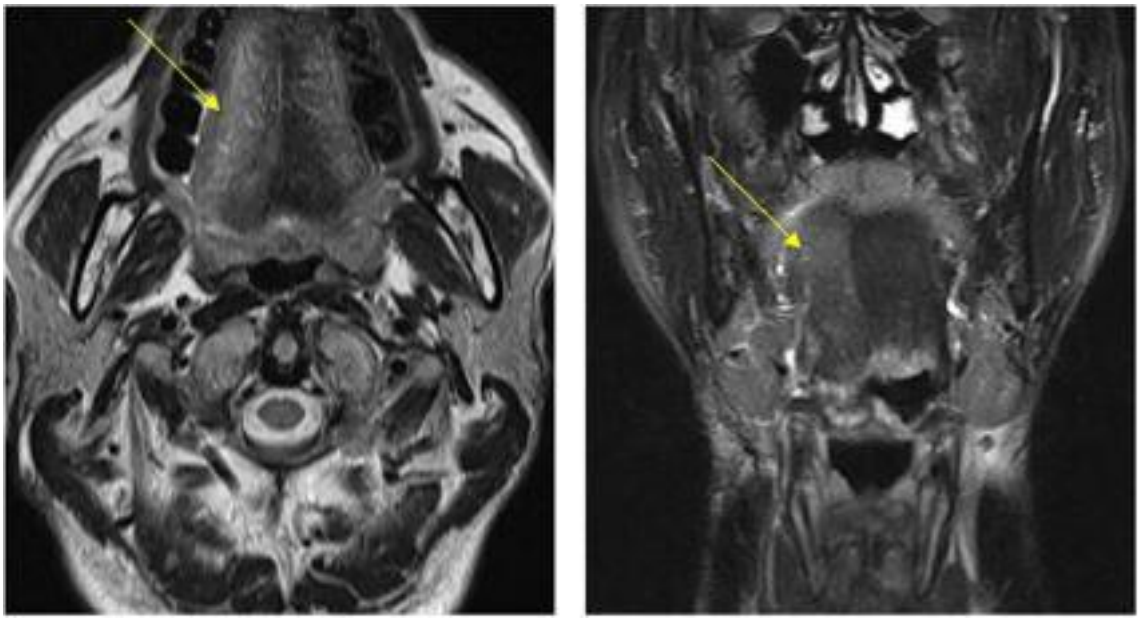


Fig. 2 Neck MRI images showing T2 high signal change with atrophy of right tongue (yellow arrows).