

Isolated Unilateral Hypoglossal Nerve Injury Associated with the Endotracheal Intubation

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Cranial nerve injuries are well-recognized complications of laryngoscopy and tracheal intubation and face mask ventilation. Most of injuries were thought to be related to suboptimal use of the laryngeal mask airway (LMA[®]) [1]. We report a case of isolated unilateral hypoglossal nerve injury that was associated with use of the tracheal intubation during shoulder arthroscopy operation.

A male patient of age 24 yr was referred to P. Stradins clinical university hospital in department of neurology because he was complaining of a dysarthria and clumsy tongue movements that developed after anaesthesia. Immediately after the operation, the patient noticed speech difficulties and deviation of the tongue. No other symptoms were noticed. The patient was discharged on the same day after surgery from orthopedic clinic. Whereas the symptoms held one week without reduction, he was admitted to our hospital with the main complaint of speech difficulties. Neurological examination revealed right hypoglossal nerve (XII) palsy – deviation and ipsilateral mild atrophy of the tongue without signs of the cranial nerve palsies as well as pyramidal signs or Horner syndrome. The patient had no past medical history. We got a contact with a surgeon who performed the operation to find out the circumstances of the procedure that lead to nerve injury. The patient underwent arthroscopy shoulder

operation in the semi-beach chair position one week before. Following fiberoptic tracheal intubation without sedation, general anaesthesia was administered. The operation lasted for one hour. The surgeon noted, that there were no adverse events during the maintenance of anaesthesia or emergence from it. Haemodynamic parameters remained within normal limits. The head and neck were not moved during the operation. There was no visible blood on the surface of the tube at removal. During hospitalization in our hospital computer tomography (CT) of the brain and the base of the skull, magnetic resonance imaging (MRI), and electromyography (EMG) were performed. CT and MRI showed normal condition of the brain structures and cranial nerves, the skull was unremarkable also. Needle EMG of the tongue showed denervation changes in the muscles supplied by the right hypoglossal nerve. EMG findings in the opposite side of the tongue were normal. Routine blood analysis was normal. For better recovery the patient had speech therapist consultation. With conservative management and reeducation therapy the patient was discharged from our hospital. At the follow-up, 1 month after surgery, further improvement in tongue movements was observed. The transient nature of the injury and the rapid return of the nerve to baseline function in this case are consistent with a neurapraxic injury.

DISCUSSION

Isolated hypoglossal nerve palsy can represent a diagnostic challenge in everyday neurological practice. The hypoglossal nerve is a pure motor nerve that innervates intrinsic as well as extrinsic muscles of the tongue. It could be divided into five segments: medullary (nuclear), cisternal (extramedullary intracranial), skull base (the segment which passes through the hypoglossal nerve canal), nasopharyngeal and carotid, and sublingual space (where its branches terminate innervating lingual muscles) [2–3, 7–8]. The nerve can be damaged anywhere during its course.

The frequency of cranial nerve injuries can be reduced by avoiding insertion trauma, using appropriate sizes (too small size of LMA), minimizing cuff volume, and early identification and correction of malposition, or damage after hyperextension of the neck during a difficult intubation [1, 4, 7], rheumatoid arthritis, ankylosing spondylitis, and alternative insertion techniques. Other possible causes are a stretch neuropraxia from head/neck/body positional changes, a chemical neuritis by use of the wrong lubricant or cleaning fluid, and local inflammation because of insertion trauma [1, 7]. Atrophy or hypotrophy of tongue muscles is only seen when the nuclear or peripheral segments of the hypoglossal nerve are involved. In its position distal to the base of skull, the hypoglossal nerve may be affected by vascular aneurysm, surgical procedures (carotid endarterectomy), local infection, accident trauma or tumors of the base of the skull (particularly a tumor arising from bone metastasis mostly from breast, renal cell, and prostate cancer) [8, 9], multiple sclerosis and Guillain-Barre neuropathy, Chiari malformation, and dural arteriovenous fistula. Rarely XII nerve palsy caused by internal carotid artery dissection (direct nerve compression in the parapharyngeal space by a pseudoaneurysm or compression of small nutrient vessels supplying the nerve) [2]. Isolated hypoglossal nerve palsy is a rare finding, because of its proximity to other important anatomical structures through-out its pathway. Isolated nerve palsies are rare

clinical finding in multiple sclerosis, usually limited to the 3rd, 4th, 6th, 7th and 8th cranial nerves because of the demyelination in the medulla, at the level of the hypoglossal motor nuclei [2]. A case of hypoglossal nerve neuropraxia following elective drainage of bilateral chronic subdural haematomas is described [5]. There is one report of psychogenic or hysterical XII nerve palsy in which the tongue may be deviated to the side opposite to that of the limb paralysis [6].

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