

Unilateral Hypoglossal Nerve Palsy After Lumbar Disk Herniation Surgery

Lomber Disk Herni Cerrahisi Sonrası Tek Taraflı Hipoglossal Sinir Felci

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ABSTRACT

The intrinsic muscles of the tongue are innervated by the 12th cranial nerve, the Nervus Hypoglossus (NH), a pure motor nerve. Following airway management, a complication that can occur is isolated NH paralysis. The patient's hypoglossal nerve palsy was discussed in this case report. A 50-year-old male patient was scheduled for lumbar disc herniation surgery. Following routine monitoring, the patient underwent induction, and an 8.5-mm spiral endotracheal tube was used for endotracheal intubation. Following the surgery, the patient was transferred to the ward, and after two hours complaints of numbness in the tongue, movement restriction, and speech difficulty began. When he removed his tongue from his mouth, it was deviated to the right. Airway management or prone positioning was suspected as the cause of this condition, and right isolated NH palsy was diagnosed. The methylprednisolone therapy was applied to the patient for one week. After one month, the patient recovered completely without any sequelae. A rare side effect of neuropraxia caused by endotracheal intubation, mask ventilation, bronchoscopy, placement of laryngeal mask airway or prone positioning is isolated NH paralysis. Steroid medication for a short period of time is often effective and curative. Patients undergoing any type of airway manipulation should be aware of the risk of isolated NH palsy.

Keywords: Airway management, hypoglossal nerve palsy, methylprednisolone, nervus hypoglossus

ÖZ

Dilin intrensek kasları, saf bir motor sinir olan 12. kranial sinir, Nervus Hypoglossus (NH) tarafından innerve edilir. Hava yolu yönetimini takiben ortaya çıkabilecek bir komplikasyon izole NH felcidir. Bu olgu sunumunda hastada meydana gelen izole tek taraflı hipoglossal sinir felci tartışılmıştır. Lomber disk herni cerrahisi planlanan 50 yaşında erkek hastaya rutin monitörizasyonun ardından induksiyon uygulandı ve 8,5 mm spiralli endotrakeal tüp ile endotrakeal entübasyon gerçekleştirildi. Ameliyat sonrası servise transfer edilen hastada 2 saat sonra dilde uyuşma, hareket kısıtlılığı ve konuşma güçlüğü şikayetleri başladı. Dilini ağzından çıkardığında sağa deviye olduğu görüldü. Hava yolu yönetiminin veya pron pozisyonun bu durumdan sorumlu olabileceği düşünüldü ve sağ izole NH felci tanısı konuldu. Hastaya bir hafta süreyle metilprednizolon tedavisi verildi. Bir ay sonra hasta sekelsiz olarak tamamen iyileşti. Endotrakeal entübasyon, maske ventilasyonu, bronkoskopi, laringeal maske kullanımının veya pron pozisyonun neden olduğu nöropraksinin nadir bir yan etkisi izole NH felcidir. Kısa süreli steroid tedavisi tipik olarak verilir ve tedavi edicidir. Herhangi bir şekilde hava yolu manipülasyonu geçiren hastalarda, izole NH felci olasılığının farkında olunmalıdır.

Anahtar sözcükler: Hava yolu yönetimi, hipoglossal sinir felci, metilprednizolon, nervus hypoglossus

INTRODUCTION

Neurapraxia, also known as unilateral hypoglossal nerve (XII cranial nerve) palsy, is a rare consequence during airway management. Dysphagia, dysarthria, and ipsilateral tongue deviation are its defining features (1). This nerve is particularly sensitive to pressure from airway devices where it runs between the stylohyoid ligament and the larger horn of the hyoid bone (2). It primarily innervates the intrinsic muscles in the tongue. This case report presents a patient who under-

went surgery in prone position under general anesthesia and developed hypoglossal nerve palsy following surgery. Possible causes are discussed.

CASE REPORT

A lumbar disc herniation operation was performed on a 50-year-old male patient who weighed 90 kg and was an American Society of Anesthesiology (ASA) score I patient, with a Mallampati score of III. Propofol (2 mg kg⁻¹), fentanyl (1


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mcg kg⁻¹), and rocuronium (0.6 mg kg⁻¹) were used to induce anesthesia. The patient was successfully intubated with an 8.5 mm endotracheal tube after that. A dexmedetomidine infusion and 2% sevoflurane in a mixture of 50% medical air and oxygen were used to maintain anesthesia. The procedure took about 160 minutes. The patient showed no tongue abnormalities upon extubation. However, two hours after being brought to the ward, he started to experience tongue numbness, dysarthria, and slurred speech. A right-sided tongue deformity was discovered during physical examination. A solitary hypoglossal nerve palsy was determined to be the patient's condition after consultation with the ear-nose-throat (ENT) and neurology departments. The patient was prescribed steroids at a dosage of 1 mg kg⁻¹ for one week after being diagnosed with unilateral isolated hypoglossal nerve palsy. Within a month, his symptoms were fully under control. The patient's condition could not be explained by any other pathology, and all laboratory tests were normal. The underlying cause was assumed to be airway manipulation, hyperextension during mask ventilation, or prone position.

DISCUSSION

Following airway management techniques like endotracheal intubation and laryngeal mask airway placement, isolated hypoglossal nerve palsy can develop (2). Bronchoscopy, endotracheal tube malposition, excessive cuff pressure, mask



Figure 1: Deviation of the tongue due to the unilateral paralysis of nervus hypoglossus.

ventilation, the triple airway maneuver, oropharyngeal airway insertion technique, patient posture, and malpositioning are other potential etiological factors (1-5). Additionally, systemic venous catheterization through the internal jugular vein might result in hypoglossal nerve palsy (6).

Michel and Brusis showed that anterior tongue displacement during intubation causes the hypoglossal nerve to lengthen (7). Additionally, nerve distension may be impacted by head extension, for a while in the “sniffing position” during intubation. They hypothesize that the amount of tension placed on the nerve may cause either acute impairment (known as neurapraxia) or permanent damage (known as neurotmesis) due to fiber extraction. Compression of the nerve can occur when the endotracheal tube is poorly positioned on the tongue or moved from one side to the other. Additionally, in some circumstances, the use of sizable throat packs may be a significant factor (7).

Because the hypoglossal nerve runs superficially beneath the angle of the jaw, nerve injury can occur during mask ventilation. Furthermore, neck hyperextension in the prone posture during surgery might produce nerve compression on the greater horn of the hyoid bone (8). In a study conducted by Decavel et al. on patients who followed up in intensive care as intubated due to severe COVID-19 infection, they reported that at least one lower cranial nerve palsy occurred in 10 (11%) of 88 patients (9). All these patients were periodically placed in the prone position, and they reported that the hypoglossal nerve was also affected in all but one of these patients.

Severe pressure administered to maintain airway opening at the mandible angle can compress the nerve beneath the submandibular gland, also causing discomfort during recovery (10).

Laryngoscopy, mask ventilation during induction or recovery, compression of the endotracheal tube, or hyperextension of the neck during the prone position are all possible causes of hypoglossal palsy in this patient.

The precise incidence of hypoglossal nerve injury is unknown, but it is estimated to be low (4). In these cases, symptoms normally disappear within a week to four months with short-term steroid therapy (2).

CONCLUSION

Anesthesiologists should be aware of the hypoglossal nerve's (cranial nerve XII) path in relation to head and neck posture. Mask ventilation, orotracheal intubation, bronchoscopy, use of laryngeal mask airway, or hyperextension of the neck in a prone position during the surgical procedure may be involved in the etiology of unilateral hypoglossal nerve palsy. Although

hypoglossal nerve palsy following surgery is uncommon, anesthesiologists, neurologists, and ENT doctors need to be cautious about this potential consequence as they may be consulted for the diagnosis and etiology of both peripheral and central tongue palsy.

AUTHOR CONTRIBUTIONS

Conception or design of the work: MI, SU

Data collection: MI, AH

Data analysis and interpretation: MI, AH, SU

Drafting the article: AH, MI

Critical revision of the article: MI, SU

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