

# CASE REPORT

Med J SDU / SDÜ Tıp Fak Derg ▶ 2024;31(2):187-189 doi: 10.17343/sdutfd.1426727

## Isolated Hypoglossus Nerve Injury After Septoplasty

Furkan YEŞİLKUŞ<sup>1</sup>, Erdoğan OKUR<sup>1</sup>, Nazan OKUR<sup>2</sup>, Yusuf Çağdaş KUMBUL<sup>1</sup>

<sup>1</sup> Suleyman Demirel University, Faculty of Medicine, Department of Otorhinolaryngology, Isparta, TÜRKİYE

<sup>2</sup> Suleyman Demirel University, Faculty of Medicine, Department of Radiology, Isparta, TÜRKİYE

**Cite this article as:** Yeşilkuş F, Okur E, Okur N, Kumbul YÇ. Isolated Hypoglossus Nerve Injury After Septoplasty Med J SDU 2024; 31(2): 187-189.

### Abstract

Cranial nerve injuries due to intubation are rare. While isolated nerve injuries may develop, injuries may occur in which more than one cranial nerve is affected. The most important step in these nerve

injuries is to determine which cranial nerve or nerves are injured and then determine the treatment method. The current case presents isolated hypoglossal nerve injury after surgery.

**Keywords:** Anesthesia, cranial nerves, hypoglossal nerve, neck injuries

### Introduction

Isolated cranial nerve injury is a very rare complication of general anesthesia. Specific hypoglossal nerve palsy affects the mobility of the tongue and basic swallowing and speech functions. Hypoglossal nerve injury is most often associated with the placement and/or positioning of the endotracheal tube (1). Early diagnosis of these complications is important due to possible differential diagnoses such as ischemic stroke, intracranial hematoma, carotid artery dissection, airway obstruction, or airway trauma.

In the present case, isolated hypoglossal nerve injury noticed in the postoperative period after septoplasty is presented in light of the current literature.

### Case Report

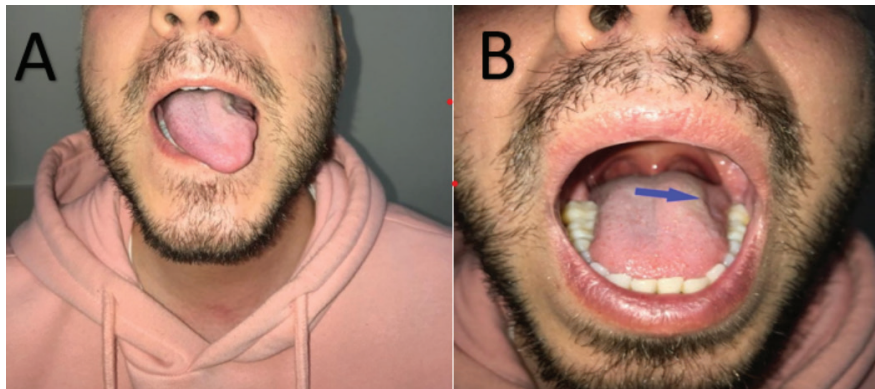
A 28-year-old male patient applied to our clinic with a complaint of nasal congestion. Physical

examination of the patient observed that the septum was deviated to the left side and both inferior turbinates were hypertrophied. Otherwise, otorhinolaryngological examination was normal. The patient was recommended surgery for septoplasty and submucosal resection of both inferior turbinates. The patient had no history other than smoking for 10 pack years, and no abnormalities were found in examinations performed for general anesthesia preparation. The patient was discharged on the 1st day. Three days after the operation, the patient who attended our clinic to remove the nasal packages was noticed to have evident speech impairment. On physical examination, there was slight atrophy in the left half of the tongue and a shift to the left when the tongue was protruding (Figure 1). The patient, whose cranial nerve examinations and cranial contrast-enhanced diffusion magnetic resonance imaging were normal, was diagnosed with isolated left hypoglossus nerve injury. The reason for this was thought to be intubation trauma or tube compression of the left

**Corresponding Author and Contact Address:** F.Y. /furkanyesilkus@gmail.com

**Application Date:** 28.01.2024 • **Accepted Date:** 17.04.2024

**ORCID IDs of the Authors:** F.Y: 0009-0008-4871-0200; E.O: 0000-0003-4384-840X; N.O:0000-0002-3458-2737; Y.Ç.K: 0000-0002-0713-2933



**Figure 1**

When the patient protrudes his tongue, the tongue deviated towards the damaged side (A) and dark-blue arrow indicates the atrophic area posterolateral to the tongue (B).

hypoglossal nerve. The patient started on 1 mg/kg methylprednisolone. The treatment was tapered and terminated within 2 weeks. The patient was called for regular weekly otorhinolaryngological examination. The patient's tongue movements started were mild at the end of the 1st month and completely returned to normal at the end of the 3rd month. Informed consent was obtained from the patient.

### Discussion

The hypoglossal nerve is the 12th cranial nerve originating from the medulla oblongata in the brainstem. It innervates all external and internal muscles of the tongue, except the palatoglossus, which is innervated by the vagus nerve. It is a nerve that only has motor functions. The hypoglossal nerve descends along the internal carotid artery, passes medially over the external carotid artery (2 to 5 cm above the carotid bifurcation), and courses medial to the posterior belly of the digastric muscle to stimulate the tongue muscles (2). In hypoglossal nerve injury, one side of the tongue is usually affected, and when the patient sticks out their tongue, the tongue deviates towards the damaged side. While tumors are in first place (about half) in the etiology of unilateral hypoglossal nerve palsy, other causes include idiopathic, trauma, stroke, hysteria, surgery, multiple sclerosis, infection and Guillain-Barre neuropathy (3).

Hypoglossal nerve injury is a rare perioperative complication that has physical, social, and psychological impacts on affected patients. The hypoglossal nerve can be injured alone or together with the lingual nerve or recurrent laryngeal nerve (Tapia syndrome) (4). There was no physical examination finding of lingual or vagal nerve damage in our patient. Additionally, hypoglossal

nerve damage may occur as a symptom of another intracranial event. Therefore, early recognition is important. Our case was evaluated with contrast-enhanced cranial magnetic resonance imaging in the postoperative period to exclude intracranial events included in the differential diagnosis. Since no abnormality was observed in the magnetic resonance images and no additional pathology was observed in the physical examination of the patient, this situation was evaluated as nerve neuropraxia due to nerve compression during intubation or intubation trauma caused by the laryngoscope. In order to prevent possible psychological effects on the patient, he was given information about similar patients in the medical literature.

Isolated hypoglossal nerve injury associated with tracheal intubation via laryngoscopy is usually unilateral and is considered a rare postoperative complication with multifactorial causes. Other causes include use of LMA, cricoid pressure, and direct compression of the hypoglossal nerve below the angle of the mandible during mask ventilation (5). It is noteworthy that in most case reports, unilateral hypoglossal nerve injury develops on the left side (5). In our case, there was left-sided paralysis. In otorhinolaryngological operating rooms, in most cases the mechanical ventilator is located on the patient's left side because the otolaryngologist is located on the right side of the patient. The fact that the anesthesiologist keeps the intubation tube safe by positioning it on the opposite side to the surgeon (left side) may explain the frequency of left-sided hypoglossal paralysis in otorhinolaryngology cases. Another reason associated with mechanic ventilator may be that since the mechanical ventilator is on the left, unwanted manipulations made by the surgeon in the head and neck region during the intraoperative

period may cause the intubation tube to be displaced to the left. As a result, manipulations by the anesthetist and/or surgeon may cause the tube to be placed on the left side.

Complete recovery of hypoglossal nerve function is usually achieved within the first six months. This progressive recovery of function is suggestive of neuropraxic nerve damage, which is typical of compression injury (6). Although there are no clearly proven treatment options for nerve injuries in these cases in the literature, the combination of steroids and vitamin complexes generally accelerates nerve healing (4). Due to the side effects of steroids, only vitamin B complex use is mentioned in the literature (7). We treated our case with steroid therapy in accordance with the literature (4,8).

## Conclusion

Unilateral hypoglossal nerve palsy is a rare complication after surgery. As in the case we presented, paralysis is reversible since it is mostly at the level of neuropraxia. Steroid treatment is thought to be effective in restoring nerve function.

## Conflict of Interest Statement

The authors have no conflicts of interest to declare.

## Ethical Approval

Since the current article is a case-report ethics committee approval was not received. However informed consent form was obtained from the patient.

## Consent to Participate and Publish

There are no human subjects in our study.

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Availability of Data and Materials

Data could be provided if requested by the reviewers or editors.

## Authors Contributions

FY: Conceptualization; Data curation; Formal analysis; Methodology; Validation; Visualization; Writing-original draft

EO: Conceptualization; Formal analysis; Methodology; Validation; Resources; Supervision; Writing-review & editing.

NO: Conceptualization; Data curation; Validation; Supervision; Writing-review & editing.

YÇK: Conceptualization; Formal analysis; Validation; Visualization; Supervision; Writing-review & editing.

## References

1. Leuzinger K, Misra L. Unilateral Hypoglossal Nerve Palsy in a Patient with a Difficult Airway Requiring Prolonged Intubation. *Case Rep Anesthesiol* 2021;2021:8842503. Published 2021 Feb 18. doi:10.1155/2021/8842503
2. Kojima A, Saga I, Ishikawa M. Intraoperative Hypoglossal Nerve Mapping During Carotid Endarterectomy: Technical Note. *World Neurosurg* 2018;113:249-253. doi: 10.1016/j.wneu.2018.02.123. Epub 2018 Mar 1. PMID: 29501517
3. Keane JR. Twelfth-nerve palsy. Analysis of 100 Cases. *Arch Neurol* 1996;53(6):561-6. doi: 10.1001/archneur.1996.00550060105023. PMID: 8660159.
4. Yavuzer, R., Başterzi, Y., Aezköse, Z. et al. Tapia's Syndrome Following Septorhinoplasty. *Aesth. Plast. Surg* 2004;(28):208–211 <https://doi.org/10.1007/s00266-003-3037-7>
5. Venkatesh B, Walker D. Hypoglossal Neuropraxia Following Endotracheal Intubation. *Anaesth Intensive Care* 1997 Dec;25(6):699-700. doi: 10.1177/0310057X9702500635. PMID: 9452858.
6. Tesei F, Poveda LM, Strali W, Tosi L, Magnani G, Farneti G. Unilateral Laryngeal and Hypoglossal Paralysis (Tapia's Syndrome) Following Rhinoplasty in General Anaesthesia: Case Report and Review of the Literature. *Acta Otorhinolaryngol Ital* 2006;26(4):219-21. PMID: 18236639; PMCID: PMC2640002.
7. Alpaz HC, Kaygusuz İ, Karlidağ T, Kaplama ME. Septorhinoplasti Sonrası Tek Taraflı İzole Hipoglossal Sinir Paralizisi: İki Olgu Sunumu. *KBB-Forum* 2009;8(4).
8. Lagalla G, Logullo F, Di Bella P, Provinciali L, Ceravolo MG. Influence of Early High-Dose Steroid Treatment on Bell's Palsy Evolution. *Neurol Sci* 2002;23(3):107-12. doi: 10.1007/s100720200035. PMID: 12391494.