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An Uncommon Complication: Isolated Unilateral Hypoglossal Nerve Palsy After Septorhinoplasty

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ABSTRACT:

An uncommon complication: Isolated unilateral hypoglossal nerve palsy after septorhinoplasty

Objective: Isolated hypoglossal nerve palsy is a rare complication of long lasting operations under general anesthesia like cosmetic surgeries and orthopedic operations, caused by the use of laryngeal mask or intubation tube. In this case report, we discuss the probable causes and treatment methods of this complication in the light of the current literature.

Case: In this study, we present a 35-year old patient who developed isolated left hypoglossal nerve palsy right after septorhinoplasty. The patient received B vitamin complex and a gradual tapering dose of oral methylprednisolone treatment of 1mg/kg and his tongue movements completely recovered after three months.

Conclusion: Hypoglossal nerve palsy is the consequence of neuropraxia caused by compression of the nerve in between the intubation tube or its cuff and the hyoid bone or cervical vertebra. In this case report, we evaluated factors that increase the complication rate, such as the use of nitrous oxide during the surgery, the malposition of the intubation tube or the laryngeal mask. Precautions such as using adequate size intubation tubes, gentle intubation of the patient without trauma, proper positioning of the intubation tube, avoiding long-time hyperextension of the position of the head of the patient and checking intracuff pressure continuously with a manometer would help to prevent these kind of complications.

Keywords: Hypoglossal nerve, palsy, rhinoplasty

ÖZET:

Nadir görülen bir komplikasyon: Septorinoplasti sonrası tek taraflı izole hipoglossal sinir paralizisi

Amaç: İzole hipoglossal sinir felci, özellikle estetik operasyonlar, ortopedik girişimler gibi uzun süren operasyonların genel anestezisi esnasında laringeal maske ya da entübasyon tüpü kullanımı sonrasında görülebilen ender bir komplikasyondur. Bu sunumda, güncel literatür bilgileri ışığında bu komplikasyonun olası nedenleri ve tedavi yöntemleri tartışılmıştır.

Olgu: Bu çalışmada, septorinoplasti operasyonu sonrası izole sol hipoglossal sinir felci gelişen 35 yaşındaki erkek hastamızı sunduk. B vitamini kompleksi ve 1mg/kg'dan azalan dozda oral steroid tedavisi başlanan hastanın 3 ay sonrasında dil hareketlerinin tamamen düzeldiği gözlemlendi.

Sonuç: Hipoglossal sinir felci, hastanın entübe olduğu esnada entübasyon tüpünün kendisinin ya da kafının, hyoid kemiğe ya da servikal vertebraya basısı neticesinde sinirde nöropraksi oluşumuna bağlıdır. Bu çalışmada, bu tür komplikasyonları arttıran anestezi esnasında nitröz oksit kullanımı, kullanılan entübasyon tüpünün ya da laringeal maskenin malpozisyonu gibi faktörler incelendi. Hastaya uygun büyüklükte entübasyon tüpü kullanılması, hastanın travma olmadan, nazik bir şekilde entübe edilmesi ve entübasyon tüpünün seviyesinin düzgün ayarlanması, hasta kafasının operasyon esnasında uzun süre hiperekstansiyonda ve aynı pozisyonda kalmaması, intrakaf basıncın sürekli olarak manometre ile kontrol edilmesi bu tür komplikasyonların gelişmesini engelleyecektir.

Anahtar kelimeler: Hipoglossal sinir, paralizi, rinoplasti

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INTRODUCTION

After general anesthesia, throat pain, dry throat, dysphagia, edema of the uvula, speech disorder and oropharyngeal ulcerations are the nonspecific early complications which usually improve with follow-up. In addition, lingual nerve, hypoglossal nerve, and recurrent laryngeal nerve palsies and paralyses are of important complications that can be seen in the early period but rarely occur, which cause a distressed period for both the patient and the physician (1).

Isolated hypoglossal nerve palsy is a rare complication of long lasting operations under general anesthesia like cosmetic surgeries and orthopedic operations, caused by the use of laryngeal mask or intubation tube. Hypoglossal nerve is the 12th cranial nerve, and sensitive anatomically to pressure created by the intubation tube at the level of the mandibular angle, between the stylohyoid ligament and the greater horn of the hyoid bone, where it passes by (2,3). When we reviewed the literature, we observed over 30 cases including with hypoglossal nerve palsy/paralysis due to generalized anesthesia or prolonged mechanical ventilation (4,5). In this study, we present a patient with isolated left hypoglossal nerve palsy following septorinoplasty operation.

CASE PRESENTATION

Septorhinoplasty surgery was planned for a 35-year-old male patient with a complaint of nasal congestion and nasal malformation who admitted to our outpatient clinic. On the preoperative examination of the patient, Mallampati score was 3 and ASA score was 2. Intramuscular 5 mg diazepam 30 minutes before induction anesthesia was applied to the patient. During general anesthesia induction, the patient was given intravenous propofol at 2 mg/kg and rocuronium at 0.6 mg/kg. The patient underwent laryngoscopy with a No. 4 Macintosh laryngoscope (No. 4, Heine, Herrsching, Germany) and the patient was intubated in the supine position with the No. 8 endotracheal tube at first attempt. Endotracheal tube cuff pressure was set to maximum 20 mmHg and as to have no audible gas leakage. The intubation tube was fixed to the midline and the patient's lungs were easily ventilated with intermittent positive pressure. As inhalation anesthetic, sevoflurane 2%, 3 L oxygen per minute, and nitrous oxide were administered. To prevent laryngeal edema close to the patient's awakening, 8 mg dexamethasone was administered intravenously. The head of the patient, who has been given a semi-supine position of about 20 degrees during the operation was in the midline and was supported with a donut pillow underneath. During the operation of approximately 3 hours, the patient underwent controlled hypotensive anesthesia with a systolic arterial blood pressure of 80-90 mmHg. During the general anesthesia and when the patient is awakening, there was no significant change in the cardiovascular and pulmonary system of the patient, the patient was haemodynamically stable and well-oxygenated during the operation. There was no difficulty encountered during extubation of the patient.

Figure-1: The postoperative 3rd day photo of the patient with left isolated hypoglossal nerve palsy

The next morning, the patient had difficulty swallowing and difficulty speaking (Figure-1). Limitation of tongue movements was observed on his examination. When he took his tongue out, it was deviated to the left and he could not move it to the right. The patient's gag reflex was present, he had no fasciculations in his tongue, pharyngeal and soft palate movements were normal and there was no problem in sense of taste. Indirect laryngoscopy revealed normal vocal cord movements. Other

cranial nerve examinations other than isolated left hypoglossal nerve palsy on the neurological examination were normal. The patient who was consulted in neurology clinic and had cranial tomography had no pathology, and vitamin B complex and oral methylprednisolone treatment of 1mg/kg in gradually decreasing dose was initiated and the treatment was completed within two weeks. There was relief in the patient's tongue movements 2 weeks later and after 3 months, the tongue movements were completely reversed.

DISCUSSION

Isolated hypoglossal nerve palsy is a rare clinical entity with a variety of central and peripheral etiological causes. The nucleus of the hypoglossal nerve is located in the medulla oblongata, and the fibers that arise from here pass through the hypoglossal duct leaving the skull base, advancing extracranially through the nasopharyngeal carotid space in the parapharyngeal region, in close relation with the 9th, 10th and 11th cranial nerves and internal carotid artery and internal juguler vein. As it goes downwards, it starts to move between the internal carotid artery and the internal jugular vein and rotates towards the floor of the mouth at the level of the jawbone, advancing posteriorly to the belly of the digastric muscle and becomes superficial. The hypoglossal nerve which became superficial travels at the level of the greater horn of the hyoid bone, crosses the lingual artery and moves towards the sublingual region (6).

On the journey from medulla oblangata to the floor of the mouth, the hypoglossal nerve can be paralyzed at various levels. Malignant lesions such as metastatic tumors, leukemia, lymphoma, nasopharyngeal cancers and schwannoma generally cause this paralysis and this is followed by idiopathic cases, gunshot injuries, infections (EBV), carotid artery dissection, surgical interventions (after tonsillectomy, etc.) and paralyses occuring following intubation. In addition, multiple sclerosis and stroke in terms of supranuclear lesions may also cause isolated paralysis (7-11).

The endotracheal intubation techniques developed since the early 20th century triggered various complications. Recurrent laryngeal nerve injury due to intubation was first reported by Bauer (7) in 1958. Combined hypoglossal and lingual nerve paralysis with isolated hypoglossal nerve paresis after intubation was first reported and published in 1970 by Agloni et al. (8-11). Tapia's syndrome, first described by Antonio Garcia Tapia, a Spanish ear-nose-throat specialist in 1904, as the palsy of hypoglossal nerve and the recurrent branch of the vagal nerve due to an extracranial cause, was first described as due to intubation in the literature by Boisseau et al. (12) in 2002.

Isolated hypoglossal nerve paralysis due to intubation is a rare complication due to neurapraxia (13). During intubation, neurapraxia develops when the nerve is trapped between the greater horn of the hyoid bone and the intubation tube itself or its cuff, resulting in ipsilateral deviation of the tongue, difficulty speaking and difficulty swallowing (5,14). Patients recover with a rate of 50% in the first two weeks and with a rate of 80% in the first four weeks, and in the first 6 months, the tongue paralysis generally recovers completely (13,14). It is usually seen after long-standing orthopedics, plastic surgery and otolaryngology surgeries and in male patients (13,15). Because the use of nitric oxide as an inhalation anesthetic during the operation will increase the cuff pressure it would increase the chance of nerve paralysis (5).

Treatment of isolated hypoglossal nerve paralysis varies according to the location of the lesion causing the paralysis. In addition to the treatment of the underlying disease, short-term steroid therapy with vitamin B complex is generally considered adequate (14-16).

In our case, left isolated hypoglossal nerve neurapraxia developed after septorhinoplasty surgery. Patient to stay at supine position during anesthesia, use of appropriate size of intubation tube for the patient, gentle intubation of the patient without trauma and proper leveling of the intubation tube, avoiding long-time hyperextension and the same positioning of the head of the patient during the operation and checking intracuff pressure continuously with a manometer would help to prevent these kind of complications.

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