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Unilateral vocal cord paralysis following maxillofacial deformity correction

Maksillofasiyal deformite düzeltmesi sonrası gelişen unilateral vokal kord paralizi

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Abstract
General anesthesia has a low morbidity and mortality rate and is considered a safe procedure. Moderate hoarseness and sore throat are considered acceptable during the early postoperative period due to minor trauma even after first attempt noninvasive intubation. Vocal cord paralysis is an infrequent complication of endotracheal intubation. It also presents with hoarseness and that is why early diagnosis is difficult, especially if it appears after the orthognathic surgery procedure. There is only one case report of this complication after orthognathic surgery. In this case report, a 33-year-old healthy female patient who had unilateral vocal cord paralysis after bimaxillary orthognathic surgery is presented. Although hoarseness was the first symptom, it was considered as mild hoarseness due to intubation and could not be diagnosed in the early postoperative phase until the video-laryngoscopic examination was performed. Vocal cord paralysis lasted for five months and resolved spontaneously. Although very unusual, surgeons or anesthesiologists should be aware of this unpleasant complication and pay attention to vocal cord functions after orthognathic surgery. If there is no risk of aspiration, at least six months is required before performing any interventions.
Keywords: Unilateral vocal cord paralysis, Orthognathic surgery, Complication, Maxillofacial deformity

Öz
Genel anestezi, düşük morbidite ve mortalite oranına sahip, güvenli bir işlemdir. Tek seferde sağlanan, girişimsel olmayan endotrakeal entübasyon sonrası minor travma ile gelişen orta derecede ses kısıklığı ve boğaz ağrısı, erken postoperatif dönemde normal kabul edilir. Ses kısıklığı ile seyreden vokal kord paralizi ise endotrakeal entübasyonun çok nadir görülen bir komplikasyonudur. Bu nedenle özellikle ortognatik cerrahiden sonra ortaya çıkarsa erken tanı koymak zordur. Ortognatik cerrahi sonrası bu komplikasyon, sadece bir vaka raporunda bildirilmiştir. Bu olguda, 33 yaşında sağlıklı bir kadın hastada bimaksiller ortognatik cerrahi sonrası gelişen, ses kısıklığı ile seyreden tek taraflı vokal kord paralizi bildirildi. Ses kısıklığı entübasyona bağlı olarak kabul edildi ve hastada video laringoskopik inceleme yapılana kadar erken postop fazda vokal kord paralizi teşhis edilemedi. Vokal kord paralizi beş ay sürdü ve herhangi bir girişimsel tedavi uygulanmadan düzeldi. Çok nadir bir komplikasyon olmasına rağmen, vokal kord paralizi cerrahlar veya anestezi uzmanları tarafından göz ardı edilmemelidir ve ortognatik cerrahi sonrası vokal kord fonksiyonlarına dikkat etmelidir. Aspirasyon riski yoksa, herhangi bir girişimsel tedavi yapmadan önce en az 6 ay beklenmesi gerekir.
Anahtar kelimeler: Unilateral vokal kord paralizi, Ortognatik cerrahi, Komplikasyon, Maksilofasiyal deformite

Introduction

Instrumentation/manipulation of the airway is a routine part of anesthesia care. Although endotracheal intubation (EI) is associated with postoperative laryngeal morbidity, the incidence of hoarseness and vocal cord injuries is not precise [1].

Sharing the airway is one of the most problematic situations in oral and maxillofacial surgical anesthesia. Mandibular resection with EI was performed by MacEwen in 1878 the very first time. Although this method was rarely used in surgical practice before the 1960s, it is now almost as routine as placing a peripheral intravenous (IV) catheter. EI is a life-saving ventilation technique [2].

General anesthesia has a low morbidity and mortality rate and is considered a safe procedure. Among these complications, hoarseness is frequently seen in the postoperative period. Although vocal cord paralysis (VCP) is very rare, it is one of the causes of hoarseness. Factors such as the age of the patient, previous diseases, operation time, the position of the endotracheal tube and cuff pressure have been reported to cause this condition. VCP is one of the most dangerous complications of EI, resulting in severe hoarseness and aspiration [3].

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VCP must be diagnosed by video stroboscopic evaluation of laryngeal structure and function. Regarding the management, there are no studies that include a large number of these patients due to low incidence. Treatment options are voice therapy, medialization injection laryngoplasty with Hyaluronic Acid (HA) and medialization thyroplasty [3].

This report aims to present a clinical case of unilateral vocal cord paralysis (UVCP) secondary to EI for orthognathic surgery. In this case report, we are presenting a 35-year-old female who returned with the complaint of hoarseness following orthognathic surgery.

Case presentation

A 33-year-old healthy female was referred to Medipol University Mega Hospital, Department of Oral and Maxillofacial Surgery with aesthetic and functional complaints. Mandibular hypoplasia, anterior open-bite, increased overjet, decreased overbite, increased midfacial height and class II malocclusion were diagnosed. The patient was ASA-2 with no systemic diseases but a smoker. During the presurgical phase, the patient underwent leveling and alignment of maxillary and mandibular arches and removal of all prosthetic restorations.

On the day of surgery, anesthesia induction was started with aritmal® 2% (60 mg lidocaine), Dormofol® 1% (200 mg propofol), Talinat® 0.5mg/10ml (75 mcg fentanyl), and Esmeron® 50 mg/5 ml (35 mg rocuronium). One-shot nasotracheal intubation was performed despite Mallampati classification three. One mg Cezol® and 1.5 mg/kg Prednol® were administered intravenously. Local anesthesia was administered for hemostasis, for which two vials of jetocaine® (20 mg lidocaine HCl and 0.00125 epinephrine) was diluted 1:1 with a physiological saline solution. Three mm anterior and 5 mm posterior impaction for the maxilla, bilateral sagittal split ramus osteotomy and 3mm advancement for mandible and three mm anterior vertical reduction by genioplasty was achieved and surgery was terminated following hemostasis.

The patient was extubated following the observation of spontaneous respiration. She was admitted to the intensive care unit (ICU) with suspected laryngeal irritation by the suggestion of anesthesia staff and started on intravenous steroids against laryngeal edema. During the one-day ICU follow-up period, no respiratory distress was observed. As a result, the patient was discharged to a standard patient room with a relatively stable airway and vital functions. After one more day at the hospital, the patient was discharged. During intraoral suture removal at the 12th postoperative day, hoarseness was detected. The patient was consulted with the department of Otorhinolaryngology (ENT). Laryngoscopy showed normal abduction and adduction at the right vocal cord, but paralysis at the left vocal cord. Unilateral (left) VCP was the final diagnosis. There was no further pathology at oropharynx. Six months follow up was planned without any further treatment. The plan was to inject intra-chordal HA if symptoms persisted.

At the end of the first postoperative month, symptoms relieved and normal voice returned. History and clinical examination revealed laryngitis. However, symptoms returned after the recovery of laryngitis. We had to wait until the fifth postoperative month for totally recovery from VCP. The patient's consent was obtained to be presented as a case report.

Discussion

As in any interventional procedure, intubation has its complications, which can be classified as those occurring in the early and late periods. Hoarseness, subglottic stenosis, and VCP are examples of late-term complications. Minor injuries to the airway that cause temporary hoarseness are not considered as post-intubation complications. This is quite common, as high as 30% and is considered by most anesthesiologists and patients as a natural consequence of the procedure rather than a complication [4].

Multiple studies have shown that prolonged intubation may also result in severe laryngeal damage, which may lead to chronic laryngeal disability. One of the rare complications of intubation is VCP (<1% of intubations). VCP occurs due to compression of the recurrent nerve between the endotracheal tube and the thyroid cartilage. Therefore, the pressure of the cuff should be kept between 20mm Hg and 40 mm Hg. High cuff pressures can damage recurrent nerve even in short-term intubation. VCP associated with EI may also occur due to trauma during anesthesia induction or extubation. Laryngeal nerve injury and VCP may be unilateral or bilateral. The unilateral form is more common. Unilateral VCP should be considered if hoarseness, dysphonia, or dysphagia develops immediately after extubation. It generally resolves over days to months. Bilateral vocal cord injury is less common but more critical [5].

Early diagnosis is vital to avoid respiratory tract complications for VCP; however, poor prognostic factors complicate early diagnosis. Most studies have examined patients with unilateral VCP with various etiologies. There are many recommended treatment methods in the literature. Unfortunately, there is no appropriate study to evaluate treatment options in this complication. That is the main reason why efforts should be focused on prevention [6].

The incidence of VCP is very low [6]. Fauzdar et al. [7] reported the only case of VCP after an orthognathic surgery. The change in the voice quality of the cases is thought to be caused by injury to the recurrent laryngeal nerve during EI. In the present case report, the occurrence of VCP might be due to EI, extended cuff pressure, or deep and/or compressed insertion of the oropharyngeal pack. The last one was not stated in the literature as a possible cause of this unacceptable complication.

The patient underwent an unexpected recovery on the postoperative 28th day. First, we thought that the patient recovered. We realized that his recovery occurred due to laryngitis and symptoms returned after recovery from laryngitis. We hypothesized that laryngeal edema due to laryngitis caused enlargement at vocal cord region and vocal cords were able to close, hence relieving hoarseness. Our treatment plan was unilateral HA injection if the patient's symptoms did not resolve by the end of the sixth postoperative month.

The symptoms had disappeared in the follow-up examination on the 143rd postoperative day, and did not return by the 6th, 12th and 18th months. There were no relapses or any differences in speech. In another case that was reported previously, symptoms occurred in the sixth postoperative week

and lasted about five months. There was no aspiration nor any airway complication at any time during the follow-up period. In the other case report, the patient had hoarseness and noted a slight cough when ingesting thin fluids with no difficulty in consuming thick fluids. In the present case, although the patient's symptoms lasted longer, there was no difficulty in swallowing. Although the symptoms were not life-threatening, the patient was unable to speak appropriately for nearly five months and this complication affected her daily life and psychology dramatically.

As there is no treatment other than injection and nerve replacement surgery, gentle intubation, checking the cuff pressure at induction and during the procedure, inserting the oropharyngeal pack carefully, not too loose but without compression, and decreasing the total intubation time may help avoid this annoying complication. If doubt exists in one or more of these parameters, the anesthetist and surgeon should observe the vocal cord function immediately following extubation.

Conclusion

VCP is a very rarely observed complication following orthognathic surgery and postoperative edema due to intubation and upper airway infections may complicate the diagnosis. If the anesthesiologist or surgeon suspects that this complication may develop, the vocal cord function should be examined immediately. Although exceedingly rare, anesthesiologist and the surgeon should be aware of this unpleasant complication and be patient before performing corrective surgeries or HA injections.

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