Airway management in a patient with Reinke’s edema—A case report—

Departments of Anesthesiology and Pain Medicine, *Otorhinolaryngology, Jeju National University Hospital, Jeju National University School of Medicine, Jeju, Korea

So Hui Yun, Jong Cook Park, Kang Woo Kim, and Gil Chae Lim*

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Corresponding author: Jong Cook Park, M.D., Ph.D., Department of Anesthesiology and Pain Medicine, Jeju National University Hospital, Jeju National University School of Medicine, Aran 13-gil, Jeju 63241, Korea. Tel: 82-64-717-2028, Fax: 82-64-717-2042, E-mail: pjcook@jejunu.ac.kr

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Reinke’s edema begins with a chronic diffuse edema on the surface of the lamina propria of the vocal folds. It frequently occurs in women, smokers, professional voice users, and in patients with gastroesophageal reflux disease. Herein, we report the case of a patient who experienced ventilation difficulties during general anesthesia using positive pressure mask ventilation. (Anesth Pain Med 2015; 10: 317-320)

Key Words: Airway management, Airway obstruction, Reinke’s edema.

Reinke’s edema (RE), also known as polypoid corditis, laryngitis, and degenerative or chronic hypertrophic laryngitis, is associated with representative pathological conditions of the superficial lamina propria [1-3]. Patients with this condition rarely have difficulty in voluntary breathing [4]. The exact etiology of this condition is not well understood [5].

CASE REPORT

A 56-year-old woman with RE was scheduled for laryngeal microsurgery. The patient was initially diagnosed with RE at an otolaryngology outpatient clinic, 2 years earlier. She was lost to follow-up until being recently readmitted to the outpatient clinic with dyspnea as the chief complaint (Fig. 1). The patient worked in a restaurant and had a 40-pack-year smoking history. She had a history of hoarseness that had started 25 years earlier and dyspnea of 3 weeks duration when she started breathing heavily after shouting loudly. At that time, the patient expectorated a 100-Won coin-sized amount of blood while coughing. Her breathing difficulty was aggravated while lying down; however, no breathing difficulty was observed while sitting or standing. In the preceding week, the patient made a “kuk-kuk” sound while asleep, and she woke up frequently.

Pulmonary function tests performed before the surgery showed a moderately obstructive pattern. Forced vital capacity, 1 s forced expiratory volume, and forced expiratory flow (25–75%) were 60, 67, and 58% of the predicted values, respectively.

The patient was admitted to the operating room without premedication and she underwent noninvasive blood pressure (NIBP) monitoring, electrocardiography, and pulse oximetry. Her heart rate was 71 bpm, NIBP was 123/82 mmHg, and SpO2 was 94%. After preoxygenation for about 3 min, induction of anesthesia was accomplished with 250 mg (5 mg/kg) thiopental and 50 mg (1 mg/kg) rocuronium. After induction, it was difficult to administer positive pressure mask ventilation with pressure over 30 mmHg. We decided on intubation after 30 s from the administration of the induction agents. At that time, the SpO2 was 98%. First, we tried intubation with a direct laryngoscope; however, we observed that the vocal cords were almost completely occluded by the degenerative polypoid. Next, we retried intubation with a Glidescope (Veraton Medical, Burnaby, Canada) while observing the lesion. We did not face any problems with intubation using the Glidescope because the lesion could be
Fig. 1. Laryngoscopic image taken at the ambulatory care unit showing the patient’s edematous vocal cords. (A) Image taken in 2012. (B) Image taken in 2014.

Fig. 2. Endoscopic image showing the patient’s edematous vocal cords. (A) Degenerative polypoid lesion (arrow) that obstructed the airway opening. (B) Laser tube insertion using a Glidescope. (C) Intraoperative removal of the lesion using laser. (D) After removal of the lesions.

Fig. 3. Postoperative image of the excised lesion.

When the patient was able to maintain a regular breathing pattern, with good ventilation and oxygenation, and without stridor or other signs of upper airway obstruction, she was moved to the recovery room. While in the recovery room, breathing room air, the patient’s arterial blood gas results were lifted up easily, and the laser tube (ID 6.0 mm) (Laser-Shield® II Endotracheal Tube, Medtronic Xomed, Jacksonville, USA) was inserted very gently (Figs. 2A and 2B). Immediately after the intubation, the SpO₂ was 92%. The total time taken for the intubation, was 1 min 18 s. Lesions on both sides of the vocal cords were excised using a laser, and the surgery was completed after confirming the absence of hemorrhage in the operated area. (Figs. 2C, 2D, and 3).
pH 7.338, \(\text{PaCO}_2\) 48.2 mmHg, \(\text{PaO}_2\) 94.3 mmHg, and absolute base excess −0.5 mmol/L.

**DISCUSSION**

Reinke’s space is a subepithelial space that ends abruptly at the junction of the squamous and respiratory epithelium of the vocal folds. Therefore, RE is one of the most frequently diagnosed, benign lesions causing voice disorder, as in this case [4,6]. Compared to men, women with this condition more frequently have bilateral vocal cord changes [6]. This condition affects phonation and results in a raspy voice. It rarely causes problems with breathing or spontaneous ventilation [4].

The treatment of RE may be conservative, including stopping smoking, and reducing voice abuse. The surgical treatment consists of excising the lesions and the superficial lamina propria of the vocal folds surgically or using CO\(_2\) laser techniques [7,8]. Several studies on RE have been carried out in the fields of otorhinolaryngology and radiology. However, anesthesiologists are typically exposed to situations such as that described here only through case reports on airway management in international journals.

In general, tracheal intubation is performed during surgery under general anesthesia to maintain proper breathing. During this period, depending on the patient’s condition, airway management is difficult in some patients, including those with limited neck mobility (flexion or extension), mouth opening disabilities due to underlying diseases or other causes, or pathological cellular structures that invade or affect the upper respiratory system [9]. Compared to a direct laryngoscope, a Glidescope enables improved glottis visualization, particularly in patients with potential or simulated difficult airways [10,11]. There are several alternative techniques that can be used in patients who experience breathing difficulty during intubation [12]. As in this case, videoscopes have advantages such as a rapid learning curve, ease of use by novices, increased first-attempt success and decreased time to intubation, minimal head or neck manipulation, and favoring communication between the different specialists involved in the treatment by allowing multi-person visualization [10,13]. However, the strongest predictor of Glidescope failure is altered neck anatomy with presence of a surgical scar, radiation changes, or a mass [14].

d’Hulst et al. [15] found difficulty with ventilation caused by a large air leak despite the laryngeal mask airway being easily inserted, because polypoid hyperplasia of the larynx had been misdiagnosed as laryngeal mask airway malposition. Fortunately, in our case, this condition had already been discussed in the records by the laryngologist before induction. Thus, we had no problems with intubation using the Glidescope.

Reinke’s edema, as in the case of the patient in the present study, can also present as a lesion that obstructs the upper airway, thereby making mask ventilation difficult after loss of spontaneous breathing. Therefore, sufficient knowledge about the patient’s condition is necessary for safe induction of anesthesia. Before deciding whether to induce anesthesia, the patient’s medical history and the fact whether he/she has presented with such symptoms previously should be taken into account. In addition, it is necessary to be prepared for several alternative techniques such as the use of a videoscope.

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