Endotracheal intubation-related vocal cord ulcer following general anesthesia

Choon-Kyu Cho¹, Jae-Jung Kim¹, Tae-Yun Sung¹, Sung-Mee Jung², and Po-Soon Kang¹

Department of Anesthesiology and Pain Medicine, ¹Konyang University Hospital, Konyang University College of Medicine, Daejeon, ²Yeungnam University Medical Center, Yeungnam University College of Medicine, Daegu, Korea

Post-intubation throat pain is a common complaint that is caused by focal ischemia, damage to the laryngeal mucosa, or edema. However, if the laryngeal symptoms persist after 72 h, vocal cord paralysis, the formation of granulation tissue, or ulcers can occur [1]. Most vocal cord ulcers that are caused by intubation are found after progression to granuloma. However, we recently observed a patient in whom the ulcer was detected before progression, and was successfully treated with conservative interventions.

A 39-year-old male (167 cm, 66 kg) was scheduled for elective Guyon's tunnel release surgery. The patient had no significant medical history, except for septoplasty surgery 6 years ago using general anesthesia with endotracheal intubation. Pre-operatively, he exhibited no laryngopharyngeal symptoms such as sore throat, hoarseness, or stridor. Anesthesia was induced using 130 mg propofol, and endotracheal intubation was performed with 35 mg rocuronium. An endotracheal tube with an internal diameter of 8.0 mm, and a high volume/low pressure cuff was used. Laryngoscopy was performed using a standard 3 Macintosh metal blade, a stylet, and external laryngeal pressure, and was characterized as Cormack-Lehane laryngoscopy grade III. There was slight friction when going through the vocal cord during intubation, but the process was otherwise successful. The duration of intubation was 65 min, and anesthesia was completed without any specific hemodynamic instability. Emergence was smooth, and extubation was completed without any coughing or vigorous movement.

After surgery, the patient persistently complained of throat

pain during the hospitalization period. However, the attending physician and nurse overlooked his complaints because throat pain was considered to be a normal side effect of intubation. He was therefore discharged 4 days after the operation without any further examination. The day after discharge, the patient was concerned that his sore throat persisted, unlike his previous experience with general anesthesia and intubation, and visited an otolaryngology outpatient clinic. Laryngeal endoscopic examination showed an ulcer in the posterior of the vocal cord (Fig. 1A). Prednisolone (5 mg, BID) and esomeprazole (40 mg, QD) were prescribed, and voice rest was recommended. His sore throat improved after 1 week, and laryngoscope examination revealed partial cure of the vocal cord ulcer (Fig. 1B). After subsequent visits, the ulcer had completely healed without progressing to granuloma.

Vocal cord ulcers are non-neoplastic lesions of the posterior glottis, and represent an early stage in the progression of vocal cord granulomas [2]. Generally, vocal cord ulcers occur due to mechanical or chemical damage, such as the overuse of voice, chronic coughing, throat clearing, or gastroesophageal reflux disease [3]. The common symptoms of vocal cord ulcers and granulomas are throat pain, hoarseness, and coughing [4].

The causes of vocal cord ulcers related to endotracheal intubation are vocal cord mucosa damage during intubation and extubation, clapping movements between the vocal cords and the tube, continuous pressure of the tube during anesthesia, use of a tube that is too large, or infection. During endotracheal intubation, inflammation can occur on the mucous membrane of the

Corresponding author: Tae-Yun Sung, M.D., Department of Anesthesiology and Pain Medicine, Konyang University Hospital, Konyang University College of Medicine, 685, Gasoo-won-dong, Seo-gu, Daejeon 143-701, Korea. Tel: 82-42-600-9316, Fax: 82-42-545-2132, E-mail: unt1231@naver.com

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Fig. 1. (A) Five days after surgery, a vocal cord ulcer was observed in the right-sided posterior of the vocal cord. (B) Twelve days after surgery, the vocal cord ulcer had decreased in size after medical therapy and voice rest.

vocal process area of arytenoid cartilage, and its severity tends to increase with longer intubation times or increased pressure [5].

In the current case, the duration of intubation was short, and there was little or no movement of the head and neck during the surgery or extubation. It is therefore likely that the vocal cord ulcer was caused by friction with the tube during intubation, damaging the vocal cord mucosa. It is also possible that the endotracheal tube used was too large, or that the pressure exerted by the external cricoids led to backward and lateral tilt, making the vocal process more prominent and vulnerable to injury [5].

Most vocal cord ulcers can be cured with conservative treatment such as voice therapy, or medical interventions including steroids, antibiotics, proton pump inhibitors, or histamine-2 receptor blockers. However, if the cause of ulcer is iatrogenic or

the ulcer has progressed to granuloma, it may lead to aspiration and respiratory distress, and so long-term treatment or even surgical excision may be required [1,4].

To prevent post-intubation vocal cord ulcers from occurring, using an appropriately sized tube, adequate sedation and muscle relaxation, performing smooth intubation, stabilization of the tube, and extubation without laryngeal reflexes are recommended [4,5].

In conclusion, anesthesiologists should recognize that vocal cord ulcers could occur as a complication of intubation following endotracheal anesthesia. Persistent post-operative laryngo-pharyngeal symptoms should not be overlooked, and appropriate examinations will help identify complications, such as ulcers, before they progress to granuloma.

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