A Case of Laryngeal Granuloma Likely Caused by Laryngopharyngeal Reflux Disease Following a Sagittal Split Ramus Osteotomy

Mami Nakamura, DDS,* Akio Uda, DDS, PhD,* Naokazu Kataoka, DDS,* Kana Nagasaka, DDS,* Kazuhisa Tamashige, DDS,* Daichi Mori, DDS,* Hideo Niwa, MD, PhD,† and Koh Shibutani, DDS, PhD*

*Department of Anesthesiology, Nihon University School of Dentistry at Matsudo, Chiba, Japan, and †Department of Head and Neck Surgery, Nihon University School of Dentistry at Matsudo, Chiba, Japan

Laryngeal granuloma is an uncommon complication of prolonged endotracheal intubation. A 25-year-old woman with severe jaw deformity underwent sagittal split ramus osteotomy under general anesthesia. Two days after extubation, the patient complained of hoarseness, sore throat, and dyspnea. When symptoms persisted, she was evaluated in the Otolaryngology Department. She was diagnosed with laryngeal granuloma of the bilateral arytenoid cartilages, and conservative treatment was selected. Administration of corticosteroid hormones, proton pump inhibitors, and a subsequent follow-up examination performed in our outpatient clinic showed no evidence of recurrence 10 months after the initial presentation.

Key Words: Laryngeal granuloma; General anesthesia; Laryngopharyngeal reflux disease; Gastroesophageal reflux disease; Conservative treatment.

Laryngeal granuloma is one of the complications of endotracheal intubation and presents as a protruding inflammatory mass arising in the posterior portion of the vocal cords at the arytenoid cartilages.^{1,2} We report a case of laryngeal granuloma likely caused by laryngopharyngeal reflux disease (LPRD) following nasotracheal intubation for sagittal split ramus osteotomy (SSRO).

A 25-year-old woman with severe jaw deformity underwent SSRO under general anesthesia. Her preoperative physical evaluation and laboratory data were normal. Anesthesia was induced by remifentanyl hydrochloride combined with propofol. Rocuronium bromide was administered to facilitate muscle relaxation, and an easy and smooth right nasotracheal intubation was performed. The anesthesia was maintained with nitrous

oxide in oxygen, remifentanyl, and propofol. The surgery and anesthesia were completed uneventfully. The duration of the surgery and anesthesia were 1 hour 39 minutes and 2 hours 29 minutes, respectively. Extubation occurred without coughing, bucking, or agitation. The patient was able to phonate appropriately and remained comfortable in the early postoperative period without hoarseness or sore throat.

Two days after extubation, the patient complained of hoarseness, sore throat, and dyspnea. Two months postoperatively after experiencing varying intensity of symptoms, she was diagnosed in the Otolaryngology Department with laryngeal granuloma of bilateral arytenoid cartilages. No laryngeal nerve damage was found. The otolaryngologist found the presence of gastroesophageal reflux disease (GERD) in the interview, and nonsurgical treatment was selected. Administration of corticosteroid hormones and proton pump inhibitor (PPI) were instituted. Subsequent follow-up examination performed in our outpatient clinic showed no evidence of recurrence 10 months after the initial presentation. The table shows the progress of the hoarseness, sore throat, laryngeal granuloma, and treatment following the otolaryngology consultation.

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Address correspondence to Dr Mami Nakamura; Nihon University School of Dentistry at Matsudo, Chiba, Japan; nakamura.mami22@nihon-u.ac.jp.

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Progress of Hoarseness, Sore Throat, Laryngeal Granuloma, and Treatment After Otolaryngology Consultation

Day (after Otolaryngology consultation)		First examination	9 days later	1 month later	
Hoarseness		+	—	+	
Sore throat		+	—	+	
Laryngeal granuloma
		Size Left (mm)	72 × 68	32 × 32	120 × 100
		Right (mm)	40 × 36	65 × 65	40 × 36
		Drug (mg/day)	Rabeprazole sodium(20) Prednisolone (30)	Rabeprazole sodium(20) Prednisolone (30)	Rabeprazole sodium(20) Prednisolone (20)
		Treatment (mg)	Nebulizer Linde Ron (0.2) Bestron (10)		DIV Clayton (300)
Others		Diagnosed LPRD			
<hr/>					
3 months later		4 months later	6 months later	10 months later	
—		+	—	—	
—		—	—	—

80 × 100		85 × 65	74 × 44	—	
—		—	—	—	
Rabeprazole sodium(10)		Rabeprazole sodium(10) Prednisolone (10)→only 7 days	Rabeprazole sodium(20) Prednisolone (10)→only 7 days	Rabeprazole sodium(10)	
		DIV Clayton (300)	Nebulizer Linde Ron (0.2) Bestron (10)		
Sleep disorder →Prednisolone stop		Prednisolone restart			

Predisposing factors for laryngeal granuloma include age, gender, anatomic characteristics, and fragility of the laryngotracheal mucosa. Adult women are more likely to develop granulomas, as are patients who are

obese, have a short neck, or possess other congenital anomalies involving the airway.^{3–5} The etiologic factors related to anesthesia for laryngeal granuloma are as follows: size and material of intratracheal tube, pressure

and position of cuff, intubation technique and time, surgical site, body and shift in head position, neck extension time, patient body movement such as bucking during extubation, general physical condition (anemia, hypoxemia, hypoproteinemia, and malnutrition), allergic diathesis, infection of the upper airway, acid reflux, chronic cough, and vocal overuse.^{1,3–5,8} Although surgical removal remains useful in treating vocal process granulomas, conservative therapies such as voice therapy and drug therapy (corticosteroid hormones, PPI, H2 blockers) have recently prevailed.^{2–8} This case was treated effectively with corticosteroid hormones and PPI.

The occurrence of laryngeal granuloma in this case may likely be explained by the combination of physical irritation caused by tracheal intubation and the aggravation of GERD caused by surgical stress, swelling, and intermaxillary fixation. These conditions progressed to LPRD.

We report a rare case of a laryngeal granuloma following orthognathic surgery, which may have been aggravated by GERD. A past medical history of GERD should be reviewed and laryngeal granuloma should be considered if appropriate symptoms occur postoperatively. Early diagnosis and treatment are recommended.

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REFERENCES

1. Kamachi M, Yoshioka M, Akamatsu Y, Honma K, Yamaguchi K. Two cases of postintubation granuloma of the larynx. *Masui (Jpn J Anesthesiol)*. 2009;58:1282–1285.
2. Ohashi M, Ota F, Iida M, Hesaka H, Moriyama H. Clinical study of laryngeal granuloma. *O R L Tokyo*. 2006;49:365–371.
3. Kawaida M, Fukuda H, Kawasaki Y, et al. Conservative treatment with non-specific granuloma of the larynx: corticosteroid inhalation therapy. *Jpn J Logop Phoniatr*. 1991;32:11–17.
4. Adachi K, Umezaki T, Komune S. The relationship of laryngeal granuloma and gastro-eso-phageal reflux disease (GERD) experienced our department. *Otologia Fukuoka*. 2006;52:119–122.
5. Nito T, Tayama N. Laryngeal granuloma. *JOHNS*. 2004;20:968–972.
6. Yoshida T, Nomura K, Honjo I, Hirano M. *Mook of otorhino-laryngology head and neck surgery* [in Japanese]. 1st ed. Tokyo, Japan: Kanehara Shuppan; 1992.
7. Oyama S, Hamajima Y, Watanabe N, Murakami S, Suzuki M. The relationship between laryngeal granuloma and gastro-eso-phageal reflux disease (GERD). *Otologia Fukuoka*. 2006;52:123–127.
8. Kawasaki Y, Fukuda H, Tsuji DH, Otsuki J, Takayama E, Isogai Y. Malignant transformation in non-specific granuloma of the larynx. *Otologia Fukuoka*. 1990;36:1232–1235.