Experimental Laryngeal Granuloma in a Rat GERD Model

Rintaro Shimazu, MD, PhD; Yuichiro Kuratomi, MD, PhD; Akira Inokuchi, MD, PhD

Department of Otolaryngology, Head & Neck Surgery, Faculty of Medicine, Saga University

ABSTRACT

Objective: Acid reflux and mucosal injury of the larynx, caused by vocal abuse, chronic laryngitis, and acid reflux esophagitis, may be involved in the development of laryngeal granuloma. However, the exact mechanisms underlying laryngeal granuloma are unclear. We induced an experimental laryngeal granuloma by causing mechanical injury to the vocal cord mucosa in rats with chronic acid reflux esophagitis. The developed laryngeal granuloma presented the same pathological structure as a human laryngeal granuloma. The current study described the pathological changes of the larynx and vocal cord in rats with chronic acid reflux esophagitis. Methods: A granuloma was observed in the vocal cord mucosa of the rat at two weeks after the surgery, and this presented the same pathological structure as human laryngeal granuloma. The current study described the pathological changes of the larynx and vocal cord in rats with chronic acid reflux esophagitis. Results: A granuloma was observed in the vocal cord mucosa of the rat at two weeks after the surgery, and this presented the same pathological structure as human laryngeal granuloma.

RESULTS

The histological changes of the pharynx and larynx in the GERD rat model were observed at two weeks post-surgery. The developed laryngeal granuloma presented the same pathological structure as a human laryngeal granuloma. The current study described the pathological changes of the larynx and vocal cord in rats with chronic acid reflux esophagitis. Furthermore, in the GERD rat model, the thickening of the mucosa and the proliferation and dilatation of the capillaries were noted in the mucosa around the arytenoid cartilage as in the hypopharyngeal mucosa, indicating that inflammation caused by gastric acid reflux had extended to the larynx. Moreover, the earliest change in the larynx was seen in the arytenoid cartilage (Figure 5). Conclusions: In 1986, Delahunt et al. reported the experimental formation of a laryngeal granuloma by directly applying an acid solution in the canine vocal cord. This was the first report that presented the association between gastric acid reflux and laryngeal granulomas using an animal model. The present study was the first to report the development of a laryngeal granuloma due to the chronic reflux of gastric acid in a rat model with chronic acid reflux esophagitis. The developed laryngeal granuloma presented the same pathological structure as a human laryngeal granuloma. The current study described the pathological changes of the larynx and vocal cord in rats with chronic acid reflux esophagitis.