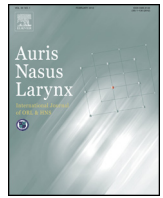




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## Successful treatment of radiation-induced mucositis with proton pump inhibitor administration: A report of two laryngeal cancer cases

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### ABSTRACT

Presently, the relationship between laryngopharyngeal reflux (LPR) and radiation-induced mucositis has not been fully explored. In the present study, we report 2 cases of laryngeal cancer in which radiation-induced mucositis ameliorated after proton pump inhibitor (PPI) administration.

Case 1 was diagnosed with T1aN0M0 right glottis carcinoma and was treated with radiation therapy. Grade 3 mucositis occurred after administration of 46 Gy irradiation. PPI was administered and mucositis ameliorated quickly without cessation of radiation therapy. Case 2 was diagnosed with T2N0M0 supraglottic cancer and was treated with concurrent chemoradiation therapy. Grade 3 mucositis occurred after administration of 44 Gy irradiation. PPI was administered and mucositis ameliorated quickly without cessation of chemoradiation therapy. In both cases, a remarkable therapeutic effect of PPI was observed in the perilaryngeal areas including the epiglottic vallecula, arytenoid, and postcricoid area. In both cases, LPR involvement was suspected before the onset of radiation therapy.

The two cases presented here, indicated a causal relationship between LPR and radiation-induced mucositis. In cases of severe mucositis in the perilaryngeal area in patients with LPR prior to radiation therapy, PPI administration may be an effective therapeutic option.

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## 1. Introduction

For head and neck malignancies, management of radiation-induced mucositis is an important consideration in those undergoing radiation therapies. Severe mucositis can result in reduced treatment completion, which is a crucial problem

because treatment completion rates are correlated with survival and local control [1]. Various methods have been applied for the treatment of radiation-induced mucositis [2].

In the past decades, a number of studies have investigated laryngopharyngeal reflux (LPR) etiology, diagnostic methods, and its relationship with laryngeal cancer [3]. Chronic stress caused by LPR [4] could make the laryngeal/pharyngeal membrane more susceptible to irradiation damage. However, to our knowledge, there have been no investigations of the relationship between LPR and radiation-induced mucositis.

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LPR is difficult to diagnose and diagnosis is made conventionally according to symptoms and laryngeal findings [3]. In the present study, we report 2 cases of laryngeal cancer, in which radiation-induced mucositis ameliorated after proton pump inhibitor (PPI) administration. In both cases, pre-irradiation involvement of LPR was indicated according to patient symptoms and laryngeal findings.

## 2. Case reports

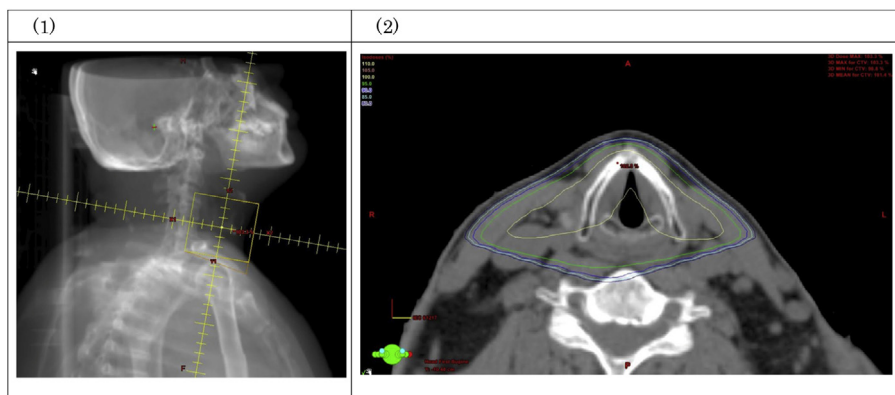
### 2.1. Case 1

A 64-year-old man with trachyphonia visited our department and was subsequently diagnosed with T1aN0M0 right glottis carcinoma. Radiation therapy was administered (Fig. 1), and routine oral care was provided in an effort to prevent mucositis. During treatment, grade 3 mucositis (CTCAE version 4.0) [5] was observed after administration of 46 Gy irradiation. Mucositis was strong in the arytenoid–postericoid area, which was unusual for radiation therapy of T1 glottis cancer. Severe mucositis was observed posterior to the primary lesion. Chronic mucositis due to LPR was suspected because prior to radiation therapy, the patient had pyrosis and LPR-like laryngeal findings, such as posterior commissure hypertrophy and pseudosulcus. After administration of low-dose lansoprazole (15 mg/day), his pharyngeal pain ameliorated quickly. By the time 52 Gy irradiation was commenced, the mucositis had

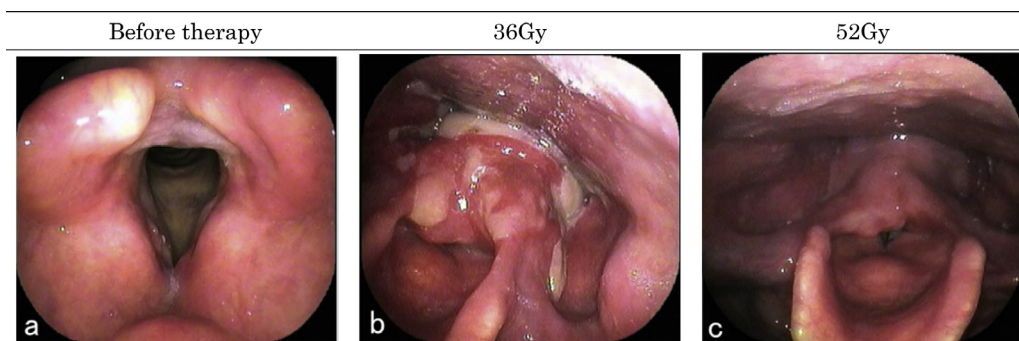
resolved from grade 3 to grade 1 and ulceration in the arytenoid–postericoid region had disappeared (Fig. 2). The patient completed the planned treatment (66 Gy in 31 fractions) without cessation of radiation.

### 2.2. Case 2

A 72-year-old man with trachyphonia visited our department and was subsequently diagnosed with T2N0M0 supraglottic cancer. Concomitant chemoradiation therapy (80 mg/m<sup>2</sup> cisplatin on days 1, 22, and 43) was administered (Fig. 3), and routine oral care was provided in an effort to prevent mucositis. Grade 3 mucositis (CTCAE version 4.0) [5] was noted after administration of 44 Gy irradiation. Pseudo-membrane was observed in the laryngeal plane of epiglottic–subglottic area, in accordance with the range of the primary lesion, and small ulcers, as well as marked swelling of the membrane was apparent in the epiglottic vallecula–hypopharynx region. Chronic mucositis due to LPR was suspected because, prior to radiation therapy, the patient had pyrosis and LPR-like laryngeal findings, such as posterior commissure hypertrophy and ventricular obliteration. After the administration of rabeprazole (10 mg/day), the pharyngeal pain ameliorated quickly. At the time 62 Gy of radiation was delivered, the mucositis had resolved from grade 3 to grade 2, and the ulcers in the epiglottic vallecula–arytenoid region had resolved (Fig. 4). The patient completed the planned treatment



**Fig. 1.** Radiation treatment plan for case 1. Two opposed lateral fields with appropriate angles and wedges were used. A total dose of 66 Gy at 2 Gy per fraction per day, with 5 fractions per week were delivered via a 6-MV photon beam. (1) Beams-eye view of the treatment volume. (2) Isodose distribution on the axial plane.



**Fig. 2.** Laryngopharyngeal findings of case 1. (a) Malignancy in the anterior half of the vocal cord. Posterior commissure hypertrophy and erythema. (b) Ulcer and swelling in the arytenoid–postericoid area. (c) Significant amelioration of mucositis.

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