A gastrointestinal endoscopy-assisted minimally invasive surgery for superficial cancer of the uvula is described by Hiroyuki Odagiri, Toshiro Iizuka, Daisuke Kikuchi, Mitsuru Kaise, Hidehiko Takeda, Kenichi Ohashi, and Hideo Yasunaga.

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Abstract

Previous studies reported that endoscopic resection was effective for the treatment of superficial pharyngeal cancers, as for digestive tract cancers. However, the optimal treatment for superficial cancer of the uvula has not been established, because of the rarity of this condition. We present two males in their 70s with superficial cancer of the uvula, detected by upper gastrointestinal endoscopy. Both patients underwent surgical resection of the uvula under general anesthesia. The extent of the lesions was determined by gastrointestinal endoscopy using magnifying observation with narrow-band imaging, enabling performance of minimally invasive surgery. Endoscopic submucosal dissection was performed to achieve en bloc resection of intramucosal carcinoma that had infiltrated the area adjacent to the uvula. Gastrointestinal endoscopists should carefully examine the laryngopharynx to avoid missing superficial cancers. Our minimally invasive treatment for superficial cancer of the uvula had favorable postoperative outcomes and avoided postoperative loss of breathing, swallowing, and articulation functions.

Keywords: Superficial Uvula Cancer; Minimally Invasive Surgery; Endoscopic Submucosal Dissection.
Introduction

In almost all reported cases of superficial pharyngeal cancer (SPC), the cancer was located in the pyriform sinus, posterior wall of the pharynx, or lateral wall of the pharynx\(^1\). Superficial cancer of the uvula is very rarely detected, and to our knowledge no case reports describing this condition have previously been published.

The reported 5-year survival rate of patients with pharyngeal cancer is poor, ranging from 13% to 27%\(^2-4\). Early detection is therefore important. However, most pharyngeal cancers are detected at an advanced stage because it is difficult to differentiate between SPC and normal mucosa.

Recent advances in endoscopic technology such as magnifying observation and narrow-band imaging (NBI) can enhance the visualization of mucosal microstructures including mucosal capillaries of the gastrointestinal tract, enabling early detection of pharyngeal cancers\(^5-8\). Recent studies reported that endoscopic resection, including endoscopic mucosal resection and endoscopic submucosal dissection (ESD), was effective for the treatment of SPCs\(^8-10\). However, little is known about the clinicopathological features and clinical course of superficial cancer of the uvula. We report here two cases of superficial cancer of the uvula diagnosed by upper gastrointestinal endoscopy (UGIE), which were treated by resection using a minimally invasive approach.

Case Reports
**Case 1**

A 71-year-old man with a history of bladder cancer and early esophageal cancer underwent follow-up UGIE after esophageal ESD, which revealed a light red and slightly depressed area in the mid-esophagus. This lesion was suspected to be metachronous early esophageal cancer, and he was admitted to our hospital for further investigation.

Physical examination revealed a urostomy stoma in his right lower abdominal wall. Laboratory test results were all normal, including tumor marker levels. He had smoked 20 cigarettes per day for 50 years, and consumed 55 units of alcohol per week.

Magnifying endoscopy (ME) revealed a small red area on his uvula (Figure 1-a) in addition to the esophageal lesion. Examination of the lesion on his uvula using ME with NBI revealed a brownish area with outgrowth and dilatation of atypical vessels (Figure 1-b). Examination of an incisional biopsy specimen from the uvula showed high grade intraepithelial neoplasia or squamous cell carcinoma.

Computed tomography and ultrasonography did not show lymph node or distant metastasis. Three weeks after esophageal ESD, he underwent surgical resection of the lesion on the uvula under general anesthesia. To minimize the invasiveness of surgical resection, the attending gastrointestinal endoscopist determined the extent of the lesion using ME with NBI and iodine staining, and placed marking dots to delineate the edges of the lesion. The affected mucous membrane around the uvula was then resected using ESD (Figure 1-c). Finally, an otolaryngologist resected the body of the uvula after ligation at the base, resulting
in successful en bloc removal of the lesion (Figure 1-d). Histopathological examination of the resected lesion showed oropharyngeal carcinoma in situ, with negative surgical margins (Figure 1-e and f). No microscopic lymphovascular or venous invasion was observed. The patient was discharged without postoperative complications, and remained free of recurrence during 4 years of follow-up.

**Case 2**

A 74-year-old man with a history of colon cancer, lung cancer, and early esophageal cancer underwent follow-up UGIE after esophageal ESD. He had smoked 20 cigarettes per day for 40 years and consumed 55 units of alcohol per week. UGIE revealed a small nodule on the posterior aspect of the uvula (Figure 2-a), and ME with NBI clearly showed an outgrowth with atypical dilated vessels on the posterior aspect of the uvula (Figure 2-b). Examination of an incisional biopsy specimen of the nodule showed carcinoma in situ. Computed tomography and ultrasonography did not show lymph node or distant metastasis. He underwent surgical resection of the lesion on his uvula under general anesthesia. The attending gastrointestinal endoscopist performed ME with NBI and iodine staining, and determined that the lesion was limited to the uvula (Figure 2-c). An otolaryngologist therefore performed simple uvulectomy without ESD of the surrounding mucosa (Figure 2-c and d). Histopathological examination of the resected specimen showed en bloc removal of the lesion with negative surgical margins. The tumor had invaded approximately 850 µm into the submucosa, with a basaloid pattern (Figure 2-e and f). No
microscopic lymphovascular or venous invasion was observed. The patient was discharged without postoperative complications, and remained free from recurrence during 3 years of follow-up.

Discussion

We experienced two rare cases of superficial cancer of the uvula, which were diagnosed by UGIE. As minimally invasive surgery is essential for the prevention of postoperative complications, we performed minimal resection of the lesions after determining their extent using ME with NBI and iodine staining. In Case 1, use of ESD enabled successful en bloc removal of the lesion. Surgical resection after marking the mucosa with ME and NBI without ESD would also be a plausible alternative; however, a clear surgical margin can be achieved when making a surgical incision using ESD, allowing more accurate histopathological evaluation.

According to a nationwide questionnaire survey conducted by the Japan Society for Head and Neck Cancer, 88 new cases of upper oropharyngeal cancer (including cancer of the uvula) were reported from 2001 to 2003. However, no cases of intramucosal carcinoma of the upper oropharynx were reported. Most oropharyngeal cancers were detected at an advanced stage11.

The laryngopharynx has important functions including breathing, swallowing, and articulation. Curative resection of advanced laryngopharyngeal cancer reduces the patient’s quality of life because of the cosmetic consequences and loss of pharyngeal functions12.
Laryngopharyngeal cancer is generally detected and treated by otolaryngologists, and gastrointestinal endoscopists may pay little attention to the laryngopharyngeal area during UGIE examination. However, UGIE is generally more suitable for the detection of early laryngopharyngeal cancer than nasopharyngoscopy, because it allows clearer visualization of the gastrointestinal mucosa. Recent advances in endoscopic technology, such as ME and NBI, have enabled easier detection of SPC by gastrointestinal endoscopists. During UGIE examinations, especially in patients at high risk of upper aerodigestive tract cancers such as heavy smokers and drinkers, gastrointestinal endoscopists should pay careful attention to the pharyngeal area to avoid missing superficial cancers marked by subtle mucosal changes.

Some patients experience pain and discomfort of the laryngopharynx due to pharyngeal reflux. A systematic approach to examination of the laryngopharynx is important, as follows: (1) hard and soft palates, (2) uvula, (3) right and left arches of the palate, (4) posterior wall of the oropharynx, (5) right and left walls of the oropharynx, (6) right and left sides of the epiglottic vallecula, (7) posterior wall of the hypopharynx, (8) right and left sides of the piriform sinus, and (9) arytenoid region. This systematic approach may reduce the number of early cancers that are missed. If the pharyngeal area is too narrow to be observed by UGIE, using a mouthpiece and asking the patient to articulate a sound may expand the pharynx and improve the visual field for UGIE examination.

Several previous studies reported that detection of a slight change in microvascular structure
was useful for diagnosing superficial cancers of the gastrointestinal tract\textsuperscript{16,17}. ME with NBI is a well-validated procedure, which clearly demonstrates areas with changes in microvascular structure by brownish spots\textsuperscript{5}. However, routine endoscopic examination using ME with NBI may be far from feasible. Gastrointestinal endoscopists should pay careful attention to changes in mucosal color and texture when performing UGIE with white light.

The clinicopathological features of cancer of the uvula are poorly understood because of the rarity of this condition\textsuperscript{18,19}. Treatment of advanced cancer of the uvula may include surgical resection, radiotherapy, and chemotherapy, and the need for lymph node dissection (LND) should be considered. A study of 21 patients with T1 or T2 cancer of the uvula reported that these lesions were associated with high rates of metastasis, because of the abundance of lymphatic vessels beneath the mucosa\textsuperscript{18}. In patients with intramucosal carcinoma as in Case 1, LND may not be necessary. However, pharyngeal cancers with submucosal invasion as in Case 2 require close follow-up. A recent study of 47 patients with SPC who underwent endoscopic treatment reported that recurrence was only detected in patients with submucosal invasive cancers\textsuperscript{20}. We did not perform LND in Case 2, because preoperative computed tomography and ultrasonography did not detect metastasis. However, careful follow-up should be continued for this patient.

Velopharyngeal insufficiency may occur after the surgical resection of oropharyngeal cancer, but can be reduced by minimizing the invasiveness of surgery. Our surgical approach was effective at
maintaining the patients’ quality of life. Further follow-up is required to determine the long-term prognosis of patients with superficial cancer of the uvula.

Conflicts of interest

None.

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None.
References


Figure legends

Fig.1 Images of Case 1. Gastrointestinal endoscopy with white light revealed the small red area on his uvula (A), and magnifying endoscopy with narrow-band imaging showed the redness as a brownish area (B). Endoscopic submucosal dissection was performed to resect a mucosal lesion surrounding the uvula (C). The lesion including an affected mucous membrane around the uvula was removed as en bloc specimen (D). Histopathological examination of the resected specimen showed oropharyngeal carcinoma in situ (E and F).

Fig.2 Images of Case 2. Gastrointestinal endoscopy with white light revealed a small nodule on the posterior aspect of his uvula (A), and magnifying endoscopy with narrow-band imaging clearly showed an outgrowth with atypical dilated vessels on the uvula (B). Magnifying endoscopy with narrow-band imaging and iodine staining revealed that the lesion was limited to the uvula (C). Simple uvulectomy without endoscopic submucosal dissection of the surrounding mucosa was performed (D). Histopathological examination of the resected specimen showed en bloc removal of the lesion with negative surgical margins, but the tumor had invaded into the submucosa, with a basaloid pattern (E and F).