

Single Case

Effectiveness of Triamcinolone Injections in Preventing Scar Deformity following Endoscopic Submucosal Dissection for Pharyngeal Cancer

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Keywords

Pharyngeal cancer · Endoscopic submucosal dissection · Squamous cell carcinoma

Abstract

Introduction: Endoscopic submucosal dissection (ESD) is an effective treatment for superficial pharyngeal cancer. However, pharyngeal deformity caused by postoperative ulcer contraction is a major concern and can result in a poor quality of life. While local steroid injections have been shown to prevent strictures after ESD for esophageal cancer, their effectiveness in preventing deformities following ESD for pharyngeal cancer remains unclear. **Case Presentation:** A 60-year-old woman with superficial pharyngeal cancer in the left pyriform sinus underwent ESD. After ESD, 80 mg of triamcinolone acetonide was injected into the ulcer bed to prevent scar contracture. The patient experienced mild pharyngeal pain, which resolved within a few days. Histopathological examination confirmed the lesion was well-differentiated SCC, with negative resection margins and no lymphovascular invasion. Follow-up endoscopy at 6 weeks showed granulation tissue in the surgical wound, which completely healed without pharyngeal deformity by 14 weeks post-ESD. **Conclusion:** This case demonstrated that the injection of triamcinolone in an ulcer that developed after ESD may be an effective method of preventing pharyngeal deformity caused by scar contracture.

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Introduction

Endoscopic submucosal dissection (ESD) is an effective and minimally invasive treatment for superficial pharyngeal squamous cell carcinoma (PSCC) that has been applied in clinical practice [1, 2]. Although the outcomes and long-term prognosis of PSCC are favorable [3–5], problems such as the technical difficulty of treatment in a confined space, laryngeal edema during treatment, and pharyngeal deformity caused by postoperative ulcer contraction remain. Although treatment strategies, including the use of an ultrathin endoscope and laryngeal forceps [6], for ESD have been reported, the prevention of scar contracture after ESD for PSCC has not been reported.

Strictures caused by ulcer scarring after ESD for esophageal cancer are major concerns that can result in a poor quality of life [7]. Therefore, local steroid injections are recommended to prevent lesions with circumferences larger than three-quarters [8]. Local steroid injections after transoral videolaryngoscopic surgery for pharyngeal cancer have been reported [9]; however, the effectiveness of local steroid injections for ulcers after ESD has not been demonstrated. We report the injection of triamcinolone in an ulcer after ESD to prevent pharynx deformity in a patient with PSCC.

Case Presentation

A 60-year-old asymptomatic woman was referred to our hospital for a detailed examination and treatment of a pharyngeal lesion detected using upper gastrointestinal endoscopy during a routine postoperative examination. Biopsy results revealed squamous cell carcinoma (SCC). The patient had a history of esophagectomy for esophageal cancer 2 years before presentation, and recurrence was not observed during the subsequent period before PSCC was diagnosed. Tumor markers were not increased with 1.2 µg/L SCC antigen and 1.1 µg/L cytokeratin 19 fragment.

White-light endoscopy revealed an erythematous lesion on the left pyriform sinus and attenuated background translucency of the dendritic vessels. The lesion was approximately 20 mm and comprised partial melanosis; therefore, it was categorized as type 0–IIb. The entire lesion appeared as a brown area on narrow-band imaging. Magnifying endoscopy with narrow-band imaging revealed that the lesion was dilated and irregularly aligned and comprised abnormal microvessels and loop-like formations (Fig. 1a–d), suggesting that tumor invasion was limited to the subepithelial layer. Because neither computed tomography nor cervical ultrasonography revealed signs of lymph node metastasis, ESD was performed under general anesthesia using a Dual Knife (Olympus Medical Systems, Tokyo, Japan) and a VIO 3 electrosurgical unit (ERBE Elektromedizin, Tübingen, Germany). At the time of treatment, the lesion was stained with Lugol's iodine, which was used as a guide for marking. Marking dots were made 2 mm outside the lesion, including the small Lugol-unstained area near the lesion.

A mucosal incision was created after Glyceol® (Chugai Pharmaceutical, Tokyo, Japan) was injected. After the circumferential incision was created, the submucosal layer was dissected with the CAST hood (TOP Corporation, Tokyo, Japan), a small-caliber tip transparent hood, while preserving the branch of the superior laryngeal nerve. En bloc resection of the lesion was performed without adverse events. To prevent scar deformity, 80 mg of triamcinolone acetate was injected in the subepithelial layer of the ulcer bed after ESD (Fig. 2a–f). Triamcinolone was diluted with saline to a concentration of 10 mg/mL. A 25-gauge, 4-mm needle (TOP Corporation, Tokyo, Japan) was used for injections. When performing the steroid injection, the needle was extended out of the sheath for insertion. The needle tip was carefully advanced to the epithelial tissue, ensuring that the injection was not delivered to the muscular

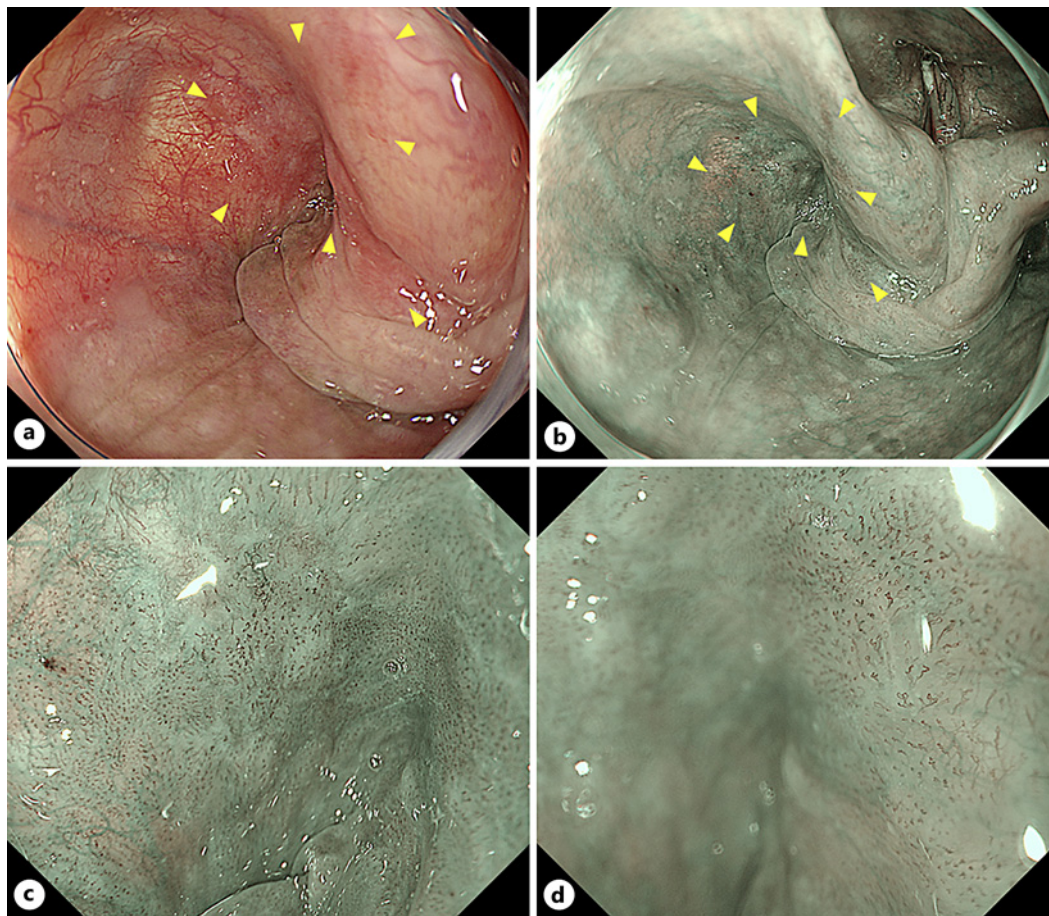


Fig. 1. Endoscopic findings of the lesion. **a** White-light endoscopy image showing an erythematous flat lesion on the left pyriform sinus with attenuated background translucency of the dendritic vessels (yellow arrowheads). **b** The entire lesion appears as a brown area during narrow-band imaging (NBI) (yellow arrowheads). **c, d** Image obtained using magnifying endoscopy with NBI reveals a dilated lesion with irregularly aligned abnormal microvessels with loop-like formations.

layer. The triamcinolone was evenly injected across the entire post-ESD ulcer to ensure thorough distribution. During both the intraoperative and postoperative periods, no steroids were administered other than the local injection of triamcinolone to the lesion. The patient experienced mild pharyngeal pain after the treatment, but the severity was comparable to that of a typical pharyngeal ESD procedure. The pain improved within a few days. Histopathology revealed well-differentiated SCC (23 × 10 mm) with a tumor thickness of 240 μm that invaded the subepithelium. The lesion had a negative resection margin, and lymphovascular invasion was not detected (Fig. 3a, b). Food intake was resumed on day 2 after ESD, and the patient was discharged on day 7 after ESD. After discharge, no dysphagia or symptoms such as discomfort during swallowing were observed, and the patient was able to maintain a good diet. As a result, there was no significant change in the patient's quality of life before and after the ESD procedure. Because the curative criteria for endoscopic treatment of superficial pharyngeal cancer are not clear, careful follow-up including endoscopy and computed tomography was scheduled. Follow-up endoscopy revealed that the surgical wound was scarred with granulation tissue 6 weeks after ESD and completely healed without pharyngeal deformity by 14 weeks after ESD (Fig. 4a–c).

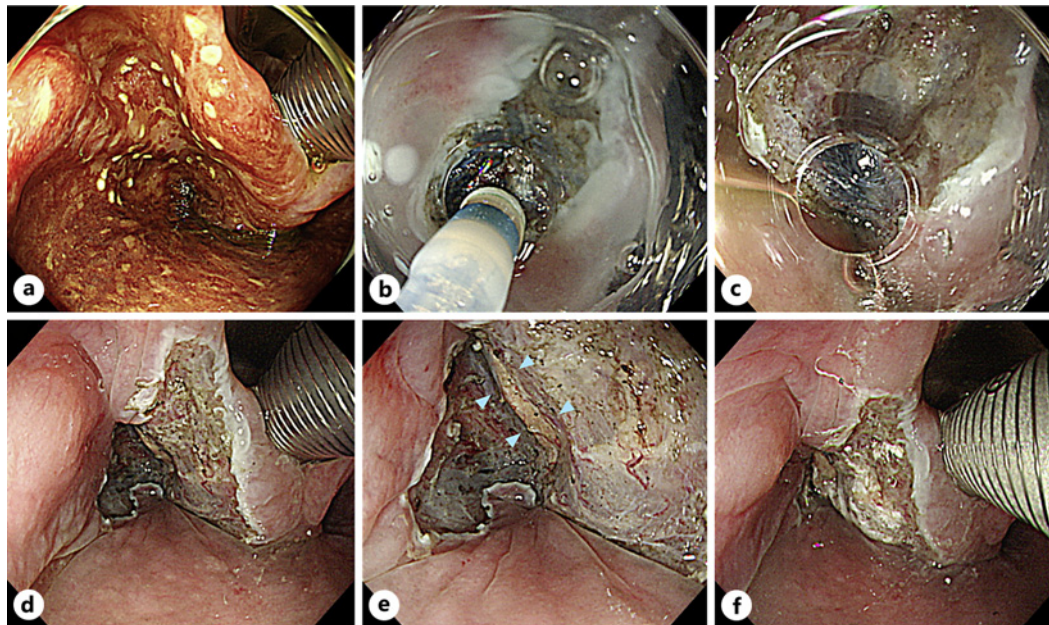


Fig. 2. Endoscopic submucosal dissection (ESD) performed for pharyngeal cancer. **a** Lugol's iodine staining shows a Lugol-voiding area from the pyriform sinus to the postcricoid area. Dots are marked 2 mm outside the lesion. **b, c** The mucosal incision is created outside the marked dots. After separating the normal mucosa from the lesion, the submucosal layer is dissected with a small-caliber tip transparent hood. **d, e** En bloc resection of the lesion is performed without adverse events, preserving the branch of the submucosal superior laryngeal nerve (blue arrowheads). **f** A total of 80 mg triamcinolone acetate is injected in the subepithelial layer of the ulcer bed after ESD.

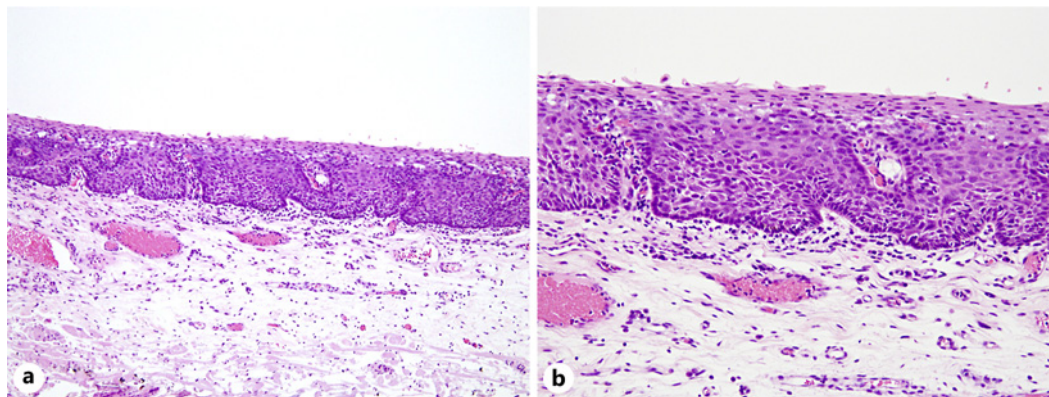


Fig. 3. Histological examination findings of the resected specimen. Photomicrographs (**a**: $\times 100$, **b**: $\times 200$) of pharyngeal squamous cell carcinoma stained with hematoxylin and eosin. Tumor cells infiltrating the subepithelial layer without lymphovascular invasion.

Discussion

PSCC and esophageal SCC require close monitoring to detect metachronous cancer and field cancerization with SCC [10]. As with esophageal cancer, multiple Lugol-voiding lesions are risk factors for and predictors of metachronous carcinogenesis [11, 12]. Patients who have

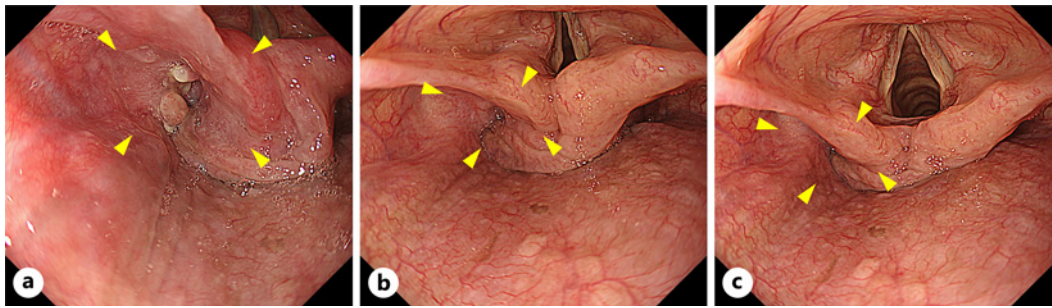


Fig. 4. Treated ulcer at 6 weeks (a) and 14 weeks (b, c) after endoscopic submucosal dissection (ESD). The surgical wound was scarred with granulation tissue 6 weeks after ESD and completely healed without deformity of the pyriform sinus and postcricoid area by 14 weeks after ESD (yellow arrowheads).

undergone ESD for superficial PSCC often develop other metachronous superficial PSCC and require repeated ESD. The accumulation of pharyngeal deformities as a result of repeated ESD can lead to severe deformity of the pharynx or strictures of the pharyngeal-esophageal junction that can be directly related to dysphagia, which may lead to a decreased quality of life and the risk of aspiration pneumonia.

Because steroids can inhibit not only collagen synthesis but also fibrosis and inflammation, triamcinolone injections in ulcers after ESD have been clinically applied to prevent strictures after ESD [13, 14]. Although the esophagus has a cylindrical shape, the pharynx has a unique and complex proximity of the aryepiglottic fold, pyriform sinus, and posterior wall, thus making even small ulcers susceptible to deformities caused by scar contracture. Endoscopic balloon dilatation can be performed for esophageal strictures; however, when deformity occurs, its removal is difficult. Therefore, precautionary measures are necessary to prevent deformation after ESD for PSCC. Because the application of tissue shielding using polyglycolic acid sheets [15, 16] and mucosal epithelial cell sheets [17, 18] can be anatomically difficult, triamcinolone injection was chosen to prevent scar contracture of the pharynx in this patient. To the best of our knowledge, this is the first reported case of steroid injection in an ulcer after ESD to prevent scar contracture after ESD for PSCC. This patient experienced a good clinical course without treatment-related complications and the wound healed completely without pharyngeal deformity or other sequelae, suggesting the usefulness of triamcinolone injections after ESD for PSCC.

The pharynx, like the esophagus, is histologically covered with stratified squamous epithelium; however, unlike the esophagus, the pharynx does not contain muscularis mucosae. The subepithelial layer of the pharynx corresponds to the submucosal layer of the esophagus, which is dissected during ESD for PSCC. Compared to the submucosal layer of the esophagus, the subepithelial layer is thinner, especially on the posterior wall; therefore, local triamcinolone injection may require careful selection of the injection site to avoid injection in the muscular layer. In the present case, steroids were injected in the pyriform sinus and postcricoid areas, which have relatively abundant subepithelial tissue and are prone to deformity; therefore, they are good candidate areas for steroid injections. To reduce the risk of laryngeal edema, glycerol was avoided as the diluent and saline was used instead. Careful adjustment of the concentration of triamcinolone allowed for minimizing the required injection volume, thereby reducing the risk of laryngeal edema and other potential complications.

This study had some limitations. The usefulness of steroid injections for the prevention of deformities after ESD for PSCC is hypothetical. Additionally, there is no standard injection method; therefore, triamcinolone was injected empirically with reference to the injections used for esophageal ESD.

In conclusion, the injection of triamcinolone in ulcers after ESD for PSCC is neither costly nor technically difficult. Therefore, triamcinolone injection may be an effective method of preventing pharyngeal deformity caused by scar contracture. Further studies should be performed to determine the appropriate amount of triamcinolone that should be injected and verify the safety of triamcinolone injections in the pharynx.

Statement of Ethics

Ethical approval is not required for this case report in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000543878>).

Conflict of Interest Statement

Yugo Suzuki, Shinji Ito, Tsuyoshi Ishii, Minoru Oda, and Shu Hoteya declare that they have no conflicts of interest.

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Author Contributions

Yugo Suzuki was the primary author of this manuscript, contributing to the conception, drafting, and revision of the article. Yugo Suzuki, Shinji Ito, Tsuyoshi Ishii, Minoru Oda, and Shu Hoteya were involved in the clinical care and management of the patient. Shu Hoteya supervised the diagnostic and therapeutic approaches. All authors reviewed and approved the final manuscript.

Data Availability Statement

All data generated or analyzed during this study are included in this article and its online supplementary material files. Further inquiries can be directed to the corresponding author.

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