Circumferential Endoscopic Submucosal Dissection as a Treatment Option For Superficial Esophageal Squamous Cell Neoplasia: a Retrospective Case Series Study.

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BACKGROUND

Traditionally, esophageal cancer treatment includes esophagectomy, often associated with significant morbidity and mortality. However, endoscopic resection emerged as a successful method for diagnosing and treating esophageal neoplastic lesions. Selected superficial squamous cell carcinoma (SCC) lesions are best addressed with endoscopic submucosal dissection (ESD). Circumferential ESD allows resection of the entire circumference of an esophageal segment en-bloc for extensive neoplasia. It has been practiced in Asian countries but has limited experience in the United States

OBJECTIVE OF THE STUDY

This study aims to present our experience with circumferential endoscopic submucosal dissection for multifocal esophageal squamous cell neoplasia.

METHODS AND PROCEDURES

- This is a retrospective case study from a single institution from January 2019 to January 2022 of all patients undergoing circumferential ESD for squamous neoplasia. Our institutional review board approved this study.
- Patients had at least squamous cell high-grade dysplasia or SCC without evidence of invasion on biopsies. They were counseled on endoscopic and surgical options and managed in a multidisciplinary team approach with a gastroenterologist and thoracic surgeon.
- The target area was marked using soft coagulation along the proximal margin and distal margin. The marked areas were then injected with diluted methylene blue solution or lifting agent. ESD was performed with an ERBE hybrid knife. A complete circumferential distal incision was performed and then a complete proximal circumferential incision. A repeated tunnel technique was used dissect the specimen.
- The aid of traction was employed at the discretion of the endoscopist with a modified clip and snare technique in which the proximal portion of the specimen was dissected, then a snare (outside of the endoscope) was secured to the proximal aspect with three endoscopic clips, and then gently closed tethering the clips together and enabling traction of the specimen by applying gentle tension on the snare.
- Steroid injection of the resection site was performed at the discretion of the endoscopist.
- Endoscopy to assess healing and perform dilation was planned a month post-ESD, followed by surveillance endoscopy.

RESULTS

- Four patients (mean age 71.8 years (range 57-79), gender 1 F) were included. All patients had extensive substance use history with alcohol (1), smoking (2), or both (1). Surgery was not optimal due to comorbidities (2), gastric bypass anatomy (1), or advanced age (1).
- All patients underwent successful circumferential ESD (Figure 1). Intralesional steroids post-resection were administered in 2 patients.
- R0 resection was achieved in all cases. Resection pathology was multifocal HGD in 1, SCC staged T1a m3 in 1, and SCC staged T1b Sm1 in 2.
- An average of 3.75 dilations (range 1-7) were performed after ESD.
- One patient discontinued surveillance due to comorbidities. Three other patients are still in surveillance. One had evidence of recurrence with focal high-grade squamous dysplasia at 52 months post-ESD, for which a repeat ESD was successfully performed. The other two patients without evidence of recurrence over follow-up.

CONCLUSIONS

Endoscopic submucosal dissection is a safe and effective treatment option for superficial esophageal squamous cell neoplasia when performed by experienced endoscopists. In this study, we present our approach to this esophagus-sparing technique for patients with superficial esophageal squamous neoplasia, utilizing a multidisciplinary approach. Ongoing surveillance is essential to identify and manage any synchronous or metachronous lesions.

TABLE 1

	Pathology by biopsy	Lenght of resection base	R0	Post procedure pathology	# dilations	Follow up (months)	Recurrence
Patient 1	HGD	7 cm	Yes	HGD Multifocal	2	12.9 Lost follow-up	No
Patient 2	HGD	5 cm	Yes	Invasive squamous cell carcinoma to submucosa	1	53.42	No
Patient 3	SCC	9 cm	Yes	Invasive squamous cell carcinoma to submucosa	5	58.8	Yes at 52 months
Patient 4	CIS	8 cm	Yes	Invasive squamous cell carcinoma to muscularis mucosa	7	40.89	No

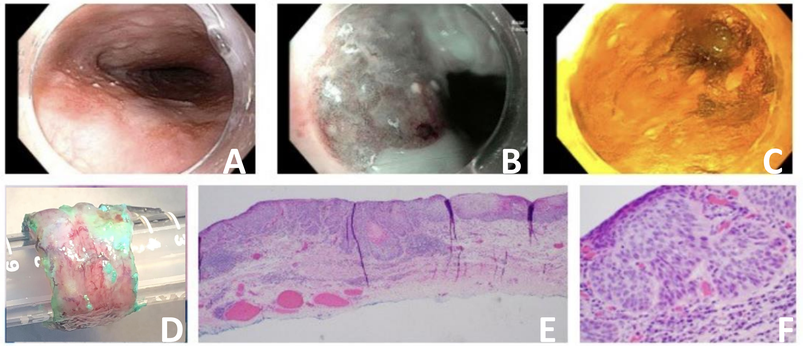


Figure 1:
(A) White light high resolution endoscopy demonstrating erythematous and irregular mucosa in mid esophagus.
(B) Narrow band imaging with near focus demonstrating discoloration, branching and irregular vascularity.
(C) Chromoendosocopy with Lugol's solution demonstrating extensive area of lugol void staining raising concern for neoplasia.
(D) Tubular en-bloc circumferential ESD specimen
(E) H&E low power demonstrates a sharply demarcated area of high-grade squamous dysplasia with abnormal keratin pearl formation and irregular pushing nests which focally dissect through the muscularis mucosa, compatible with superficially invasive squamous cell carcinoma.
(F) H&E high power shows high grade squamous dysplasia with brisk mitotic activity.

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