



Endoscopic Submucosal Dissection (ESD) for Early Gastric Cancer (EGC) with Ten Year Follow up

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Abstract

Gastric cancer is the fourth leading cause of cancer-related death worldwide. Early gastric cancer (EGC) is defined as cancer confined to the mucosa or superficial submucosa without any lymph node involvement. It carries a low risk of lymph node metastasis and can be eligible for endoscopic removal. Endoscopic submucosal dissection (ESD) is a minimally invasive, stomach-preserving treatment option for patients with EGC with long-term favorable outcomes. This report presents a 64-year-old female with a 20-pack-year smoking history and a medical history of EGC. She was diagnosed with EGC ten years ago, and an ESD was performed at that time. Her recent ten year follow up surveillance evaluation did not show any recurrence of her cancer, demonstrating that long term cancer free survival is possible in EGC with ESD alone. ESD is considered first-line therapy for select cases of EGC due to its ability to achieve en bloc resection, allow accurate histopathologic staging, and preserve gastric anatomy. Compared to gastrectomy, ESD is associated with significantly lower morbidity, and much improved quality of life. In appropriately selected patients, survival rates post-ESD often exceed 90%. This case demonstrates a patient who underwent ESD for EGC and at her current evaluation was found to be cancer-free after 10 years. This case further emphasizes the existing evidence that ESD offers oncologic outcomes comparable to surgical resection and helps mitigate the risks and long-term nutritional complications associated with gastrectomy and offers much better quality of life.

Keywords: *Gastric cancer, endoscopic submucosal dissection (ESD), endoscopic mucosal resection (EMR), endoscopic ultrasound (EUS), gastrectomy.*

Case

The patient is a 64-year-old female with a 20-pack-year smoking history, family history of colon cancer, and a past medical history of type 2 diabetes and colonic polyps. Ten years ago, she underwent esophagogastroduodenoscopy (EGD) for dyspepsia and acid reflux and was diagnosed with early gastric cancer (EGC), and an endoscopic submucosal dissection (ESD) was performed. She was negative for *H. pylori* infection. At her ten-year surveillance, she was evaluated with EGD, endoscopic ultrasound (EUS), and cross-sectional imaging; there was no evidence of recurrent gastric cancer. She was recommended smoking cessation and a follow up EGD in a year.

During EGD 2 cm lesion in the antrum with raised margins and central depression (IIb and IIc) lesion highly suspicious for adenocarcinoma was noted and the biopsy confirmed well differentiated adenocarcinoma. EUS showed superficial submucosal involvement without any lymph node or liver metastasis. Cross sectional imaging did not show any metastatic disease. After obtaining informed consent ESD was performed under general anesthesia. The margin of the lesion was marked using soft coagulation current using Duel knife (Olympus America). The lesion was raised using saline mixed with methylene blue. The mucosal incision was made with duel knife using endocut Q current and the submucosal dissection was done using spray coagulation current (ERBE Germany). The blood vessels were cauterized using coagulation grasper (Olympus, America) using soft coagulation current. The lesion was completely removed en bloc and sent to pathology. Figures 1 to 4 depict the ESD procedure. The patient was discharged home on the same day. She was closely followed up with cross sectional imaging and periodic endoscopic evaluations. Figure 5 shows the last EGD procedure done 10 years following the original ESD showing no recurrence of cancer and the biopsies were negative for cancer and for *H. pylori* infection.

Discussion

Gastric cancer is a major global health concern and serves as the fifth most common malignancy and the fourth leading cause of cancer death worldwide.[1] Incidence and mortality rates are significantly higher in East Asian countries (Japan and Korea) and Europe compared to the United States.[2] The disease is more common in men, who face more than double the incidence and mortality rates compared to women.[1] *Helicobacter pylori* (*H. pylori*) is the leading environmental risk factor and is responsible for up to 89% of non-cardia gastric cancers.[1] Other significant risk factors include diets high in red meat and processed meats, tobacco smoking, alcohol, high salt intake, and obesity.[1] Some studies suggest high amounts of

citrus fruits and polyphenols may reduce risk, while other evidence indicates that aspirin and NSAIDs may play a protective role.[1] Roughly 90% of gastric cancer cases are sporadic, while about 10% of cases are linked to genetic predisposition, with Hereditary Diffuse Gastric Cancer (CDH1) syndrome being the strongest genetic link.[2]

Diagnosis typically begins with upper endoscopy, often prompted by symptoms such as weight loss, anemia, dyspepsia, and reflux.[2] Chest, abdomen, and pelvic CT scans are baseline for staging, and endoscopic ultrasound (EUS) is important for determining depth of tumor invasion (T stage), especially early-stage tumors that may be eligible for endoscopic removal.[2] Many cancer centers consider staging laparoscopy as initial part of the workup in patients with more advanced cancer because it can identify radiologically occult carcinomatosis; additionally, molecular testing such as evaluation of microsatellite stability (MSI) status is becoming increasingly common.[2]

For patients with non-metastatic disease (T2N0 or greater), a combined approach with either perioperative or adjuvant chemotherapy is preferred over surgery alone.[2] The primary surgical options are subtotal or total gastrectomy with adequate lymph node dissection.[2] For early gastric cancer (EGC), defined as cancer confined to the mucosa or superficial submucosa (less than 500 μm), there is a very low risk of lymph node metastasis (LNM) and an endoscopic approach can be pursued.[3] Endoscopic submucosal dissection (ESD) allows for pathological staging and preservation of the stomach to maintain a higher quality of life compared to radical surgery.[4] In metastatic disease, treatment is typically palliative and focused on symptomatic management and extension of life.[2]

ESD is a first line minimally invasive treatment for selected EGC, associated with excellent five-year survival rates, often exceeding 90%.[4] Absolute indications include lesions in which LNM risk is less than 1% (tumor less than 3 cm and submucosal invasion less than 500 μm); further, expanded indications include tumors with a minimal LNM risk (typically <3%) where an en bloc resection can be achieved.[3] Relative indications include patients who are not good surgical candidates or when a precise histopathological diagnosis cannot be established.[1] Compared to endoscopic mucosal resection (EMR), ESD is associated with higher en bloc and curative resection rates and lower rates of local recurrence.[4] ESD does carry an increased risk of perforation and requires a longer operative time, but it is associated with shorter hospital stays and its clinical outcomes are considered comparable to surgical outcomes.[3]

This case emphasizes the effectiveness of an endoscopic approach for treatment of early gastric cancer, as our patient remained disease-free ten years following an ESD. This long-term disease-free survival supports

evidence that ESD can provide clinical outcomes comparable to gastrectomy while avoiding the complications of a major surgery. This is especially advantageous as surgical gastrectomies are associated with higher perioperative risks and long-term nutritional deficiencies and poor quality of life.[3]

Surgical Pathology Final Reports
<p>Surgical pathology final report from 3/09/2015 before ESD*</p> <p>Biopsies of gastric ulcer: Gastric mucosal fragments with intramucosal adenocarcinoma at least. All three biopsies show gastric mucosa with nests and collections of atypical glandular cells, some of which have a signet ring cell appearance. These atypical cells infiltrate within the lamina propria, but no submucosa is present for analysis. A pancytokeratin immunostain highlights these atypical cells.</p>
<p>Surgical pathology final report from 3/25/2015 from ESD*</p> <p>Submucosal dissection of gastric carcinoma in the gastric antrum: Gastric adenocarcinoma extends just barely to submucosa, and both the peripheral and deep margins are free of malignancy.</p>
<p>Surgical pathology final report from 10/30/2025 10 years after ESD</p> <p>Stomach, previous ESD site, biopsy: Benign gastric mucosa. No evidence of carcinoma.</p>

**The original pathology slides were unavailable due to disposal after 10 years.*

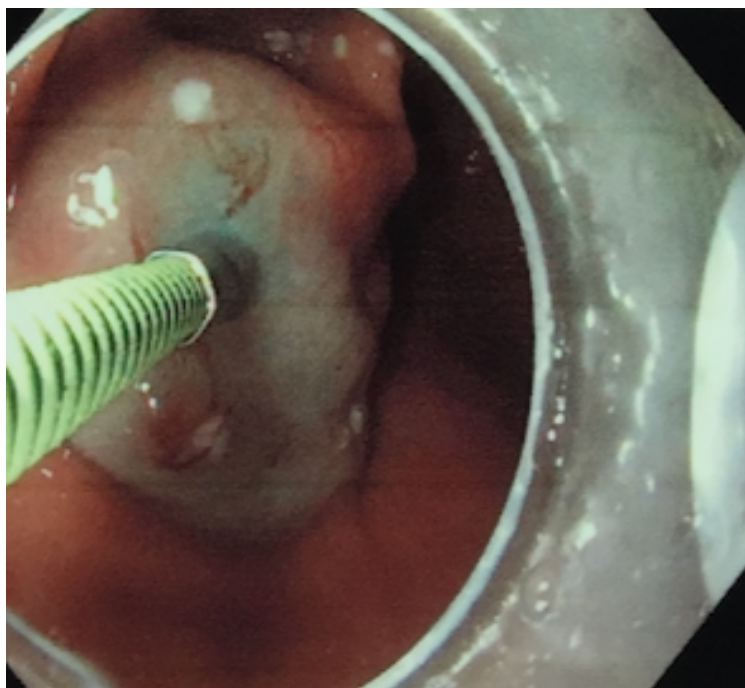


Figure 1: The lesion being raised using saline and methylene blue after marking the peripheral margin.

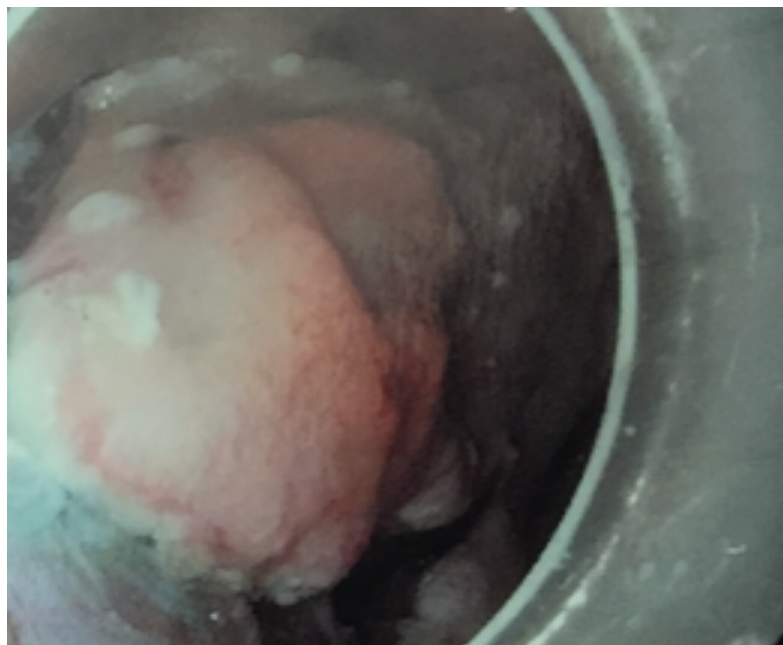


Figure 2: Mucosal incision

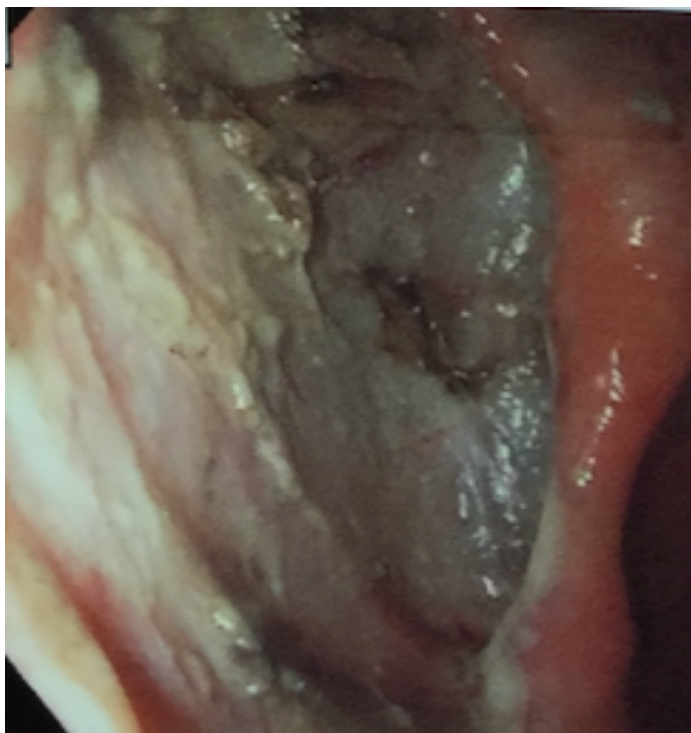


Figure 3: The lesion site after ESD.

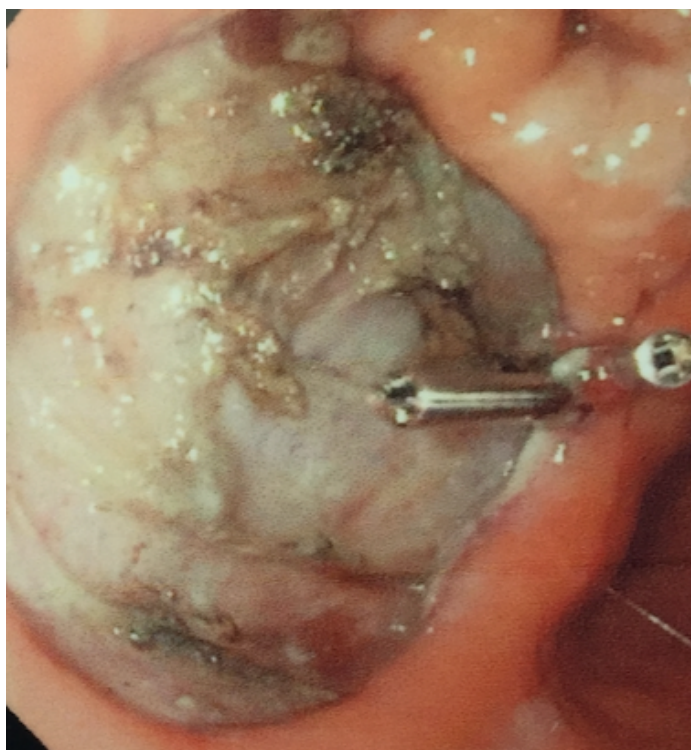


Figure 4: The site after ESD and the mucosa was not closed



Figure 5: Last EGD procedure done 10 years following the original ESD showing no recurrence of cancer.

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