

Endoscopic Treatment of Early-stage Large Gastric Cancer and Closure with Hand-suturing Technique

© Fatih Aslan¹, © Serhat Özer¹, © Orhun Çiğ Taşkın²

¹Koç University Hospital, Clinic of Gastroenterology and Advanced Endoscopy, İstanbul, Turkey

²Koç University Hospital, Clinic of Pathology, İstanbul, Turkey

ABSTRACT

Gastric cancer is one of the leading causes of cancer-related mortality worldwide. Endoscopic submucosal dissection (ESD), when indicated based on tumor size, stage, and histological characteristics, is a highly successful curative, minimally invasive, non-surgical endoscopic treatment option. However, the risk of adverse events is higher compared to traditional methods. Here, we present a case of ESD in an early-stage gastric carcinoma and endoscopic closure using a new hand-suturing system.

Keywords: ESD, suturing, gastric cancer, bleeding, metaplasia, endoscopy, dysplasia

INTRODUCTION

Gastric cancer is a leading cause of cancer-related mortality worldwide [1]. Early diagnosis and treatment interventions improve prognosis and mitigate adverse outcomes [2,3]. Endoscopic submucosal dissection (ESD), when indicated based on tumor size, stage, and histological characteristics, is a highly successful curative, minimally invasive, non-surgical endoscopic treatment option [4]. However, the risk of adverse events, such as early or delayed perforation and bleeding, is higher with traditional methods like endoscopic mucosal resection and polypectomy [5]. Here, we present a case of ESD in an early-stage gastric carcinoma (EGC) and endoscopic closure using a new hand-suturing system.

CASE PRESENTATION

A 77-year-old male patient presented with gas, bloating, and nausea that had persisted for the past month, which were alleviated with medical treatment and diet. His medical history included ischemic heart disease, for which aspirin and clopidogrel were administered. Upper endoscopic examination revealed irregular areas with unclear borders in the greater curvature and posterior wall of the corpus-antrum junction, with widespread intestinal metaplasia throughout the stomach. Chromoendoscopy with indigo carmine after acetic acid washing

revealed a flat, irregular area approximately 7 cm in diameter without ulcers (Figures 1, 2). Biopsies reveal intramucosal well-differentiated adenocarcinoma with high-grade dysplasia. Endoscopic ultrasound showed an intact muscularis propria and submucosal layer with no regional lymph nodes. Positron emission tomography did not show distant metastasis or lymph node involvement. Considering the patient's comorbid conditions and written consent, ESD was performed under general anesthesia. A 155x105 mm en-bloc resection specimen was obtained. There was no muscular damage in the resection

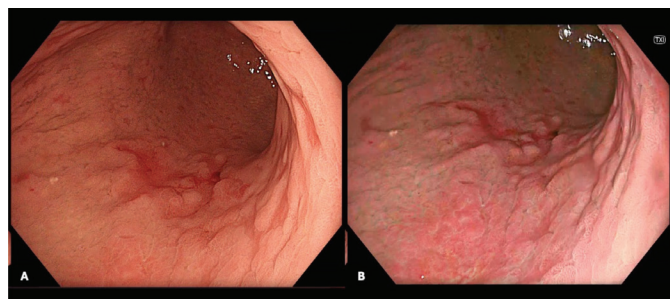


Figure 1. (A) Appearance of early gastric cancer with white light imaging. (B) Appearance of early gastric cancer with texture and color enhancement imaging



Address for Correspondence: Prof. Fatih Aslan, Koç University Hospital, Clinic of Gastroenterology and Advanced Endoscopy, İstanbul, Turkey

Phone: +90 850 250 82 50 **E-mail:** fatihaslandr@gmail.com **ORCID ID:** 0000-0002-1002-7202

Received: 26.05.2024 **Accepted:** 31.07.2024



Copyright© 2024 The Author. Published by Galenos Publishing House on behalf of Azerbaijan Gastroenterology and Invasive Endoscopy Society. This is an open access article under the Creative Commons Attribution-Attribution-NonCommercial 4.0 (CC BY-NC 4.0) International License.

area (Figure 3). Prophylactic coagulation was applied to visible vascular areas. Due to the patient's age and the necessity for anticoagulant and antiplatelet therapy, the resection area was closed using an endoscopic needle holder (Olympus, Sutuart, FG 260, Tokyo, Japan) with absorbable barbed suture (V-Loc 180, 3-0, Medtronic Ltd, Dublin, Ireland) (Figures 4, 5). Anticoagulant therapy was resumed 12 hours post-procedure per cardiology's recommendation, and the patient was discharged on postoperative day 2. Histopathological

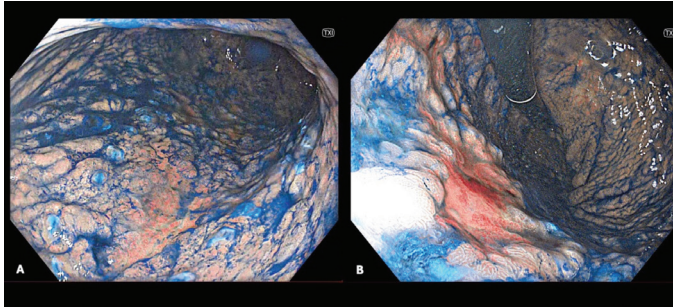


Figure 2. (A) Chromoendoscopic appearance of early gastric cancer. (B) Chromoendoscopic appearance of early gastric cancer

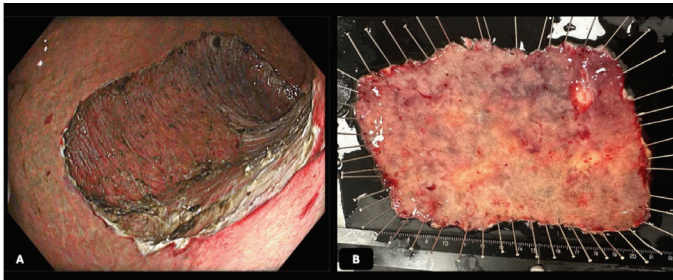


Figure 3. (A) Appearance of the resection area after endoscopic submucosal dissection. (B) En-bloc resection specimen appearance (155x105 mm)

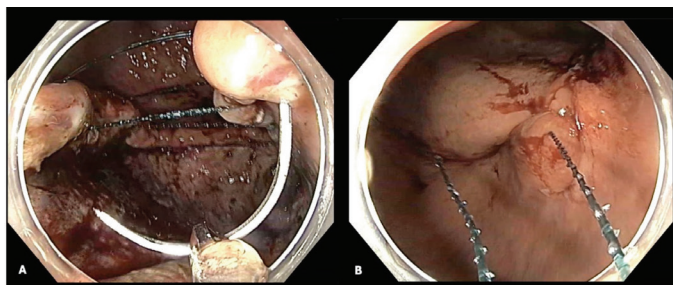


Figure 4. (A) Closure of the resection area using a V-Loc with needle holder. (B) Closure of the resection area using a V-Loc with needle holder

examination confirmed intramucosal carcinoma with high-grade dysplasia, approximately 10 cm in diameter (Figure 6). The vertical and horizontal margins were negative. No lymphovascular involvement was observed. Six months later, endoscopic follow-up revealed a linear scar without residual or recurrent lesions or metachronous lesions.

DISCUSSION

In the treatment of EGC, ESD has been a highly successful curative, non-surgical treatment option not only in East Asia but also increasingly in Western countries [6]. However, compared with traditional methods, there is a higher risk of adverse events, such as early and late bleeding and perforation. These risks increase with factors such as age, sex, lesion size, resection area, location, comorbid conditions like cirrhosis and renal failure, and anticoagulant-antiplatelet therapy [7-9]. In this case, the resection area was successfully closed using a new suturing system. After the procedure, clopidogrel and aspirin were immediately resumed, and no early or late bleeding occurred during follow-up.

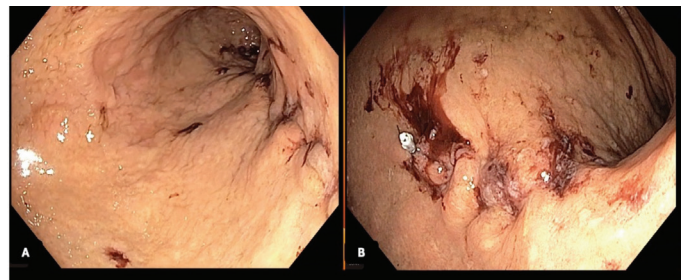


Figure 5. (A) Appearance of the resection area closed with hand suturing. (B) Appearance of the resection area closed with hand suturing

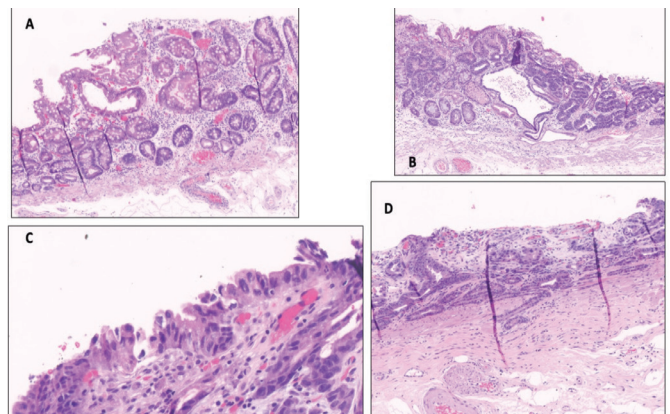


Figure 6. (A) Intestinal metaplasia, (B) high-grade dysplasia, (C) high-grade dysplasia/intramucosal carcinoma, (D) muscularis mucosa invasion

One issue following extensive resection is the development of strictures due to healing. The risk of strictures increases with the size of the resection area, presence of fibrosis, inflammation, neovascularization, and fibroblast activity [10-12]. Endoscopic suturing has been reported to result in less neovascularization and fibroblast activity [13]. In our case, despite the large resection area, no symptomatic or endoscopic strictures were observed during follow-up.

In patients with EGC and comorbidities requiring anticoagulant and antiplatelet therapy, ESD can be successfully performed regardless of lesion size at experienced centers. We believe that new endoscopic suturing systems will play a significant role in preventing late post-procedure adverse events.

Ethics

Informed Consent: Obtained.

Authorship Contributions

Surgical and Medical Practices: F.A., S.Ö., Data Collection or Processing: F.A., S.Ö., O.Ç.T., Analysis or Interpretation: F.A., O.Ç.T., Literature Search: F.A., Writing: F.A.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74:229-63.
2. Al-Haddad MA, Elhanafi SE, Forbes N, Thosani NC, Draganov PV, et al. American Society for Gastrointestinal Endoscopy guideline on endoscopic submucosal dissection for the management of early esophageal and gastric cancers: methodology and review of evidence. *Gastrointest Endosc.* 2023;98:285-305.e38.
3. Yao K, Uedo N, Kamada T, Hirasawa T, Nagahama T, et al. Guidelines for endoscopic diagnosis of early gastric cancer. *Dig Endosc.* 2020;32:663-98.
4. Hatta W, Gotoda T, Oyama T, Kawata N, Takahashi A, Yet al. A Scoring system to stratify curability after endoscopic submucosal dissection for early gastric cancer: "eCura system". *Am J Gastroenterol.* 2017;112:874-81. Erratum in: *Am J Gastroenterol.* 2019;114:1925-6.
5. Facciorusso A, Antonino M, Di Maso M, Muscatiello N. Endoscopic submucosal dissection vs endoscopic mucosal resection for early gastric cancer: a meta-analysis. *World J Gastrointest Endosc.* 2014;6:555-63.
6. ASGE standards of practice committee; Forbes N, Elhanafi SE, Al-Haddad MA, Thosani NC, et al. American Society for Gastrointestinal Endoscopy guideline on endoscopic submucosal dissection for the management of early esophageal and gastric cancers: summary and recommendations. *Gastrointest Endosc.* 2023;98:271-84.
7. Hashimoto M, Hatta W, Tsuji Y, Yoshio T, Yabuuchi Y, et al. Rebleeding in patients with delayed bleeding after endoscopic submucosal dissection for early gastric cancer. *Dig Endosc.* 2021;33:1120-30.
8. Miura Y, Tsuji Y, Yoshio T, Hatta W, Yabuuchi Y, et al. Association between perioperative management of antiplatelet agents and risk of post-endoscopic submucosal dissection bleeding in early gastric cancer: analysis of a nationwide multicenter study. *Gastrointest Endosc.* 2023;97:889-97.
9. Tanoue K, Fukunaga S, Nagami Y, Sakai T, Maruyama H, et al. Long-term outcome of endoscopic submucosal dissection for early gastric cancer in patients with severe comorbidities: a comparative propensity score analysis. *Gastric Cancer.* 2019;22:558-66.
10. Iizuka H, Kakizaki S, Sohara N, Onozato Y, Ishihara H, et al. Stricture after endoscopic submucosal dissection for early gastric cancers and adenomas. *Dig Endosc.* 2010;22:282-8.
11. Kim GH, Jee SR, Jang JY, Shin SK, Choi KD, et al. Stricture occurring after endoscopic submucosal dissection for esophageal and gastric tumors. *Clin Endosc.* 2014;47:516-22.
12. Yang F, Hu Y, Shi Z, Liu M, Hu K, et al. The occurrence and development mechanisms of esophageal stricture: state of the art review. *J Transl Med.* 2024;22:123.
13. Akimoto T, Goto O, Sasaki M, Mizutani M, Tsutsumi K, et al. Endoscopic hand suturing for mucosal defect closure after gastric endoscopic submucosal dissection may reduce the risk of postoperative bleeding in patients receiving antithrombotic therapy. *Dig Endosc.* 2022;34:123-32.