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[Case report]

Successful endoscopic submucosal dissection for early gastric cancer adjacent to gastric cardia varix

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Abstract

A 58-year-old man with liver cirrhosis and renal failure was diagnosed with esophageal varices (EVs) and a gastric cardia varix (GCV) by esophagogastroduodenoscopy (EGD). The patient also exhibited early gastric cancer (EGC) in the upper gastric body adjacent to the GCV. The EVs and GCV were treated using endoscopy before endoscopic submucosal dissection (ESD) of the EGC to prevent variceal bleeding during ESD. Endoscopic variceal ligation (EVL) was performed to treat the EVs. In addition, extra-variceal polidocanol injection and argon plasma coagulation (APC) were performed after EVL. Follow-up EGD two months after APC revealed that the GCV had diminished in size. Then, ESD was performed with polidocanol injection into the submucosa around the GCV to prevent bleeding. During ESD, the EGC was resected *en bloc* without severe bleeding. Complications were not observed after ESD. Histopathological examination of the ESD specimens indicated that the resection was curative.

Key words : endoscopic resection, endoscopic treatment, esophageal varix, gastric neoplasm, injection

Introduction

Endoscopic submucosal dissection (ESD) has become a standard treatment for early gastric cancer (EGC) without lymph node metastasis^{1,2)}. However, intraoperative and postoperative bleeding are still major complications of ESD¹⁾. Reported cases of EGC with liver cirrhosis and gastric varices^{3,4)} underscore the increased risk of intraoperative bleeding. This report describes a case of successful ESD using submucosal polidocanol injection for EGC adjacent to the gastric cardia varix (GCV).

Case Report

A 58-year-old man with liver cirrhosis and re-

nal failure came to our hospital to receive treatment for EGC, esophageal varices (EVs), and GCV. He was a social drinker and had smoked one pack of cigarettes per day for 20 years. He had taken drugs for diabetes mellitus and chronic renal failure. Laboratory diagnostic findings were the following : alanine aminotransferase, 24 IU/L ; total bilirubin, 1.5 mg/dL ; albumin, 4.2 g/dL ; creatinine, 1.97 mg/dL ; blood urea nitrogen, 21 mg/dL ; Hb, 13.9 g/dL ; platelet count, 84,000 /mm³ ; and prothrombin time, 85.1%. The assays for hepatitis viral markers, anti-nuclear antibodies, and anti-mitochondrial M2 antibodies were all negative. His liver function was evaluated as Child-Pugh grade A.

Esophagogastroduodenoscopy (EGD) conducted using an endoscope (GIF-H260Z endoscope ;

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Olympus Medical Systems Corp., Tokyo, Japan) revealed red EVs (LmF2CbRC1 [cherry red spots] according to the grading system proposed by the Japanese Research Society for Portal Hypertension⁵). They extended from the middle of the esophagus to the GCV (Fig. 1A). Additionally, a 10-mm reddish, irregular, slightly depressed lesion was observed at the anterior wall of the upper gastric body adjacent to the GCV (Fig. 1B). Histological analysis of a biopsy specimen of this lesion showed that it was a well-differentiated adenocarcinoma. Chromoendoscopy using indigo carmine clarified the tumor border (Fig. 1C). Endoscopic ultrasonography (EUS) that was performed using a 20-MHz micro-probe (UM-3R; Olympus Medical Systems Corp., Tokyo, Japan) revealed EVs contiguous to the GCV, having maximal diameter of 5 mm (Fig. 1D) and supplied by the left gastric vein and perforating veins, which penetrated into EVs in the lower esophagus. The depth of tumor invasion appeared to be intramucosal. The EGC was very close to the GCV.

Non-contrast computed tomography (CT) showed neither lymph node nor distant metastases. Because of his renal failure, contrast-enhanced CT was not performed. The EGC lesion was regarded as an indication of ESD. Following a thorough discussion of treatment options, the patient consented to ESD. Treatment priority was assigned to the EVs and GCV to prevent bleeding before and during ESD. Intra-variceal endoscopic injection sclerotherapy (EIS) with ethanolamine oleate (EO) and iodopovidone could not be used to treat EVs because the patient was experiencing renal failure. Therefore, we performed endoscopic variceal ligation (EVL) using a pneumoactive EVL device (Sumitomo Bakelite Co. Ltd., Tokyo, Japan) (Fig. 2A). To prevent fibrosis around the EGC, the GCV was not ligated. All EVs were ligated from the esophagogastric junction to the oral side, particularly EVs at the perforating veins. Two EVL sessions were performed a week apart. One week after the second EVL session, extra-variceal EIS was performed: 20 mL of 1%

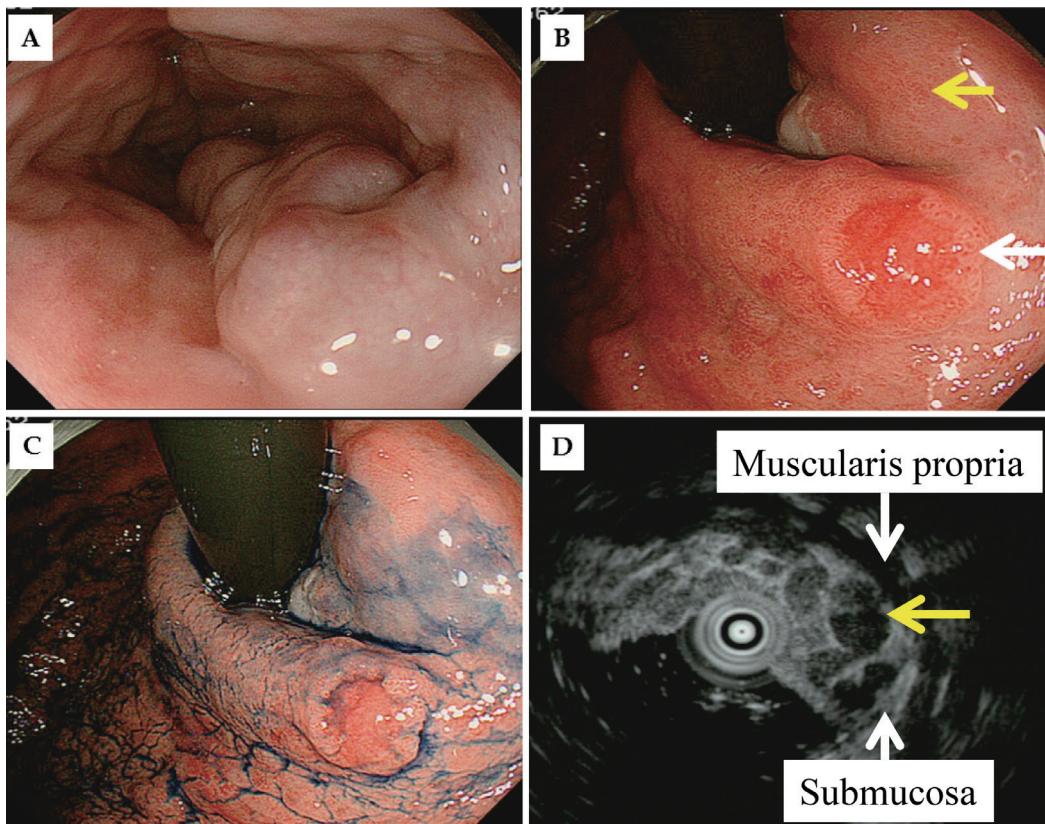


Fig. 1. Endoscopic images taken before endoscopic treatment of esophageal varices (EVs).

- A : White light imaging revealed EVs extending from the middle esophagus to the gastric cardia varix (GCV).
- B : White light imaging revealed an EGC (white arrow) at the anterior wall of the upper gastric body adjacent to the GCV (yellow arrow).
- C : Chromoendoscopy using indigo carmine clarified the tumor border.
- D : Endoscopic ultrasonography showed a 5-mm-diameter GCV (yellow arrow) in the submucosa at the lesser curvature of the upper gastric body contiguous to EVs.

polidocanol (aethoxysclerol ; Kaigen Co. Ltd., Osaka, Japan) was injected around the esophageal ulcers caused by the EVL to eradicate residual blood flow from the varices (Fig. 2B). One week after extra-variceal EIS, we performed argon plasma coagulation (APC) on the lower esophagus to promote esophageal mucosal fibrosis (Fig. 2C). The APC was performed using argon gas at a flow rate of 1 L/min and a high frequency arc output of 40 W (APC300 ; Erbe Elektromedizin GmbH, Tübingen, Germany). Follow-up EGD conducted two months after APC revealed that the EVs had disappeared (Fig. 3A). Moreover, the GCV had diminished in size (Fig. 3B). EUS revealed a GCV of 2 mm diameter (Fig. 3C).

ESD was performed for EGC using a gastroscope with a water jet system (GIF-Q260J ; Olympus Medical Systems Corp., Tokyo, Japan) and an electrosurgical unit (ICC-200 ; Erbe Elektromedizin GmbH,

Tübingen, Germany). Two electrosurgical knives (Dual knife, IT knife 2 ; Olympus Medical Systems Corp., Tokyo, Japan) were used in conjunction with electrosurgical hemostatic forceps (Coagrasper ; Olympus Medical Systems Corp., Tokyo, Japan). To prevent bleeding from the GCV during ESD, 1% polidocanol was injected into the submucosa around the GCV (Fig. 4A). The total dose of polidocanol was 10 mL. After mucosal incision, hyaluronic acid (MucoUp ; Johnson & Johnson, Tokyo, Japan) was injected to create a submucosal fluid cushion (Fig. 4B). The lesion was resected *en bloc* by ESD (Figs. 4C and 4D). Neither severe intraoperative bleeding nor complication was observed during or after ESD. The histopathological examination of the ESD specimens revealed well-differentiated adenocarcinoma that had invaded to the level of the mucosa and which were 5 × 2 mm, with disease-free margins. No lymphovascular invasion was detected

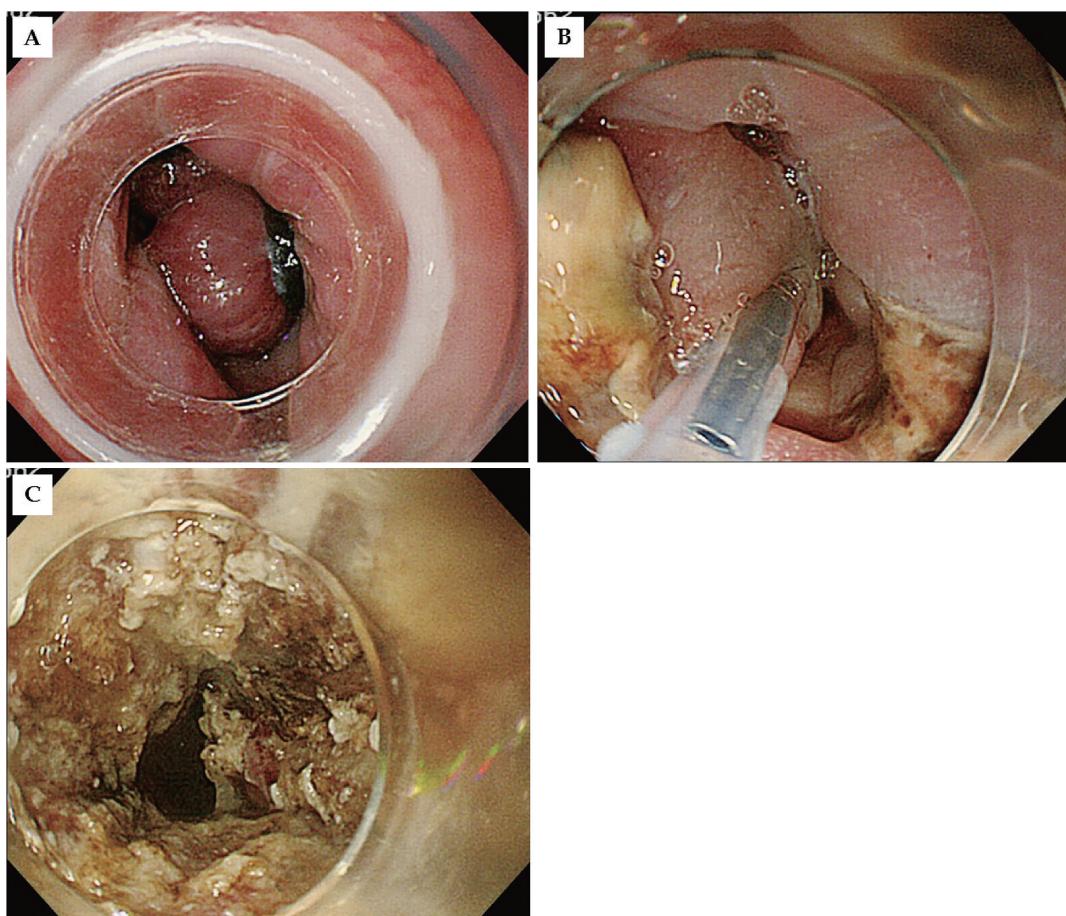


Fig. 2. Endoscopic images taken during endoscopic treatment of esophageal varices (EVs).

- A : Endoscopic variceal ligation (EVL) was performed to treat EVs. All EVs were ligated from the esophago-gastric junction to the oral side, with special attention devoted to perforating veins.
- B : Extra-variceal endoscopic injection sclerotherapy (EIS) was conducted with 20 mL of 1% polidocanol injected around the ulcers caused by EVL.
- C : Argon plasma coagulation was performed on the lower esophagus after EVL and extra-variceal EIS.

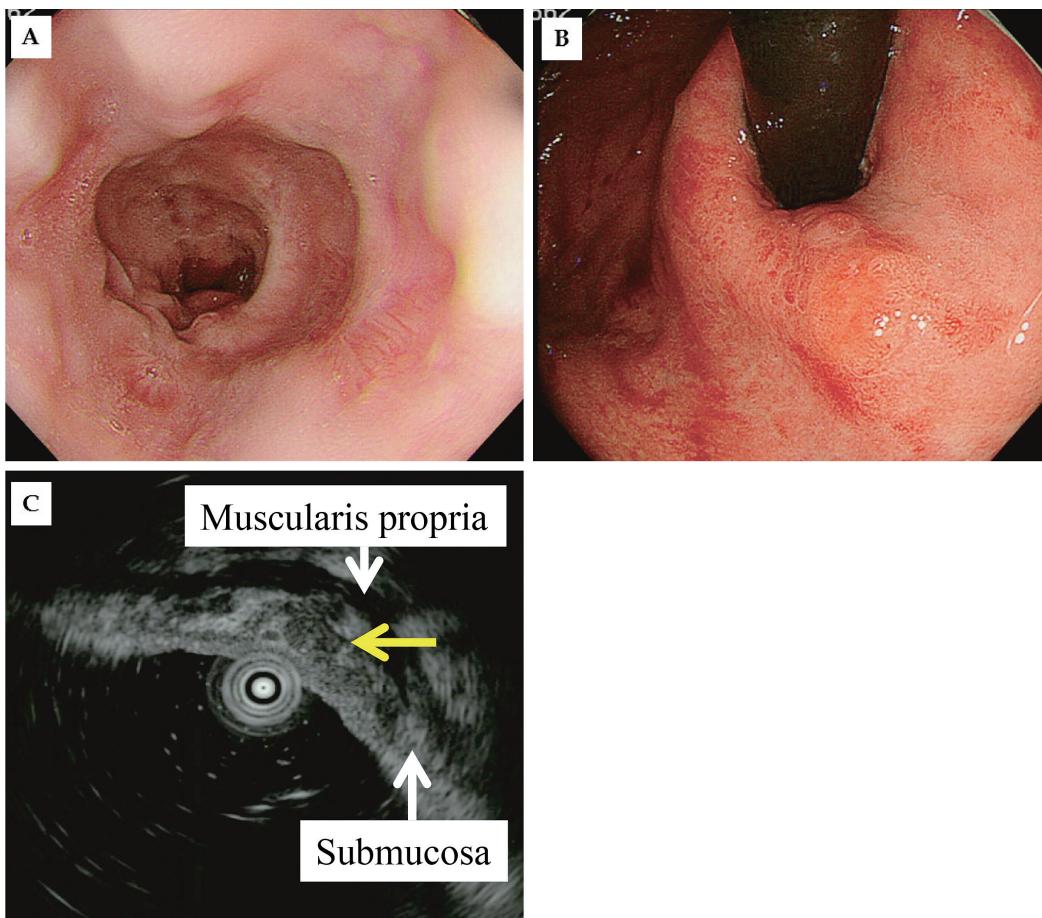


Fig. 3. Endoscopic images taken 2 months after endoscopic treatment of esophageal varices (EVs).

A : White light imaging revealed the absence of EVs after treatment.

B : White light imaging showed that the gastric cardia varix (GCV) had become smaller.

C : Endoscopic ultrasonography revealed a 2-mm-diameter GCV (yellow arrow) in the submucosa at the lesser curvature of the upper gastric body.

(Figs. 5A and 5B). Therefore, we concluded that the EGC had been resected curatively by ESD. No fibrosis was detected around the GCV. Follow-up EGD two months after ESD revealed a healing ulcer. At 36 months after ESD, the patient was alive and in good health with no evidence of the disease.

Discussion

This report described the successful treatment of an EGC, adjacent to a GCV, using ESD with submucosal polidocanol injection. Previous reports have described the effectiveness and safety of treatment of EGC with ESD in patients with liver cirrhosis⁶⁻⁹⁾. However, for EGC in patients with liver cirrhosis adjacent to varices, severe bleeding from the varices during mucosal incision or submucosal dissection might occur during ESD. To prevent intraoperative bleeding, we felt it was necessary to eradicate the varices before performing ESD.

Reportedly, ESD combined with EIS using cyanoacrylate and EO³⁾ and endoscopic variceal obstruction (EVO) using N-butyl-2-cyanoacrylate⁴⁾ is effective for the treatment of EGC adjacent to a gastric fundal varix. ESD was conducted after eradication of the gastric fundal varices using EIS or EVO. In our case, the EGC was located adjacent to a GCV continuous with EVs. Injection of cyanoacrylate or N-butyl-2-cyanoacrylate was difficult because of the small size of the GCV. The effectiveness of ESD combined with intra-variceal EIS using EO to treat early esophageal cancer located close to EVs has also been reported¹⁰⁾. Because the GCV leads directly to EVs, intra-variceal EIS using EO to treat EVs induces vessel thrombosis in the GCV concomitantly with vessel thrombosis in the EVs without the formation of fibroses. Therefore, intra-variceal EIS using EO is a preferred treatment option for EGC adjacent to a GCV. However, in our case, intra-variceal EIS using EO could not be performed because

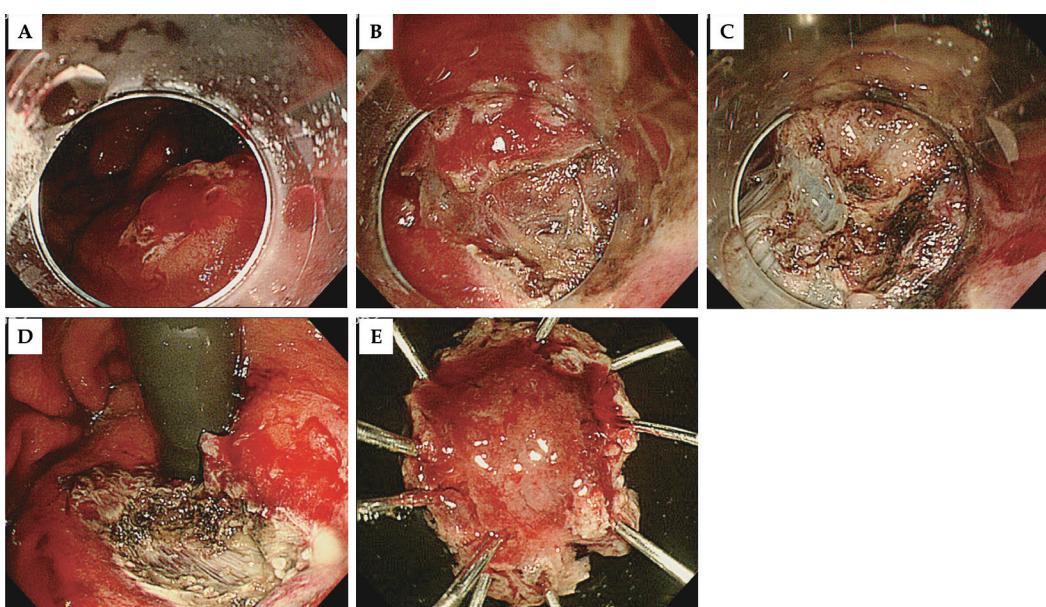


Fig. 4. Endoscopic images taken during endoscopic submucosal dissection (ESD), and a resected specimen.
A : Polidocanol injection of the gastric cardia varix (GCV) was performed immediately before mucosal incision ; 10 mL 1% polidocanol was injected into the submucosa around the GCV and gastric cancer.
B : Mucosal incision around the GCV was performed safely with Dual knife without severe bleeding.
C : Submucosal dissection was performed safely with Dual knife and IT knife 2.
D and E : The lesion was resected *en bloc*.

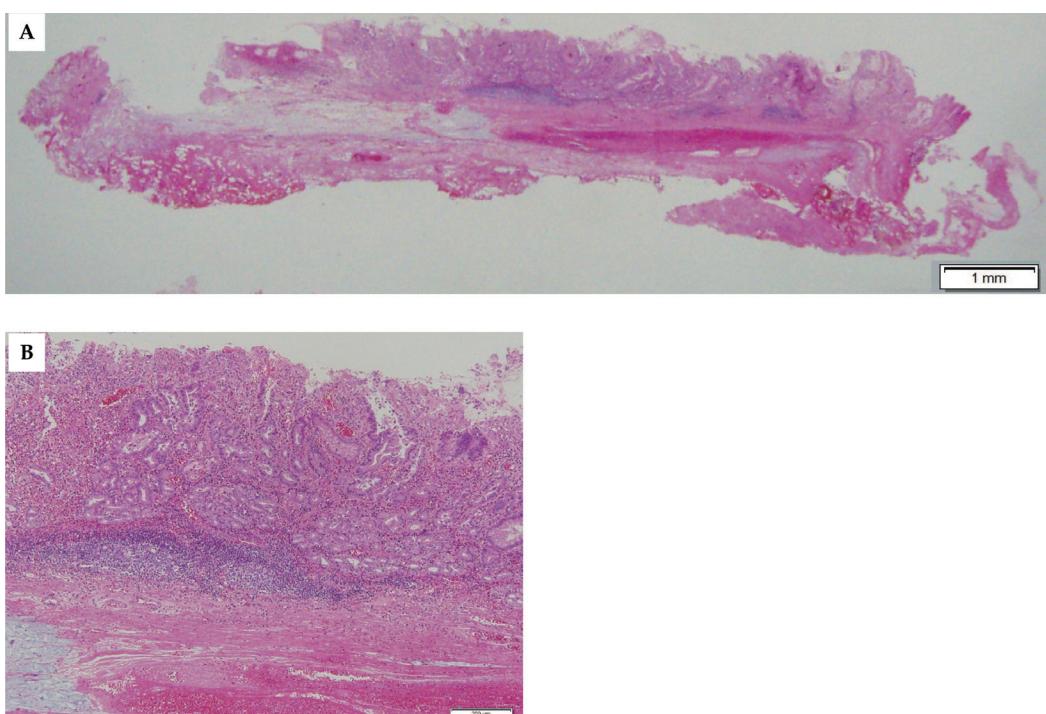


Fig. 5. Histopathological examinations results for endoscopic submucosal dissection (ESD) specimens (hematoxylin and eosin stained).
Histopathological examination revealed well-differentiated adenocarcinoma that had invaded to the level of the mucosa with disease-free margins. Fibrosis around the GCV was not detected. (A, Low power field ; B, Medium power field. The length of the scale bar in figure 5B is 200 μm).

the patient was in renal failure¹¹⁾. Therefore, we performed EVL, extra-variceal EIS, and APC to eliminate the blood flow from EVs. Particularly, EVL was done to ligate the perforating veins that had been revealed by EUS to prevent the inflow of vessels from outside the esophageal wall into the EVs. Extra-variceal EIS using polidocanol was performed to produce local thrombosis, an inflammatory reaction, and fibrosis degeneration at the residual varices^{11,12)}. APC was performed to promote esophageal mucosal fibrosis. EVL combined with APC completely eliminated EVs and prevented their recurrence^{13,14)}. In summary, this treatment of EVs enabled us to reduce the GCV, probably by rerouting the variceal blood flow to collateral pathways through eradication of the blood flow to EVs.

Furthermore, it is noteworthy that we performed ESD with submucosal polidocanol injection to treat the remaining GCV before mucosal incision, thereby preventing bleeding around the GCV. Polidocanol injection is an effective treatment for hemostasis of acute upper gastrointestinal bleeding by acute dehydration and fixation of the tissue and for extra-variceal EIS by vessel thrombosis and fibrosis¹⁵⁾. A previous histological report described that fibrotic changes coexisting with EGC are related closely to technical difficulties that occur during ESD¹⁶⁾. Funakoshi *et al.* reported that adhesion caused by EIS performed using polidocanol made it difficult to perform endoscopic mucosal resection for early esophageal cancer¹⁷⁾. Therefore, polidocanol was injected immediately before performing ESD to minimize fibrosis around the GCV. The endoscopic treatment of EVs by endoscopy and polidocanol injection enabled us to perform ESD successfully for the treatment of EGC adjacent to a GCV in a patient with liver cirrhosis and renal failure. In our case, combination therapy consisting of EVL, extra-variceal EIS, APC for EVs, and polidocanol injection for GCV was effective at preventing intraoperative bleeding during ESD.

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Conflict of Interest

The authors declare that they have no conflict of interest, financial or otherwise, in relation to this study.

References

- Chung IK, Lee JH, Lee SH, *et al.* Therapeutic outcomes in 1000 cases of endoscopic submucosal dissection for early gastric neoplasms : Korean ESD Study Group multicenter study. *Gastrointest Endosc*, **69** : 1228-1235, 2009.
- Isomoto H, Shikuwa S, Yamaguchi N, *et al.* Endoscopic submucosal dissection for early gastric cancer : a large-scale feasibility study. *Gut*, **58** : 331-336, 2009.
- Uno K, Iijima K, Koike T, *et al.* Endoscopic submucosal dissection combined with endoscopic injection sclerotherapy for early gastric cancer on gastric fundal varices. *Surg Laparo Endo Per*, **22** : e226-229, 2012.
- Kim YS, Cho WY, Cho JY, Jin SY. Successful treatment of early gastric cancer adjacent to a fundal varix by endoscopic submucosal dissection and endoscopic cyanoacrylate therapy. *Clin Endosc*, **45** : 169-173, 2012.
- The Japan Society for Portal Hypertension. The rules for study of portal hypertension. Third ed. Tokyo : Kanehara Co., 37-38, 2013.
- Repici A, Pagano N, Hassan C, *et al.* Endoscopic submucosal dissection of gastric neoplastic lesions in patients with liver cirrhosis : A systematic review. *J Gastrointest Liver Dis*, **21** : 303-307, 2012.
- Ogura K, Okamoto M, Sugimoto T, *et al.* Efficacy and safety of endoscopic submucosal dissection for gastric cancer in patients with liver cirrhosis. *Endoscopy*, **40** : 443-445, 2008.
- Kwon YL, Kim ES, Lee KI, *et al.* Endoscopic treatments of gastric mucosal lesions are not riskier in patients with chronic renal failure or liver cirrhosis. *Surg Endosc*, **25** : 1994-1999, 2011.
- Choi JH, Kim ER, Min BH, *et al.* The feasibility and safety of the endoscopic submucosal dissection of superficial gastric neoplastic lesions in patients with compensated liver cirrhosis : a retrospective study. *Gut Liver*, **6** : 58-63, 2012.
- Inoue H, Endo M, Takeshita K, *et al.* Endoscopic resection of carcinoma in situ of the esophagus accompanied by esophageal varices. *Surg Endosc*, **5** : 182-184, 1991.
- Miyaaki H, Ichikawa T, Taura N, Miuma S, Isomoto H, Nakao K. Endoscopic management of esophagogastric varices in Japan. *Ann Transl Med*, **2** : 42, 2014.
- Yoshida H, Mamada Y, Taniai N, *et al.* Treatment modalities for bleeding esophagogastric varices. *J Nippon Med Sch*, **79** : 19-30, 2012.
- Nakamura S, Mitsunaga A, Murata Y, Suzuki S, Hayashi N. Endoscopic induction of mucosal fibrosis by argon plasma coagulation (APC) for

- esophageal varices : A prospective randomized trial of ligation plus APC vs. ligation alone. Endoscopy, **33** : 210-215, 2001.
14. Cipolletta L, Bianco MA, Rotondano G, Marmo R, Meucci C, Piscopo R. Argon plasma coagulation prevents variceal recurrence after band ligation of esophageal varices : preliminary results of a prospective randomized trial. Gastrointest Endosc, **56** : 467-471, 2002.
15. Rutgeerts P, Geboes K, Vantrappen G. Experimental studies of injection therapy for severe non-variceal bleeding in dogs. Gastroenterology, **97** : 610-621, 1989.
16. Nagata S, Jin YF, Tomoeda M, *et al.* Influential factors in procedure time of endoscopic submucosal dissection for gastric cancer with fibrotic change. Dig Endosc, **23** : 296-301, 2011.
17. Funakoshi K, Akiyama N, Kozakai I, *et al.* Successful endoscopic therapy of superficial esophageal cancer on varices in a patient with alcoholic liver cirrhosis. Dig Endosc, **13** : 212-215, 2001.