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ABOUT COVER

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CASE REPORT

Endoscopic clipping for the secondary prophylaxis of bleeding gastric varices in a patient with cirrhosis: A case report

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Abstract

BACKGROUND

Bleeding from gastroesophageal varices (GOV) is a serious complication in patients with liver cirrhosis, carrying a very high mortality rate. For secondary prophylaxis against initial and recurrent bleeding, endoscopic therapy is a critical intervention. Endoscopic variceal clipping for secondary prophylaxis in adult GOV has not been reported.

CASE SUMMARY

A 66-year-old man with cirrhosis was admitted to our hospital complaining of asthenia and hematochezia for 1 wk. His hemoglobin level and red blood cell counts were significantly decreased, and his fecal occult blood test was positive. An enhanced computed tomography of the abdomen showed GOV. The patient was diagnosed with hepatitis B cirrhosis-related GOV bleeding. A series of palliative treatments were administered, resulting in significant clinical improvement. Subsequently, an endoscopic examination revealed severe gastric fundal varices, prompting endoscopic variceal clipping. There were no further episodes of gastrointestinal bleeding. The GOV improved significantly on follow-up imaging and was confirmed as improved on endoscopy at the 5th post-operative month.

CONCLUSION

Our results suggest that endoscopic clipping is an inexpensive, safe, easy, effective, and tolerable method for the secondary prophylaxis of bleeding from gastric type 2 GOV. However, additional research is indicated to confirm its long-term safety and efficacy.

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Core Tip: Gastrointestinal bleeding as a sequela of portal hypertension can be catastrophic and fatal. For patients without secondary prevention, the rebleeding and mortality rate is high; therefore, secondary prophylaxis is vital, and endoscopic techniques are primary methods used to perform this. Our novel endoscopic technique could play a critical role in the prevention of variceal re-bleeding, and we propose that it is a safe and efficacious method for the secondary prophylaxis of Type 2 GOV rebleeding. Our work provides an idea for the further study in this field.

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INTRODUCTION

One of the most life-threatening complications of liver cirrhosis is acute variceal bleeding, which is associated with an increased mortality rate of approximately 20% at 6 wk[1]. For patients without secondary prevention, the rebleeding rate was as high as 60%, and the mortality rate reached 33% within 1-2 years[2]. Therefore, secondary prophylaxis is vital, and endoscopy is the primary method used to perform secondary prophylaxis techniques. A variety of techniques, including endoscopic variceal ligation (EVL), endoscopic injection sclerosis (EIS), and tissue adhesive injection, are available to manage gastroesophageal varices (GOV). GOV can be divided into Type 1 GOV and Type 2 GOV (GOV 2). GOV1 manifests as relatively straight varices extending along the lesser curvature of stomach to 2-5 cm below the gastroesophageal junction, while GOV 2 extends beyond the gastroesophageal junction into the fundus of the stomach [3]. However, these treatments are not without potentially serious complications. EVL, which can cause cerebral air embolism[4] and infective endocarditis[5], has not been widely used in gastric varices. EIS has a high complication rate for gastric ulceration, perforation, and rebleeding (37%-53%)[3,6], and its sclerosing agent can leak into the inferior vena cava[7]. The tissue adhesive injection procedure can result in embolization, leading to potentially fatal complications such as pulmonary[8] and spinal cord embolisms[9]. Endoscopic hemostatic metal clips were first designed by Hayashi *et al*[10] in 1975 and were initially used to achieve hemostasis in focal gastrointestinal bleeding[11] with the added benefit of a low rebleeding rate[12]. To our knowledge, endoscopic variceal clipping (EVC) for secondary prophylaxis in adult GOV has not been reported. Therefore, we present a retrospective case in which metal clips were utilized for the treatment of severe GOV 2 in a cirrhotic patient and evaluate the efficacy of EVC.

CASE PRESENTATION

Chief complaints

A 66-year-old man with cirrhosis was admitted to our hospital with a complaint of asthenia and hematochezia for 1 wk.

History of present illness

The patient had black stool for 1 wk and frequent bouts of asthenia.

History of past illness

He had a significant medical history of diabetes, hypersplenism, hypoalbuminemia,

cholecystitis, mild anemia and bradycardia, and hepatitis B/decompensated cirrhosis, for which he received entecavir.

Personal and family history

He had no history of alcohol abuse, toxic exposure, or hereditary disease.

Physical examination

His vitals at admission and pertinent physical examination findings were notable for a pulse of 84 and blood pressure 134/76 mmHg; he was lucid with a hepatic face, pale lips and conjunctiva, palmar erythema, chest spider angiomas, and mild bilateral pitting edema; the rest of his examination findings were unremarkable.

Laboratory examinations

Initial laboratory test results were shown in Table 1. The 14C-urea breath test was negative.

Imaging examinations

Chest computed tomography (CT) showed inflammation in the middle lobe of the right lung, and an enhanced upper abdominal CT showed gastric varices (Figure 1A-D).

FINAL DIAGNOSIS

The patient was diagnosed with hepatitis B cirrhosis-related GOV bleeding.

TREATMENT

The patient and their family members refused emergency endoscopy as they were worried about endoscopy related complications. At the same time, blood transfusion therapy with 1000 mL of packed red blood cells, acid suppressive agents (lansoprazole), hemostatic agents, antibiotic therapy (levofloxacin), somatostatin injection, glycemic control agents, enteral fasting, parenteral nutrition, and a laxative (lactulose) were all administered for 11 d. He responded well to treatment as his hemoglobin level stabilized (> 70 g/dL) and no rebleeding occurred. On day 4, he was administered meperidine and diazepam before an upper gastrointestinal endoscopy [Olympus CV290 (Olympus Corporation, Tokyo, Japan)] was performed; several large gastric fundal varices without a spurting bleeding point were found (Figure 1E-H). The patient refused EIS and tissue adhesive injection as he was worried about procedural complications and treatment costs. We therefore used EVC to treat the severe gastric varices. Subsequently, the varicose veins were successfully managed with 20 metal clips (Nanwei Medical Pharmaceutical Co., Ltd, Nanjing, China; Figure 1I-L). Specifically, we adopted the rotatable metal clips ROCC-F-26-195-C (opening size 14 mm, working length 1950 mm) and ROCC-D-26-195 (opening size 10 mm, working length 1950 mm), respectively. In the reversal location for endoscope, we adjusted the front end of endoscope to be perpendicular to the vessel cross-section, and subsequently, pushed the clip from biopsy channel, then slowly closed the clip after the varicose vein was completely caught in the clip; with the cardia as the center, we first clamped the small diameter and relatively isolated varicose veins, then clamped the larger varices. First, we clamped the inflow segment of the varices, and then clamped the outflow segment of the varices. The clip should be as close as possible to muscularis propria when clamping the varices, and the distance between the clip and dentate margin of cardia must be more than 10 mm.

OUTCOME AND FOLLOW-UP

The patient had no black stools on the 2nd postoperative day and was discharged a week after operation. He had no further episodes of gastrointestinal bleeding with a normal hemoglobin level and liver function tests noted at the 5th month of follow-up. Follow-up imaging showed significantly improved gastric varices (Figure 2A-D), and the follow-up endoscopy showed well-healed gastric varices at the 5th postoperative month (Figure 2E-H).

Table 1 Laboratory findings on admission

	Result	Reference range	
Red blood cell count, × 10^{12}/L	1.89	3.8-5.8	Decreased
Hemoglobin level, g/dL	59	115-175	Decreased
Alkaline phosphatase, U/L	43	45-125	Decreased
Albumin, g/L	29.4	40-55	Decreased
Total protein, g/L	56.1	65-85	Decreased
Alanine aminotransferase, U/L	16	9-50	Normal
Serum creatinine, μmol/L	75	57-111	Normal
Direct bilirubin, μmol/L	7.9	0-6.89	Increased
Plasma fibrinogen level, g/L	4.44	2-4	Increased
Random blood glucose, mmol/L	29.45	3.89-6.11	Increased
Plasma D-dimer, mg/L	0.61	0-0.5	Increased
Urea nitrogen, mmol/L	9.76	3.6-9.5	Increased
Serum lipase, U/L	133.9	13-60	Increased
Creatine kinase, U/L	382	50-310	Increased
Alpha-fetoprotein, ng/mL	17.4	0-13.6	Increased
Glycosylated hemoglobin, %	7.6	4.0-6.5	Increased
Hepatitis B virus DNA, iu/mL	9020	< 100	Increased
Hepatitis B virus surface antigen	Positive	Negative	Abnormal
Hepatitis B E antibody	Positive	Negative	Abnormal
Hepatitis B core antibody	Positive	Negative	Abnormal
Fecal occult blood test	Positive	Negative	Abnormal
Hepatitis C virus antibody	Negative	Negative	Normal
Helicobacter pylori antibody	Negative	Negative	Normal
Human immunodeficiency virus antibody	Negative	Negative	Normal
Syphilis antibody	Negative	Negative	Normal

This retrospective case report was approved by the ethics review board of Shenzhen Shiyan People's Hospital (Approval no. 2021SZSY-01). The patient provided written informed consent for the participation and publication of this report. He was satisfied with the treatment received.

DISCUSSION

A new method of endoscopic therapy using metal clips for the secondary prevention of bleeding from gastric varices in patients with cirrhosis was devised. Our study expands the clinical application of endoscopic clipping and offers a new solution for secondary prophylaxis of bleeding from gastric varices. The results suggested that our endoscopic clip method is safe, inexpensive, easy, and effective and was well tolerated by a patient with GOV 2.

EVC appears to be an effective technique for the secondary prophylaxis of bleeding from GOV 2. During the procedure, the endoscope did not have to be withdrawn, simplifying the operation by shortening the surgical time while minimizing medical risks. In addition, metal clips are more cost-efficient than tissue adhesives and sclerosing agents and have good histocompatibility; furthermore, their safety and efficacy profile in endoscopic hemostasis has garnered more approval in the literature. Employing EVC not only simplifies the endoscopy but precludes the need for surgery and long-term conventional treatment. Mitsunaga *et al*[13] reported 82 prophylactic

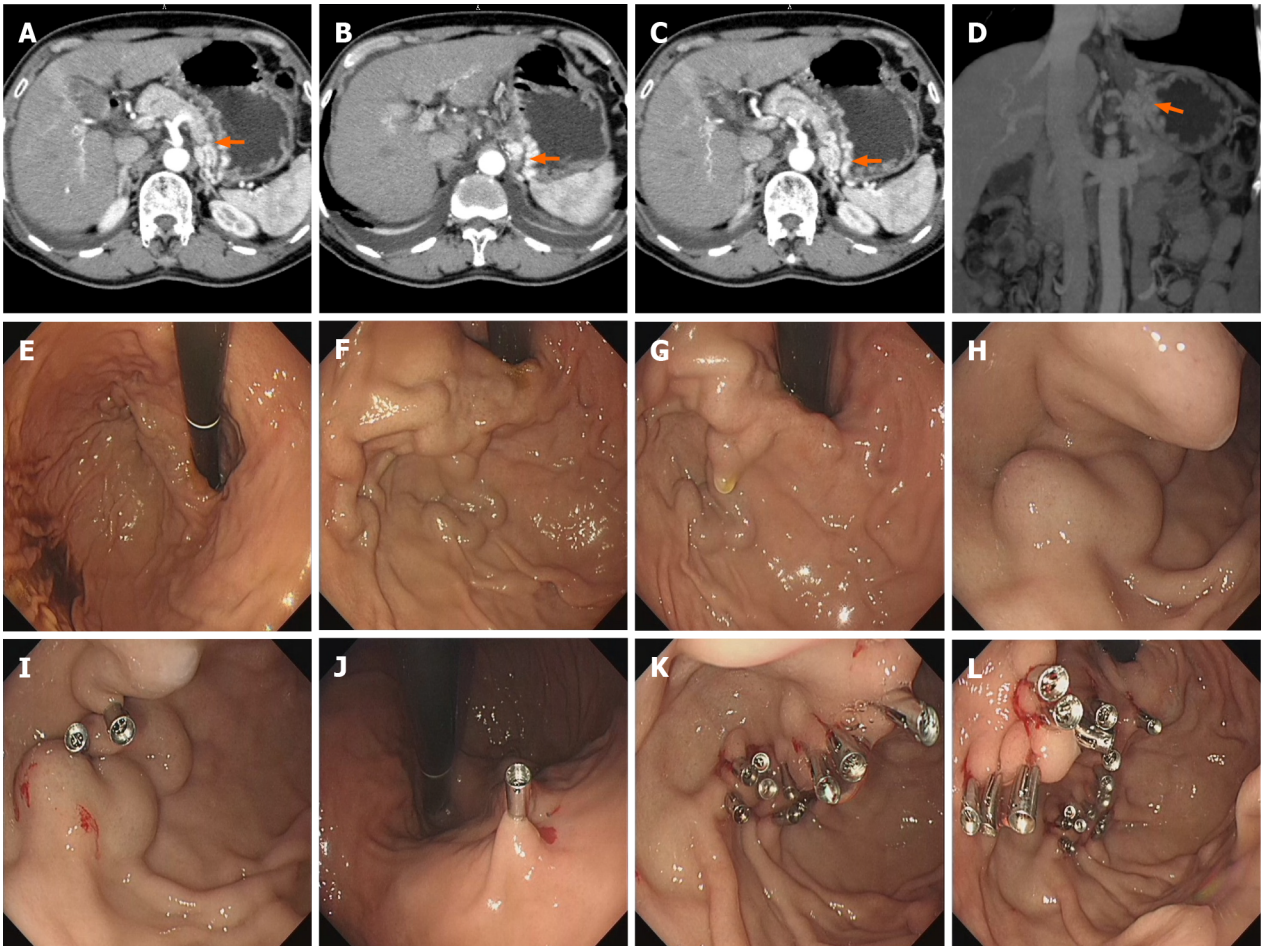

Figure 1 Preoperative abdominal computed tomography, preoperative and intraoperative endoscopy images. A-D: Preoperative abdominal computed tomography showing esophagogastric venous plexus presenting multiple dilated, tortuous blood vessels (arrows, gastric varices); E-H: Preoperative endoscopic examination revealing several large, nodular gastric fundal varices (largest diameter 15 mm), with no bleeding points or red-color signs revealed during endoscopy; I-L: Immediately after deployment of the clips, the outlet and inlet of the gastric varices were closed by clips, resulting in variceal atelectasis.

(primary prevention) EVCs without variceal progression in 89.9% with good security. Miyoshi *et al*[14] first reported EVC applied prophylactically to 9 patients with esophageal (rather than gastric) varices without major complications such as massive bleeding, achieving the desired effect. In this case, we utilized EVC for the secondary prophylaxis of gastric varices with encouraging results.

We believe that EVC is suitable for LDRf Type D 1.0-2.0 gastric varices and GOV 2, which are long, nodular, and tortuous veins that are continuous with esophageal varices[3]. Following the flow direction of varicose veins, metal clips were used by clipping both ends of the vein; this effectively blocks part of the blood flow, resulting in vessel collapse. The clips should be applied gently and released slowly to avoid pulling the veins. The time of shedding of the clips was longer, and more clips were required for simple EVC. Somatostatin was then employed, which reduces splanchnic blood flow, decreases portal venous pressure, and improves the safety and efficacy of the endoscopic procedure[2]. EVC relieves gastric varices and decreases portal vein pressures, so we had expected liver function to improve. The patient had normal liver function at postoperative five-month follow-up, indicating that our theory was correct.

However, there were some EVC complications, such as uncorrected hemorrhagic shock, uncontrolled hepatic encephalopathy, and uncooperative patients, that must also be considered. Therefore, future large-scale randomized controlled trials would be prudent to provide qualitative evidence and confirm the efficacy of EVC for secondary prophylaxis in bleeding from gastric varices.

CONCLUSION

In conclusion, gastrointestinal bleeding can be a fatal complication of portal

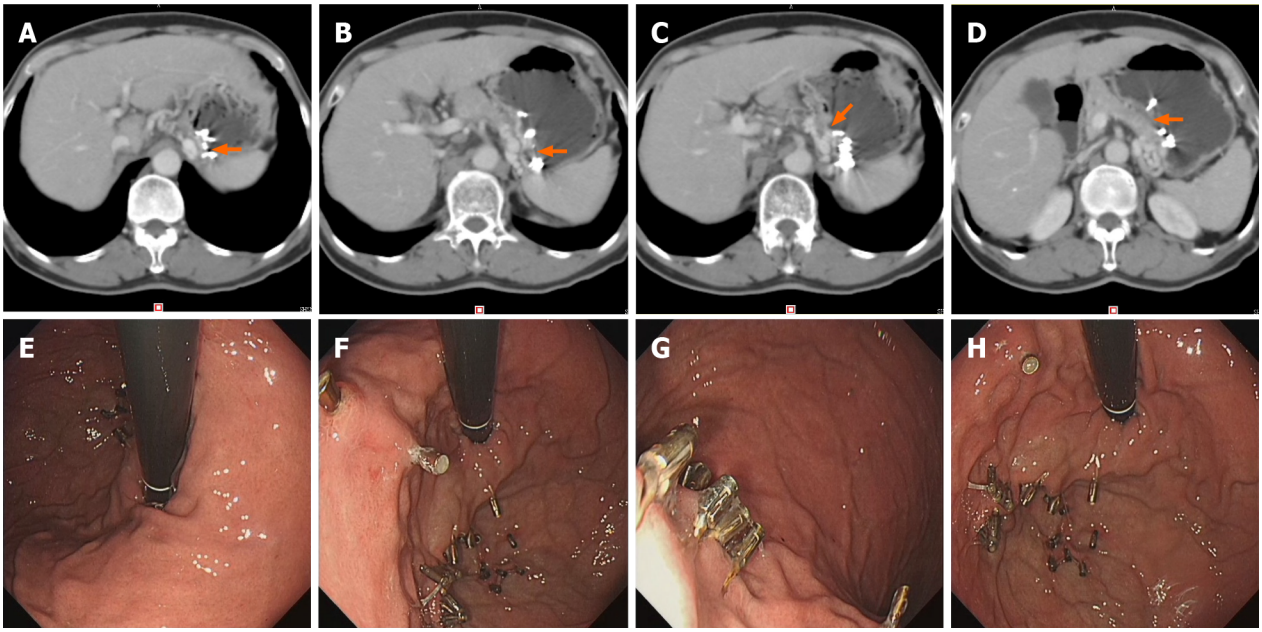

Figure 2 Follow up imaging and endoscopy images. A-D: Imaging follow-up showing the significantly improved gastric varices (arrows) at the 5th postoperative month; E-H: Gastroscopy showing the clips still in place with well-healed varices at the 5th postoperative month.

hypertension. Endoscopic techniques play a critical role in the prevention of variceal rebleeding. We propose that EVC is a safe and effective method for the secondary prophylaxis of GOV 2. Our report supports endoscopic clipping as an important treatment modality in the secondary prophylaxis of GOV. However, additional research is needed to confirm its long-term safety and efficacy.

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