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Case Report

Transjugular intrahepatic portosystemic shunt for esophagojejunal variceal bleeding after total gastrectomy: A case report[☆]

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ABSTRACT

Esophagojejunal varices occurring after total gastrectomy are rare but potentially fatal in cases of variceal bleeding. Owing to their rarity, treatment strategies for this condition are not well established. Here, we describe the case of a 48-year-old woman who presented with hematemesis and melena. Four years prior, she underwent a total gastrectomy for gastric cancer. Esophagojejunal variceal bleeding supplied by a dilated jejunal vein, along with liver cirrhosis, was diagnosed as per endoscopy and computed tomography findings. Initial attempts at endoscopic therapy were unsuccessful. Subsequently, transjugular intrahepatic portosystemic shunt placement was performed to reduce the portal pressure gradient, resulting in the cessation of bleeding. At the 1-month follow-up endoscopy, the varices had resolved, and no rebleeding occurred during 6 months of follow-up. Transjugular intrahepatic portosystemic shunt placement may be considered as an effective treatment option for esophagojejunal variceal bleeding.

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Introduction

Bleeding from esophagojejunal varices at the anastomosis site following total gastrectomy is a rare but life-threatening complication [1]. Treatment strategies for this condition remain poorly defined, with pharmacological therapy and endoscopic

interventions often attempted as first-line approaches; endovascular treatment is considered in cases of failure [1–3]. Transjugular intrahepatic portosystemic shunt (TIPS) placement has emerged as a minimally invasive treatment for portal hypertension complications, including variceal bleeding [4]. However, reports on the use of TIPS for esophagojejunal variceal bleeding are limited [3]. Here, we present a case of

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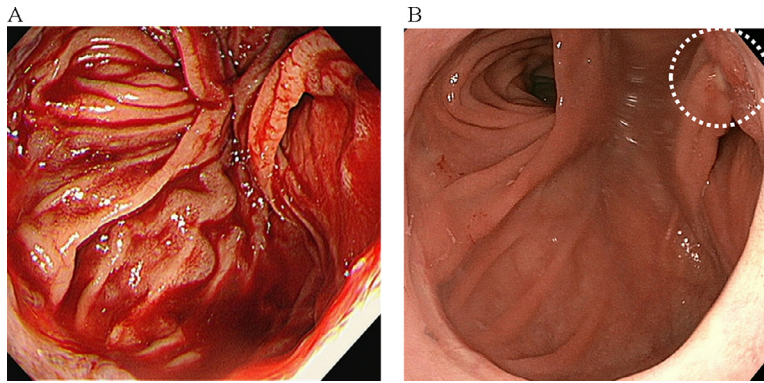


Fig. 1 – (A) Initial upper endoscopy revealing diffuse variceal formation with active bleeding at the esophagojejunosomy site. (B) Follow-up endoscopy conducted 1 month after transjugular intrahepatic portosystemic shunt creation, showing the resolution of varices. Additionally, a scar from endoscopic variceal ligation is identified (dotted circle).

successful TIPS treatment for bleeding from esophagojejunal varices following total gastrectomy, aiming to contribute to the body of knowledge in managing this challenging clinical scenario.

Case report

A 48-year-old woman presented to our hospital's emergency department with hematemesis and melena that began 3 days prior. She had undergone wedge resection for hepatocellular carcinoma located at segment IV in 2018 and total gastrectomy with Roux-en-Y esophagojejunosomy for gastric cancer in 2019 (4 years before presenting with hematemesis and melena) while being followed up for hepatitis B virus-related liver cirrhosis. Upon admission, her vital signs were as follows: blood pressure, 94/61 mmHg; heart rate, 92 beats/min; respiratory rate, 20 breaths/min; and SpO₂, 100%. Laboratory analysis indicated severe anemia with a hemoglobin level of 6.3 g/dL (reference range, 10.6–13.5 g/dL), a white blood cell count of 7120/ μ L (reference range, 4370–9680/ μ L), a platelet count of 82,000/ μ L (reference range, 130,000–400,000/ μ L), an albumin level of 2.8 g/dL (reference range, 3.2–4.8 g/dL), a total bilirubin of 2.80 mg/dL (reference range, 0.30–1.20 mg/dL), a prothrombin time of 19.9 seconds (reference range, 9.4–13.2 seconds), and an international normalized ratio of 1.81 (reference range, 0.86–1.20). The patient had a Child-Pugh score of B9 and a MELD (Model for End-stage Liver Disease) score of 17. During emergency upper endoscopy, diffuse varices were observed around the esophagojejunal anastomosis site, with active bleeding from the varices (Fig. 1A). Endoscopic variceal ligation (EVL) was attempted; however, because of the extensive varices and damage to the jejunal mucosa, effective ligation could not be achieved, resulting in ongoing bleeding. Subsequently, endoscopic variceal obturation (EVO) was performed, but persistent oozing blood was observed. The following day, computed tomography revealed a cirrhotic configuration of the liver and confirmed variceal formation at the esophagojejunosomy site, associated with a dilated jejunal vein, consistent with the diagnosis of esophagojejunal variceal bleed-

ing with liver cirrhosis (Fig. 2A). Laboratory tests showed a decrease in the hemoglobin level by approximately 2 g/dL, and subsequent endoscopy revealed persistent diffuse oozing blood. Therefore, considering the ineffectiveness of further endoscopic therapy, TIPS was planned.

In the angiography suite, under local anesthesia and conscious sedation, access to the right internal jugular vein was obtained, followed by catheterization of the right hepatic vein using a 5F catheter (Torcon NB Advantage; Cook Medical, Bloomington, IN, USA). After hepatic venography, the right portal vein was punctured using a Colapinto needle (Ring Transjugular Intrahepatic Access Set; Cook Medical). The direct portal pressure measured from the main portal vein was 24 mmHg. Portography revealed maintained hepatopetal flow in the intrahepatic portal vein; however, hepatofugal flow was observed in several branches of the superior mesenteric vein, including the dilated jejunal branch. Additionally, diffuse esophagojejunal varices originating from the dilated jejunal vein were identified, demonstrating drainage pathways into the azygos system (Fig. 3A). Therefore, after dilation of the hepatic parenchymal tract with an 8 × 40 mm balloon catheter (Mustang; Boston Scientific, Marlborough, MA, USA), a 10 × 70 mm covered stent (SEAL; S&G Biotech Inc., Yongin, South Korea) was deployed across the tract. Subsequently, angioplasty was performed using an 8-mm balloon catheter. The post-TIPS portal vein pressure was 12 mmHg, and the inferior vena cava pressure was 4 mmHg, resulting in a reduced pressure gradient from 20 to 8 mmHg. Completion venography after TIPS creation demonstrated a reversal of flow in the superior mesenteric vein to the hepatopetal direction, a patent TIPS, and non-opacification of varices (Fig. 3B). Thereafter, the patient experienced no further bleeding during admission; however, her serum ammonia level increased to 136 μ /dL, subsequently decreasing to 42 μ /dL after the administration of rifaximin and lactulose. One month later, follow-up endoscopy revealed improvement in the varices (Fig. 1B). At 2 postoperative months, computed tomography showed that the varices and dilatation of the jejunal vein were no longer evident, and the TIPS stent was patent (Fig. 2B). During the 6-month clinical follow-up period, there were no instances of rebleeding or hepatic encephalopathy.

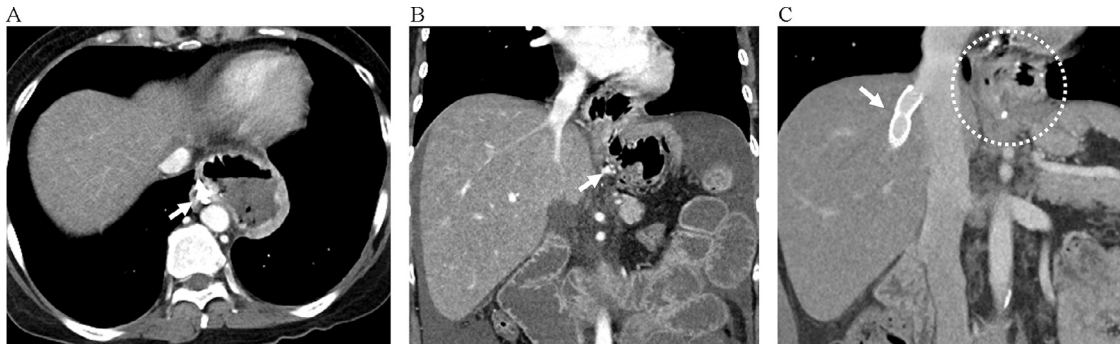


Fig. 2 – Axial (A) and coronal (B) reformatted computed tomography (CT) scans showing prominent variceal formation involving the esophagojejunostomy site. Arrow in A = endoscopically injected histoacryl. Arrow in B = dilated jejunal vein supplying the varices. (C) Follow-up CT scan obtained 2 months after the transjugular intrahepatic portosystemic shunt (TIPS) procedure showing resolution of both the varices and jejunal vein dilatation (dotted circle). The patency of the TIPS stent was confirmed (arrow).

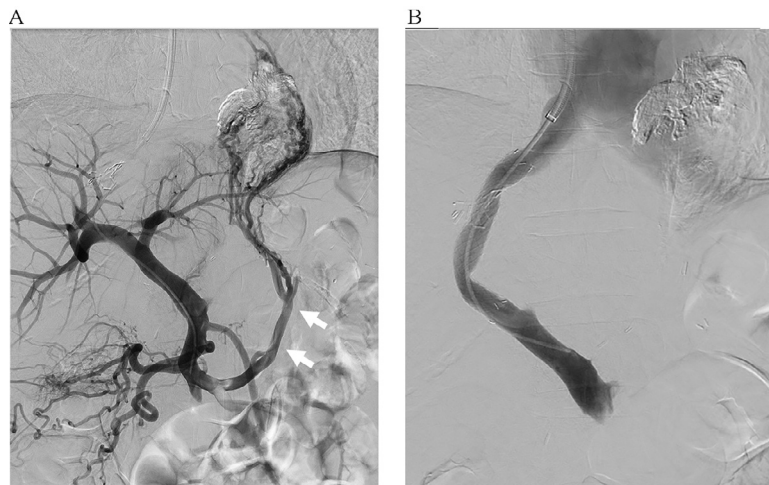


Fig. 3 – (A) Initial portography showing hepatofugal flow in superior mesenteric vein (SMV) branches, including the jejunal vein (arrows). The dilated jejunal vein supplied the diffuse esophagojejunal varices, which drained into the azygos system. (B) Portography after transjugular intrahepatic portosystemic shunt (TIPS) creation revealing reversion of flow in the SMV branches to the hepatopetal direction and a patent TIPS stent.

Discussion

Gastroesophageal varices are a common complication of portal hypertension in liver cirrhosis, and endoscopic interventions are recognized as the preferred treatment modality [5]. Esophagojejunal varices following gastrectomy, classified as ectopic varices, are rarely reported and lack established treatment strategies owing to their infrequency. However, rupture of ectopic varices is critical, with mortality rates of up to 40% [6].

The mechanism underlying the formation of esophagojejunal varices is as follows. During gastrectomy, the left gastric vein is resected along with the posterior and short gastric veins, which act as common collateral pathways from gastroesophageal varices. As a result, the jejunal vein

connected to the anastomosis site receives hepatofugal flow in the setting of portal hypertension, leading to dilation and subsequent supply to esophagojejunal varices [1]. Additionally, the hyperhemodynamic state of the jejunal circulation induced by total gastrectomy, along with neovascularization occurring in the granulation tissue of the anastomosis site, has also been proposed as a contributing factor [7].

Most cases of esophagojejunal varices reported to date have been treated by endoscopic interventions, such as EVL or EVO, as first-line therapy. However, this approach carries the risk of recurrence and may not serve as definitive treatment. Moreover, altered postoperative anatomy can complicate procedures, and performing EVL on the thinner-walled jejunum entails a risk of perforation, leading to ongoing debate [8]. Additionally, reoperation is hindered by challenges like tissue

adhesion resulting from prior surgery or complex anatomical alterations from reconstruction.

Several endovascular options are available for treating ectopic varices [6]. Recanalization and stenting of the occluded portal vein are effective in the management of localized portal hypertension, while embolotherapy, such as percutaneous transhepatic variceal embolization (PTVE) and balloon-occluded retrograde transvenous obliteration, or portal decompressive treatment using TIPS, are appropriate for generalized portal hypertension. Esophagojejunal varices, typically associated with generalized portal hypertension, are treated primarily with PTVE with coils, ethanolamine oleate, gelatine sponge particles, and n-butyl cyanoacrylate in reported cases [1,2,9]. However, PTVE carries the risk of non-target embolization, the potential for incomplete embolization leading to revascularization, and the possibility of new varix formation secondary to unresolved portal hypertension. However, TIPS offers a fundamental solution by reducing portal pressure. TIPS has been established as effective for the pre-emptive use or secondary prevention of esophageal variceal bleeding in selected patients [4], and early TIPS has been known to reduce treatment failure and mortality [10]. A case has been reported where TIPS was performed sequentially secondary to increased portal pressure after PTVE for esophagojejunal varices [3]. However, in this case, TIPS was attempted as the initial approach after consideration of its benefits. After successful TIPS placement, the need for additional PTVE remains controversial [11]; however, it was deemed unnecessary in this case because of the reversal of hepatofugal flow and the non-visualization of varices. Recently, with the widespread use of covered stents, TIPS patency has significantly improved, reducing concerns regarding varix recanalization owing to TIPS dysfunction [12]. However, post-TIPS liver function deterioration and the occurrence of hepatic encephalopathy remain concerns. Appropriate patient selection using scoring systems, such as MELD, is crucial [13].

In summary, we successfully treated esophagojejunal variceal bleeding following total gastrectomy with TIPS stent placement alone. This highlights the potential value of TIPS as an effective treatment option in similar cases of ectopic variceal bleeding, for which formal treatment protocols have yet to be established.

IRB approval

The publication of this case report was approved by the hospital's institutional review board (KNUCH-2024-04-001).

Patient consent

Written, informed consent for the publication of their case was obtained from the patient.

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