

DUODENAL VARICES CAUSING MASSIVE LOWER GASTROINTESTINAL HEMORRHAGE

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Bleeding from ectopic varices accounts for 1.6%-6% of all bleeding related to portal hypertension due to cirrhosis.¹⁻⁵ The prevalence of ectopic varices is higher in extrahepatic portal hypertension.² Of all the bleeding ectopic varices, the varices at the enterostomy site are the most common, followed by anorectal, colon, duodenum, and jejunum or ileum.¹⁻² Bleeding from the duodenal varices, although rare, is often massive and life-threatening, possibly because they are more difficult to detect and to treat than esophageal varices.

Treatment options for bleeding duodenal varices include intra-operative suture ligation,⁶ endoscopic varix ligation,⁷ duodenal resection,⁸ portacaval shunt⁹ and injection sclerotherapy.¹⁰⁻¹⁶ There is no consensus on the best management of bleeding duodenal varices, and randomized studies are unlikely to be feasible because of the rarity of the condition. Only eight cases of endoscopic injection sclerotherapy have been reported in the literature.¹⁰⁻¹⁷ We report the ninth case of successful endoscopic injection sclerotherapy of actively bleeding duodenal varices, where the patient was admitted with massive lower gastrointestinal hemorrhage. We also reviewed the literature, focusing mainly on the etiopathogenesis, and various options of medical and surgical treatment of duodenal varices.

Case Report

In August 1996, a 45-year-old male patient with a 15-year history of alcohol abuse was admitted in a private hospital with the complaint of massive lower gastrointestinal bleeding, without any preceding past history of abdominal illness. He was managed with 12 units of blood transfusion, 10 units of fresh frozen plasma and 4 units of platelet concentrate within four days. Upper and lower gastrointestinal endoscopies were performed, but could not determine the source of bleeding. He was referred to Dammam Central Hospital for possible early selective

angiography and radioisotope scan to determine the source of bleeding.

On admission, the patient had a pulse of 115/min. and a blood pressure of 100/60. His nutritional status was good, and there was no evidence of encephalopathy. Head and neck examinations were normal. There was severe pallor with mild icterus. The patient had palmar erythema, but no gynecomastia or spider angiomas were seen. Chest and cardiovascular examinations were normal. Abdominal examination showed tender and smooth hepatomegaly 7 cm below the subcostal margin. Bowel sounds were hyperactive. There was no ascites, splenomegaly, mass, or abdominal tenderness. Rectal examination demonstrated the presence of maroon-colored, liquid stool. The laboratory findings were as follows: hemoglobin 6.4 g/dL; hematocrit 20 vol%; WBC 24,600; platelets 35,000/mm³; albumin level 3.8 g/dL; total bilirubin level 2.9 mg/dL; prothrombin time 14 sec. (control 12 sec.) with INR 1.3; SGOT 47 IU/L, SGPT 67 IU/L; GT 309 U/L; and alkaline phosphatase 143 U/L. HBV and HCV serological markers were negative. Abdominal ultrasound suggested cirrhotic liver with signs of portal hypertension.

Emergency full colonoscopy could not reveal any lesion, but unaltered blood was seen entering via the ileocecal valve. The patient underwent another emergent

TABLE 1. Review of all reported cases of successful sclerotherapy in bleeding duodenal varices.

Author/year	Sclerosants	Amount (mL)	Vasopressin	Need for sclerotherapy
Sauerbruch, 1982 ¹²	1% polidocanol	8	No	Yes
Kirkpatrick, 1985 ¹⁰	Ethanolamine oleate	35	Yes	No
Gertsch, 1988 ¹¹	1% polidocanol	25	No	Yes
Tsuji, 1989 ¹⁵	1% polidocanol and 200 units human thrombin	9	No	No
Nardone, 1991 ¹⁶	1% aethoxysklerol	30	No	Yes
Barbish, 1993 ¹³	3% sodium tetradecyl sulphate, 50% glucose	4	Yes	No
Born, 1995 ¹⁷	1% polidocanol	4	No	No (TIPPS)
Wu, 1995 ¹⁴	Sodium tetradecyl sulphate	16	Yes	Yes
Present study	Ethanolamine oleate	20	Yes	No

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FIGURE 1. Spurting of blood from a duodenal varix before endoscopic injection sclerotherapy.



FIGURE 2. Duodenal varices post-sclerotherapy.

esophagogastroduodenoscopy (EGD), which revealed only grade 1 esophageal varices (according to Beppu's classification) without any stigmata of recent bleed. There were large polypoidal type, bluish and tortuous varices in the third part of the duodenum which were not bleeding. Incidentally, during the procedure, an active jet-like bleeding was visualized from the inferolateral wall of the third part of duodenum (Figure 1). The duodenal varices were injected intravariceally with 20 mL of 5% ethanolamine oleate at multiple sites, with only very minimal bleeding at the injection site (Figure 2). The patient also received a vasopressin bolus of 20 units, followed by continuous infusion of 0.2-0.4 IU/min for the next 24 hours. He was given six more units of packed red blood cells, and two units of fresh-frozen plasma. The patient's course after the endoscopic injection sclerotherapy was uneventful. The patient remained free from bleeding, and repeated endoscopy after three days showed thrombosis of all injected varices, but the overlying and surrounding duodenal mucosa revealed multiple fresh ulcerations. Follow-up sclerotherapy was avoided on ulcerated mucosa, which might have led to perforation, since the duodenal wall is thin compared to the esophageal wall. A week later, the patient was discharged on ranitidine and propranolol.

Four weeks after the first procedure, an EGD showed that the duodenal mucosal ulcers had healed completely. In the follow-up period of two years, with clinical investigation at monthly intervals, there was no further episode of bleeding from the varices. The subsequent endoscopies showed the complete sclerosis of the duodenal varices. The patient was last seen in June 1998, with no further episodes of any gastrointestinal bleeding. The patient also had complete abstinence from alcohol since his first bleeding episode in 1996.

Discussion

Duodenal varices were apparently first recognized radiologically in 1931 by Alberti.¹⁸ These varices were usually seen in the second and third part of the duodenum,¹⁹⁻²⁰ as seen in our case. The vasculature of duodenal varices consists of single afferent and efferent vessels, forming a portosystemic shunt, differing from the vasculature of gastroesophageal varices.²¹ The afferent vessel of the duodenal varices is the superior or inferior pancreaticoduodenal vein originating in the portal vein trunk or superior mesenteric vein. The efferent vein drains directly or indirectly into the inferior vena cava, via the lumbar or the retroperitoneal veins.²²

Endoscopic evidence of duodenal varices in patients with portal hypertension is uncommon, although paraduodenal varices could be demonstrated angiographically in a high percentage (43%) of these patients. Moreover, massive bleeding from the duodenal varices is a rare event,²³ as these varices tend to have a smaller diameter and shorter length than esophageal varices. In addition, they are usually located deeper and mainly on the serosa of the duodenum,²² in contrast to the submucosal position of esophageal varices. However, duodenal varices can also be submucosal, as noted in our case and others.^{9,14,24}

The actual presence of duodenal varices is certainly higher than that suggested in the literature.^{25,26} In patients with liver disease and hemorrhage from duodenum, one should consider the possibility of bleeding duodenal varices, even though duodenal ulcer will more often be the correct diagnosis. The only problem is knowing the correct source of the bleeding. Usually the physician has a low index of suspicion of bleeding duodenal varices, and diagnosis may be made even more difficult when they are

not bleeding. It may also be difficult to diagnose bleeding from duodenal varices when there is a large amount of intraluminal blood, as occurs in cases of life-threatening bleeding. In one of the series,²⁷ incorrect preoperative diagnosis included bleeding from duodenal ulcer (six patients), from esophageal varices (two patients), and from bowel hemangioma (one patient).

Vasopressin has been effective after selective administration (into the superior mesenteric artery) but not as systemic administration.²⁸ Rai et al.²⁹ used thrombin to inject in the duodenal varices, because, at least theoretically, the agent is not likely to cause significant ulceration and also because hemostasis is usually immediate. It was also suggested that the thrombin injection may be a safer alternative than conventional sclerotherapy, but systemic thrombosis, anaphylactic reaction and disseminated intravascular coagulation (DIC) are the main drawbacks to accepting the intravariceal thrombin as an alternative of treatment. There have been a few studies in which thrombin was used in combination with other sclerosants to obliterate esophageal varices. These studies have found that the bleeding related to injection was significantly less when thrombin was injected before the needle was withdrawn.³⁰⁻³³ This also seems to reduce the risk of mucosal ulceration and duodenal perforation, as well as requiring a lesser dose of ethanolamine in stopping the bleeding.³⁴

In recent years, the tissue adhesive n-butyl-2-cyanoacrylate (Histoacryl) has been successfully used for endoscopic hemostasis of esophageal and fundal variceal bleeding.³ Endoscopic embolization by Histoacryl has also been tried successfully in massive bleeding from duodenal varices,^{36,37} but it was complicated by right pulmonary artery embolism.³⁸

Haruta et al.³⁹ used endoscopic ligation of duodenal varices, but they also treated the varices with balloon-occluded retrograde transvenous obliteration (BRTO), and the duodenal varices were successfully decompressed without any complication.

When all sclerotherapy reports were analyzed (Table 1), the methods varied with respect to the amount and type of sclerosing agent, concurrent use of vasopressin, and the need for follow-up sclerotherapy sessions. All eight reported cases were successful in controlling the bleeding duodenal varices, but it invariably caused duodenal ulceration of the mucosa. In a recent report by Wang et al.,⁴⁰ surgery (mesocaval shunt) had to be performed after sclerotherapy failed to stop the bleeding.

During the management of lower gastrointestinal hemorrhage from an unidentified source in the presence of portal hypertension, it is prudent to consider that bleeding duodenal varices could be a site of hemorrhage. The authors conclude that emergency sclerotherapy has been shown to be a useful first-line therapeutic measure in the treatment of duodenal varices, however, due to the rarity of the condition, there is still no consensus on the type and

dose of sclerosing agents. Sclerotherapy is especially recommended in patients where an emergency portocaval shunt is risky and hazardous. Until more cases of successful band ligation or injection of Histoacryl are reported, sclerotherapy will continue to be the first line of treatment, although some recent reports of combining thrombin with ethanolamine injection are promising.

References

1. Ramage LK. Ectopic variceal bleeding. *Gastrointest Endosc Clin North Am* 1992;2:95-102.
2. Lebrech D, Benhamou J-P. Ectopic varices in portal hypertension. *Clin Gastroenterol* 1985;14:105-21.
3. Salam AA, Goldman M, Smith D, Hill H. Gastric, intestinal and gall-bladder varices: hemodynamic and therapeutic considerations. *South Med J* 1979;72:402-8.
4. Hosking SW, Smart HL, Johnson AG, et al. Anorectal varices, hemorrhoids and portal hypertension. *Lancet* 1989;1:349-52.
5. Wilson SE, Stone RT, Christie JP, Passaro E. Massive lower gastrointestinal varices. *Arch Surg* 1979;114:1158-61.
6. Ritcher RM, Pochaczewsky R. Duodenal varices. *Arch Surg* 1967;95:269-73.
7. Tazawa J, Sakai Y, Koizumi K, Asahina Y, Tajiri K, Yamaoka K, et al. Endoscopic ligation for ruptured duodenal varices (letter). *Am J Gastroenterol* 1995;90:677-8.
8. Kunisaki T, Someya N, Shimokawa Y, Okuda K. Varices in the distal duodenum seen with a fiberduodenoscope. *Endoscopy* 1973;5:101-4.
9. Sheaburn EW, Cooper DR. Duodenal varices treated by portocaval shunt. *Arch Surg* 1966;93:425-7.
10. Kirkpatrick JR, Shoenut JP, Micflikier AB. Successful injection sclerotherapy for bleeding duodenal varix in intrahepatic portal obstruction. *Gastrointest Endosc* 1985;31:259-60.
11. Gertsch P, Blumgart LH. Cure of a bleeding duodenal varix by sclerotherapy. *Br J Surg* 1988;75:717.
12. Sauerbruch T, Weinzierl M, Dietrich HP, Antes G, Eisenberg J, Paumgartner G. Sclerotherapy of a bleeding duodenal varix. *Endoscopy* 1982;14:187-9.
13. Barbish AW, Ehrinpreis MN. Successful endoscopic injection sclerotherapy of a bleeding duodenal varix. *Am J Gastroenterol* 1993;88:90-9.
14. Wu CS, Chen CM, Chang KY. Endoscopic injection sclerotherapy of bleeding duodenal varices. *J Gastroenterol Hepatol* 1995;10:481-3.
15. Tsuji H, Okano H, Fugino H, et al. A case of endoscopic injection sclerotherapy for a bleeding duodenal varix. *Gastroenterol Jpn* 1989;24:60-4.
16. Nardone G, Budillon G. Treatment of duodenal varices by sclerotherapy. *Gastrointest Endosc* 1991;37:407-8.
17. Born P, Huber W, Neuhaus H, Classen M. Hemorrhage caused by duodenal varices. *Dtsch-Med-Wochenschr* 1995;120:1241-7.
18. Alberti W. Über den röntgenologischen Nachweis von Varizen im Bulbus duodeni. *Fortschr Geb Röntgenstr* 1931;43:60-5.
19. Tanaka T, Kato K, Taniguchi T, Takagi D, Takeyama N, Kitazawa Y. A case of ruptured duodenal varices and review of literature. *Jpn J Surg* 1988;18:595-600.
20. Al-Mofarreh M, Al-Moagel-Alfarag M, Ashoor T, Shadoochi F. Duodenal varices: report of 13 cases. *Z Gastroenterol* 1986;24:673-80.
21. Hashizume M, Tanoue K, Ohta M, Ueno K, Sugimachi K, Kashiwagi M. Vascular anatomy of duodenal varices: angiographic and histopathological assessments. *Am J Gastroenterol* 1993;88:1942-5.
22. Perchik L, Max TC. Massive hemorrhage from varices of the duodenal loop in cirrhotic patient. *Radiology* 1963;80:641-4.
23. Stephan G, Miething R. Roentgendagnostik varicoser duodenalveränderungen bei. *Radiology* 1968;8:90-5.
24. Amin R, Alexis R, Korzis J. Fatal ruptured duodenal varix: a case report and review of literature. *Am J Gastroenterol* 1985;80:13-8.
25. Itzchak Y, Glickman MG. Duodenal varices in extrahepatic portal obstruction. *Radiology* 1977;124:619-24.
26. Olson RW, Hodgson JR, Adson MA. The significance of duodenal deformity in patients with extrahepatic portal obstruction. *Mayo Clin*

- Proc 1963;38:289.
27. Khouqueer F, Morrow C, Jordan P. Duodenal varices as a cause of massive upper gastrointestinal bleeding. *Surgery* 1987;102:548-52.
 28. Kunert H, Ottenjann R. Endoscopy in bleeding duodenal varices. *Endoscopy* 1976;8:99-101.
 29. Rai R, Penzer SW, Miskovsky E, Miskovsky E, Thuluvath PJ. Thrombin injection for bleeding duodenal varices. *Am J Gastroenterol* 1994;89:1871-3.
 30. Yaki N, Kubu M, Noro Y, et al. Manifestation of temporary symptoms during endoscopic variceal sclerotherapy using thrombin as a sclerosant. *Jpn J Med* 1991;30:193-201.
 31. Nakamura R, Bucci LA, Sugawa C, et al. Sclerotherapy of bleeding esophageal varices using a thrombogenic cocktail. *Am Surgeon* 1991; 57:226-30.
 32. Kitano S, Hashizume M, Yamaga H, et al. Human thrombin plus 5% ethanolamineoleate injected to sclerose esophageal varices: a prospective randomized trial. *Br J Surg* 1989;76:715-8.
 33. Gardner CE, Brooks WS. Absence of disseminated intravascular coagulation with endoscopic sclerosis of esophageal varices. *Gastrointest Endosc* 1982;28:67-9.
 34. Sans M, Llach J, Bordas JM, Andreu V, Roverter JC, Bosch J, et al. Thrombin and ethanolamine injection therapy in arresting uncontrolled bleeding from duodenal varices. *Endoscopy* 1996;28:403.
 35. Soehendra N, Grimm H, Maydeo A, et al. Endoscopic sclerotherapy: personal experience. *Hepatogastroenterology* 1991;38:220-3.
 36. Labenz G, Borsch G. Successful endoscopic hemostasis of duodenal variceal bleeding with Histoacryl. *Endoscopy* 1993;25:194.
 37. D'Imperio NA, Piemontese D, Baroncini P, Billi D, Borioni PP, Dal Monte P, et al. Evaluation of undiluted N-Butyl-2-cyanoacrylate in endoscopic treatment of upper gastrointestinal tract varices. *Endoscopy* 1996;28:239-43.
 38. Benedetti G, Sablich R, Lacchin T, Masiero A. Endoscopic treatment of bleeding duodenal varices by bucrylate injection. *Endoscopy* 1993; 25:432-3.
 39. Haruta I, Isobe Y, Ueno E, Toda J, Mitsunaga A, Noguchi S, et al. Balloon-occluded retrograde transvenous obliteration (BRTO): a promising non-surgical therapy for ectopic varices. A case report of successful treatment of duodenal varices by BRTO. *Am J Gastroenterol* 1996;91:2594-7.
 40. Wang CS, Jeng LB, Chen MF. Duodenal variceal bleeding successfully treated by mesocaval shunt after failure of sclerotherapy. *Hepato-gastroenterology* 1995;41:59-61.