



Current approaches to the management of jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy

Dmitry Victorovich Garbuzenko

Specialty type: Gastroenterology and hepatology

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's classification

Scientific Quality: Grade B

Novelty: Grade B

Creativity or Innovation: Grade B

Scientific Significance: Grade C

P-Reviewer: Nakagawa K

Received: April 28, 2024

Revised: August 20, 2024

Accepted: September 9, 2024

Published online: October 7, 2024

Processing time: 150 Days and 21.5 Hours



Dmitry Victorovich Garbuzenko, Department of Faculty Surgery, South Ural State Medical University, Chelyabinsk 454092, Russia

Corresponding author: Dmitry Victorovich Garbuzenko, DSc, MD, PhD, Professor, Department of Faculty Surgery, South Ural State Medical University, 64 Vorovskogo Street, Chelyabinsk 454092, Russia. garb@inbox.ru

Abstract

Jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy due to portal hypertension caused by extrahepatic portal vein obstruction is a life-threatening complication and is very difficult to treat. Pharmacotherapy, endoscopic methods, transcatheter embolization of veins supplying the jejunal afferent loop, portal venous stenting, and surgical procedures can be used for the treatment of jejunal variceal bleeding. Nevertheless, the optimal management strategy has not yet been established, which is due to the lack of randomized controlled trials involving a large cohort of patients necessary for their development.

Key Words: Pancreaticoduodenectomy; Hepaticojejunostomy; Extrahepatic portal vein obstruction; Portal hypertension; Jejunal variceal bleeding; Management

©The Author(s) 2024. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Pharmacotherapy, endoscopic methods, transcatheter embolization of veins feeding the afferent loop of the jejunum, portal vein stenting and surgical interventions can be used to treat jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy. Nevertheless, the optimal management strategy has not yet been established, which is due to the lack of randomized controlled trials involving a large cohort of patients necessary for their development.

Citation: Garbuzenko DV. Current approaches to the management of jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy. *World J Gastroenterol* 2024; 30(37): 4083-4086

URL: <https://www.wjgnet.com/1007-9327/full/v30/i37/4083.htm>

DOI: <https://dx.doi.org/10.3748/wjg.v30.i37.4083>

INTRODUCTION

I read with interest a case report by Liu *et al*[1], who presented three patients with jejunal variceal bleeding at the site of choledochojejunostomy managed by endoscopic sclerotherapy with lauromacrogol/ α -butyl cyanoacrylate injection. All of the patients had previously undergone Whipple procedure. Jejunal variceal bleeding at the site of choledochojejunostomy (hepaticojejunostomy) after Whipple procedure (pancreaticoduodenectomy) is described quite rarely, and the incidence of this complication is still unknown[2].

MANAGEMENT OF JEJUNAL VARICEAL BLEEDING AT THE SITE OF HEPATICOJEJUNOSTOMY AFTER PANCREATICODUODENECTOMY

Portomesenteric venous complications such as stenosis and thrombosis are serious complications of pancreaticoduodenectomy[3]. As a result of extrahepatic portal vein obstruction (EHPVO), portal hypertension promotes the formation of hepatopetal collaterals *via* low-resistant natural vascular spaces such as pancreaticoduodenal or gastrocolic veins along the afferent jejunal loop rather than newly formed postoperative tissue around the hepatic hilum. This can lead to the development of jejunal varices at the site of hepaticojejunostomy and bleeding from these varices[4].

The management of patients with jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy can be challenging and requires a multidisciplinary approach involving gastroenterologists, endoscopists, interventional radiologists, and surgeons to determine optimal therapeutic tactics. Mild bleeding may stop spontaneously. However, continuous bleeding requires immediate medical attention[5].

Although the existing evidence on the efficacy of pharmacological treatment for EHPVO-related variceal bleeding remains inconclusive, modern guidelines consider it possible to apply the recommendations for gastroesophageal variceal bleeding in liver cirrhosis patients. These guidelines suggest the use of vasoactive drugs such as terlipressin, somatostatin, and octreotide for at least 5 days. Non-selective β -blockers, including propranolol, nadolol or carvedilol, is the treatment of choice for secondary prophylaxis[6].

Endoscopic treatment, in particular, sclerotherapy injecting N-butyl-2-cyanoacrylate[7-9] or 1% aethoxysklerol[10], argon plasma coagulation[11], endoclip[12], *etc.*, can be used as a first-line method to control EHPVO-related jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy. The anatomic difficulty often prevents the jejunal afferent loop from being reached using conventional upper gastrointestinal endoscopy. In this situation, balloon-assisted enteroscopy may be useful[13].

Transcatheter embolization of veins supplying the jejunal afferent loop is an interventional radiological procedure to prevent EHPVO-related jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy. To perform this procedure, a surgical approach *via* the ileocolic vein or a percutaneous transsplenic approach can be applied. N-butyl-2-cyanoacrylate mixed with lipiodol or 5% ethanolamine oleate with iopamidol are usually used for embolization[10,14]. The disadvantages of transcatheter embolization of veins supplying the jejunal afferent loop are the technical complexity due to the abundance of collaterals at the hepatic hilum, the potential danger of liver dysfunction and worsening of portal hypertension caused by blockage of the hepatopetal flow with high probability of recurrence of variceal bleeding. However, if combined with portal venous angioplasty and stenting, this approach can be particularly effective[15].

Portal venous stenting is another interventional radiological procedure to prevent EHPVO-related jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy[16]. Self-expanding nitinol stents are placed in the portal vein usually *via* an ultrasonography-guided percutaneous transhepatic and/or transsplenic approach, and a surgical approach for insertion *via* the ileocolic vein. Stent length should be selected to ensure coverage of the entire stenotic lesion (approximately 2 cm longer)[17,18]. In a study by Nakai *et al*[19], portal vein stent placement was technically feasible and effective in improving portal hypertension. However, stent occlusion was not uncommon. Residual portal vein stenosis > 30% after stent placement is largely associated with stent occlusion.

Surgical procedures for EHPVO-related jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy include meso-Rex bypass and portosystemic shunts. Meso-Rex bypass represents the only and last resort to restore physiological portal vein flow for EHPVO. Although successful in a majority of patients, this procedure is associated with major morbidity and mortality and should be performed in tertiary centers experienced in vascular liver surgery to obtain the best results[20]. A portosystemic shunts allows for reliable portal decompression for EHPVO. The shunting site and anastomosis method can be selected individually. For example, Lee *et al*[21] reported on the mesocaval shunt operation after the failure of portal venous stenting. Saeki *et al*[10] created an end-to-side anastomosis between the dilated jejunal vein and the right ovarian vein. Shiozaki *et al*[22] performed a superior mesenteric vein to the right testicular vein shunt operation.

CONCLUSION

The optimal management strategy for EHPVO-related jejunal variceal bleeding at the site of hepaticojejunostomy after pancreaticoduodenectomy has not yet been established. This is due to the lack of randomized controlled trials involving a large cohort of patients necessary for their development.

FOOTNOTES

Author contributions: Garbuzenko DV contributed to the conception, design, acquisition, analysis, interpretation of data, wrote the manuscript and approved the final version.

Conflict-of-interest statement: All the authors report no relevant conflicts of interest for this article.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

Country of origin: Russia

ORCID number: Dmitry Victorovich Garbuzenko [0000-0001-9809-8015](https://orcid.org/0000-0001-9809-8015).

S-Editor: Li L

L-Editor: Webster JR

P-Editor: Cai YX

REFERENCES

- Liu J, Wang P, Wang LM, Guo J, Zhong N. Outcomes of endoscopic sclerotherapy for jejunal varices at the site of choledochojejunostomy (with video): Three case reports. *World J Gastroenterol* 2024; **30**: 2059-2067 [PMID: [38681128](https://pubmed.ncbi.nlm.nih.gov/38681128/) DOI: [10.3748/wjg.v30.i14.2059](https://doi.org/10.3748/wjg.v30.i14.2059)]
- Block PD, Farrell JJ, Li DK. A Rare Cause of Gastrointestinal Bleeding After Pancreaticoduodenectomy. *Gastroenterology* 2023; **165**: 34-36 [PMID: [36592728](https://pubmed.ncbi.nlm.nih.gov/36592728/) DOI: [10.1053/j.gastro.2022.12.022](https://doi.org/10.1053/j.gastro.2022.12.022)]
- Thompson SM, Fleming CJ, Yohanathan L, Truty MJ, Kendrick ML, Andrews JC. Portomesenteric Venous Complications after Pancreatic Surgery with Venous Reconstruction: Imaging and Intervention. *Radiographics* 2020; **40**: 531-544 [PMID: [31977263](https://pubmed.ncbi.nlm.nih.gov/31977263/) DOI: [10.1148/rg.2020190100](https://doi.org/10.1148/rg.2020190100)]
- Hyun D, Park KB, Cho SK, Park HS, Shin SW, Choo SW, Do YS, Choo IW, Choi DW. Portal Vein Stenting for Delayed Jejunal Varix Bleeding Associated with Portal Venous Occlusion after Hepatobiliary and Pancreatic Surgery. *Korean J Radiol* 2017; **18**: 828-834 [PMID: [28860900](https://pubmed.ncbi.nlm.nih.gov/28860900/) DOI: [10.3348/kjr.2017.18.5.828](https://doi.org/10.3348/kjr.2017.18.5.828)]
- Han A, Min SK. Ectopic Variceal Bleeding from the Hepaticojejunostomy due to Extrahepatic Portal Vein Occlusion: How to Treat? *Vasc Specialist Int* 2023; **39**: 22 [PMID: [37667820](https://pubmed.ncbi.nlm.nih.gov/37667820/) DOI: [10.5758/vsi.230053](https://doi.org/10.5758/vsi.230053)]
- de Franchis R, Bosch J, Garcia-Tsao G, Reiberger T, Ripoll C; Baveno VII Faculty. Baveno VII - Renewing consensus in portal hypertension. *J Hepatol* 2022; **76**: 959-974 [PMID: [35120736](https://pubmed.ncbi.nlm.nih.gov/35120736/) DOI: [10.1016/j.jhep.2021.12.022](https://doi.org/10.1016/j.jhep.2021.12.022)]
- Ali S, Asad Ur Rahman, Navaneethan U. An Unusual Cause of Recurrent Gastrointestinal Bleeding After Whipple's Surgery. *Gastroenterology* 2017; **153**: e1-e2 [PMID: [28672119](https://pubmed.ncbi.nlm.nih.gov/28672119/) DOI: [10.1053/j.gastro.2016.12.046](https://doi.org/10.1053/j.gastro.2016.12.046)]
- Sharma B, Mitchell R, Parapini M, Donnellan F. Cyanoacrylate injection of an ectopic variceal bleed at a choledochojejunal anastomotic site in a patient with post-Whipple anatomy. *VideoGIE* 2020; **5**: 29-31 [PMID: [31922079](https://pubmed.ncbi.nlm.nih.gov/31922079/) DOI: [10.1016/j.vgie.2019.09.006](https://doi.org/10.1016/j.vgie.2019.09.006)]
- Tanikawa T, Ishii K, Katsumata R, Urata N, Nishino K, Suehiro M, Kawanaka M, Haruma K, Kawamoto H. Treatment of ectopic variceal bleeding at choledochojejunostomy by endoscopic glue injection therapy with cyanoacrylate: Report of three cases including long-term outcomes. *DEN Open* 2022; **2**: e110 [PMID: [35898592](https://pubmed.ncbi.nlm.nih.gov/35898592/) DOI: [10.1002/deo2.110](https://doi.org/10.1002/deo2.110)]
- Saeki Y, Ide K, Kakizawa H, Ishikawa M, Tashiro H, Ohdan H. Controlling the bleeding of jejunal varices formed at the site of choledochojejunostomy: report of 2 cases and a review of the literature. *Surg Today* 2013; **43**: 550-555 [PMID: [22777133](https://pubmed.ncbi.nlm.nih.gov/22777133/) DOI: [10.1007/s00595-012-0243-4](https://doi.org/10.1007/s00595-012-0243-4)]
- Tange Y, Hasegawa N, Sugiyama Y, Endo M, Terasaki M, Yamamoto Y, Ishige K, Fukuda K, Suzuki H, Mizokami Y. Usefulness of argon plasma coagulation for bleeding around hepaticojejunal anastomosis. *DEN Open* 2022; **2**: e69 [PMID: [35310759](https://pubmed.ncbi.nlm.nih.gov/35310759/) DOI: [10.1002/deo2.69](https://doi.org/10.1002/deo2.69)]
- Baba H, Wakabayashi M, Oba A, Baba H, Mitsuoka A, Nakamura H, Sanada T, Kuwabara H, Nakajima K, Goseki N, Ishida H. Unusual bleeding from hepaticojejunostomy controlled by adult variable stiffness colonoscopy: report of a case and literature review. *Int Surg* 2014; **99**: 584-589 [PMID: [25216425](https://pubmed.ncbi.nlm.nih.gov/25216425/) DOI: [10.9738/INTSURG-D-13-00126.1](https://doi.org/10.9738/INTSURG-D-13-00126.1)]
- Itokawa F, Itoi T, Ishii K, Sofuni A, Moriyasu F. Single- and double-balloon enteroscopy-assisted endoscopic retrograde cholangiopancreatography in patients with Roux-en-Y plus hepaticojejunostomy anastomosis and Whipple resection. *Dig Endosc* 2014; **26** Suppl 2: 136-143 [PMID: [24750164](https://pubmed.ncbi.nlm.nih.gov/24750164/) DOI: [10.1111/den.12254](https://doi.org/10.1111/den.12254)]
- Wakasugi M, Tsujie M, Goda S, Ohnishi K, Koga C, Tei M, Kawabata R, Hasegawa J. Laparotomy-assisted transcatheter variceal embolization for bleeding jejunal varices formed at the site of choledochojejunostomy: Report of a case and review of the literature. *Int J Surg Case Rep* 2020; **77**: 554-559 [PMID: [33395844](https://pubmed.ncbi.nlm.nih.gov/33395844/) DOI: [10.1016/j.ijscr.2020.11.091](https://doi.org/10.1016/j.ijscr.2020.11.091)]
- Yoshimatsu R, Yamagami T, Ishikawa M, Kajiwara K, Kakizawa H, Hiyama E, Tashiro H, Murakami Y, Ohge H, Awai K. Embolization therapy for bleeding from jejunal loop varices due to extrahepatic portal vein obstruction. *Minim Invasive Ther Allied Technol* 2016; **25**: 57-61 [PMID: [26330264](https://pubmed.ncbi.nlm.nih.gov/26330264/) DOI: [10.3109/13645706.2015.1075557](https://doi.org/10.3109/13645706.2015.1075557)]
- Shim DJ, Shin JH, Ko GY, Kim Y, Han K, Gwon DI, Ko HK. Portal vein stent placement with or without varix embolization of jejunal variceal bleeding after hepatopancreatobiliary surgery. *Acta Radiol* 2017; **58**: 423-429 [PMID: [27307028](https://pubmed.ncbi.nlm.nih.gov/27307028/) DOI: [10.1177/0284185116654329](https://doi.org/10.1177/0284185116654329)]
- Kato A, Shimizu H, Ohtsuka M, Yoshitomi H, Furukawa K, Miyazaki M. Portal vein stent placement for the treatment of postoperative portal vein stenosis: long-term success and factor associated with stent failure. *BMC Surg* 2017; **17**: 11 [PMID: [28143477](https://pubmed.ncbi.nlm.nih.gov/28143477/) DOI: [10.1186/s12893-017-0209-y](https://doi.org/10.1186/s12893-017-0209-y)]
- Khan A, Kleive D, Aandahl EM, Fosby B, Line PD, Dorenberg E, Guvåg S, Labori KJ. Portal vein stent placement after hepatobiliary and

- pancreatic surgery. *Langenbecks Arch Surg* 2020; **405**: 657-664 [PMID: 32621087 DOI: 10.1007/s00423-020-01917-9]
- 19 **Nakai H**, Shimizu H, Taniguchi T, Kawahara S, Yamaoka T, Sasaki N, Isoda H, Nakamoto Y. Long-term efficacy and risk factors for stent occlusion in portal vein stent placement: a multi-institutional retrospective study. *CVIR Endovasc* 2022; **5**: 27 [PMID: 35708871 DOI: 10.1186/s42155-022-00307-0]
- 20 **Brichard M**, Iesari S, Lerut J, Reding R, Goffette P, Coubeau L. Meso-Rex bypass for the management of extrahepatic portal vein obstruction in adults (with video). *Hepatobiliary Pancreat Dis Int* 2022; **21**: 25-32 [PMID: 34426078 DOI: 10.1016/j.hbpd.2021.08.003]
- 21 **Lee SD**, Park SJ, Kim HB, Han SS, Kim SH, You TS, Kim YK, Cho SY, Lee SA, Ko YH, Hong EK. Jejunal varix bleeding with extrahepatic portal vein obstruction after pylorus-preserving pancreaticoduodenectomy: report of two cases. *Korean J Hepatobiliary Pancreat Surg* 2012; **16**: 37-42 [PMID: 26388904 DOI: 10.14701/kjhbps.2012.16.1.37]
- 22 **Shiozaki S**, Matsugu Y, Hamaoka M, Ishimoto T. Superior mesenteric vein to the right testicular vein shunt operation for jejunal varices bleeding associated with extrahepatic portal vein obstruction after pancreaticoduodenectomy: a case report. *Surg Case Rep* 2022; **8**: 33 [PMID: 35199245 DOI: 10.1186/s40792-022-01390-0]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: office@baishideng.com
Help Desk: <https://www.f6publishing.com/helpdesk>
<https://www.wjgnet.com>

