MINIREVIEWS

5934  Development of clustered regularly interspaced short palindromic repeats/CRISPR-associated technology for potential clinical applications
Huang YY, Zhang XY, Zhu P, Ji L

5946  Strategies and challenges in treatment of varicose veins and venous insufficiency
Gao RD, Qian SY, Wang HH, Liu YS, Ren SY

5957  Diabetes mellitus susceptibility with varied diseased phenotypes and its comparison with phenome interactome networks
Rout M, Kour B, Vuree S, Lulu SS, Medicherla KM, Suravajhala P

ORIGINAL ARTICLE

Clinical and Translational Research

5965  Identification of potential key molecules and signaling pathways for psoriasis based on weighted gene co-expression network analysis
Shu X, Chen XX, Kang XD, Ran M, Wang YL, Zhao ZK, Li CX

5984  Construction and validation of a novel prediction system for detection of overall survival in lung cancer patients

Case Control Study

6001  Effectiveness and postoperative rehabilitation of one-stage combined anterior-posterior surgery for severe thoracolumbar fractures with spinal cord injury
Zhang B, Wang JC, Jiang YZ, Song QP, An Y

Retrospective Study

6009  Prostate sclerosing adenopathy: A clinicopathological and immunohistochemical study of twelve patients
Feng RL, Tao YP, Tan ZY, Fu S, Wang HF

6021  Value of magnetic resonance diffusion combined with perfusion imaging techniques for diagnosing potentially malignant breast lesions
Zhang H, Zhang XY, Wang Y

6032  Scar-centered dilation in the treatment of large keloids
Wu M, Gu JY, Duan R, Wei BX, Xie F

6039  Application of a novel computer-assisted surgery system in percutaneous nephrolithotomy: A controlled study
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>6050</td>
<td>Influences of etiology and endoscopic appearance on the long-term outcomes of gastric antral vascular ectasia</td>
<td>Kwon HJ, Lee SH, Cho JH</td>
</tr>
<tr>
<td>6060</td>
<td>Evaluation of the clinical efficacy and safety of TST33 mega hemorrhoidectomy for severe prolapsed hemorrhoids</td>
<td>Tao L, Wei J, Ding XF, Ji LJ</td>
</tr>
<tr>
<td>6069</td>
<td>Sequential chemotherapy and icotinib as first-line treatment for advanced epidermal growth factor receptor-mutated non-small cell lung cancer</td>
<td>Sun SJ, Han JD, Liu W, Wu ZY, Zhao X, Yan X, Jiao SC, Fang J</td>
</tr>
<tr>
<td>6082</td>
<td>Impact of preoperative carbohydrate loading on gastric volume in patients with type 2 diabetes</td>
<td>Lin XQ, Chen YR, Chen X, Cai YP, Lin JX, Xu DM, Zheng XC</td>
</tr>
<tr>
<td>6091</td>
<td>Efficacy and safety of adalimumab in comparison to infliximab for Crohn's disease: A systematic review and meta-analysis</td>
<td>Yang HH, Huang Y, Zhou XC, Wang RN</td>
</tr>
<tr>
<td>6105</td>
<td>Successful treatment of acute relapse of chronic eosinophilic pneumonia with benralizumab and without corticosteroids: A case report</td>
<td>Izhakian S, Pertzov B, Rosengarten D, Kramer MR</td>
</tr>
<tr>
<td>6119</td>
<td>Hepatic epithelioid hemangioendothelioma after thirteen years' follow-up: A case report and review of literature</td>
<td>Mo WF, Tong YL</td>
</tr>
<tr>
<td>6128</td>
<td>Effectiveness and safety of ultrasound-guided intramuscular lauromacrogol injection combined with hysteroscopy in cervical pregnancy treatment: A case report</td>
<td>Ye JP, Gao Y, Lu LW, Ye YJ</td>
</tr>
<tr>
<td>6136</td>
<td>Carcinoma located in a right-sided sigmoid colon: A case report</td>
<td>Lyu LJ, Yao WW</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6148</td>
<td>Overlapping syndrome of recurrent anti-N-methyl-D-aspartate receptor encephalitis and anti-myelin oligodendrocyte glycoprotein demyelinating diseases: A case report</td>
<td>Yin XJ, Zhang LF, Bao LH, Feng ZC, Chen JH, Li BX, Zhang J</td>
</tr>
<tr>
<td>6163</td>
<td>Disseminated strongyloidiasis in a patient with rheumatoid arthritis: A case report</td>
<td>Zheng JH, Xue LY</td>
</tr>
<tr>
<td>6168</td>
<td>CYP27A1 mutation in a case of cerebrotendinous xanthomatosis: A case report</td>
<td>Li ZR, Zhou YL, Jin Q, Xie YY, Meng HM</td>
</tr>
<tr>
<td>6175</td>
<td>Postoperative multiple metastasis of clear cell sarcoma-like tumor of the gastrointestinal tract in adolescent: A case report</td>
<td>Huang WP, Li LM, Gao JB</td>
</tr>
<tr>
<td>6192</td>
<td>Presentation of Boerhaave’s syndrome as an upper-esophageal perforation associated with a right-sided pleural effusion: A case report</td>
<td>Tan N, Luo YH, Li GC, Chen YL, Tan W, Xiang YH, Ge L, Yao D, Zhang MH</td>
</tr>
<tr>
<td>6205</td>
<td>Nontraumatic convexal subarachnoid hemorrhage: A case report</td>
<td>Chen HL, Li B, Chen C, Fan XX, Ma WB</td>
</tr>
<tr>
<td>6211</td>
<td>Growth hormone ameliorates hepatopulmonary syndrome and nonalcoholic steatohepatitis secondary to hypopituitarism in a child: A case report</td>
<td>Zhang XY, Yuan K, Fang YL, Wang CL</td>
</tr>
<tr>
<td>6218</td>
<td>Vancomycin dosing in an obese patient with acute renal failure: A case report and review of literature</td>
<td>Xu KY, Li D, Hu ZJ, Zhao CC, Bai J, Du WL</td>
</tr>
<tr>
<td>6234</td>
<td>Primary intestinal lymphangiectasia presenting as limb convulsions: A case report</td>
<td>Cao Y, Feng XH, Ni HX</td>
</tr>
<tr>
<td>6241</td>
<td>Esophagogastric junctional neuroendocrine tumor with adenocarcinoma: A case report</td>
<td>Kong ZZ, Zhang L</td>
</tr>
</tbody>
</table>
Contents

Thrice Monthly Volume 10 Number 18 June 26, 2022

6247 Foreign body granuloma in the tongue differentiated from tongue cancer: A case report
Jiang ZH, Xu R, Xia L

6254 Modified endoscopic ultrasound-guided selective N-butyl-2-cyanoacrylate injections for gastric variceal hemorrhage in left-sided portal hypertension: A case report
Yang J, Zeng Y, Zhang JW

6261 Management of type IIIb dens invaginatus using a combination of root canal treatment, intentional replantation, and surgical therapy: A case report
Zhang J, Li N, Li WL, Zheng XY, Li S

6269 Clivus-involved immunoglobulin G4 related hypertrophic pachymeningitis mimicking meningioma: A case report
Yu Y, Lv L, Yin SL, Chen C, Jiang S, Zhou PZ

6277 De novo brain arteriovenous malformation formation and development: A case report
Huang H, Wang X, Guo AN, Li W, Duan RH, Fang JH, Yin B, Li DD

6283 Coinfection of Streptococcus suis and Nocardia asiatica in the human central nervous system: A case report
Chen YY, Xue XH

6289 Dilated left ventricle with multiple outpouchings — a severe congenital ventricular diverticulum or left-dominant arrhythmogenic cardiomyopathy: A case report
Zhang X, Ye RY, Chen XP

6298 Spontaneous healing of complicated crown-root fractures in children: Two case reports
Zhou ZL, Guo L, Sun SK, Li HS, Zhang CD, Kou WW, Xu Z, Wu LA

6307 Thyroid follicular renal cell carcinoma excluding thyroid metastases: A case report
Wu SC, Li XY, Liao BJ, Xie K, Chen WM

6314 Appendiceal bleeding: A case report
Zhou SY, Guo MD, Ye XH

6319 Spontaneous healing after conservative treatment of isolated grade IV pancreatic duct disruption caused by trauma: A case report
Mei MZ, Ren YF, Mou YP, Wang YY, Jin WW, Lu C, Zhu QC

6325 Pneumonia and seizures due to hypereosinophilic syndrome—organ damage and eosinophilia without synchronisation: A case report
Ishida T, Murayama T, Kobayashi S

6333 Creutzfeldt-Jakob disease presenting with bilateral hearing loss: A case report
Na S, Lee SA, Lee JD, Lee ES, Lee TK

LETTER TO THE EDITOR

6338 Stem cells as an option for the treatment of COVID-19
Cuevas-González MV, Cuevas-González JC
ABOUT COVER
Editorial Board Member of *World Journal of Clinical Cases*, Cristina Tudoran, PhD, Assistant Professor, Department VII, Internal Medicine II, Discipline of Cardiology, "Victor Babes" University of Medicine and Pharmacy Timisoara, Timisoara 300041, Timis, Romania. cristina13.tudoran@gmail.com

AIMS AND SCOPE
The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING
The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

RESPONSIBLE EDITORS FOR THIS ISSUE
Production Editor: Ying-Yi Yuan; Production Department Director: Xu Gan; Editorial Office Director: Jin-Lei Wang.

NAME OF JOURNAL
*World Journal of Clinical Cases*

ISSN
ISSN 2307-8960 (online)

LAUNCH DATE
April 16, 2013

FREQUENCY
Thrice Monthly

EDITORS-IN-CHIEF
Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/2307-8960/editorialboard.htm

PUBLICATION DATE
June 26, 2022

COPYRIGHT
© 2022 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/gerinfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/gerinfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/gerinfo/239

ONLINE SUBMISSION
https://www.f6publishing.com

© 2022 Baishideng Publishing Group Inc. All rights reserved. 7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
E-mail: bpgoffice@wjgnet.com https://www.wjgnet.com
Modified endoscopic ultrasound-guided selective N-butyl-2-cyanoacrylate injections for gastric variceal hemorrhage in left-sided portal hypertension: A case report

Jian Yang, Yan Zeng, Jun-Wen Zhang

**Abstract**

**BACKGROUND**

Left-sided portal hypertension (LSPH), also known as sinistral portal hypertension or regional portal hypertension, refers to extrahepatic portal hypertension caused by splenic vein obstruction or stenosis. N-butyl-2-cyanoacrylate (NBC) has been widely used in the endoscopic hemostasis of portal hypertension, but adverse events including renal or pulmonary thromboembolism, mucosal necrosis and gastrointestinal (GI) bleeding may occur after treatment. Herein, we report successfully managing gastric variceal (GV) hemorrhage secondary to LSPH using modified endoscopic ultrasound (EUS)-guided selective NBC injections.

**CASE SUMMARY**

A 35-year-old man was referred to our hospital due to an upper GI hemorrhage. Gastroscopy revealed GV hemorrhage and computed tomography venography (CTV) confirmed LSPH. The patient requested endoscopic procedures and rejected surgical therapies including splenectomy. EUS-guided selective NBC injections were performed and confluences of gastric varices were selected as the injection sites to reduce the injection dose. The “sandwich” method using undiluted NBC and hypertonic glucose was applied. No complications occurred. The patient was followed up regularly after discharge. Three months later, the follow-up gastroscopy revealed firm gastric submucosa with no sign of NBC expulsion and the follow-up CTV showed improvements in LSPH. No recurrent GI hemorrhage was reported during this follow-up period.

**CONCLUSION**

EUS-guided selective NBC injection may represent an effective and economical treatment for GV hemorrhage in patients with LSPH.
INTRODUCTION

Left-sided portal hypertension (LSPH), also known as sinistral portal hypertension or regional portal hypertension, refers to extrahepatic portal hypertension caused by splenic vein obstruction or stenosis [1-3]. LSPH accounts for about 5% of extrahepatic portal hypertension and is characterized by isolated gastric varices (GVs) and normal liver functions [3]. Pancreatic diseases are the major causes of LSPH. Most patients with LSPH have no obvious clinical symptoms and they are often diagnosed during the endoscopic examination after gastrointestinal (GI) bleeding. Therefore, LSPH should be considered in patients with pancreatic diseases who develop unexplained GI hemorrhage [1,4].

Gastric variceal (GV) hemorrhage leads to significant mortality in patients with portal hypertension. Although N-butyl-2-cyanoacrylate (NBC) has been widely used in the endoscopic hemostasis of portal hypertension, the early expulsion of NBC and the resultant hemorrhage is not uncommon [5]. Compared with conventional endoscopic injection, endoscopic ultrasound (EUS)-guided procedures in patients with GV bleeding demonstrated better diagnostic capability and clinical efficacy [6,7].

Herein, we report the successful management of GV hemorrhage secondary to LSPH using modified EUS-guided selective NBC injection.

CASE PRESENTATION

Chief complaints
A 35-year-old man was referred to our hospital due to an upper GI hemorrhage.

History of present illness
A few hours before admission, the patient had no apparent reason for one occurrence of sudden vomiting of blood mixed with stomach contents and the amount was estimated to be about 50-100 mL. He denied melena and syncope.

History of past illness
Nine months previously, this patient was admitted to our hospital due to persistent upper abdominal pain. He was diagnosed with severe acute pancreatitis (SAP) and underwent EUS-guided drainage of a pancreatic walled-off necrosis. He also had a 6-year history of hypertension and took enalapril regularly.

Personal and family history
This patient had a 10-year smoking history (a pack per day) and has not quit smoking. He denied alcoholism and taking nonsteroidal anti-inflammatory drugs.
Physical examination
After admission, physical examination revealed no abnormality except for 130/91 mmHg blood pressure.

Laboratory examinations
No apparent abnormalities were found in the emergency blood analysis.

Imaging examinations
After admission, gastroscopy confirmed GV hemorrhage (IGV1 by Sarin classification), and no esophageal varices or portal hypertensive gastropathy was found (Figure 1). Abdominal computed tomography venography (CTV) revealed stenosis of the proximal superior mesenteric vein, invisible proximal splenic vein and increased collateral circulations (Figure 2). Neither a portal vein thrombosis nor a splenorenal shunt was detected.

FINAL DIAGNOSIS
LSPH and GV hemorrhage.

TREATMENT
The patient requested endoscopic procedures and rejected surgical therapies including splenectomy. EUS-guided selective NBC injections were performed for the treatment and prophylaxis of GV hemorrhage.

A linear Pentax echoendoscope (Hoya Co., Tokyo, Japan) and the color Doppler flow imaging were employed to determine the puncture site. EUS revealed an enlarged portal vein without cavernous transformation (Figure 3A). The confluences of GVs were selected as the injection sites to reduce the injection dose. A 22-gauge needle (Boston Scientific Co., Natick, MA, United States) was used to perform the puncture into the selected GVs (Figure 3B). The “sandwich” method using undiluted NBC (0.5 mL/ampoule; Beijing Compont Medical Devices Co., Beijing, China) and hypertonic glucose was applied (Figure 3C). A total of 2 mL of NBC was injected into three different confluences of GVs. Hyperechoic fillings and decreased blood flow signals were observed after injections (Figure 3D).

OUTCOME AND FOLLOW-UP
The patient fasted for 1 d after the procedure. No complications, including ectopic embolism, fever and post-injection GI bleeding occurred. The patient was followed up regularly after discharge. Three months later, the follow-up gastroscopy revealed no sign of NBC expulsion (Figure 4) and follow-up CTV showed improvements in LSPH (Figure 5). No recurrent GI hemorrhage and other complications were reported during the 3-mo follow-up.

DISCUSSION
Pancreatic diseases such as pancreatitis and pancreatic tumors are the most common etiology of LSPH [3,8]. The anatomical proximity between the splenic vein and the pancreas makes the splenic vein more susceptible to pancreatic diseases. When pancreatic disease obstructs the splenic vein flow, the pressure of the left portal vein system increases and blood flows retrogradely through the short and posterior gastric veins and the gastroepiploic veins, which would lead to GVs. In patients with acute pancreatitis, infected walled-off necrosis was one of the risk factors for LSPH and early anticoagulation could not wholly prevent its occurrence[8]. In this case, the patient had a history of SAP and infected pancreatic necrosis which may be responsible for his LSPH. About 20% of patients with portal hypertension may develop GVs[9], and although LSPH is a rare cause of upper GI hemorrhage, GV hemorrhage in patients with LSPH secondary to pancreatic disease is not uncommon. Liu et al[10] reported that about 15.3% of LSPH patients had complicated bleeding GVs and the death risk is relatively higher when recurrent GV hemorrhage occurs so this is worthy of attention.

It is well known that splenectomy is the most effective treatment for LSPH. However, transjugular intrahepatic portosystemic shunt, balloon retrograde transvenous obliteration, endoscopic injection sclerotherapy (EIS) and endoscopic NBC injection were reported effective for patients who are not suitable or unwilling to choose surgery[11]. Although endoscopic NBC injection therapy has been proven minimally invasive and effective[12], conventional endoscopic NBC injections may also cause
severe complications including renal or pulmonary thromboembolism, fever, severe pain caused by intraperitoneal injection, mucosal necrosis at the injection site and GI bleeding[13]. As reported in recent years, an EUS-guided hemostasis treatment, including injection of NBC or in combination with coils, injection of thrombin or absorbable gelatin sponge, and clip-assisted endoscopic NBC injection, demonstrated promising results in reducing complication risks[14,15].

Modified EUS-guided selective NBC injection was applied for three distinct advantages in this present case. First, a reduced NBC dose may result in a lower occurrence of post-operational GI bleeding and ectopic embolism. EUS can also provide the detection of submucosal GVs, their confluences and real-time effectiveness evaluation for GV obliteration[7]. These advantages make it possible to identify and select confluences of gastric varices which were in the direction of bleeding gastric vessels and used as injection sites to reduce the injection dose. Although EUS-guided coil injection is reported superior to conventional NBC injection in terms of rebleeding after treatment[16], it was believed that a reduced dose of NBC would be injected into GVs in the modified EUS-guided selective NBC injection, which would lead to lower chances of post-injection ulcer and GI hemorrhage. Besides, reduced NBC dose may result in a similar lower occurrence of ectopic embolism in selective NBC injection as in the coils-combined injection method and clip-assisted injection method. Second, there would be no additional risk of radioactive exposure; coils and metal clips were not used in this modified injection procedure, which decreased the cost of endoscopic procedures. Third, selective NBC injection demonstrated a faster and firmer obliteration effect in GV hemorrhage than thrombin and absorbable gelatin sponge injections, making NBC injection more suitable than other procedures for acute GV bleeding. NBC rarely causes vascular necrosis and was reported superior to EIS in the hemostasis rate for GV bleeding[17]. Thus, EUS-guided selective NBC injection was performed for this patient based on the above factors and the result was adequate. Despite all these advantages, the operation time of EUS-guided selective NBC injection seemed a little longer than that of conventional

Figure 1 Gastroscopic image. Gastroscopy revealed gastric variceal with signs of recent bleeding in the absence of active bleeding.

Figure 2 Abdominal computed tomography venography image. Computed tomography venography revealed stenosis of the proximal superior mesenteric vein (red arrow), invisible proximal splenic vein, and increased collateral circulations (yellow arrows).
CONCLUSION

Modified EUS-guided selective NBC injection may represent an effective and economical treatment for
Figure 5 Computed tomography venography image. Compared with the results before the operation (Figure 2), follow-up computed tomography venography revealed improvements in left-sided portal hypertension and collateral circulations (red arrows).

GV hemorrhage in patients with LSPH.

FOOTNOTES

Author contributions: Yang J, Zeng Y and Zhang JW designed the research study; Yang J and Zhang JW performed the endoscopic procedures; Yang J and Zeng Y performed the literature search, analyzed the data and wrote the manuscript; All authors have read and approved the final manuscript.

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: The authors declare that they have no conflict of interest.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

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/Territory of origin: China

ORCID number: Jian Yang 0000-0001-8170-0727; Yan Zeng 0000-0003-4935-1306; Jun-Wen Zhang 0000-0003-2911-598X.

Corresponding Author’s Membership in Professional Societies: Chinese Society of Gastroenterology.

S-Editor: Zhang H
L-Editor: Filipodia CL
P-Editor: Zhang H

REFERENCES

Yang J et al. EUS-guided selective injections for variceal hemorrhage


