A Rare Case of Retrogastric Abscess Occurring Six Months after N-Butyl-2-Cyanoacrylate Injection into Gastric Varices

Ikram Hussain,1 Andrew Eu Boon Kwek,2 Veeraraghavan Meyyur Aravamudan,3 Chern Hao Chong,1 and Tiing Leong Ang2

1Gastroenterology and Hepatology, Woodlands Integrated Health Campus (WIHC), Singapore
2Gastroenterology and Hepatology, Changi General Hospital, Singapore
3Department of Medicine, Woodlands Integrated Health Campus (WIHC), Singapore

Correspondence should be addressed to Ikram Hussain; ikram_hussain@whc.sg

Received 7 November 2017; Revised 28 November 2017; Accepted 6 December 2017; Published 8 January 2018

1. Introduction

Gastrointestinal (GI) variceal bleeding due to portal hypertension is one of the common medical emergencies. Its therapy begins with adequate resuscitation with fluids and splanchnic vasoconstrictors (e.g., somatostatin or terlipressin) and eventually requires an urgent upper GI endoscopy [1]. Upon endoscopy, most patients are found to harbour esophageal varices while in a minority of patients, gastric varices are the primary sites of bleeding. The hemorrhage due to gastric varices is usually more profuse and life-threatening as compared to the bleeding from esophageal varices. Successful endoscopic hemostasis of such bleeding gastric varices can be technically challenging, and a variety of modalities are often tried. In countries where it is approved, N-butyl-2-cyanoacrylate (Histoacryl®; B, Braun, Melsungen, Germany) intravariceal injection therapy is considered the first line therapy to obliterate bleeding gastric varices [1]. This chemical, upon coming in contact with blood or water, quickly polymerises into a solid mass which then clogs the gastric varices. The widespread utilization of such practice is supported by several studies claiming the efficacy of such therapy to be over 80%–90% [2, 3].

Although efficacious in halting gastric variceal hemorrhage, the use of N-butyl-2-cyanoacrylate has been associated with embolic or/and infective complications. The latter complication is thought to result from the break in the mucosa along with introduction of foreign materials [4, 5]. In the majority of such cases, complications related to the infection are self-resolving and without any consequences, though serious infections have infrequently been reported. Here, we report a rare case of retrogastric abscess after injection of N-butyl-2-cyanoacrylate into the bleeding gastric varices.

2. Case Report

A 39-year-old Chinese man was hospitalized for right thigh cellulitis. He had a past medical history of poorly controlled type 2 diabetes mellitus. Based on clinical, biochemical, and radiological assessment, he was also concomitantly diagnosed with Child’s C liver cirrhosis which was attributed to alcoholic liver disease. The values of initial laboratory tests are represented in Table 1. The ultrasonography of abdomen revealed small amount of ascites and patent portal vein. On day 9 of hospitalization, the patient suffered a massive
hematemesis. After adequate resuscitation, an urgent upper GI endoscopy was performed by an experienced proceduralist. During endoscopy, gastroesophageal varices (Sarin’s GOV-2) with large gastric component (at the cardia and fundus) toward the greater curvature were visualized (Figure 1). A white spot, the “nipple sign,” was visible at one of the gastric varices, suggesting it to be the point of hemorrhage. The gastric varices were injected with the commercially prepared mixture of the N-acetyl-2-cyanoacrylate and Lipiodol (Laboratoire Guerbet, Aulnay-sous-Bois, France) in 0.5 ml : 0.8 ml ratio. The proceduralist and nurses adhered to the institutional protocol of intravariceal injection of N-acetyl-2-cyanoacrylate. A total of 5 ml of the mixture was injected in 5 separate aliquots at 5 different locations with complete obliteration (Figure 2). Additionally, three variceal ligation bands were applied to the varices in the lower esophagus. Although prophylactic antibiotic therapy (intravenous ceftriaxone) was administered, patient developed fever five days after the variceal treatment. This fever was attributed to a new urinary tract infection (UTI) with growth of pan-sensitive *Escherichia coli* in urine. A computed tomography of the abdomen was performed which again showed small amount of ascites, but no localized intra-abdominal collection was observed. Additionally, radiological appearances of the pancreas were unremarkable. The patient

Table 1: Values of initial laboratory tests during the two respective hospitalizations.

| Test                             | Time A   | Time B   | Unit       | Reference interval |
|----------------------------------|----------|----------|------------|--------------------|
| White blood cells                | 12.32    | 7.42     | ×10⁹/L     | 3.40–9.60          |
| Red blood cells                  | 3.1      | 2.90     | ×10¹²/L    | 3.70–9.60          |
| Hemoglobin                       | 8.7      | 8.1      | g/dL       | 10.9–15.1          |
| Mean cell volume                 | 91.5     | 89.3     | fl         | 80.0–95.0          |
| Mean corpuscular hemoglobin      | 30.6     | 27.9     | pg         | 27.0–33.0          |
| Mean corpuscular hemoglobin      | 34.1     | 33.8     | g/dL       | 32.0–36.0          |
| Hematocrit                       | 33.5     | 31.2     | %          | 32.7–44.4          |
| Platelets                        | 112      | 126      | —          | 132–372            |
| Mean platelet volume             | 10.1     | 9.7      | —          | 8.7–12.2           |
| Red cell distribution width      | 14.1     | 13.7     | %          | 11.4–14.8          |
| Sodium                           | 133      | 134      | mEq/L      | 135–145            |
| Potassium                        | 3.6      | 4.4      | mEq/L      | 3.5–5.0            |
| Chloride                         | 95       | 97       | mEq/L      | 95–110             |
| Carbon dioxide                   | 26       | 22       | mEq/L      | 22–31              |
| Creatinine                       | 1.19     | 1.39     | mg/dL      | 0.57–1.02          |
| Urea                             | 25.49    | 21.84    | mg/dL      | 5.60–18.21         |
| Glucose                          | 176.6    | 142.3    | mg/dL      | 72.0–140.5         |
| Albumin                          | 2.3      | 3.0      | g/dL       | 3.8–4.8            |
| Bilirubin, total                 | 3.16     | 1.57     | mg/dL      | 0.29–1.75          |
| Bilirubin, conjugated            | 2.57     | 1.29     | umol/L     | 0–0.29             |
| Aspartate aminotransferase       | 115      | 98       | U/L        | 10–50              |
| Alanine aminotransferase         | 69       | 43       | U/L        | 10–70              |
| Alkaline phosphatase             | 141      | 126      | U/L        | 40–130             |
| Prothrombin time                 | 14.4     | 14.3     | Seconds    | 9-2-11             |

Time A denotes the period when variceal bleeding occurred, and Time B represents the hospitalization for retrogastric abscess.

![Figure 1: Endoscopic image of bleeding varices in the cardia and fundus.](image1)

![Figure 2: Endoscopic image of hardened gastric varices after intravariceal injection with N-butyl-2-cyanoacrylate.](image2)
was discharged well after treatment of the UTI. Nonselective beta-blocker therapy (tablet propranolol) was initiated before discharge. The patient was advised to complete the courses of antibiotics (namely, five more days of cloxacillin for cellulitis and ten days of ciprofloxacin for UTI).

A follow-up endoscopy was performed after 10 days of the index endoscopy where complete obliteration of the gastroesophageal varices was ascertained. The patient remained well for next 6 months until he was rehospitalized for high spiking fever. He did not report any epigastric pain. The abdomen was soft and not tender. The patient had been abstinent from alcohol for last 6 months. The values of initial laboratory tests are shown in Table 1. Parenteral antibiotic therapy (ceftriaxone) was administered. Growth of pansensitive *Escherichia coli* was noted in the aerobic blood culture. A computed tomography (CT) of the abdomen and pelvis was performed in view of nonresolving fever despite clearance of bacteremia in subsequent blood cultures. The CT scan (Figures 3 and 4) showed a retrogastric abscess (5.1 cm × 3.4 cm × 4.3 cm in size) adjacent to the diaphragmatic crus and pancreatic tail. The previously injected N-butyl-2-cyanoacrylate was still visible around the gastric cardia, in the perigastric varices, and in the left adrenal vein. Also, there was a new partial thrombosis of the left renal vein. As compared to the abdominal imaging six months ago, there was no ascites. Additionally, there were no radiological features of acute or chronic pancreatitis. An infectious disease specialist was consulted who suspected inadequate penetration of the abscess with cephalosporin. The antibiotic therapy was switched to carbapenem, and a conservative nondrainage approach was undertaken for two reasons: the bacteremia had already cleared, and the size of the abscess was relatively small for drainage. Another CT scan was performed after one week which...
confirmed interval reduction in the size of retrogastric abscess (now 4.8 cm × 2.4 cm × 4.5 cm). After clinical improvement, the patient was subsequently discharged thirteen days after hospitalization. Further antimicrobial therapy was administered at the outpatient parenteral therapy centre. Two CT scans (Figures 5 and 6) were repeated at one month intervals, which showed gradual resolution of the retrogastric abscess to a small nonliquid lesion. Overall, the patient received three months of antibiotics. Over next one year of follow-up, there was no clinical or radiological recurrence of the retrogastric abscess.

3. Discussion

Gastrointestinal variceal bleeding is a frequently encountered medical emergency in acute care hospitals, and endoscopic hemostatic therapy is emergently employed in such scenario. Bleeding gastric varices are found in a minority of such patients. As compared with the esophageal varices, the incidence of hemorrhage from gastric varices is lower, but the bleeding from the latter tends to be more severe, more difficult to control, and more life-endangering. Intravariceal injection of gastric varices with tissue adhesives (or glues), for example, N-butyl-2-cyanoacrylate, is considered more effective than sclerotherapy or variceal ligation [2, 3]. Although the injection of N-butyl-2-cyanoacrylate is considered effective, many complications have been reported with its use, namely, thromboembolism and septic complications [6, 7]. For instance, Ausloos et al. recently enumerated 9 cases of N-butyl-2-cyanoacrylate glue-related infection in the literature [8]. To our knowledge, there has been only one case reported before our case of a retrogastric abscess after cyanoacrylate variceal injection [9].

The septic complications associated with the injection of N-butyl-2-cyanoacrylate are attributed to a variety of factors: break in the mucosal barrier with the injection or with the posttherapeutic mucosal ulceration; deposition of foreign material; and reduced antimicrobial clearance in clogged blood vessels. Although prophylactic antibiotics are administered while treating bleeding varices, delayed serious septic complications may still occur due to the aforementioned reasons. Lee et al. reported two cases of delayed adrenal abscess which happened 4–6 months after the variceal injections [10]. Similarly, in our case, the retrogastric abscess happened 6 months after variceal injection with N-butyl-2-cyanoacrylate. We believe that the abscess had occurred due to persistent deposition of N-butyl-2-cyanoacrylate which acted as a nidus for microbes and also hindered clearance of microbes due to adjacent venous obstructions. As we did not aspirate the collection, confirmation of *Escherichia coli* in its content could not be performed. Although this is a limitation in the present case, the retrogastric collection behaved like an abscess in the clinical context and thus responded to antimicrobial therapy.

This case highlights a rare complication of retrogastric abscess which occurred six months after gastric variceal injection with N-butyl-2-cyanoacrylate. As the size of abscess was small in our patient, nondrainage antimicrobial management was successful. Larger abscesses or poor responders should be considered for drainage as the penetration of antimicrobials may be inadequate. Although abscess formation is a rare occurrence after variceal injection with N-butyl-2-cyanoacrylate, our report emphasizes to consider the differential diagnosis of a perigastric abscess in a septic patient, even if the use N-butyl-2-cyanoacrylate was in the past.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors’ Contributions

Ikram Hussain, Andrew Eu Boon Kwek, Veeraraghavan Meyyur Aravamudan, and Ting Leong Ang helped in compilation of the text and literature search. Chong Chern Hao helped in radiological images and literature search. Ikram Hussain and Veeraraghavan Meyyur Aravamudan helped in the compilation of the text, literature search, and editing the manuscript.

References

[1] R. de-Franchis and Baveno VI Faculty, “Expanding consensus in portal hypertension: report of the Baveno VI consensus workshop: stratifying risk and individualizing care for portal hypertension,” *Journal of Hepatology*, vol. 63, no. 3, pp. 743–752, 2015.

[2] S. K. Sarin, A. K. Jain, M. Jain, and R. Gupta, “A randomized controlled trial of cyanoacrylate versus alcohol injection in patients with isolated fundic varices,” *American Journal of Gastroenterology*, vol. 97, no. 4, pp. 1010–1015, 2002.

[3] P. C. Tan, M. C. Hou, H. C. Lin et al., “A randomized trial of endoscopic treatment of acute gastric variceal haemorrhage: N-butyl-2-cyanoacrylate injection versus band ligation,” *Hepatology*, vol. 43, no. 4, pp. 690–697, 2006.

[4] P. Wahl, F. Lammer, D. Conen, R. Schlumpf, and A. Bock, “Septic complications after injection of N-butyl-2-cyanoacrylate: report of two cases and review,” *Gastrointestinal Endoscopy*, vol. 59, no. 7, pp. 911–916, 2004.

[5] G. Wright, W. R. Matull, L. Zambreanu et al., “Recurrent bacteremia due to retained embolized glue following variceal obliteration,” *Endoscopy*, vol. 41, no. 2, pp. E56–E57, 2009.

[6] A. Turler, M. Wolf, D. Dorlars, and A. Härzer, “Embolic and septic complications after sclerotherapy of fundic varices with cyanoacrylate,” *Gastrointestinal Endoscopy*, vol. 53, no. 2, pp. 228–230, 2001.

[7] N. Hamad, J. Stephens, G. F. Maskell, S. H. Hussaini, and H. R. Dalton, “Case report: thromboembolic and septic complications of migrated cyanoacrylate injected for bleeding gastric varices,” *British Journal of Radiology*, vol. 81, no. 971, pp. e263–e265, 2008.

[8] F. Ausloos, S. Hillaire, P. Bedossa et al., “N-butyl-2-cyanoacrylate in gastric varices: a cause for recurrent sepsis,” *American Journal of Gastroenterology*, vol. 108, no. 12, pp. 1937–1938, 2013.

[9] P. Verger, J. Blais, M. Gruau, and Y. Haffaf, “Retrogastric abscess secondary to gastric varices obturation with cyanoacrylate,” *Gastroentérologie Clinique et Biologique*, vol. 22, no. 2, pp. 248–249, 1998.

[10] B. Y. Lee, J. Y. Jang, S. W. Jeong et al., “Two cases of adrenal abscesses following histoacryl (N-butyl-2-cyanoacrylate) injection,” *Gut and Liver*, vol. 5, no. 2, pp. 242–244, 2011.