Novel treatment (new drug/intervention; established drug/procedure in new situation)

Duodenal varices successfully treated with cyanoacrylate injection therapy

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Summary

Duodenal varices are a rare complication of portal hypertension secondary to liver cirrhosis. Compared to oesophageal varices, they bleed less often but are also more difficult to diagnose and treat. There is no established treatment for bleeding duodenal varices and different treatment strategies have been employed with variable results. The authors present a case of 52-year-old male who was admitted with melaena. Upper gastrointestinal endoscopy was performed which identified bleeding varices in the second part of duodenum. The varices were injected with cyanoacrylate and the outcome was favourable. Subsequent endoscopies showed complete resolution of the varices. The authors conclude that cyanoacrylate injection is an effective first-line treatment for bleeding duodenal varices.

BACKGROUND

Gastrointestinal variceal bleeding is one of the most common cause of death in patients with portal hypertension.¹ Ectopic variceal bleeding (lying outside the gastro-oesophageal region) accounts for 2–5% of variceal bleeding – 17% of which occurs in the duodenum.¹ Duodenal varices are rare but bleeding is a life-threatening complication, with a mortality of up to 40% for the initial bleeding episode.² Currently, it is difficult to evaluate the best treatment option for duodenal variceal bleeding because of the limited data. Different treatment options have been utilised to control duodenal variceal bleeding including endoscopic, interventional radiological and surgical modalities. We report a case of duodenal variceal bleed in a patient with decompensated alcoholic liver disease treated successfully by cyanoacrylate injection. Hence, this case explores an area in upper gastrointestinal bleeding where the best treatment option is not fully known and establishes cyanoacrylate as a successful mode of therapy with good outcome.

CASE PRESENTATION

A 52-year-old Caucasian male was admitted to the hospital after he had an episode of passing black coloured stools. There were no associated symptoms of haematemesis or abdominal pain. There was no history of similar episode.

His medical history included decompensated alcoholic liver disease and psoriasis.

His medications on admission were thiamine 100 mg once daily and vitamin B compound strong 1 tablet twice daily. There were no known allergies. The patient revealed that he had cut down on alcohol intake significantly and was only taking a glass of red wine every day for the past 2 years. Patient was a non-smoker, he lived with his wife and was unemployed.

On examination, the patient was pale and looked unwell. His pulse was 100/min and regular, blood pressure was 71/36 mm Hg, aural temperature was 35.5°C, respiratory

rate was 18/min and saturations 98% on 4 l of oxygen. He was jaundiced. Abdomen was soft and slightly distended but upon percussion shifting dullness could not be elicited. There was no organomegaly. Heart sounds were normal and chest was clear to auscultation. Per rectal examination confirmed malaena.

INVESTIGATIONS

Chest x-ray and abdominal x-ray were unremarkable. ECG showed sinus tachycardia.

Initial blood investigations were as follows: haemoglobin 7 g/dl (normal: 13.0–17.5), mean cell volume 87.3 fl (normal: 80–99), haematocrit 20.2% (normal: 40–50%), white cell count $12 \times 10^9/l$ (normal: 4–11), platelets 127 (normal: 150–400), sodium 143 mmol/l (normal: 135–145), potassium 3.4 mmol/l (normal: 3.5–5.2), urea 15.4 mmol/l (normal: 2.5–7.5), creatinine 124 μ/l (normal: 50–110), albumin 25 g/l (normal: 35–52), bilirubin 69 μ/l (normal: 0–17), alkaline phosphatase 173 IU/l (normal: 100–280), alanine transaminase 32 IU/l (normal: 10–32), aspartate transaminase 49 IU/l (normal: 10–32), prothrombin time 20 s (normal: 9–13).

An urgent oesophagogastroduodenoscopy (OGD) was organised which revealed a bunch of three varices in the second part of the duodenum with a cherry red spot on one of the varix with some fresh blood in the duodenum (figure 1). The rest of the upper gastrointestinal tract appeared normal.

TREATMENT

Patient was initially managed with fluid resuscitation and subsequently he was given 6 units of blood and 4 units of fresh frozen plasma with a wide bore peripheral venous access. Patient was also commenced on intravenous omeprazole 40 mg twice daily, terlipressin 2 mg four times a day, cefotaxime 1 g twice daily and pabrinex. During OGD, the varix was injected with cyanoacrylate leading

Figure 1 A bunch of duodenal varices in second part of duodenum.

to bleeding (figure 2) which was secured with further cyanoacrylate injection. A total of 2.5 ml of cyanoacrylate was injected into the three varices achieving haemostasis (figure 3).

OUTCOME AND FOLLOW-UP

Post-OGD he was admitted to the gastroenterology ward and observed closely for 4 days. He had no further episodes of melaena and maintained haemodynamic stability. His haemoglobin post-transfusion remained consistently between 11 and 12 g/dl. The intravenous medications were discontinued and patient was commenced on propranolol 40 mg twice daily postoperative and discharged home. The patient was reviewed in the outpatient gastroenterology clinic and reported no further bleed and had remained stable since and is under regular follow-up by the gastroenterology team.

DISCUSSION

Varices are dilated portosystemic venous collateral vessels that form as a direct consequence of portal hypertension. The most common location of varices is gastro-oesophageal region.

Ectopic varices refer to varices occurring anywhere in the abdomen except in the cardia and oesophagus.¹ They are reported to occur in various locations, such as the gastric fundus, body and antrum of the stomach, duodenum, intra- and extrahepatic biliary tree, adjacent to surgically created enteric stoma, small bowel, colon, anorectum, intraperitoneum, vesicle and vagina.^{3–9} Bleeding ectopic varices account for less than 5% of all variceal haemorrhages.¹⁰

The prevalence of duodenal varices is not well known. Although duodenal varices were present in 40% of patients

with portal hypertension who had angiographic evaluation,¹¹ endoscopic incidence of duodenal varices was found to be 0.4% in a 9-year follow-up of patients with portal hypertension.¹² This discrepancy is due to the serosal and submucosal location of duodenal varices,¹³ which limits visualisation during endoscopy.

Vascular anatomical studies of the duodenal varices revealed that they arise via increased shunting of blood via the portosystemic communication from the pancreaticoduodenal veins via the veins of Retzius to the inferior vena cava.¹²

Duodenal varices can be classified as hepatic (two-third of the cases) and extra hepatic (one-third of the cases). Cirrhosis is the most common hepatic cause and accounts for 30% of all cases of duodenal varices.^{12–14} They are also more common in patients previously treated for oesophageal varices by sclerotherapy. Duodenal variceal haemorrhage can present as profuse melaena, hematochezia or haematemesis. When patient presents with melaena without haematemesis, possibility of bleeding duodenal varix should be considered. Haemorrhage from the ruptured varices may potentially be fatal.¹⁴

There are no randomised-controlled trials relating to the management of this life-threatening condition because it is relatively uncommon. Literature regarding treatment options is thus limited to single cases, or small series. Treatment options in duodenal variceal bleeding include endoscopic procedures (band ligation, sclerotherapy, clipping), interventional radiological procedures like transjugular intrahepatic portosystemic shunt, percutaneous transhepatic obliteration, trans-ileocolic vein obliteration, balloon-occluded retrograde transvenous obliteration and surgery (variceal ligation, duodenal resection and extra-hepatic portosystemic shunt creation).^{2 15–18}

Figure 2 Bleeding post cyanoacrylate injection therapy.

Figure 3 Haemostasis post injection of cyanoactylate with remnants of glue therapy.

Endoscopic intervention in duodenal varices can be more challenging than conventional treatment of oesophageal varices. Inherent duodenal anatomy can make identifying the extent of the varix and maintaining full visualisation of the lesion difficult. Furthermore, the relative thinness of the duodenal wall compared to the other parts of the upper

gastrointestinal tract makes this region more at risk for perforation and complications.¹⁹

Various sclerosants and tissue adhesives have been used in the management of duodenal variceal bleeding. Cyanoacrylate is a tissue adhesive that rapidly polymerises upon contact with blood and embolises the varix. It

has been used to achieve haemostasis in patients with gastrointestinal variceal bleeding and specifically has been successful in primary endoscopic haemostasis or secondary therapy of duodenal varices following failure of other endoscopic approaches.^{20–24}

Cyanoacrylate injection is not without risks. The reported complications are pulmonary emboli, portal and splenic vein thrombosis, cerebrovascular accidents and recurrent bleeding following cast extrusion and impaction of the injector needle within the varix.^{25–30} However, in this case there were no complications and the procedure was successful with complete resolution of varices confirmed on subsequent OGD's.

Learning points

- ▶ Portal hypertension due to cirrhosis can lead to development of varices outside the usual gastro-oesophageal region.
- ▶ Bleeding duodenal varices can thus present like upper gastrointestinal bleeding and although rare, should be considered in patients presenting with melaena without haematemesis.
- ▶ Thorough examination by OGD will clinch the diagnosis. If missed, the consequences are life-threatening.
- ▶ Although treatment of bleeding duodenal varices is not established, cyanoacrylate injection therapy is an effective first-line treatment as our case demonstrates.

Competing interests None.

Patient consent Obtained.

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Malik A, Jungle N, Khan A, Sutton J, Gasem J, Ahmed W. Duodenal varices successfully treated with cyanoacrylate injection therapy. *BMJ Case Reports* 2011;10.1136/bcr.02.2011.3913, date of publication

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