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Case Report

Traumatic omental variceal rupture–treatment with transjugular portosystemic shunt (TIPS) and embolization [☆]

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ABSTRACT

Bleeding ectopic varices is an uncommon but life-threatening complication of portal hypertension that requires a high clinical index of suspicion for early diagnosis and management. Transjugular intrahepatic portosystemic shunt is a safe and effective treatment option for bleeding ectopic varices. However, due to a high re-bleeding rate despite a patent shunt and reduced portosystemic gradient, adjunctive measures directed at embolization of the varices should be attempted. Herein, we report a case of bleeding omental varices after traumatic injury in a cirrhotic patient presenting with hemoperitoneum and hemorrhagic shock.

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Background

Ectopic varices are portosystemic collaterals located in sites other than the gastroesophageal region that arise as a means to decompress the portal system [1,2]. Ectopic varices account for up to 5% of variceal bleeds and have variable clinical manifestation depending on the location which include hematemesis, hematochezia, and hemoperitoneum. Hemoperitoneum with associated hypovolemic shock is a severe complication of ruptured ectopic varices with a mortality of 60%–100% [2]. Herein, we report a case of traumatic rupture of omental varices in a patient with decompensated cirrhosis

and portal hypertension due to nonalcoholic steatohepatitis (NASH). The patient underwent placement of a transjugular intrahepatic portosystemic shunt (TIPS) to decompress the portal pressure, followed by trans-TIPS embolization of the ectopic omental varices.

Case presentation

A 63-year-old woman with decompensated cirrhosis and a Model for End-Stage Liver Disease (MELD) score of 20 presented to the emergency department (ED) following a ground-

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Fig. 1 – Axial contrast-enhanced image of the abdomen and pelvis shows hemoperitoneum with layering blood products (arrowheads) and abnormal tangle of vessels in the periumbilical region and in the region of the greater omentum (arrows). No active extravasation was noted.

level fall onto the abdomen. She had received her weekly paracentesis for refractory ascites earlier that day prior to presenting to the ED. In the ED, the patient was initially alert and oriented but later went into hypoxic respiratory failure requiring intubation. After intubation, she went into hypovolemic shock and cardiac arrest, requiring 1 cycle of cardiopulmonary resuscitation (CPR) to achieve a return of spontaneous circulation. Given concern for active bleeding (hemoglobin of 6.9 g/dL from baseline of 11.7), she was initiated on massive transfusion protocol, and a CT angiogram of the abdomen and pelvis was performed.

CT angiogram of the abdomen and pelvis showed abnormal venous channels in the periumbilical region and in the region of greater omentum with associated moderate-to-large volume hemoperitoneum (Fig. 1). Given the suspected location of the bleeding, endoscopic management was not an option, and the patient was deemed high risk for surgery. Therefore, interventional radiology was consulted for portal decompression.

She underwent creation of a transjugular intrahepatic portosystemic shunt TIPS between the right hepatic vein and right portal vein. Digital subtraction venogram performed with the catheter placed at the confluence of the splenic vein and superior mesenteric vein showed no abnormal filling of the varices (Fig. 2). However, despite successful TIPS placement, the patient continued to deteriorate clinically requiring continuous blood transfusion and pressor support. Therefore, an immediate CT angiogram was performed to evaluate for any arterial source of bleeding, given that the patient had a same-day paracentesis. Repeat CT angiogram showed active extravasation from the ectopic omental varices off the superior mesenteric vein despite portal decompression by the TIPS (Fig. 3).

Using the same internal jugular venous access, a 5-Fr Bernstein catheter (Merit) and Glidewire (Terumo) were advanced through the TIPS stent into the superior mesenteric vein and subsequently into the omental veins where digital subtraction venograms showed active extravasation (Fig. 3). Utilizing a microcatheter system (2.4 Fr Progreat [Terumo]), the bleeding omental varices were successfully embolized using a combination of Gelfoam and metallic coils (Fig. 4).

Following TIPS placement and embolization, the patient's blood pressure stabilized with decreasing vasopressor and blood product requirements. However, the hospital course was complicated by disseminated intravascular coagulation and multiorgan failure, resulting in the patient's death within 1 week of the intervention.

Discussion

Ectopic varices develop due to portal hypertension at sites other than the gastroesophageal region and can present with hypovolemic shock, hemoperitoneum, hematemesis, or hematochezia, depending on the location. These are broadly classified as “luminal,” – those involving the small bowel, colon, rectum, and anal canal, and “extra-luminal,” – those involving the omental and mesenteric veins, retroperitoneal veins, and those forming around the falciform ligament, umbilicus, gallbladder, ovary, and vagina [2,3].

Hemoperitoneum due to rupture of ectopic varices have been described before but data is limited to case reports and case series [4–6]. This is a serious complication and is associated with a high morbidity and mortality. The factors predictive of outcomes are related to baseline liver function status,



Fig. 2 – Digital subtraction venogram performed by injection of contrast through the pigtail catheter at the confluence of the splenic vein and superior mesenteric vein (arrowhead) shows flow of contrast through the newly created TIPS (arrow) with no abnormal filling of the varices.

severity of hemorrhagic shock, and the operative time taken to achieve hemostasis [2]. In the presented case, the cause of the ectopic omental variceal rupture was either iatrogenic injury during paracentesis or a mechanical fall onto the abdomen. Our patient had a poor functional hepatic reserve with a MELD of 20 and presented with severe hemorrhagic shock and cardiac arrest requiring CPR.

Management options for bleeding extra-luminal ectopic varices are aggressive resuscitation and include either surgery or endovascular intervention. Endoscopic management is usually a first-line investigation for patients with “luminal” ectopic varices, however, it has a limited role if the source of bleeding is extra-luminal ectopic varices. Surgery is recommended for patients with good underlying liver function and local expertise. Given a Child-Pugh grade of C and a MELD score of 20, our patient was not a surgical candidate.

The endovascular IR techniques for the management of ectopic varices include TIPS creation, TIPS combined with embolization, and transhepatic portal access and embolization. TIPS has been shown to achieve initial hemostasis in up to 100% of patients but is associated with about 20% risk of re-bleeding [7]. TIPS combined with trans-catheter embolization of the culprit varices has shown to reduce the risk of re-bleeding [8]. Similarly in the presented case, TIPS creation with reduction of portosystemic gradient of < 12 mm Hg did not achieve hemostasis and therefore embolization of the culprit omental varices were performed using a combination of Gelfoam and metallic coils. In our case, the confounding history was same-day paracentesis and therefore an immediate CT angiogram was obtained after TIPS to rule out any iatrogenic arterial bleeding such as from traumatic injury to inferior epigastric artery or deep circumflex iliac artery. Once the arterial source was ruled out and CT angiogram confirmed variceal bleeding, successful embolization of the omental varices was performed in the same setting. Percuta-

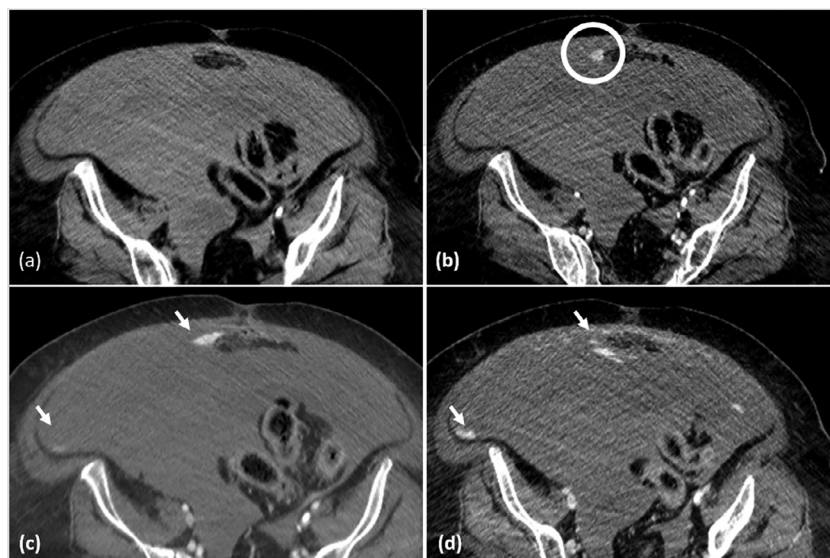


Fig. 3 – Axial contrast-enhanced images of the abdomen and pelvis (A–D) show contrast blush in the umbilical region on the arterial phase (white circle) with continued contrast pooling in the venous (C) and 90-second delayed phase images (D), consistent with active bleeding (white arrows). The culprit vessels were traced to the omental veins from the superior mesenteric vein (not shown).

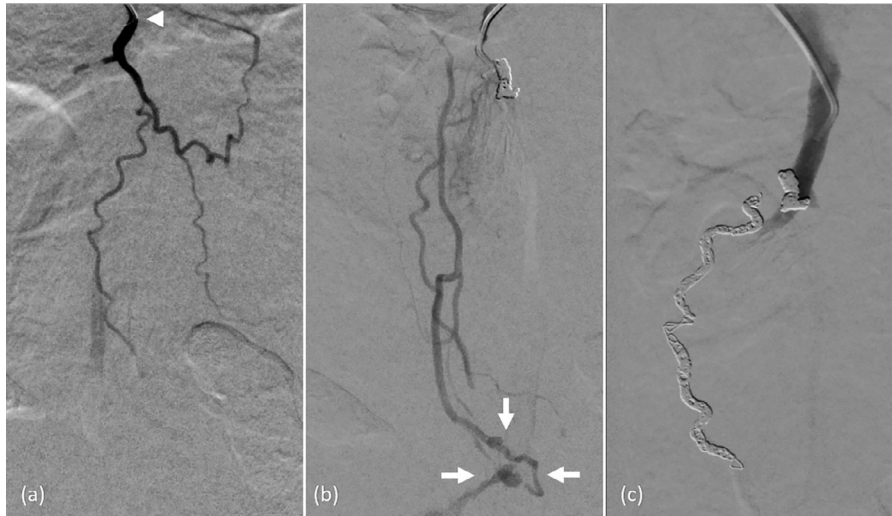


Fig. 4 – Intraprocedure angiographic images (A–C) show abnormally dilated and tortuous omental vessels with active bleeding (arrows) after selective catheterization of the origin of the omental vein (arrowhead in “A”) off the superior mesenteric vein. These were successfully embolized using a combination of Gelfoam and metallic coils (C).

neous transhepatic portal venous access and subsequent embolization of the ectopic varices can be considered in patients with contraindications to TIPS, such as those with high MELD score, right-sided heart failure, severe pulmonary hypertension, challenging anatomy for TIPS placement, and presence of liver masses that would increase the operative time, morbidity, and mortality of the procedure.

Moreover, patients with portal hypertension and refractory ascites who require frequent paracentesis should undergo a careful pre-procedure review of prior imaging and an ultrasound examination, including a Doppler evaluation, of the access site, to reduce the risk of iatrogenic vascular injuries. This practice should not only help identify the critical arteries along the course, including the inferior epigastric artery and deep circumflex iliac artery but also help identify ectopic omental varices and caput medusa.

Bleeding ectopic varices is an uncommon cause of hemorrhagic shock in patients with cirrhosis and portal hypertension. It contributes to a high mortality rate in this population and requires a high index of suspicion to make a timely diagnosis. There is a lack of established guidelines on how to approach these patients due to heterogeneity of the condition and absence of randomized trials. However, based on available data, TIPS combined with embolization of the bleeding varices is an effective technique for achieving hemostasis with low re-bleeding risks in patients with extraluminal ectopic varices.

Patient consent

Consent was obtained from the patient’s family for the publication of this case report, including the accompanying images.

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