First Report of Balloon-Occluded Antegrade Cyanoacrylate Glue Embolization (BAGE) for Bleeding Rectal Varices from India

Lijesh Kumar1, Cyriac Abby Philips2, Philip Augustine3

ABSTRACT
Rectal variceal bleeding occurs in 38% of patients with portal hypertension leading to an overall mortality in 5%. Conventional management involves endoscopic measures utilizing sclerotherapy/glue injection/banding ligation or surgical management. Some patients, mostly Child A or B cirrhotics, pose difficulty for traditional management and have been shown to benefit from transjugular intrahepatic portosystemic shunting (TIPSS) or interventional balloon occluded shunt embolization procedures, balloon occluded transvenous obliteration being the most common used modality, however, seldom reported in literature. In this report, we present the case, through striking images and real time step by step procedural video; of a difficult to control rectal variceal bleeding in a Child C cirrhotic in whom, balloon occluded antegrade glue embolization of multiple shunts was performed with beneficial outcomes.

Key words: Interventional radiology, Embolization, Glue therapy, Sclerotherapy, Portal vein, Ectopic varices.

INTRODUCTION
Rectal variceal bleeding, can at times be difficult to manage through conventional methods and prove fatal if not emergently salvaged. There have been several reports of bleeding rectal varices treated with endoscopic variceal ligation, endoscopic sclerotherapy, transjugular intrahepatic portosystemic shunt and surgery. Even though various strategies have been described in literature, consensus guidelines for management of bleeding rectal varices are lacking due to heterogeneity of associated portosystemic collateral anatomy, due to which, no single effective method has yet been established.[1] In 1997, Kimura et al reported the successful treatment of bleeding rectal varices with a new interventional radiological procedure utilizing double balloon-occlusion assisted embolotherapy.[2] Thereafter reports on modification of this technique for bleeding rectal varices, mostly through balloon occluded retrograde route and use of sclerosant has been described. Here we report the case of a difficult to manage rectal variceal bleeding, utilizing balloon occluded antegrade technique and cyanoacrylate glue therapy followed by coil embolization for immediate hemostasis achievement translating to beneficial outcome in a Child C cirrhotic.

CASE REPORT
A 42-year-old male patient, known case of decompensated alcoholic cirrhosis (Child C) with prior endoscopic band ligation sessions for bleeding esophageal varices in the last 3 years, currently listed for living donor liver transplantation, presented to the emergency department with torrential rectal bleeding associated with postural symptoms for one day. Physical examination revealed an alert patient, oriented to place, but not time with scleral icterus, pallor, tachycardia, diaphoresis and blood pressure was 88/60 mm Hg with grade 3 ascites and flapping tremors. Laboratory evaluation revealed hemoglobin 7.6 g/dL with serum bilirubin 12.8 mg/dL and international normalized ratio 2.1. One unit of packed red cells was transfused and intravenous terlipressin started. An urgent sigmoidoscopy was noncontributory in view of poor visualization due to fresh blood and clots. Transjugular intrahepatic portosystemic shunt was not ideal in view of advanced liver disease. A review of prior contrast imaging of the abdomen revealed large portosystemic shunt with afferent supply by inferior mesenteric vein through a shunt to the superior rectal vein (Figure 1A) forming large rectal varices; the efferent supply being internal iliac vein (Figure 1B). The large portosystemic shunt supplied the rectal variceal complex (Figure 1C, black arrow) through anterior, anterolateral and posterior tributaries (Figure 1C, arrows). In view of advanced liver disease status, failure to control bleed with traditional modality and complex shunt anatomy, interventional radiological approach was called for. A 7 Fr drainage catheter (Cook Medical, Bloomington) was inserted in right sub-diaphragmatic region to drain the ascites slowly and continuously. The left common femoral vein was punctured under ultrasound guidance and a 7 Fr sheath inserted. Using 5...
Figure 1: A - Computed venography of abdomen showing a large portosystemic shunt with afferent supply by inferior mesenteric vein through a shunt to the superior rectal vein forming large rectal varices; B - internal iliac vein serves as the efferent; C – the rectal variceal complex (black arrow) is supplied by 3 tributaries of the shunt (arrows); D - A plain computed tomography done 24 hours later showing complete obliteration of rectal varices with glue cast formation (arrow). SMV – superior mesenteric vein, IMV – inferior mesenteric vein, PV – portal vein; EIV – external iliac vein, IIV – internal iliac vein.

Figure 2: A - Venogram taken from the inferior mesenteric vein showing large shunt in pelvic region (arrow); and B - associated rectal varices (arrows); C - keeping the balloon inflated (white arrow), tributaries of the shunt were sequentially cannulated embolized with N-butyl-2-Cyanoacrylate (black arrow); D - post embolization venogram showed absent filling of the varices (arrows).

Table 1: The reported interventional radiology approaches to management of rectal variceal bleeds (4-10)

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Cases</th>
<th>Child status</th>
<th>Procedure</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kimura et al (1997)</td>
<td>1</td>
<td>A</td>
<td>Double balloon occluded embolization</td>
<td>Ethanolamine oleate+iopamodol</td>
</tr>
<tr>
<td>Hidajat et al (2002)</td>
<td>1</td>
<td>A</td>
<td>TIPSS followed by variceal embolization</td>
<td>Ethanolamine oleate</td>
</tr>
<tr>
<td>Okazaki et al (2006)</td>
<td>1</td>
<td>B</td>
<td>Balloon-occluded anterograde transhepatic obliteration</td>
<td>Ethanolamine Oleate+iopamidol</td>
</tr>
<tr>
<td>Ibukuro et al (2009)</td>
<td>1</td>
<td>C</td>
<td>Embolization through paraumbilical vein</td>
<td>Gelfoam, lipiodol, ethanol, micro-coils</td>
</tr>
<tr>
<td>Watanabe et al (2011)</td>
<td>1</td>
<td>A</td>
<td>Balloon occluded retrograde transvenous obliteration</td>
<td>Ethanolamine oleate+lipiodol</td>
</tr>
<tr>
<td>Arai et al (2013)</td>
<td>1</td>
<td>A</td>
<td>Trans-ileocolonic vein obliteration</td>
<td>Ethanolamine oleate+lipiodol</td>
</tr>
<tr>
<td>Minamiguchi et al (2013)</td>
<td>2</td>
<td>B</td>
<td>Balloon-occluded anterograde shunt obliteration</td>
<td>Ethanolamine oleate+iopamidol</td>
</tr>
<tr>
<td>Ono et al (2015)</td>
<td>2</td>
<td>A</td>
<td>Balloon-Occluded Antegrade Transvenous through greater sciatic foramen</td>
<td>Ethanolamine oleate+iopamidol</td>
</tr>
</tbody>
</table>
shunt anatomy, large number of coils and associated cost; plug-assisted (PARTO) shunt occlusion would have also been complicated in view of complex shunt anatomy. The use of cyanoacrylate glue proved much cheaper, shunt occlusion much faster and in the process, more beneficial. Before we commit to endoscopic management as the standard of care in bleeding rectal varices, the determination hemodynamics/shunt anatomy of rectal varices in each patient is important for selecting the most appropriate treatment modality.\[11\] Our report is unique in many ways – one, we performed a demanding intervention procedure in a Child C cirrhotic, seldom reported in literature and two – we utilized balloon occlusion through retrograde transfemoral approach and used cyanoacrylate glue based embolization through the transhepatic antegrade route; all the while draining tense ascites – a complexity which is currently not described in literature.

**CONCLUSION**

With development in interventional procedures for portal hypertension and improved technical ease, newer studies/trials in management of ectopic variceal bleeding must consider interventional radiology procedures as possible first line of management in patients deemed as ‘difficult to control bleed’ or ‘difficult portal hemodynamic anatomy’.

**REFERENCES**


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