



# Endoscopic Band Ligation for the Hemostasis of Active Esophageal Variceal Hemorrhage: Technique, Tips, and Tricks

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the standardization of supportive treatment, use of vasoactive drugs, and advances in endotherapy and interventional radiotherapy.<sup>1</sup>

Patients with AEVH should be managed in well-monitored units. The initial ABC (airway, breathing, circulation) of resuscitation should be ensured. Two or more large-bore catheters should be placed for rapid volume replenishment, usually with crystalloids. A central venous catheter insertion is helpful in monitoring the volemic status of the patient and the administration of intravenous fluids. Patients with massive hemorrhage and /or altered sensorium should be intubated with an endotracheal tube. For stabilizing the hemodynamic condition, a restrictive packed red blood cell transfusion is preferred, with a target hemoglobin level of 7 to 8 g/dL. Exceptions such as massive hemorrhage and cardiovascular comorbidities should be considered, and a higher target hemoglobin level (up to 9–10 g/dL) is desirable. Antibiotic prophylaxis is recommended in all cirrhotic patients with AEVH. The preferred antibiotic choice is intravenous ceftriaxone (1 g/day for 7 days). Recent studies suggest that either lactulose or rifaximin may prevent hepatic encephalopathy in patients with cirrhosis with gastrointestinal bleeding.<sup>1</sup>

The combination of a vasoactive drug (e.g., terlipressin, somatostatin, octreotide) and endotherapy is recommended for AEVB. For the reduction of portal pressure, intravenous infusion of vasoactive drugs should be administered for 3 to 5 days. Endoscopic band ligation (EBL) is a preferred endoscopic method for the hemostasis of AEVH. Sclerotherapy could be used in those cases where it is not possible to perform an EBL.<sup>1</sup>

AEVH during endoscopy is a significant challenge for endoscopists. Profuse blood in the esophagus may obscure the identification of the bleeding point and may lead to

Acute esophageal variceal hemorrhage (AEVH) is one of the most deadly complications of portal hypertension and a leading cause of death in decompensated cirrhotic patients. In the last two to three decades, bleeding-related deaths have decreased from approximately 50% to 15 to 20% due to

endoscopic hemostasis failure. Fortunately, the incidence of active bleeding during endoscopy is not very high. It is generally believed that approximately 10% of cases with portal hypertensive bleeding presented as active variceal bleeding during endoscopy. Endotherapy should be performed by experienced endoscopists. Stigmata of recent variceal hemorrhage such as white nipple signs or hematocystic spots should be searched for and treated as quickly as possible in cases of AEVH. An EBL is mostly performed with the patient in the left lateral decubitus position. It consists of the placement of elastic bands on variceal columns, which are sucked into a plastic hollow cylinder attached to the tip of the endoscope. An EBL set usually has six to seven preloaded bands. It is preferable to place at least one band on each variceal column.

EBL is a safe and effective method for the hemostasis of AEVH. Newer transparent caps improve the visibility by nearly 30%. However, in the presence of active bleeding, the field of vision might be restricted by the cap mounted on the tip of endoscope. Visualization of bleeding point is further compromised due to the gush of blood and blood clots in the esophageal lumen. Water infusion and suction is helpful in visualizing the bleeding point. Water irrigation pump through the instrument or auxiliary water channel can be used for water infusion. The band should be deployed at the site of variceal rupture. In case of nonvisualization of bleeding point, the cap on the tip of the endoscope can be used to apply pressure proximal and distal to the suspected bleeding focus to reveal the bleeding point.<sup>2</sup> If the exact point of variceal rupture is not found despite this effort, several bands can be placed for the ligation of the varix within 5 cm from the gastroesophageal junction, which may reduce bleeding, and further bands can be placed subsequently. In the absence of

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clear visualization of the bleeding focus, placement of bands at gastroesophageal junction can suck mucosa; however, banding of the mucosa is less harmful than sclerotherapy.<sup>2-4</sup> Alternatively, to prevent aspiration and better visualization of the bleeding focus, patients should be placed in the left lateral decubitus position and the head of the bed raised to a Fowler position (15–90 degrees). EBL can also be performed with the patient in a sitting or semisitting position. Change in the patient's position promotes gravity drainage of blood, thus keeping the endoscopic field clear. Data on the comparison of different patient positions for the hemostasis of active AEVH are lacking.

Despite the optimal medical treatment and endotherapy, up to 10 to 20% of patients present with refractory AEVH. Deployment of fully covered self-expandable metallic stent appears to be a promising therapeutic endoscopic technique that can be used for hemostasis in cases of refractory AEVH as an alternative to balloon tamponade. Balloon tamponade may be used to achieve temporary control of the hemorrhage in case of severe bleeding; however, it is often associated with serious complications (aspiration, death, and esophageal rupture). Early transjugular intrahepatic portosystemic shunting is indicated in patients at high risk of treatment failure (hepatic venous pressure gradient > 20 mm Hg and/or Child–Turcotte–Pugh [CTP] C patients with <14 points and CTP-B patients with active variceal bleeding during endoscopy) after initial medical and endoscopic therapy or a rescue therapy.<sup>1</sup>

In the current issue, “Management of acute variceal bleed by esophageal variceal ligation in an unconventional

position – an urban center insight,”<sup>5</sup> the authors showed successful EBL of all patients with active esophageal variceal bleeding. During endoscopy, patient position was shifted from the left lateral decubitus position to the sitting position, and improvement in the field of vision was noted as the blood moved to the stomach due to gravity and EBL was performed. The time taken for EBL was comparable to that of prophylactic EBL. The major limitations of this study are nonrandomization of the study subjects (left lateral decubitus position vs. sitting position) and the small sample size.

#### Conflict of Interest

None.

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