

# Gastric Varices

## *An Overview for the Gastroenterology Nurse*

### ABSTRACT

Gastric varices can occur in as many as one-third of patients with portal hypertension. Within the nursing literature, however, articles focus on the management of esophageal varices and portal hypertensive gastrointestinal bleeding with few publications about management of gastric varices. Given the advancement in therapies, it is prudent for gastroenterology nurses to have an understanding of its management and treatment options. This article reviews the pathophysiology, classification, and management of patients with gastric varices and outlines the importance of the nurse's role in the education and ongoing care for this patient group.

**M**ultiple ramifications can result from portal hypertension, and all can lead to significant morbidity and mortality. Although nursing literature has numerous resources about the management of esophageal varices, information about other types of varices is almost nonexistent. It is a frequent misconception that varices, despite location, can all be treated identically. This article reviews the pathophysiology and management of gastric varices, focusing on the nursing role in therapeutic management and patient education to achieve improved patient outcomes.

### Overview of Portal Hypertension

Portal hypertension is an abnormally high pressure in the portal venous system. Most commonly, elevated portal venous pressure results from architectural changes within the liver and its adjoining blood vessels due to liver damage. Although noncirrhotic portal hypertension exists, it most commonly occurs in the

context of cirrhosis. A hepatic venous pressure gradient more than 5 mmHg defines portal hypertension, and it becomes clinically consequential at a hepatic venous pressure gradient of more than 10 mmHg (Bari & Garcia-Tsao, 2012). At this point, the development of varices, hepatic encephalopathy, and ascites may occur. In addition, once portal hypertension occurs, collateral blood vessels develop; gastroesophageal varices (GOVs) are one example of these collateral veins.

### Incidence and Significance of Gastric Varices

In the cirrhotic population, GOVs are present in about 50% of patients, corresponding to the severity of liver disease. Whereas 40% of Child Class A patients have varices, upwards of 85% of those who are Child Class C will develop them. Esophageal varices remain the predominant type; however, varices can develop anywhere within the gastrointestinal tract, including the stomach, small bowel, and colon.

Gastric varices occur in approximately 5%–33% of patients with portal hypertension (Garcia-Tsao, Sanyal, Grace, & Carey, 2007). Within 2 years of development, the rate of bleeding is estimated at 25% (Sarin, Lahoti, Saxena, Murthy, & Makwana, 1992). The risk of gastric variceal bleeding increases in the presence of and with the increasing size of fundal varices, the severity of liver disease, and the presence of reddened spots on the mucosa (Ryan, Stockbrugger, & Ryan, 2004). Concomitant hepatocellular carcinoma may also be a risk factor for hemorrhage (Irani, Kowdley, & Kozarek, 2011). Although bleeding from gastric varices

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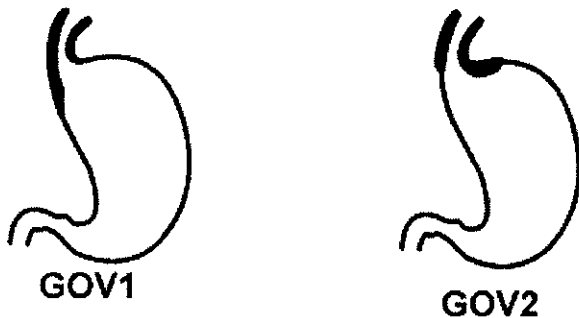
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is rarer than those in the esophagus, when it occurs, it is usually severe and more difficult to manage.

### Classification of Gastric Varices

The most common classification system, proposed by Sarin et al. in 1992 (Figure 1), is useful in determining patient management. Importantly, this classification acknowledges that some gastric varices are an anatomical continuum of esophageal varices, and it considers the anatomical location within the stomach. Gastroesophageal varices are extensions of esophageal varices, whereas isolated gastric varices (IGVs) may occur in the absence of esophageal varices. The most common type, type 1 gastroesophageal varices (GOV1), is considered an extension of esophageal varices. Type 2 GOV (GOV2) are also an extension of esophageal varices but are longer and more tortuous, extending along the fundus. In contrast, IGV type 1 (IVG1) occur in the absence of esophageal varices but are also complex and extend along the fundus. IGV type 2 (IVG2) are located in the antrum, body, and around the pylorus.

#### Gastro Esophageal Varices (GOV)



#### Isolated Gastric Varices (IGV)

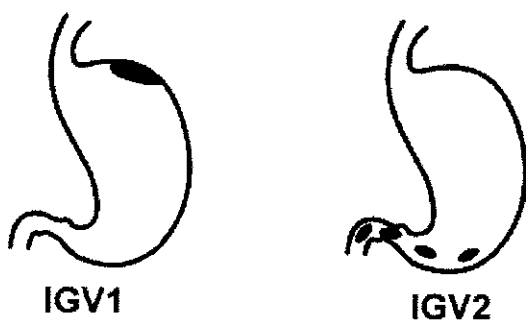


FIGURE 1. Sarin classification of gastric varices. From "Prevalence, Classification and Natural History of Gastric Varices: A Long-Term Follow-Up Study in 568 Portal Hypertension Patients," S. Sarin, D. Lahoti, S. P. Saxena, N. S. Murthy, and U. K. Makwana, 1992, *Hepatology*, 16, pp. 1343–1349.

A second classification system, proposed by Hashizume, Kitano, Yamaga, Koyangi, and Sugimachi (1990), is used less frequently. This system is based on endoscopic features and considers findings associated with the highest risk of rupture. When classifying gastric varices, the location, form, and color are considered. Form is graded as torturous (F1), nodular (F2), or tumorous (F3), whereas location has five types: anterior (La), posterior (Lp), lesser (Ll), greater curvature of the cardia (Lg), and fundus (Lf). Color is white (Cw) or red (Cr). If a glossy, thin-walled focal redness appears on a varix, it is defined as red color spot (RC spot).

### Risk Factors for Development

It remains unclear what triggers a gastric varix to bleed. Generally, it is believed that bleeding is less common as the gastric mucosa is thicker and better tolerates distention. One key factor may be erosion or ulcer formation from gastric acid. Gastric varices can be primary—those that present on initial endoscopic screening, or secondary—those that develop after endoscopic therapy of esophageal varices (Ryan et al., 2004).

### Management of Gastric Varices

The management of esophageal varices is well known, but the approach to managing gastric varices is not. Given that gastric varices are less common, well-controlled clinical trials are few and guideline development for therapeutic management is lacking.

Similar to esophageal varices, the management of gastric varices can be done in a primary or secondary fashion. There is little data to support primary prophylaxis with  $\beta$ -blockers, apart from GOV1, which are treated as esophageal varices (Ryan et al., 2004). Although routinely utilized in Asian countries, primary prophylaxis with obliteration techniques is slowly moving forward in Western countries.

Generally, the overall approach to gastric variceal management can be divided into endoscopic, radiological, or surgical management. To date, no studies exist that evaluate the role of endoscopic techniques for primary prophylaxis of gastric varices (Kochar & DuPont, 2010). Therefore, the approach generally varies from no intervention to gluing if gastric varices are categorized as high risk. Secondary prophylactic measures include variceal gluing or transjugular intrahepatic portosystemic shunt (TIPS). Evidence and efficacy of pharmacological management are nonexistent.

Endoscopic management differs on the basis of location or classification of the gastric varices. Band ligation directly to a gastric varix should be avoided as it potentially leads to the development of ulcers and

deformities of the gastric wall. This can result in secondary bleeding, which could be life threatening. GOV1, however, are amenable to banding. The location allows banding and the resultant complication rate is similar to esophageal varices alone (Monkemuller & Fry, 2010).

Type 2 GOV and IGV1 differ from GOV1. Traditional injection sclerotherapy has proven ineffective, most likely due to the presence of shunting and high blood volume and flow, which washes away the sclerosant into the general circulation (Ryan et al., 2004). This can lead to serious complications, such as emboli or uncontrolled bleeding at the injection site.

Utilization of tissue adhesives (glue) such as N-butyl-2-cyanoacrylate and 2-octyl-cyanoacrylate to obliterate the varix is the optimal approach recommended by international consensus (Hashizume, Akahoshi, & Tomikawa, 2011). Tissue adhesives provide better bleeding control with a lower rebleed rate in comparison to standard sclerotherapy (Sarin, Jain, Jain, & Gupta, 2002). Complications of glue emboli can occur, and technical concerns related to procedure performance and equipment lead some endoscopists to shy away from this technique.

Human thrombin has also been utilized with success rates approaching 70%–90% with rebleed rates of 0%–50% (Irani et al., 2011). Beriplast P, a combination of fibrinogen with factor VIII and human thrombin, is presently being investigated for hemostasis in patients with gastric varical bleeding (Hashizume et al., 2011).

Radiological intervention includes TIPS with or without coil embolization. At present, TIPS generally is not considered a first-line management strategy for gastric varices; rather, it is used when elective endoscopic treatments fail or in the case of uncontrolled, life-threatening bleeding. Effectiveness of TIPS is variable with some authors reporting success rates greater than 90%, whereas others experience ongoing issues with rebleeding. One study (Chau et al., 1998) reported a 96% initial rate of hemostasis with a rebleeding rate of 29%. Overall liver function and patient anatomy may contribute to ongoing management issues or technical feasibility.

The presence of TIPS can lead to hepatic encephalopathy. Coil embolization has been used alone as well as in conjunction with TIPS. Little is documented in the literature about the outcome benefits. In the author's institution, the combination of coil embolization with TIPS has been done a number of times with minimal therapeutic value. The rates of ongoing or rebleeding have been higher than with gluing alone (P. J. Marotta, personal communication, October 29, 2012). Balloon-occluded retrograde transvenous obliteration and balloon-occluded

endoscopic injection sclerotherapy are currently used in Asian countries, but neither technique has been extensively utilized in North America.

Surgical intervention is rarely undertaken. For individuals with noncirrhotic portal hypertension, surgical shunts can be used to manage portal hypertensive bleeding. Presently, little efficacy has been shown for its use solely in managing gastric varices (Hashizume et al., 2011). Liver transplantation may be a consideration as it corrects both the bleeding and the underlying cirrhosis, if present (Irani et al., 2011).

Management of gastric varices depends on the context of the patient presentation. Notably, if the patient is having an acute gastrointestinal bleed, the basics of gastrointestinal bleed management must be employed. First and foremost, vital signs must be assessed and intravenous access obtained. Fluid resuscitation is initiated, and a baseline complete blood count should be done. Pharmacological management with intravenous octreotide and a proton pump inhibitor should be considered, although no data are available as to the effectiveness of octreotide in bleeding gastric varices (Irani et al., 2011).

Once the patient is stable, endoscopy to assess the bleeding source should ensue. Airway protection must be maintained, and often intubation is considered in the presence of active bleeding. In patients with known gastric varices, the endoscopy nurse should have the necessary equipment available in the room with the intent to glue the varices. When managing cirrhotic patients with active portal hypertensive bleeding, the need for prophylactic intravenous antibiotics should be considered to prevent infection from bacterial translocation. This is often overlooked owing to the urgency of the situation. It is always prudent for nursing staff to remind the responsible medical team to consider antibiotics.

### **The Gluing Procedure and the Nursing Role**

In the past, glue obturation of gastric varices was often undertaken in the presence of active bleeding. Today, this technique more frequently occurs as an elective procedure (primary or secondary prevention) to prevent (re)bleeding. Specific gluing procedures differ among clinicians and institutions; however, this section provides a general overview of the technique used at the author's center, including the role of the gastroenterology nurse.

The patient is prepared per routine endoscopic practices. Consent, which includes the risks and benefits specific to the gluing procedure, is obtained by the endoscopist. Patients presenting for elective gluing are prepped in the same manner as other patients having endoscopy. A forward viewing gastroscop

**TABLE 1.** Endoscopy Equipment

Endoscopy safety checklist
Oral suction
Multiple channel gastroscope
Banding equipment
Sclerosing equipment and solutions (e.g., Histoacryl, lipiodol, saline)
Argon plasma coagulation equipment
Vital sign monitoring equipment
Oxygen
Sedation

utilized. Standard endoscopy equipment (Table 1) should be readily available in the procedure room.

Once the patient is prepared with oxygen, vital sign monitoring, and adequate sedation, routine endoscopy is undertaken. The type and location of varices are determined to assess if gluing is required. There are two types of cyanoacrylates: Histoacryl (*N*-butyl-2-cyanoacrylate) and Dermabond (2-octyl-cyanoacrylate). A disposable 23-gauge sclerotherapy needle should be used, and lipiodol is required. In preparation for using Histoacryl, six syringes are required.

The working channel of the endoscope and the injection needle are each primed with approximately 3 cc of lipiodol. In a syringe, prepare a mixture of 0.5 cc lipiodol and 1 cc Histoacryl so it is ready for use. Have an additional syringe of approximately 3 cc of lipiodol readily available to flush postinjection. The injection needle is then advanced through the working channel to the gastric varix.

After attaching the syringe that contains the glue and lipiodol mixture to the injection needle, the endoscopist positions the endoscope in a retroflexed manner and plans the location of the injection. The catheter is advanced, the needle is inserted into the varix, and the mixture of glue and lipiodol is administered. This is followed by a quick flush using the lipiodol-only syringe. The needle is withdrawn and the area assessed for bleeding. The procedure can be repeated if the varix is large. Suction should not be used to avoid risk of suctioning glue that might be external to the varix.

For endoscope protection, the injection catheter should not be pulled back through the working channel. Carefully antegrade the endoscope and remove the scope with the injection catheter out. Once removed from the patient, use wire cutters to cut the proximal aspect (at entrance of working channel) and remove the catheter from the viewing end of the scope

(P. J. Marotta, personal communication, October 29, 2012). It is essential to follow the steps carefully and work as a team to prevent improper or uncoordinated discharge of the glue and to minimize the risk of endoscopy damage.

Complications of gluing include those that could occur with any endoscopy: aspiration, fever, hemorrhage, oversedation, and bacteremia. Complications specifically related to the glue are fever and systemic embolization. Glue emboli can occur anywhere in the body, including the brain and lungs; however, most commonly the portal vein and spleen are the affected sites.

At the time of discharge from the endoscopy unit, the nurse must ensure that the patient is clinically stable. The nurse also provides education regarding the potential for urgent medical care (such as signs and symptoms of bleeding, bacteremia, and embolism). In addition, the nurse must ensure that appropriate follow-up is arranged for clinic appointments and repeat endoscopy, if needed. The nurse should stress the importance of follow-up medical care, given that the diagnosis of cirrhosis requires ongoing surveillance for portal hypertension and hepatocellular carcinoma.

## Conclusion

Although gastric varices rarely bleed, they pose a significant risk to patients. There are treatment modalities available that can lessen the associated bleeding risks. It is becoming more commonplace to undertake elective gastric variceal gluing in the outpatient setting. It remains important for gastroenterology nurses to be aware of the multiple therapeutic options for patients with portal hypertension. ❁

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# Gastric Varices

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## CE TEST QUESTIONS

**GENERAL PURPOSE:** The purpose of this learning activity is to provide information about the management of patients with gastric varices.

**LEARNING OBJECTIVES:** After reading this article and taking this test, you will be able to:

1. Define the pathophysiology, classification, and management of gastric varices.
2. Identify the nursing role in the management of gastric varices.
  1. **Varices, hepatic encephalopathy, and ascites may occur when the hepatic venous pressure gradient is more than:**
    - a. 2.5 mm Hg.
    - b. 5 mm Hg.
    - c. 10 mm Hg.
  2. **The presence of which increases the risk of gastric variceal bleeding?**
    - a. fundal varices
    - b. mucosal ulcerations
    - c. white spots on the mucosa
  3. **Which is the most common type of gastroesophageal varices?**
    - a. GOV1
    - b. GOV2
    - c. IVG1
  4. **The type of gastroesophageal varices that is amenable to band ligation is**
    - a. GOV1.
    - b. IVG1.
    - c. IVG2.
  5. **Which therapy has shown success rates of 70% to 90% for treating gastroesophageal varices?**
    - a. human thrombin
    - b. injection sclerotherapy
    - c. tissue adhesives
  6. **When is TIPS typically used in the management of gastric varices?**
    - a. as a first-line radiological strategy
    - b. as a long-term strategy to prevent rebleeding
    - c. with uncontrolled life-threatening bleeding
  7. **Management of the patient with gastric varices depends on the**
    - a. age of the patient.
    - b. presentation of the patient.
    - c. size of the varices.
  8. **When managing cirrhotic patients with active portal hypertensive bleeding, which intravenous medications should be considered?**
    - a. antibiotics
    - b. beta-blockers
    - c. corticosteroids
  9. **What is the most common reason for utilizing the gluing technique today?**
    - a. prevent infection
    - b. prevent rebleeding
    - c. treat active bleeding
  10. **Which is a glue used in the gluing procedure?**
    - a. Dermaglu
    - b. Histoacryl
    - c. Lipidolol
  11. **One complication specifically related to the glue used in the gluing procedure is**
    - a. aspiration.
    - b. fever.
    - c. hemorrhage.
  12. **One of the most common sites of glue emboli following the gluing procedure is the**
    - a. esophagus
    - b. lower leg
    - c. spleen
  13. **Following the gluing procedure, the nurse should provide education regarding the signs and symptoms of which condition that would require urgent medical care?**
    - a. abdominal pain
    - b. bleeding
    - c. constipation

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