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Saudi Society for the Study of Liver Disease and Transplantation

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Saudi Commission for Health Specialties

SASLT NEWSLETTER

July 2025

13th Issue

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WELCOME MESSAGE

Dear Colleagues,

It is my pleasure to welcome you to the 13th issue of the SASLT Newsletter. As part of our ongoing commitment to advancing the field of hepatology and fostering clinical excellence, this issue focuses on a critical yet often complex area of practice: gastric varices and their management. Although less common than esophageal varices, gastric varices can be more challenging to treat due to their distinct anatomy and higher risk of life-threatening bleeding. Understanding their pathophysiology, identifying appropriate treatment pathways, and employing a multidisciplinary approach are essential for optimal patient outcomes.

This issue features three insightful contributions from esteemed colleagues who are leaders in their respective fields. Dr. Ibrahim Omar provides a comprehensive overview in his article titled “Gastric Varices”, outlining the classification, underlying mechanisms, and clinical relevance of this condition. Dr. Ahmad Bazarbashi explores the endoscopic perspective in his article “Endoscopic Management of Gastric Varices”, where he discusses the indications, techniques, and recent advancements in therapeutic endoscopy. Complementing these perspectives, Dr. Bandar Safar presents “Interventional Radiology Management of Gastric Varices”, highlighting the role of radiological interventions such as TIPS and BRTO in treating complex cases.

Together, these articles offer a well-rounded and practical understanding of gastric varices, emphasizing the need for collaboration between gastroenterology, hepatology, and interventional radiology. I am confident that the knowledge shared in this issue will support your clinical practice and contribute meaningfully to patient care. Thank you for your continued engagement with SASLT, and for your dedication to improving liver health across the Kingdom and beyond.

Warm regards,

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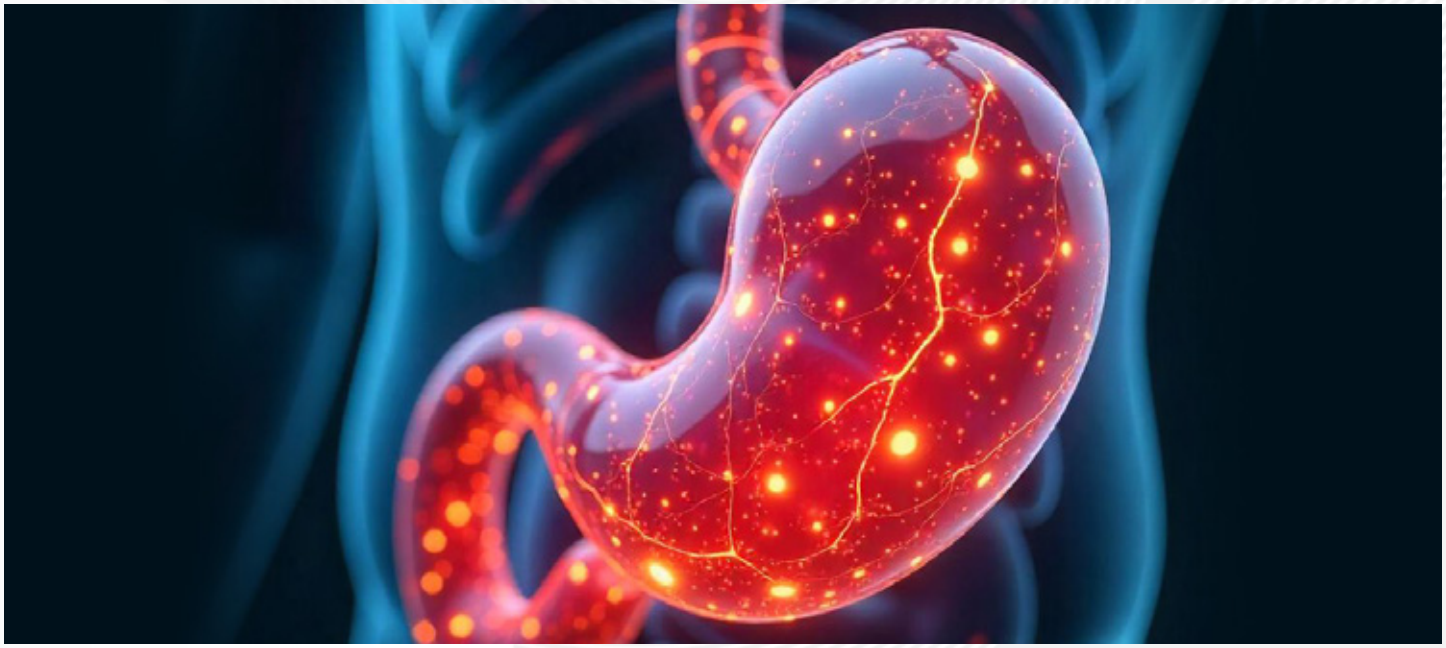
GASTRIC VARICES

DR. IBRAHIM ALOMAR

Varix is an abnormally dilated blood vessel with a tortuous course. Varices usually occur in the venous system. The portal vein (PV) is the main vessel of the PVS, resulting from the confluence of the splenic and superior mesenteric veins, and drains directly into the liver, contributing to approximately 75% of its blood flow. Hepatic artery provides the remaining hepatic blood flow. In case of portal hypertension, there will back pressure on the venous system resulting in variety of symptoms and signs including esophageal, gastric and ectopic varices. Gastric varices (GV) represent a complex collection of vascular shunts between the portosplenic venous system and the systemic veins of the abdomen and thorax. The prevalence of GV is estimated between 17% and 25% in patients with portal hypertension (pHTN) in comparison with esophageal varices (EV), which are present in up to 85% of these patients. The incidence of GV varies from 16% at 1 year to 44% at 5 years. Although EV are more prevalent and bleed more frequently, hemorrhage from GV bleeding is often more severe, with an incidence of 16%–45% at 3 years, and associated with higher mortality. GV are more common among patients with prehepatic PH, particularly in those with splenic vein thrombosis causing left-sided or sinistral PH, than among those with sinusoidal PH. Predictors of bleeding among patients with GV appear similar to those of esophageal varices: size (>10 mm for cardiofundal varices), presence of red marks, and liver disease severity.



Endoscopic Classification OF GV

In practice, most gastroenterologists use the Sarin classification with the main distinction being cardiofundal vs lesser curvature GV. However, the vascular supply and corresponding therapy for GV and EV are often different so a merged classification, such as Sarin's, can be problematic for therapeutic planning purposes. An alternative nomenclature for GV (Figure 1) based on location within the stomach is clearer and facilitates correlation with vascular imaging (Figure 1). GV can also be classified by risk of bleeding. While Sarin has identified cardiofundal GV as being higher risk for bleeding, others have identified GV size, presence of a red mark, or discoloration as risk factors of bleeding. Based on this, it is recommended adding an estimate of variceal size and high-risk stigmata (discolored marks, platelet plugs) to the Sarin classification when describing GV.

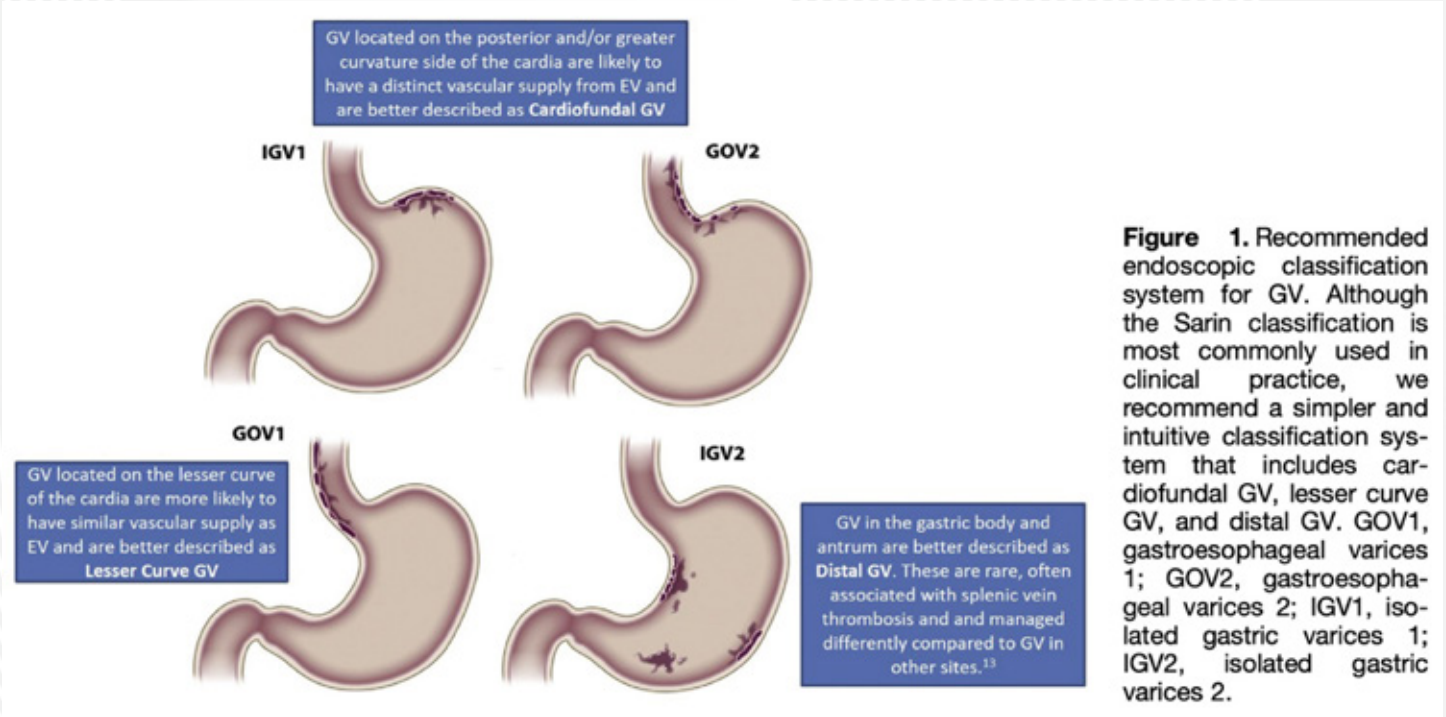


Figure 1. Recommended endoscopic classification system for GV. Although the Sarin classification is most commonly used in clinical practice, we recommend a simpler and intuitive classification system that includes cardiofundal GV, lesser curve GV, and distal GV. GOV1, gastroesophageal varices 1; GOV2, gastroesophageal varices 2; IGV1, isolated gastric varices 1; IGV2, isolated gastric varices 2.

The Importance of Cross-Sectional Imaging

Consistency of the vascular anatomy of EV makes a universal treatment approach with band ligation or transjugular intrahepatic portosystemic shunt (TIPS) viable. In contrast, the vascular anatomy of GV can be highly variable and therefore not always amenable to one particular treatment option. Studies evaluating portomesenteric venous structures have shown significant differences between vascular anatomy of GV and EV and suggest that GV may bleed at lower portal pressures, possibly related to the presence of so-called left-sided circulation from a gastrorenal shunt (GRS). A classification system has previously been defined (Figure 2), and it is recommended using this to map vascular anatomy prior to any definitive therapy for bleeding GV to guide management discussions.

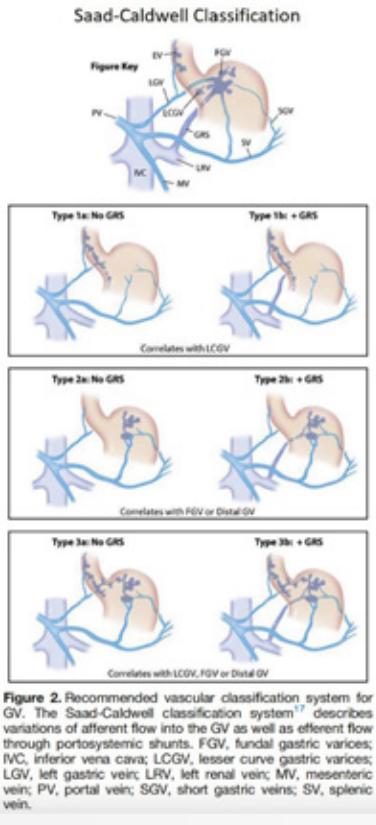


Figure 2. Recommended vascular classification system for GV. The Saad-Caldwell classification system[17] describes variations of afferent flow into the GV as well as efferent flow through portosystemic shunts. FGV, fundal gastric varices; IVC, inferior vena cava; LCGV, lesser curve gastric varices; LGV, left gastric vein; LRV, left renal vein; MV, mesenteric vein; PV, portal vein; SGV, short gastric veins; SV, splenic vein.

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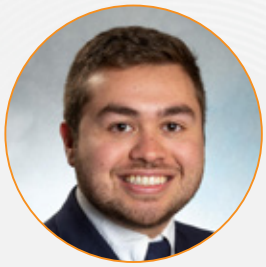
ENDOSCOPIC MANAGEMENT OF GASTRIC VARICES



DR. AHMAD NAJDAT BAZARBASHI

Introduction:

Endoscopic management of gastric varices (GV) has been historically premised on the injection of glue such as acrylate polymers into bleeding or recently bleeding gastric varices and has now evolved to include the use of endoscopic ultrasound (EUS) with coil or combination coil and glue therapy. These modalities have been proven eFective for the management of isolated gastric varices type 1 (IGV-1) and gastroesophageal varices type 2 (GOV-2). For gastroesophageal varices type 1 (GOV-1), which are extension of esophageal varices along the cardia and lesser curve, variceal band ligation remains the hemostatic intervention of choice. Endoscopic therapies for GV are often first line therapy but are not portal hypertension reducing therapies, and therefore, may be used as a bridge to portal hypertension reducing interventions such as transjugular intrahepatic porto-systemic shunt (TIPS).

Direct Endoscopic Injection Therapy:

Direct endoscopic GV injection entails the use of a needle injector that is primed with cyanoacrylate tissue adhesive (glue) such as histoacryl (also known as N-butyl-2-cyanoacrylate). The needle is advanced under direct endoscopic visualization into the bleeding or recently bleeding GV with the intention of inducing immediate thrombosis. The needle is cautiously withdrawn to avoid deroofing of the varix. Data suggest this modality is highly eFicacious, achieving high clinical and technical success rates, with studies revealing greater than 90% bleeding cessation. However, recurrent variceal bleeding is not uncommonly encountered, and risk of systemic embolization has been quoted to be 1-2% and can have detrimental eFects (embolization to the spleen, lung and even brain through patent foramen ovale have been described)

One important limitation to highlight for cyanoacrylate glue injection into GV is early polymerization. Cyanoacrylate polymerizes very rapidly when in contact with blood, which can result in de-roofing of GV when needle is pulled resulting in significant bleeding. This can be mitigated by the use of lipiodol, which can slow polymerization and can be mixed with cyanoacrylate when injected. Additionally, Acrylate polymers can also be damaging to endoscopes if not handled appropriately. Despite advances in EUS-guided injection therapy, endoscopic direct injection therapy remains the mainstay of treatment at most centers, particularly when EUS expertise are limited.

EUS-guided Cyanoacrylate Injection:

Endoscopic ultrasonography has revolutionized the management of GV. EUS allows for targeted vascular injection therapy in addition to interrogation with Doppler flow which provides real-time feedback of hemostasis (endoscopic varicealography). Reduced or cessation in doppler flow indicates variceal obliteration. EUS-guided CYA injection has proven to be associated with high clinical and technical success rates. Several comparative studies have demonstrated superiority of EUS-guided CYA injection to direct endoscopic injection therapy. For example, EUS-guided cyanoacrylate injection therapy has been associated with less CYA volume use, fewer endoscopic sessions to achieve variceal obliteration and less frequent GV related bleeding. There were no diFerence in the rate of adverse events or safety profile. Absorbable gelatin sponge (such as Surgiflo or Gelfoam) has recently shown promising results as an alternative to cyanoacrylate. This product is a synthetic collagen that absorbs up to 45 times its volume and thereby promoting immediate thrombosis. Additionally, it carries a low risk for ulcer formation as it usually dissolves within several weeks of injection

EUS-guided Coil Injection Therapy:

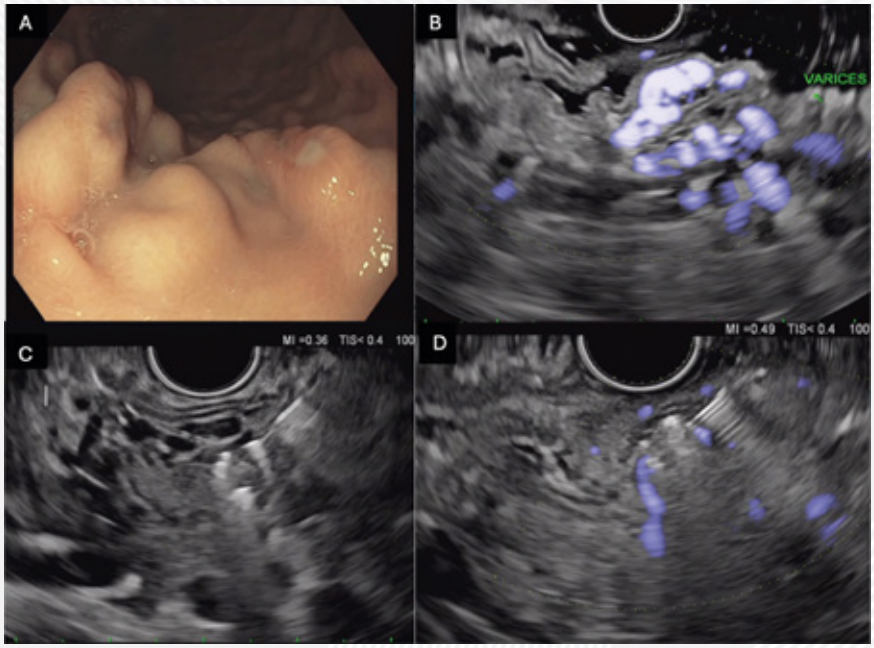
One way to mitigate against the risk of glue or cyanoacrylate systemic embolization (be it injected under endoscopic guidance or EUS-guidance) is to use coils to act as a scaFold to promoting thrombosis. It is under this concept, and in somewhat similar fashion to coilassisted retrograde transvenous obliteration (CARTO) performed by colleagues in IR, that EUS-guided coil therapy came to fruition. This entails the injection of hemostatic coils (Nitinol based coils with fingerlike thrombogenic filaments, figure 1) through a 22gauge or 19gauge fine needle aspiration (FNA) needle. EUS-guided coil injection therapy can entail injection of coils alone, or more commonly alongside other injectables such as cyanoacrylate, absorbable gelatin sponge or thrombin. The variceal nests or perforator vein is targeted, with the goal of packing as many coils as possible to achieve the immediate hemostasis and reduction or cessation in doppler flow [figure 2].

Data suggests high clinical and technical success rates with high safety profile for EUSguided coil injection therapy. Technical success rates approach 100% while clinical success rate exceed 85%. Patients often undergo surveillance with EUS at various intervals after initial coil injection therapy to ensure sustained reduction or cessation in doppler flow, with more coils injected if need be. Data also

suggests its superiority to direct injection therapy with EUS-coil therapy showing significantly lower number of sessions requirement, lower subsequent-bleeding episodes and lower re-intervention rates when compared to direct injection therapy. Additionally, data also suggests that combination therapy with coil + glue or other injectate is superior to monotherapy with coil alone. Adverse events of EUS-guided coil therapy include bleeding, infection, transient abdominal pain, and in rare instances, systemic embolization of coils.

Figure 1:
Hemostatic coil with delivery system

Figure 2:
A: Evidence of gastric varices with stigmata of recent bleeding
B:Evidence of doppler flow within gastric varices under EUS guidance
C: EUS-guided needle access and coil embolization into gastric varices
D: Significant reduction in doppler flow after coil injection therapy



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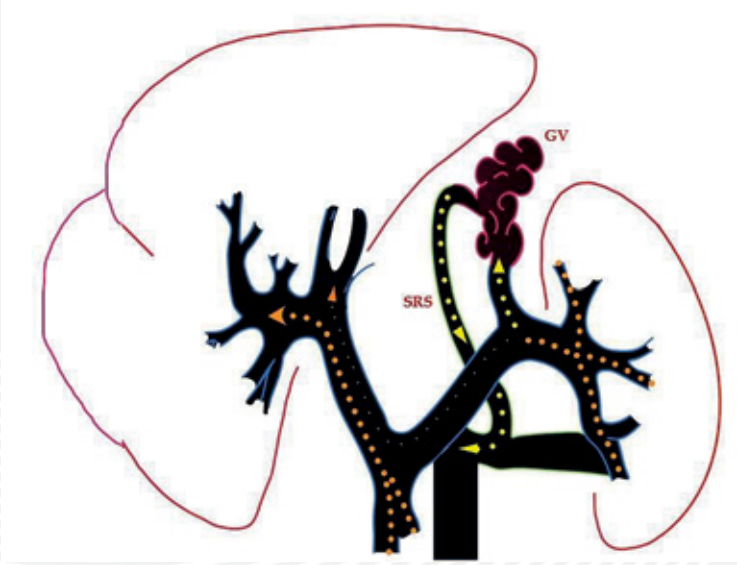
INTERVENTIONAL RADIOLOGY MANAGEMENT OF GASTRIC VARICES: A MINIMALLY INVASIVE LIFELINE

DR. BANDAR OSAID SAFAR, MD

Gastric varices (GVs) are a serious manifestation of portal hypertension, accounting for up to 20% of variceal bleeding cases, and are often associated with higher morbidity and mortality than esophageal varices. The advent of interventional radiology (IR) has transformed the management landscape of GVs, offering minimally invasive options with favorable outcomes.



Clinical Indications for IR Intervention

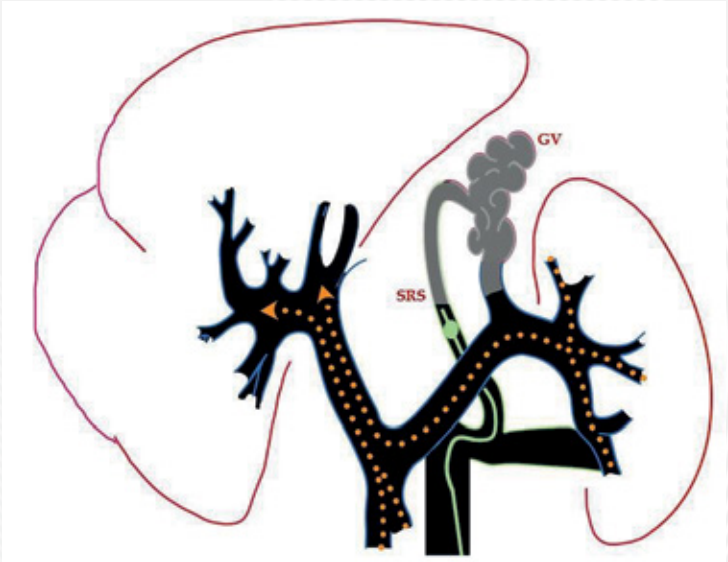
The primary indication for IR treatment of gastric varices is active or recurrent bleeding that is unresponsive to medical or endoscopic therapy. GVs, particularly those classified as isolated gastric varices (IGVs) — especially IGV1 located in the fundus — are less amenable to endoscopic band ligation or sclerotherapy due to their submucosal location and large size.

Patients with contraindications to transjugular intrahepatic portosystemic shunt (TIPS), poor hepatic reserve, or advanced liver disease may also benefit from targeted IR therapies. Moreover, IR techniques are increasingly considered as first-line therapy in select cases, particularly where anatomy is favorable for embolization or shunt occlusion.

Interventional radiology offers several procedural options for GV management:

- **Balloon-Occluded Retrograde Transvenous Obliteration (BRTO):** This technique involves occlusion of the gastrorenal shunt via a balloon catheter, followed by sclerosant injection into the varices. BRTO is particularly effective in patients with gastrorenal or gastrocaval shunts.
- **Plug-Assisted Retrograde Transvenous Obliteration (PARTO) and Coil-Assisted Retrograde Transvenous Obliteration (CARTO):** Variations of BRTO that use vascular plugs or coils instead of balloon catheters, reducing procedure time and complications.
- **Transjugular Intrahepatic Portosystemic Shunt (TIPS):** TIPS reduces portal hypertension by creating a low-resistance channel between the portal and systemic circulation. While traditionally used for esophageal varices, TIPS is also effective in GVs when decompression is needed.
- **Percutaneous Transhepatic Obliteration (PTO):** Used when a gastrorenal shunt is absent, this approach involves direct catheterization of the varices via a transhepatic route.

These procedures are typically performed under conscious sedation or light general anesthesia, with real-time fluoroscopic and ultrasound guidance, minimizing the risk associated with open surgery.



Comparison with Endoscopic Therapy:

Endoscopic treatments, such as cyanoacrylate injection, are often the first-line approach for acute GV bleeding due to their rapid accessibility. However, several limitations have been documented:

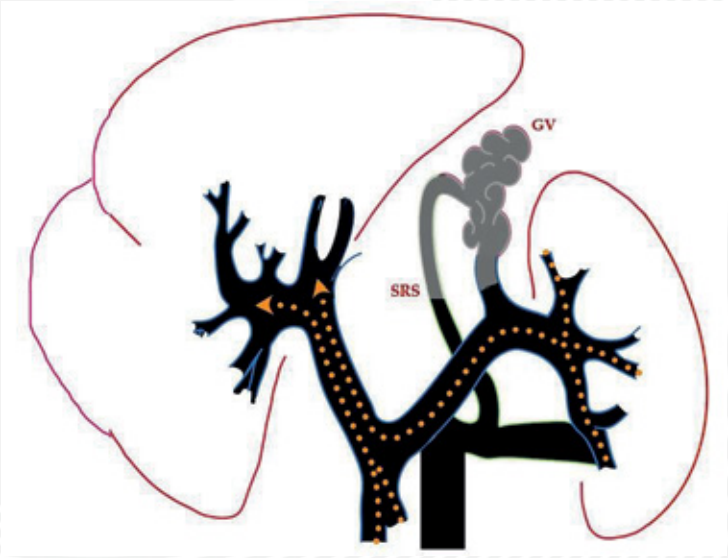
- **Efficacy:** While cyanoacrylate injection can control bleeding in over 90% of cases acutely, rebleeding rates range from 20% to 37% depending on the variceal subtype and patient comorbidity (Choudhuri et al., 2016).
- **Complications:** Risks include embolic events (e.g., pulmonary embolism), ulceration, and local tissue necrosis.
- **Durability:** Endoscopic therapy often requires repeated sessions.

In contrast, IR procedures offer longer-lasting hemostasis, particularly in patients with large or refractory varices. For example: BRTO achieves initial bleeding control in over 90% of patients, with lower rebleeding rates than endoscopy in fundal varices (Gwon et al., 2013). TIPS provides durable decompression but may be associated with hepatic encephalopathy and worsening liver function in certain patients (Rossle et al., 2010).

A meta-analysis by Al Osaimi et al. (2018) comparing endoscopic glue injection and BRTO for fundal varices found higher rebleeding-free survival and overall survival in the BRTO group, although endoscopy remains a valuable first-line modality for acute stabilization.

Outcomes and Prognosis

The success of IR procedures lies in their ability to provide durable hemostasis with fewer systemic complications. For instance: BRTO has shown excellent long-term outcomes, bleeding control rate exceeding 90%, often improving hepatic encephalopathy and liver function by preserving hepatopetal portal flow.



TIPS, while effective in decompression, carries a higher risk of encephalopathy and may not be suitable in advanced hepatic insufficiency. Meanwhile, TIPS remains crucial for patients with extensive portal hypertension and multiple variceal sites. PTO and PARTO expand options for patients with challenging anatomy.

Overall, IR interventions reduce rebleeding risk, lower procedural morbidity, shorter hospital stays and provide tailored approaches based on anatomy and liver function status.

Conclusion:

Interventional radiology has revolutionized the management of gastric varices, offering life-saving options for patients who are often critically ill and poor candidates for surgery. With an expanding toolkit of embolization and shunting techniques, IR continues to play an integral role in modern hepatology and gastroenterology.

As the evidence base grows and procedural techniques continue to evolve, the collaboration between hepatologists, gastroenterologists, and interventional radiologists will be vital in optimizing patient outcomes.

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