Management of gastric variceal hemorrhage

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Gastric varices are present in 20% of patients with portal hypertension and are particularly common in those with non-cirrhotic etiology. They may develop in the setting of either generalized or segmental (sinistral or left-sided) portal hypertension as a result of splenic vein thrombosis.

Gastric varices represent an inhomogeneous entity morphologically, topographically and hemodynamically. Hence proper classification is mandatory not only to prognosticate but also to determine optimal therapeutic option. Although a number of classifications based on variceal location, morphology and color have been proposed, the one proposed by Sarin et al is most widely used and has been recommended for use by the Baveno consensus working group. The classification takes into account location of varices in the stomach and their relation to esophageal varices. Varices are thus classified into 2 broad categories: gastro-esophageal varices (GOV) when they extend from the esophagus into the stomach and isolated gastric varices (IGV) when gastric varices are present in absence of esophageal varices. GOV are further sub-classified into GOV1 (extending along the lesser curvature of the stomach) and GOV2 (extending along the greater curvature towards the gastric fundus). Similarly IGV have been sub-classified as IGV1 (located in the gastric antrum, corpus or pylorus). GOV1 is the commonest variant, accounting for 74% of all gastric varices, while GOV2, IGV1 and IGV2 constitute 16%, 8% and 2%, respectively. The risk of bleeding is greater with fundal varices (IGV1 78% and GOV2 55%) than with GOV1 and IGV2 (10%).

Although gastric varices bleed less often than esophageal varices, gastric variceal hemorrhage is more severe, translating into higher transfusion requirements as well as mortality, and has higher incidence of rebleed. Moreover, on account of higher prevalence of spontaneous gastro-renal shunts, gastric varices can bleed at porta-systemic pressure gradient <12 mmHg and have higher incidence of encephalopathy. Risk factors for gastric variceal bleed include fundal location, large size, red color sign and advanced Child stage. Gastric varices should be implicated as the source of bleeding if there is active spurt or ooze, adherent clot, presence of large gastric varices, no esophageal varices, and no other evident source of bleeding.

Various investigators have proposed different management options, including pharmacological, endoscopic, radiological, combined and surgical approaches. However, there is a lack of consensus on the optimal algorithmic approach to management of patients with gastric varices.

Balloon tamponade

Balloon tamponade serves to buy time in an emergent situation until definitive therapy can be instituted. Conventional tamponade devices like Sengstaken-Blakemore tube have smaller-capacity gastric balloon (200 mL) that might not provide adequate compression of fundal varices. Linton-Nicholas tube has larger balloon (600 mL) and is more efficacious in this regard. Although initial hemostasis is achieved in 50%, up to 20% of these patients subsequently rebleed.

Pharmacotherapy

Currently no literature exists addressing the role of either somatostatin or vasopressin and their analogues in the management of acute gastric variceal hemorrhage. Since pharmacotherapy has proven efficacy in control of acute esophageal variceal bleed, and at least GOV1 behaves like esophageal varices, there is no reason to withhold these drugs in patients with bleeding gastric varices.

Regarding secondary prophylaxis, an open-label trial assessing efficacy of beta-blockers and nitrates demonstrated no decrease in rebleed rates or improvement in patient survival with the use of medical therapy. Further, a randomized study comparing glue injection with propranolol in prevention of rebleed could not find any difference in rebleed rates or survival but medical therapy was associated with lower complication rates.

Endoscopic therapy

Variceal sclerotherapy

Sclerotherapy using ethanolamine oleate, tetracycl sulphate or absolute alcohol, given intra-variceally, para-variceally or in combination, induces endothelial damage and consequent thrombosis of varices.
As compared to bleeding esophageal varices, endoscopic sclerotherapy is less effective in control of bleeding and requires larger amount of sclerosant, thereby leading to higher incidence of procedure-related complications. This is probably related to greater blood flow through gastric varices, leading to rapid washout of the sclerosant. In the setting of acute gastric variceal bleed, sclerotherapy has been shown to control bleed in 67%-100% of patients, with inferior results in those with fundal varices. Even the reported rebleed rates vary between 34% and 89%, which may be explained in part by the differences in technique, subtype of gastric varices and etiology of portal hypertension.

The efficacy of sclerotherapy in variceal eradication (secondary prophylaxis) is approximately 70%. Similar to the acute setting, it is relatively more successful in eradication of GOV1 (95%) than fundal varices (GOV2 and IGV1). Complications include fever, abdominal pain and dysphagia, which are usually mild, transient and self-limiting.

Variceal obturation

Variceal obturation employs injection of substances such as cyanoacrylate glue or thrombin, leading to plugging and thrombosis of varices and consequent sloughing of the cast. Current evidence favors the use of cyanoacrylate glue as the first-line management option, both for acute bleed and for secondary prophylactic eradication of gastric varices. The relative efficacy of glue injection in control of active gastric variceal bleed has been addressed in three randomized trials; it has been compared to sclerotherapy in one trial and variceal ligation in two. Two trials demonstrated better control of bleed with the use of glue injection as compared to sclerotherapy or variceal ligation (89% vs. 62% and 87% vs. 45%); the third showed equivalent results as variceal ligation. Rebleed was significantly lower with glue injection when compared to variceal ligation (31% vs. 54%) and similar to sclerotherapy.

Glue injection achieves variceal eradication in about 75% of patients (range: 50%-100%) with rebleed in 23%-50% of patients. It has been suggested that rebleed rates may be reduced with the use of endoscopic ultrasound-guided glue injection. Although complications with glue injection are similar to those with sclerotherapy, serious systemic thrombo-embolic phenomena include pulmonary, cerebral, portosplenic and retroperitoneal abscess. Such events are especially common in those with large gastro-renal shunts and hepato-pulmonary syndrome and caution is required with the use of glue in such patients.

Variceal ligation

Ligation of gastric varices less than 2 cm in diameter may be carried out using standard rubber bands while larger ones require use of detachable snare. Uncontrolled studies have demonstrated variceal ligation to be effective in controlling acute gastric variceal bleed (80%-100%), with low rebleed rate (0%-20%) and good variceal eradication (77%-100%). Randomized studies have demonstrated similar or inferior control of acute gastric variceal bleed with variceal ligation as compared to glue injection but rebleeding is definitely higher with variceal ligation.

Combination therapy

A combination of variceal ligation using snare and sclerotherapy has been reported chiefly from Japan. The technique achieves control of acute gastric variceal bleed in 100%, rebleed in 0%-8%, and variceal eradication in 85% of patients.

Interventional radiological therapy

Transjugular intrahepatic porta-systemic shunt (TIPSS)

TIPSS involves creation of a shunt between the intrahepatic branch of the portal and hepatic veins using a metallic stent under radiological guidance. Prior to the procedure, patency of the portal vein should be firmly established. There is paucity of controlled studies evaluating TIPSS in acute gastric variceal bleed, and it is to be used as second-line rescue therapy once variceal obturation has failed. TIPSS controls acute gastric variceal bleed in excess of 90% of patients, with rebleeding in up to 30% of patients, which is comparable to esophageal variceal bleed. Post-shunt encephalopathy develops in 3%-16% of patients and may require shunt revision. Variceal obturation was found to be more cost-effective than TIPSS in control of acute gastric variceal bleed.

TIPSS is as effective in secondary prophylaxis of gastric variceal bleed as its esophageal counterpart, with rebleed rates of 20%, post-shunt encephalopathy in 17%, and cumulative shunt dysfunction developing in 55%. Moreover, significantly lower mortality rate was observed after TIPSS in those with gastric varices (5-year mortality 50% vs. 75%), and this difference was confined to gastric varices at portal pressure gradient >12 mmHg.

Balloon-occluded retrograde transvenous obliteration (B-RT0)

This technique, reported predominantly by Japanese investigators, is possible in patients with known gastro-
renal shunts. B-RTO essentially consists of cannulating the gastro-renal collateral via the left renal vein using trans-jugular or trans-femoral route, occluding the collateral by balloon inflation and injection of sclerosant in a retrograde fashion under fluoroscopic control till gastric varices are completely filled. The procedure achieves control of acute gastric variceal bleed in all patients and primary prophylactic gastric variceal eradication in 85%-100% of patients, with negligible rebleed rates.

Balloon-occluded endoscopic injection sclerotherapy (B-EIS)

In this procedure, the portal vein is cannulated using the transhepatic route, smaller collaterals are embolized with coils, and the main feeding collateral (and draining gastro-renal collateral if present) is occluded, creating a closed circuit, followed by endoscopic sclerotherapy of gastric varices. Currently little information is available regarding B-EIS but preliminary data suggest similar efficacy as B-RTO.19

Surgical therapy

Porta-systemic shunt

There is paucity of literature defining the role of surgical shunts in patients with gastric variceal bleed. It is currently used in the form of salvage therapy as an alternative to TIPSS in patients with preserved liver functions. Distal spleno-renal shunt (DSRS) achieved control of gastric variceal bleed in nearly 90% of patients over a mean follow-up period of 21 months.20 A randomized study comparing TIPSS with H-graft porta-caval shunt showed that surgical shunt fared better than TIPSS in terms of post-shunt resource consumption, cost of care following hospital discharge, and patient survival.21 A recent randomized study comparing DSRS with TIPSS showed similar success in control of refractory variceal bleed and survival but significantly greater re-intervention rates for TIPSS.22

Devascularization procedure

Gastric variceal bleed due to segmental portal hypertension is effectively cured with splenectomy with or without devascularization.23 In the context of generalized portal hypertension with bleeding gastric varices, devascularization is performed as salvage procedure and is associated with 5-year survival rate of 68%.24 Recently the procedure is being performed laparoscopically and needs further evaluation.25

In summary, the natural history and management options for gastric varices have been clearer in the past two decades. An algorithmic approach (Fig)

References

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