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#### TITLE

Balloon-occluded antegrade transvenous obliteration for refractory esophageal variceal bleeding alternative to transjugular intrahepatic portosystemic shunt creation: A single center retrospective study.

#### BACKGROUND

Liver cirrhosis-associated esophageal variceal bleeding often refractory to endoscopic treatment, leaving few options other than transjugular intrahepatic portosystemic shunt (TIPS). However, Liver cirrhosis patients are often ineligible for TIPS and those patients can be treated by balloon-occluded antegrade transvenous obliteration (BATO). This study aimed to assess the safety and effectiveness of BATO as an alternative to TIPS for refractory esophageal variceal bleeding.

#### METHODS

The medical records of patients who underwent endovascular treatment for refractory esophageal variceal bleeding were retrospectively reviewed from 2018 to 2023. While TIPS creation was initially considered, BATO was indicated for patients with portal venous thrombosis (PVT), hepatic encephalopathy, or hepatoma around the hepatic vein. Peri-procedural adverse events, recurrence rates, mortality rates, rebleeding-free periods, and overall survival (OS) were compared between the BATO and TIPS groups.

#### RESULT

BATO procedures were performed on six patients (men=5) with a median age of 67.5 years (range: 57–70). The indications included PVT (n=3), encephalopathy (n=1), and hepatoma (n=2). TIPS were created in six patients (men=3), with a median age of 47.5 years (range: 43–63). No major adverse event occurred during both procedures. One patient of TIPS group died after 2 days due to hepatic failure. Half of the patients in the BATO group experienced recurrence, which was successfully treated with endoscopic ligation. One patient in the TIPS group had a rebleeding episode. Half of the patients in each group died during the follow-up period. The median rebleeding-free period and OS were 123 days (range: 27–828) and 239 days (range: 27–1643) for the BATO group and 216 days (range: 2–404) and 216 days (range: 2–1418) for the TIPS group, respectively. Kaplan-Meier and log-rank test showed no significant differences in rebleeding-free period ( $p=0.35$ ) and OS ( $p=0.95$ ).

#### CONCLUSIONS

BATO might be an alternative for those who are ineligible for TIPS in patients with refractory esophageal variceal bleeding.

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