Should B-RTO Be the First-Line Treatment for Portosystemic Encephalopathy?

Key words: balloon-occluded retrograde transvenous obliteration, portosystemic shunt, functional reserve of the liver

Balloon-occluded retrograde transvenous obliteration (B-RTO) was first introduced in 1990 to treat refractory solitary gastric fundal varices (1, 2). Although B-RTO has been performed for a decade in Japan, it is a new treatment option in Europe and America. B-RTO obliterates gastric varices that develop on the course of the portosystemic shunt vessel, and since the obliteration of gastric varices is complete, this treatment which was developed in Japan, is revolutionary. Techniques used in B-RTO vary with institution to some extent, but with this procedure, outcomes are very favorable, and there have been no reports of recurrence (3, 4). In B-RTO, once gastric varices are obliterated, the splenorenal shunt, which is a major shunt, is also closed, thereby modifying portal hemodynamics.

Kato et al (5) and Kawanaka et al (6) utilized this additional effect of B-RTO to treat portosystemic encephalopathy.

See also p 688.

Whether or not gastric varices are present, a splenorenal shunt is a major shunt between portal and systemic circulations. Hence, B-RTO is naturally very effective for the treatment of portosystemic encephalopathy. In Japan, study groups for B-RTO and hepatic failure have been actively investigating the effectiveness of B-RTO for the treatment of portosystemic encephalopathy, and have obtained very favorable results. When B-RTO closes this major shunt, the portal pressure increases, thereby changing portal hemodynamics. Although the probability of negatively affecting hepatic reserve appears to be high, there have not been any reports documenting such events. In fact, one short-term study showed that hepatic reserve improved after B-RTO. The ability of B-RTO to improve hepatic reserve can be seen in terms of improved liver function confirmed by a clinical laboratory test of blood samples, and in terms of intrinsic clearance of indocyanine green (ICG), an indicator of the metabolic activity of hepatocytes, measured by continuous ICG method (7). B-RTO improves hepatic function by increasing the portal blood flow (8, 9).

The reason for improved hepatic reserve is due to the fact that the closure of this major shunt (splenorenal shunt) causes a switch of hepatic flow from hepatofugal to hepatopetal, which in turn increases the effective hepatic blood flow (9, 10). Nakano et al (11) reported that reduced hepatic function in patients with hepatic cirrhosis is correlated to the level of collateral blood flow. However, the onset or enlargement of esophageal varices is seen in about one-quarter of the patients who undergo B-RTO for the treatment of gastric varices. Hence, in the long term, this increase in effective hepatic blood flow following B-RTO gradually diminishes and returns to the original level.

Moreover, it is possible that further advances in cirrhotic hepatopathy could negate or reduce such improvement in hepatic reserve. In to date, in the literature B-RTO seems to render no damage to hepatic function, and thus if portosystemic encephalopathy does not respond well to drug treatment, B-RTO could become the first-line option.

There are two problems however in the report of Kato et al (5). They incorrectly quoted the paper of Luca et al (12) to have said, “TIPS (transjugular intrahepatic portosystemic shunt) has also been reported as a useful therapy for chronic hepatic encephalopathy”, and argued the statement to be untrue, and then Kato et al concluded that “TIPS should be selected as a second choice to particularly treat hepatic encephalopathy”. However, Luca et al (12) did not make the above statement. This is a very serious mistake on the part of Kato et al (5). TIPS is effective for the treatment of variceal bleeding, ascites and thrombocytopenia, but one of its clinically important complications is portosystemic encephalopathy. TIPS is a treatment technique that is in direct contrast to B-RTO, and the induction of encephalopathy by portosystemic shunt creation is a well-known complication since the days of classical portacaval shunt surgery. TIPS is contraindicated in patients with portosystemic encephalopathy.

Luca et al (12) concluded “TIPS creation markedly reduces risk of rebleeding but increases risk of encephalopathy without affecting survival. Therefore, TIPS creation may not be the best first-choice therapy for prevention of recurrent variceal bleeding. Criteria for selection of candidates for TIPS creation should be assessed in future prospective studies.”

The second problem in the paper of Kato et al (5) was the following statement: “endoscopic sclerotherapy and/or band ligation have limitations in use for treatment of cardiac varices”. However, it is easier to treat cardiac varices (junctional varices, Lg-c) by endoscopic therapy than to treat fundal varices (Lg-cf and Lg-t), and there is limitation in the use of endoscopic therapy for the treatment of gastric fundal varices. As a general rule, B-RTO is not performed to treat cardiac varices (junc-
These errors aside, considering the currently available treatments, B-RTO appears to be the most promising first-line treatment for portosystemic encephalopathy in patients who do not respond to drug therapy. In conclusion, B-RTO could be the first-line treatment for portosystemic encephalopathy resistant to medical treatment.

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References