

MESENTERIC VEIN THROMBOSIS: AN ENDOVASCULAR MANAGEMENT ALTERNATIVE

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Mesenteric venous thrombosis (MVT) is an uncommon form of intestinal ischemia. Exploratory laparotomy with resection of the infarcted bowel and aggressive anticoagulant therapy are the standard care. Morbidity and mortality rates can be significant because of the delay in the diagnosis resulting from the unspecific clinical presentation.

MVT is a rare but serious form of mesenteric ischemia. The clinical presentation may vary from an asymptomatic condition to intestinal infarction and shock. Delay in the diagnosis is common because of the nonspecific symptoms; the mortality rate in recent series varies from 13% to 50%. MVT has been associated with portal hypertension, abdominal infection and inflammation, trauma, surgery, and hypercoagulable states, such as deficiencies of antithrombin III, protein C, protein S, and factor V Leiden, and with use of estrogen-containing compounds. Many of the formerly reported cases of primary or idiopathic MVT are now explained by inherited thrombophilic disorders.

The natural history of the disease is still unknown. Patients with acute MVT with peritoneal signs need prompt surgical exploration with resection of the infarcted bowel. Other patients may have subacute ischemia develop that may progress to small bowel stenosis. Patients with chronic MVT may be completely asymptomatic or may have portal hypertension develop with bleeding from gastric or esophageal varices. Early anticoagulation therapy in MVT has been shown to decrease the recurrence rate and to improve survival. In recent series, early diagnosis and aggressive treatment with anticoagulation has resulted in lower mortality rates than previously reported. When the diagnosis is confirmed early, nonoperative management results in similar morbidity, mortality, and survival rates to initial surgical approach. Despite the use of early anticoagulation therapy, transmural infarction may still occur in 18% and extrahepatic portal hypertension in 25% of the patients with acute MVT.

In patients with symptomatic MVT, endovascular treatment has been reported with encouraging initial results. Possible routes of treatment include indirect intraarterial infusion of thrombolytics through the superior mesenteric artery and direct access to the portal vein with transjugular or transhepatic routes. Because MVT is a rare condition, the number of cases reported is limited, and comparison of the different routes of treatment is not possible. Indirect intraarterial infusion of thrombolytics is less technically demanding and has the theoretic advantage of lysis of the small venules of the mesentery. Some authors believe, however, that indirect lysis is more unpredictable because of preferential flow into collaterals; this technique is generally associated with longer infusion times.

Access to the portal vein through a transjugular or transhepatic route for pharmacologic or mechanical thrombolysis has the mechanical advantage of a direct approach to the system; the placement of an infusion catheter through the occluded segment results in higher thrombolytic

activity, decreasing significantly the treatment time. An additional advantage of the direct access to the portal system is that adjunct therapies, such as balloon dilatation, balloon embolectomy, and stent placement, are also possible. The transjugular approach is generally performed with the creation of a transjugular intrahepatic portosystemic shunt; this approach is indicated for patients with cirrhosis with portal hypertension caused by portal vein thrombosis. The transhepatic route is technically simpler than the transjugular approach; the main disadvantage of the transhepatic route is the risk of bleeding, especially in patients receiving anticoagulation therapy and in patients with ascites. Although we did not observe any complications in our patients, significant intraabdominal bleeding is a potential serious complication. The use of a small gauge Chiba needle with ultrasonic guidance to access the portal vein and embolization of the liver tract with coils or gelfoam plugs at the conclusion of the procedure decreases significantly the risk of bleeding. The procedure can be safely performed with local anesthesia.

Mechanical thrombectomy is a promising new technique for the treatment of acute MVT, especially in patients at high risk for pharmacologic thrombolytic therapy. The use of mechanical devices offers the potential to reduce procedure times and to reduce or eliminate the need for pharmacologic agents. In our patients with focal thrombosis of the veins, the use of thrombectomy devices allowed us to clear the thrombus completely in a fast and efficient way, without the additional time, risk, and cost of a continuous infusion of thrombolytics. In patients with extensive thrombosis of the portal and mesenteric system, mechanical devices could initially be used to debulk the thrombus. Pharmacologic thrombolysis would probably still be necessary in most cases to treat residual thrombosis and to treat thrombus in the small and peripheral veins. The combination of mechanical and pharmacologic agents may significantly decrease treatment times in patients with extensive thrombosis. We used two different types of thrombectomy devices. One device, the Oasis thrombectomy, is a triple lumen catheter with a J-shaped fine stainless steel channel that directs a high-pressure saline jet into the clot. The unit is driven with a conventional angiographic injector. This device has cleared the clot completely in cases with focal thrombosis; in cases where the clot is adhered to the wall of the SMV the device might fail to dissolve the thrombus. The second device, the Arrow-Trerotola thrombectomy, has successfully cleared clot with a short activation time. This device consists of a nitinol fragmentation basket that is attached to a rotator unit. The device rotates at 3,000 rpm, resulting in pulverization of the clot in particles less than 3 mm. The Arrow-Trerotola device has been extensively used to declot synthetic dialysis grafts; although preclinical studies have only shown limited endothelial injury, its use in native veins is not recommended until further studies assess its safety.

In conclusion, we described the successful treatment of symptomatic MVT with the use of pharmacologic and mechanical thrombolysis through a transhepatic access, followed by embolization of the liver tract. The procedure has proven effective in treating focal and extensive thrombosis. Endovascular treatment of MVT should be offered only to symptomatic patients with early diagnosis. Minimally symptomatic patients may best be treated with systemic anticoagulation only. Prompt surgical intervention should be undertaken if the patient's condition deteriorates or clinical signs of peritonitis develop.

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