PARTIAL PORTACAVAL SHUNTS IN BLEEDING ESOPHAGEAL VARICES IN CIRRHOTIC PATIENTS

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ABSTRACT

Objective: to present “H” partial porto-caval shunt, as an efficient treatment for superior digestive hemorrhages due to esophageal varices rupture, which recurred after endoscopic treatment. Material and method: the paper presents the authors experience regarding partial porto-caval shunt performed on seven cirrhotic patients, Child-Pugh B risk class, with HTP 2B stage, which presented a hemorrhagic recurrence after endoscopic treatment. 10 mm diametre gore-tex prosthetics were used in six cases and 6 mm diametre gore-tex prosthetic, in one patient. Results: Immediate postoperative evolution and evolution in six months was considered favorable, when there were no signs of portal encephalopathy or hemorrhagic recurrence; this was the case in five of the patients in which a 10 mm diametre gore-tex was used. One patient with a 10 mm diametre gore-tex presented a immediate postoperative cardio-respiratory arrest, resuscitated, which leaded to trombosis of the shunt and relapsment of the hemorrhage, requiring transfer to another emergency service for TIPS. The 6 mm diametre gore-tex prosthetic, repeated the hemorrhage in the fifth postoperative day, fact that could not be controled and eventually leaded to the death of the patient. All six patients on which shunts with 10 mm prosthetics were performed had a good folloow up at 6 months, without any hemorrhagic recurrences (except one patient after TIPS) or encephalopathy episodes. Conclusions: partial porto-caval shunt, with 10 mm diametre gore-tex prosthetics is as an efficient treatment method of recurred superior digestive hemorrhages in cirrhotic patients with HTP.

Key Words: shunt, porta, cava, partial, cirrhosis
pressure passes beyond the value of 25 cm water, being able to reach values of up to 60 cm water. The portal hypertension (HTP) hemorrhagic complications in cirrhotic patients are due to portacaval, coronaro-eso-azygos derivation, which through the gastric coronary vein develops anastomosis with esophageal plexus, mediated by the superior gastric pole. The rupture of the esophageal varices or the gastric varices in the fundus induces reducible hemorrhages due to the blood hypertension on the port system. The mortality rate is 50% on the first hemorrhage, except the shunt or transplant intervention.³

**MATERIAL AND METHODS**

The study includes seven patients hospitalized in Hepatic Surgery Compartment of the Surgery Clinic in the Timisoara Clinical Emergency Municipal Hospital, during 2000-2003, for a recurrence of superior digestive hemorrhages by rupture of esophageal varices (EV), after endoscopic treatment and which appeared in patient with portal background (HTP stage 2B), determined by a hepatic cirrhosis risk class Child-Pugh B. The cirrhotic etiology was viral, induced by HCV in 3 cases and in the other 4 by HBV.

All the 7 patients underwent „H” partial portacaval shunt intervention using vascular gore-tex prosthetic. 10 mm diameter vascular prosthesics were used in six cases and 6 mm diameter prosthetic, in one patient. The vascular gore-tex prosthetic was interposed between the vascular branches, portal and inferior v. cava, folowing „H” letter shape, anastomosis was made by two continuous suture anchored between them, one-layer, with synthetic slow absorbable one-filament (PDS 5-0). The patients evolution was considered favourable when: the patients didn't presented any early recurrence of the hemorrhage, when they didn't develop severe hepatic insufficiency or postoperative portal encephalopathy, and when the vascular prosthetics trombosis was not produced sooner than 6 months from the intervention.

**Technical aspects of the porto-caval shunt.** The surgical approach in all seven cases of the porto-caval shunt was right subcostal laparotomy. The inferior vena cava as a posterior element of the Winslow’s hiatus, was dissected after the division into sections of the posterior peritoneum at this level, duodeno-pancreatic take-off and right liver mobilization being used in two circumstances, to create a convenient operating field. The portal vein is the posterior element of the hepatic pedicle, its division into sections requiring a longitudinal section of the peritoneum at the right free edge portal pedicle level, followed by the traction with a eyelid retractor, upward and leftward, of the main biliary duct.

**Figure 1.** Porta and inferior cava veins dissection.

After circumferential releasing on 2-3 cm distance of the PV and of the antero-lateral faces of the ICV, portacaval anastomosis was performed with two continuous sutures anchored between them, using slow absorbable one-filament (PDS 5-0), made in a terminolateral manner between the gore-tex prosthetic and the veins: porta and cava.

**Figure 2.** 90° curving prosthetic to achieve anastomosis with the inferior vena cava.

The prosthetic disposition was performed following „H” letter shape, so that a relative tension degree should exist at this level, in order to stop the curving and secondary trombosis of the shunt. The
difficulty of performing portacaval anastomosis is due to the presence of the firm lymphatic edema firm, and to the operating field smaller than in the mesentericocaval anastomosis’s case, but due to the small distance (2-4cm) between ICV and PV, at Winslow hiatus level, the shunt is shorter, straighter and without curving risk. The coronare and cardioesophageal veins ligation was performed in all the seven cases.

The outcome was considered favorable postoperative and on a six months follow up, without having any hemorrhagic recurrences, no portal encephalopathy and no shunt thrombosis. The shunt permeability was confirmed through an indirect method, the absence on the gastroscopic exam of the esophageal veins or at most the presence of first degree veins.

Partial portacaval shunt intervention performed for cirrhosis patients, risk class Child-Pugh B, showed particular technical aspects, generated by the presence of the portal hypertension and secondary to the pedicle and retro peritoneal lymphatic edema, besides the risks determined by the preexisting chronic hepatic insufficiency. Certain technical aspects, determined the reduction of the surgical risk in this patients, by simplifying the interventions, lowering the operating time and avoiding the complete stop of the blood flow in the veins: portal and inferior cava.

**Short- and long-term outcome.** All the seven patients had different outcomes depending on the
shunt’s calibre and on an immediate postoperative cardio-respiratory arrest, in one patient, which was resuscitated. In the case of five of the patients with 10 mm diameter vascular prosthetics used, the short- and long-term outcome was favorable. In the case of one patient there was an immediate postoperative cardio-respiratory arrest, after the transportation of the patient to the Intensive Care Unit, most likely due to hypothermia. The patient was resuscitated after 20 minutes. The patient didn’t present any damage after the extended cardiac arrest; the only complication was trombosis of the shunt, canceling the effect and relapse of the hemorrhage, necessitating transferation to another emergency service abroad for assembling a TIPS, which is still functional. The patient with 6 mm diameter vascular prosthetic repetated the hemorrhage in the fifth postoperative day which could not be controled and eventually leaded to the death of the patient. Postoperative hemorrhagic recurrences were detected in 2 cases, the first one was associated with the need of using a vascular graft with an unfit caliber (6 mm); and the second with the shunt trombosis immediately after the intervention because of the cardiac arrest. Postoperative encephalopathy was not detected on neither of the patients. 6 months after the shunt. The five patients with the 10 mm prostheses and the patient with TIPS, presented a favorable outcome.

DISCUSSIONS

It is known the fact that the recurrenced hemorrhages in cirrhotic patients with rupture of esophageal varices lead to a survival rate of 50-75% if the portacaval shunt or the liver transplantation are not accomplished. In our study, five (71.5 %) of the patients that benefit of a portacaval shunt after the second hemorrhagic episode had a short- and long-term (more than 6 months) favorable outcome without hemorrhagic recurrence and hepatic encephalopathy. Using the gore-tex prosthetics for portacaval shunt calibration showed a visible benefit when the diametre was: 8, 10 and 12 mm. The 8 mm diameter prosthetics were incriminated with a higher postoperative hemorrhagic recurrence, and the 12 mm diameter prosthetics with the existence of a 10 % variable intensity postoperative portal encephalopathies. The compromise solution seemed to be the 10 mm prosthetics, in which cases, the hemorrhagic recurrence rate mean was < 5%, and encephalopathy appeared exceptionally, most of the time temporarily. In our study, also, five of the six patients (83 %), in which cases we used a 10mm prosthetic had a favorable outcome, without hemorrhagic recurrence and encephalopathy. The sixth patient presented an immediate postoperative cardio-respiratory arrest, most likely due to the hypothermia. After transportation of the patient to the Intensive Care Unit, he was resuscitated after 20 minutes and surprisingly presented no neurological or other disfunctions. However, on the basis of the cardiac failure and hipopresure induced by it, there was an immediate postoperative trombosis of the shunt and relapsment of the hemorrhage, necessitating Sengstaken-Blakemore tube as an ultimate solution. Because in our country there was no possibility getting a TIPS, the patient was transferred in maximum safety conditions and under continous medical supervision to Szeged University Center (Hungary), where they assembled a TIPS, with favorable outcome. The postoperative complications on the 10 mm prosthetic „H” shunt are not due to the diametre of the shunt, but to the cardiac arrest. In the 6 mm prosthetic case there was a different situation. In this case, the portal system pressure was not decreased, so that the hemorrhagic recurrence could be avoided; so in the fifth day after the operation, a massive hemorrhagic recurrence occured, and a Sengstaken-Blakemore tube had to be installed, in order to stop the bleeding. Despite all endoscopic and drug therapy used, the patient died in the next days by hemorrhagic shock. The usage of the 6mm prosthesis was imposed by the absence of prosthesis with a fit diameter, under the pressure of a massive and hard to control hemorrhage. Although from the intervention trauma point of view and the hepatic transplantation performming perspective on this patients, TIPS represents the first choice treatment method for hemorrhages by rupture of esophageal varices (after exhaustion endoscopic treatment methods), still, the „H” partial portacaval shunt intervention using 10 mm vascular gore-tex prosthetic represents an alternative, when the first one is technically impossible. The others surgical treatment options for hemorrhages by rupture of esophageal varices on the cirrhotic patients are: end-to-side and side-to-side portacaval shunts, which are prohibited because of the poor results and technical difficulties generated, in contingency of a liver transplant, also the splenorenal shunt (Warren 1 and 2 type), which are still used today with tolerable results.
CONCLUSIONS

Partial portacaval H-graft shunt, with 10 mm diameter gore-tex prosthetics, represents an efficient treatment method of hemorrhages by rupture of esophageal varices, on cirrhotic patients recurred after exhaustion of endoscopic treatment methods and without the possibility of getting a TIPS.

REFERENCES