H-TYPE PORTOCAVA L AND MESOCAVA L SHUNTS FOR CIRRHOTIC PATIENTS WITH UPPER GASTROINTESTINAL BLEEDING DUE TO BURST ESOPHAGEAL VARICES

Introduction

Portocaval interventions in cirrhotic patients with portal hypertension initially made in a termino-lateral manner, even though had initially desaster results, allowed Child and Pugh to reveal the specific risk factors of the hepatic patients. The improvement of the surgical techniques for shunts, by making a compromise between the portal blood flow which will irrigate the liver and will be deviated, had as a result a decrease in the incidence of postoperative liver failure and of the hemorrhagical recurrence, also improving in an obvious manner the long term surviving rate in this patients.

So, Warren performing the sleno-renal shunt (type I and II), the introduction of the portocaval and mesocaval partial shunts, and finally the transjugular portosystemic shunt (TIPS), represented therapeutical alternatives for cirrhotics patients with HTP waiting for a liver transplant (1-4).

Material and method

Patients

The paper is made on 12 patients hospitalized in Hepatic Surgery Compartment of the Surgery Clinic in the Timisoara Clinic Emergency City 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 HTP background, determined by a hepatic cirrhosis risk class Child-Pugh B.

Summary: Surgery of portal hypertension for cirrhotic patients has been a continuous challenge for liver surgeons. Few methods of surgical treatment are nowadays accepted for this disease: transjugular intrahepatic portosystemic shunt (TIPSS), splenorenal shunt (Warren), H-type portocaval and mesocaval shunts and liver transplantation. In Compartment of Liver Surgery from Surgery Clinic of Timisoara Emergency Municipal Hospital, we have performed ten H-type portocaval and mesocaval shunts, five for each, for Child B cirrhotic patients with portal hypertension and grade II and III esophageal varices. These patients had a recurrent bleeding after medical and endoscopic treatment. In 8 cases we used Gore-Tex prostheses of 10-mm diameter, the other two was 6 and 10-mm diameters. From patients with 10-mm diameter shunts, results were good at 7 cases, and one patient suffered an early postoperative cardiac arrest, resuscitated, with early thrombosis of the prosthesis. This patient had to be transferred abroad for TIPSS. Patients who had received 6 and 14-mm shunts died in first month after operation because of recurrent bleeding and progressive liver failure respectively.

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Methods

All the 7 patients underwent „H” partial portacaval shunt intervention using vascular gore-tex prosthethic. There were used 10 mm diameter vascular prosthetics in 10 cases and in two cases were used different diameter prosthetics: 6 mm, and 14 mm. In 7 patients were performed portocaval anastomosis and in 5 of them, mesocaval. The vascular gore-tex prosthethic was interposed between the vascular branches, following „H” letter shaped, anastomosis was made by two continuous suture anchored between them, one-layer, with synthetic slow absorbable one-filament (PDS 5-0). Patients evolution was considered favourable when: the patients didn’t presented any early recurrence of the hemorrhage, when they didnt develop a severe hepatic insufficiency or a postoperative portal encephalopathy, and when the vascular prosthetics trombosis was not produced quicker than 6 months from the intervention.

Results

Partial portacaval shunt intervention performed for the cirrhosis patients, risk class Child-Pugh B, besides the risks determined by the preexisting chronic hepatic insufficiency, showed particular technical aspects, generated by the presence of the portal hypertension and secondary to the pedicle and retro peritoneal lymphatic edema. Certain technical aspects which need to be debated, determined the reduction of the surgical risk on 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.

Technical aspects of the meso-caval shunt

All the five interventions of this type, used the median xifo-underombilical laparotomy as the abord way. After opening the peritoneal cavity and aspiration of the ascites liquid, the transvers colon was verticalised and the big omentum was overthrowed on the abdominal wall in order to reveal the area of the parietal posterior peritoneum localised between the roots of the mesenter, transvers colon and ascendent colon. A transvers incision of the parietal peritoneum right under the inferior edge of the IIIrd doudenum is made, that also opens the right peritoneum fold of the mesenterical root. Most often, the dissection at this level of the inferior cava vein (ICV) is difficul, because of the presence in the cirrhotic patients of an important limphatic retroperitoneal edema, and because of the existence of a considerable venouse dilatation, generated by the portal hypertention. In this situation, the dissection has to be carefully performed, having all the time as a reper the IIIrd duoden, and knowing that the ICV has to searched in the posterior side of his proximal extremity; and the SMV on the lateral side of his distal extremity. Hemostasis during the dissection has to represent an „obsesiv gesture of the
surgeon”, because, due to the portal hypertention it is not possible to count on spontaneous stop of the hemorrhage, even if this is very small. After the SMV was freed circumferentially (at level of the mesenteric root), on a 3 cm distance, and also the anterior and lateral faces of the subrenal ICV, the optimum position for placing the vascular prosthesis is verified. In all five situations the posterior faces of the IIIrd duodenum and the duodenal II/III angle needed to be dissected, in order to avoid creating a compressive edge at the phrenic level, which finally was placed in the posterior side of the prothesis. A Statinschi clamp was then placed at the anterior face of the ICV, in the way that occludes only half of it’s lumen, to permit the creation of an acceptable caval blood flow, in order to drain the blood coming from the inferior half body, in this way avoiding a hypodiastolic cardiac failure. A 10mm elliptic longitudinal incision was performed were the ICV is clamped, corresponding to the placement and the prothesis diameter. To facilitate the anastomosis an artefact was used, curving the prothesis extremitry on a 180 degree, so it’s aperture will become anterior (fig.1). In this way, the suture will only be performed anterior, by two two continuous suture anchored between them, one-layer, with synthetic slow absorbable one-filament 5-0, in the way that the anastomotic edges are open. The prosthesis is then treated with heparin and dimensioned according to the mesenteric implantation place that was decided upon. The SMV anastomosis is performed on the right lateral face, the same manner, after lateral clamping with a Satinschi clamp of ½ or 2/3 of its lumen (fig.3). Before the complete closure of the anastomotic hole, heparinated serum is introduced at the prosthesis level. The Statinschi pens from the ICV is then slowly released, followed by the one at SMV.

The functionality of the shunt is followed by the quick and obvious reduction of the veins tributare to the porta system. The ligature of the coronary gastric vein and the cardio-esophageal veins accompanied by thehs portal deconnection, was performed for the efficiency of the shunt, meaning preserving a mesocaval gradient of presion of a minimum 10cm water column; and also in order to avoid a posible later bleeding from the esophageal varics. He intervention was finalised by the hemostasis and closure of the peritoneum aperture (fig.1)

Technical aspects of the porto-caval shunt. The abord way in all the seven cases of the porto-caval shunt was right subcostal laparotomy. The inferior cava vein, (ICV) as an posterior element of the Winslow’s hiatus, was dissected after the divizion 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. Portal vein (PV), is the posterior element of the hepatic pedicle, its divizon into sections requiring a longitudinal section of the peritoneum at the right free edge portal pedicle level, followed by the traction with an eyelid retractor, upward and leftward, of the main biliary duct (fig.2). After circumferential releasing on 2-3 cm distance of the PV and of the antero-lateral faces of the ICV, portacaval anastomosis was performed the same manner as the mesocaval one (fig.3). The difficulty of performing portacaval anastomosis is due to the presence of the firm lymphatic edema firm, and to the operating field smaller than mesentericocaval anastomosis’s case, but due to the small distance (2-3cm) between ICV and PV, at Winslow hiatus level, the shunt is shorter, straighter and without curving risk. The coronare and cardioesophageal veins ligature was performed in all the five cases.

### Short and long-term outcome

In all four patients on which we performed the mesocaval shunts,using 10mm diametre vascular prosthetics the short- and long-term outcome was favorable, without developing liver failure or hepatic encephalopaty and without hemorrhagic recurrence (or prosthesis thrombosis) on a 6 months follow-up. A patient on which was used a 14mm diametre vascular prosthetics developed postoperatory a progresive liver failure, with portal encephalopaty and sever problems of the blood clotting, which lead to the death of the patient on the 23-rd day from the operation.

All the seven patients on which were performed the portocaval shunts, 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 diametre vascular prosthetics used, the short- and long-term outcome was favorable and in the case of one patient there was an immediate postoperative cardio-respiratory arrest, after transportation the patient on the Intesive Care Unit, most likely due to the hipothermia, and 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 relasmp of the hemorrhage, necessitating transferation in an another emergency service abroad for assembling a TIPS, which is still functional. The patient with 6 mm diametre vascular prosthetic repetated the hemorrhage in the fifth
day postoperative which could not be controled and eventually leaded to the death of the patient.

Discussions

It is known the fact that the recurrenced hemorrhages in cirrhotic patients with rupture of esophageal varices lead to a survival rate of 25-50% if the portacaval shunt or the liver transplantation are not accomplished. In our study, 75% of the patients that benefit 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 encephalopaty. 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 diametre prosthetics were incriminated with a higher postoperative hemorrhagic recurrence, and the 12 mm diametre prosthetics with the existence of a 10 % variable intencity postoperative portal encephalopaties. The compromise solution seemed to be the 10 mm prosthetics, in which cases, the hemorrhagic recurrence rate mean was <5 %, and encephalopaty appeared exceptionally, most of the time passenger. In our study, also, nine of the ten patients, in which cases we used a 10mm prosthetic had a favorable outcome, without the hemorrhagic recurrence and encephalopaty. The tenth patient presented an immediate postoperative cardio-respiratory arrest, after transportation the patient on the Intesive Care Unit, most likely due to the hypothermia, resuscitated after 20 minutes, and surprisingly presented no neurological or other disfunctions. However, on the basis of the cardiac failure and hypopressure induced by it, there was a immediate postoperative trombosis of the shunt and relasmpment 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 transfered in maximum safety conditions and under continous medical supervision to Szeged University Center (Hungary), where the tries to unblock the shunt and assembly a TIPS failed. However they succeeded to obtain a temporarily hemostasis by endoscopic ligature of the ruptured esophageal varices, followed by the transferation of the patient in German Clinic, where they assembled a TIPS, with favorable outcome. If the postoperative complications on the 10 mm prosthetic „H“ shunt were not due to the diametre of the shunt but to the cardiac arrest, in 6 mm prosthetic case there was a different situation. In this case, the portal system pressure was not decreased so that the hemorrhagic recurrence can be avoided; so in the fifth day after operation, a massive hemorrhagic recurrence occurred, and a Sengstaken-Blakemore tube needed 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.

A patient on which was used a 14mm diametre vascular prosthetics, developed postoperatory a progresive liver failure, through the portal vascular phenomenon of vascular portal blood steeling and a secondary liver hipoirigation. The liver failure did not respond to the drug therapy, and in the absence of the possibility for performing a liver transplant, the unfavorable evolution of the patient lead to it’s dead on the 23rd postoperative day.

Although from the intervention trauma point of view and the hepatic transplantation performing perspective on this patients, TIPS represents 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 not technial posible or failes. The other surgical treatment options for the 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 weak results and technical difficulties that generates, 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 diametre gore-tex prosthetics, represents an efficient treatment method of hemorrhages by rupture of esophageal varices, on cirrhotic patients recurrenced after after exhaustion endoscopic treatment methods and without the possibility of getting a TIPS.
References: