Saphenoperitoneal shunt for intractable ascites

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ABSTRACT

Objective: Ascites usually complicates chronic liver disease, and some patients with ascites are refractory to medical treatment. Recently, saphenoperitoneal shunt (SPS) was described to treat this condition. This procedure avoids the insertion of a foreign expensive shunt into the circulation. We present our experience with this procedure with some modification in the technique.

Methods: We performed a prospective study on 11 patients with intractable ascites admitted to the Vascular Unit, Suez Canal University Hospital, Egypt from June 2001 to October 2003. We divided the long saphenous vein approximately at 15 cm distally. We turned the proximal cut end upwards and tunneled under the skin towards the midline in the suprapubic region where we anastomosed it to the peritoneum.

Results: One patient died from liver failure 8 days after the operation. Two patients died during follow-up, one at 3 months from liver failure, and the other at 4 months from variceal hemorrhage. We lost one patient to follow up. Seven patients remained alive with patent shunt up to 6 months follow up.

Conclusion: The SPS is a safe and effective procedure in the management of intractable ascites.

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Ascites usually complicates chronic liver disease. Treatment comprises diuretics and salt restriction. However, 10-20% of patients with ascites are refractory to this treatment.[1] Previously described alternative options of treatment include the use of paracentesis with compensation, peritoneovenous shunts (PVS), transjugular intrahepatic portacaval shunting (TIPS) or surgical portosystemic shunts and finally liver transplant. All of these methods are expensive with high mortality and morbidity. Recently, Vadeyar et al[2] described saphenoperitoneal shunting (SPS), which allows ascitic fluid to flow back into the circulation when intra-abdominal pressure rises above venous pressure. This procedure avoids the insertion of a foreign expensive shunt, such as Denever or LeVeen, into the circulation. We present our experience with this procedure with some modification in the technique.

Methods. A prospective study was performed on 11 patients with intractable ascites admitted to the Vascular Unit, Suez Canal University Hospital, Egypt, from June 2001 to October 2003. The study was approved by the Local Research Ethical Committee and informed consent was obtained in each case. Patients were considered candidates for this operation when they were receiving a maximal dose of diuretic and required frequent admissions for therapeutic paracentesis. All patients had low-protein ascites (less than 1g/dl).

Preoperative assessment. All patients underwent preoperative Doppler ultrasonography to confirm patency of the long saphenous vein and competence of the saphenofemoral junction to allow flow from the superficial to the deep system. All patients received preoperative antibiotics and, in cases of coagulation

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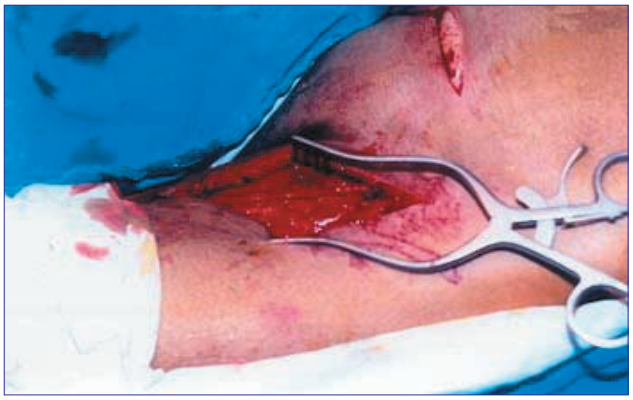

Figure 1 - Perioperative view of saphenoperitoneal shunt operation.

deficiencies, vitamin K or fresh frozen plasma was administered. On the day before surgery, the ascites was partially drained so that the abdomen was lax but still containing some fluid.

Surgical technique. All procedures were performed under local anesthesia. The long saphenous vein was exposed through a longitudinal incision from the saphenofemoral junction for approximately 15 cm distally, where it was divided. The distal cut was ligated. All tributaries of the long saphenous vein draining at the saphenofemoral junction were divided. The vein was observed to confirm that there was no backflow from the femoral vein. Heparinized saline solution was then instilled. Pfannenstiel incision and separation of recti were performed (**Figure 1**). The proximal cut end of the long saphenous vein was turned upwards and tunneled under the skin towards the abdominal incision. It was anastomosed to the cut edges of an incision in the bulging peritoneum with continuous sutures using 4/0 polypropylene. Partial drainage of the ascites on the day before operation ensured that the peritoneum was not tense during the procedure. Hemostasis was achieved, and the wounds were then closed.

Follow-up. All patients discharged from the hospital were followed up in the clinic every 6 weeks up to 6 months. At every visit, the following was checked: the abdominal girth (cm), the need for paracentesis, diuretic dose and any other complications. Duplex scan was carried out at 6 months postoperatively, or earlier if there was doubt about the patency of the shunt.

Statistical analysis. Mann-Whitney U test was performed to compare the difference between the mean preoperative abdominal girth (cm) and 6 months postoperative. Significance was set at $p<0.05$ for all comparisons. The statistical analyses were performed with the aid of SPSS-9 (Chicago, Illinois, USA) statistical analysis software.

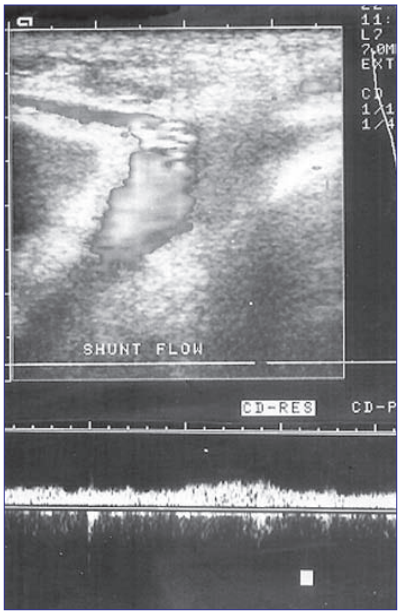

Figure 2 - Duplex scan of patent saphenoperitoneal shunt with good velocity through the shunt. No evidence of shunt stenosis or occlusion.

Results. The surgical technique was performed on 11 patients suffering from chronic liver disease (7 had hepatitis C, 2 had Bilharziasis, and 2 had both). There were 7 male and 4 female patients, and the median age was 36 years (range 25-51). One patient (9%) had developed early severe wound infection, ascitic leakage and died from liver failure 8 days after the surgery. The other postoperative complications were minor bleeding from the surgical wound in one patient (9%), and mild wound infection in 2 patients (18%). All were treated conservatively. Median length of hospital stay was 4 days (range 2-11). Two patients died during follow-up, one at 3 months from decompensated liver failure, and other at 4 months from variceal hemorrhage. One patient was lost for follow up. Seven patients remained alive with patent shunt up to 6 months follow-up. In the last 3 months before operation, paracentesis was required at median intervals of 17 days (range 11-32). In the 7 living patients who had successful surgery, only 2 paracenteses were required after operation during the follow up period. In both patients, Duplex scans documented patency of the shunts (**Figure 2**). The dose of diuretics had been reduced immediately postoperatively. At 6 months, 4 (57%) were not on any diuretic therapy, while 3 (43%) were on reduced doses. The abdominal girth reduced significantly (mean 102 cm preoperatively versus 85 cm 6 months postoperatively, $p=0.04$). There were no major complications encountered following SPS.

Discussion. The management of intractable ascites remains a therapeutic challenge. Therapeutic paracentesis is one of the best therapies,[3] and can be repeated over many months.[4] However, this requires expensive intravenous albumin replacement therapy, and renal impairment may occur. In the majority of cases, the ascites recur, requiring multiple admissions to the hospital for paracentesis. Transjugular intrahepatic portacaval shunting has been considered as an option for treatment of refractory ascites. It provides better long-term efficacy than PVS.[5] It lowers the rate of ascites recurrence as compared to paracentesis.[6] However, TIPS was shown to be associated with high mortality and morbidity and increased frequency of severe encephalopathy.[7] It has higher costs compared with repeated paracentesis plus albumin.[6] Peritoneovenous shunts[8] allow return of ascitic fluid into the circulation based on pressure gradient between peritoneal cavity with ascites and venous pressure. It was introduced by LeVeen et al[8] in 1974. Although it is effective[9] and alleviates disabling ascites more rapidly than medical management,[10] a considerable morbidity and mortality was reported with its use.[11] It has been shown to be as effective as paracentesis in controlling ascites. However, shunt occlusion was common.[12] The SPS, as performed in this study, is a purely biological shunt and has many potential advantages. Endothelium has intrinsic antithrombotic activity and should therefore significantly reduce the risk of thrombotic occlusion.[13] The first SPS was reported by Pang et al from Singapore in 1992.[14] Our study along with others showed that there was no operative mortality related to saphenoperitoneal anastomosis.[2,15-17] The main complication reported following SPS was wound infection which varies from mild to severe.[15,16,18] In our study it was mild. We found that local anesthesia was well tolerated by all patients. This is one advantage of our technique compared to others, which anastomosed the saphenous vein to the peritoneum in the posterior wall of the inguinal canal[2,15,16] under general anesthesia. The latter has predisposed to hepatic encephalopathy, which may reach up to 36%.[15] Another problem of the latter technique was that there might be potential risk of hernia formation following this operation since the internal inguinal ring was widened.[15] Most of the published series had shown excellent early and intermediate success rates with SPS.[2,14,17-19] There is documented evidence of the patency of all shunts in our series at 6 months.

In conclusion, the SPS offers all the benefits of PVS shunting without the disadvantages of using prosthetic material. It is safe, effective and suitable for the management of intractable ascites.

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