

# Surgical Shunting for Chronic Portal vein Thrombosis in non cirrhotic patients

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## ABSTRACT

**Objectives:** To determine the outcome Surgical Shunting in Patients with portal vein thrombosis.

**Methods:** A total of 20 patients were operated between Oct 2002 and Nov 2009. These patients underwent variety of surgical options available for portal vein thrombosis, depending upon individual requirements. All the patients were followed up at regular basis for outcome.

**Results:** 20 patients 12 (60%) males and 8 (40%) females were operated for portal hypertension. Mean age was 33.5 yrs. 13 (65%) patients had no obvious cause. Clinical manifestations included 10 (50%) with splenomegaly, 5 (30%) with ascites and 15 (75%) with weight loss. 75% patients were diagnosed by Doppler USG and 25% with CT scan. Ten (50%) patients underwent distal splenorenal shunt, Six (30%) had proximal splenorenal shunt and 4 (20%) had mesocaval shunting. Two patients had episode of variceal bleeding at approximately 6 months follow. One patient died due to variceal bleeding, another patient due to unknown etiology. Mean Follow up was 68.35 months (SD= $\pm$  11.62).

**Key words:** PVT, splenorenal shunt, mesocaval shunt

## INTRODUCTION

Portal vein thrombosis (PVT) is not as uncommon as had been considered. In fact some believe that there is 1% lifetime risk of PVT in general population<sup>1,2</sup>. The diagnosis can now be readily established by using Duplex, CT or MRI scans hence it is more frequently diagnosed<sup>1</sup>.

There are various causes of PVT, but whatever the cause, the sequence of events that follow are devastating and must be controlled in order to optimize the patient for definitive care. The treatment options available are solely dependent on the stage of the disease and etiology.

Patients may present with severe bleeding from esophageal or gastric varices (due to portal hypertension that invariably sets in). Ascites, abdominal spontaneous bacterial peritonitis, splenomegaly or cirrhosis may also be present. The two main types of PVT are acute and chronic<sup>3</sup>.

There are various forms of treatment modalities for PVT, these include medical and surgical. The mainstay of treatment is to minimize portal hypertension and to avoid progression of thrombosis by judicious anticoagulation.<sup>3</sup> Spontaneous recovery with re-canalization of the portal vein can be achieved in near half of the patients with anticoagulation<sup>4</sup>. The patients that do not respond to the medical therapy may require surgical intervention if they suffer from persistent complications of portal hypertension.

Variceal bleed is common and disastrous complication. Most patients respond to endoscopic intervention and pharmacological therapy<sup>1,5</sup>. Surgical options for PVT include hepatic transplant and Portosystemic shunting. The choice of procedure depends upon patients overall condition and liver status. The shunting procedures are divided into selective (splenorenal) and non-selective (mesocaval, portocaval)<sup>5</sup>. It is believed that the incidence of encephalopathy is more with non-selective shunting.

The purpose of this study is to determine the outcome of patients operated for PVT in our setup.

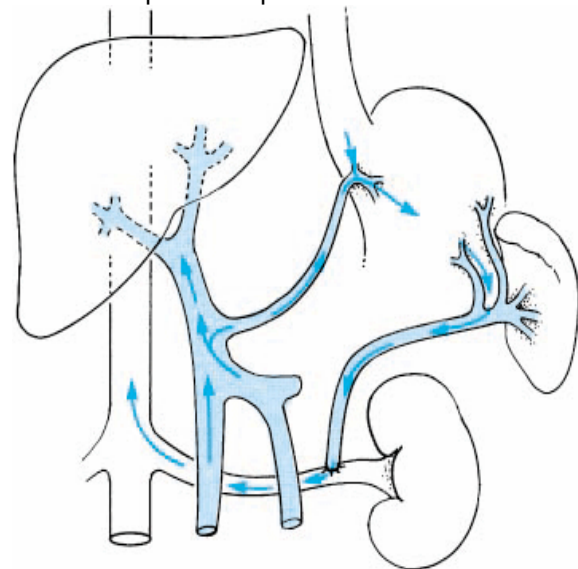


Fig 1. Splenorenal shunt (google images)

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## PATIENTS AND METHODS

This prospective study was carried out on 20 patients having chronic portal vein thrombosis (>60 days) admitted in Mayo Hospital and National Hospital and Medical center, Lahore from Oct 2002 to Nov 2009, through OPD. Informed consent was taken from the patients. All patients who did not respond to medical therapy and those who had at least two episodes of variceal bleed, requiring at least two pints of blood, and underwent endoscopy for control of bleeding in last two months, were included. Patients with cirrhotic liver, hepatocellular carcinoma and acute onset of PVT (<60 days) were excluded from the study. Patients with at least risk factor underwent baseline tests, whereas patients with no known risk factors also had thrombophilia screening (for protein C and S, Antithrombin III and lupus anticoagulant).

All patients received treatment for their active problems that included haematemesis (variceal bleeding – controlled by sclerotherapy / banding and drugs), ascites (hypoalbuminemia was corrected and paracentesis was done for few), and blood pints were arranged (at least Two). Fitness for general anesthesia was obtained. All operations were carried by experienced surgeons well acquainted with various techniques under general anesthesia. These included proximal splenorenal, distal splenorenal and mesocaval shunts. In proximal shunting splenectomy was performed followed by mobilization of splenic vein off pancreas and end to side anastomosis to left renal was done. Distal splenorenal shunting involved diverting splenic vein flow, end to side to left renal vein. Mesocaval shunt was side to side superior mesenteric vein to inferior vena cave using interposition graft. All patients received anticoagulation and prophylactic antibiotics. patients with splenectomy also received vaccination against pneumococcus, meningococcus and Hib. Follow up was done at weekly basis for first month, followed by monthly basis for next six months, and then on half yearly basis. The overall outcome in terms of encephalopathy and variceal rebleed was also noted.

## RESULTS

Twenty patients were operated for portal hypertension Oct 2002 to Nov 2009. There were 12 (60%) males and 8 (40%) females. Mean age was 33.5 yrs (SD= $\pm$ 13.02, Range 13-54). 13 (65%) patients had no obvious cause, 4 (20%) patients had history of pancreatitis, 2 (10%) patients had post splenectomy portal vein thrombosis and 1 (5%) patient had history of cholecystectomy. Clinical presentation of the patients included 10 (50%) with

splenomegaly, 5 (30%) with ascites and 15 (75%) with weight loss. Fifteen (75%) patients were diagnosed by Doppler USG and rest 5 (25%) required CT scan. All patients were CHILD A at time of surgery. Ten (50%) patients underwent distal splenorenal shunt, Six (30%) had proximal splenorenal shunt and 4 (20%) had mesocaval shunting. Post Operative recovery was uneventful in all cases with no operative mortality. Immediate shunt patency was documented to be patent in all cases by doppler scan. Two patients had episode of variceal bleeding at approximately 6 months follow up that was conservatively managed. One patient has meningitis that he recovered from with antibiotics. One patient died at 2 years due to variceal bleeding, another patient died at 28 months follow up due to unknown etiology. All patients recovered from ascites but there was one case of encephalopathy over the follow up period. Mean Follow up was 68.35 months (SD= $\pm$  11.62).

Table 1: Frequency of procedures and Post operative complications.

	Proximal Splenorenal Shunt	Distal Splenorenal Shunt	Mesocaval Shunt
Total cases	6 (30%)	10 (50%)	4 (20%)
Encephalopathy	Nil	Nil	1(5%)
Meningitis	1(5%)	Nil	Nil
Variceal bleed (Post operative)	1(5%)	2(10%)	Nil
Death	Nil	1(5%)	1(5%)

## DISCUSSION

PVT develops as a result of Variety of etiological factors both local and systemic. Apart from other investigations, screening for thrombophilia should be conducted to diagnose prothrombotic states. There is however number of patients in which no cause is sought.<sup>1</sup> In this study 65% patients had no obvious cause; rest of the patients had positive risk factors (pancreatitis, splenectomy and cholecystectomy). The types of PVT are acute and chronic. If acute PVT is left untreated, it results in chronicity. In acute presentation the patients have more features of abdominalia and fever<sup>4,6</sup>. These clinical manifestations were not seen in our study as we only included patients with chronic PVT. Rest of the clinical features were those as seen in this study i.e. ascites and variceal bleeding which are predominant in established portal hypertension<sup>1</sup>.

The radiological studies for definitive diagnosis of PVT include USG, Doppler studies, CT scan, CT angiography and MRI.<sup>1</sup> In our study, since 75% of cases were diagnosed on Doppler and the rest 25%

on CT scan, CT angiography and MRI were not performed.

The overall prognosis of PVT which ever the mode of treatment (medical or surgical) carries better prognosis without end stage liver disease or cirrhosis<sup>1,7</sup>. In this study the overall prognosis was excellent i.e. 90%. This is due to the reason that we excluded patients with cirrhosis and hepatocellular carcinoma. Orloff MJ et al<sup>8</sup> had a prognosis of 94% in their experience in patients treated for Budd Chiari syndrome with portacaval shunts.

The overall operative mortality is variable in literature. Feng LS et al<sup>9</sup> in their study reported no deaths for mesovaval shunts. Orloff MJ et al<sup>8</sup> stated the operative mortality to be 3% for portacaval shunts and Atta HM et al<sup>10</sup> reported 7.7% mortality for selective splenorenal shunts. In this study no operative deaths were encountered. Orloff MJ et al<sup>8</sup> reported shunt patency of approx 97%. In our series we had shunt patency of 100% that was confirmed by Doppler scanning.

According to Feng LS et al<sup>9</sup>, the incidence of rebleeding from varices post operatively was 3% and that of encephalopathy was 4%. In our study we had three patients with late variceal bleeding (15%). Two patients survived but one died before reaching hospital. However the incidence of encephalopathy in this study was similar (5%) to that of Feng et al. Dang XW<sup>11</sup> also stated rate of 5.6% encephalopathy after mesocaval shunts. Feng et al<sup>9</sup> stated 2% deaths over their follow up period (1-7 years), but death rate in our patients was 10% over a mean follow up of 68.35 months.

According to Orloff MJ et al<sup>8</sup>, their patients remained free of ascites and had normal liver functional test. Similar findings were seen in this study.

## CONCLUSION

PVT is not a rare disease but it carries serious complication if left untreated. The surgical options for PVT are not simple to carry out because of the complexity of the procedures, but they carry a good prognosis when performed at right time. All the procedures carry certain risks (e.g. encephalopathy) but the procedure choice is dependent on the

patient's condition. Variceal bleeding is a serious complication that requires urgent management and monitoring.

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