

Surgical Management of Portal Hypertension: Experience at a Medical College Hospital in South India

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ABSTRACT

Introduction: Portal hypertension in the presence of cirrhosis of liver carries poor prognosis. The medical management along with endoscopic therapy helps to reduce bleeding. Surgery is reserved for patients who fail medical therapy. Patients with portal hypertension with good functioning liver benefit from surgery. Study aimed to evaluate the results of surgical treatment for portal hypertension at our center Karnataka Institute of Medical Sciences Hubli, Karnataka.

Material and methods. This was a prospective observational study. There were 34 patients undergoing surgical treatment for various presentations of portal hypertension during the period of 2015 to 2019. They were analyzed for demographics, etiology, presentation, various surgeries and outcome. The data was entered into Microsoft excel sheet and analyzed.

Results: Of the 34 patients males were most common. Variceal bleeding was most common presentation followed by painful splenomegaly and anemia. 'Extrahepatic portal vein obstruction' was the leading cause of non-cirrhotic portal hypertension followed by 'non cirrhotic portal fibrosis' and 'left sided or sinistral portal hypertension'. Proximal linorenal shunt was the most common procedure followed by splenectomy with esophagogastric devascularization. The morbidity and mortality were very low and yielded durable satisfactory outcome.

Conclusion: The surgery for non-cirrhotic portal hypertension has durable and satisfactory results and can be done with minimal morbidity and mortality at trained hands. For few selected cirrhotic patients surgery in the form of devascularization or shunt offers immediate relief from bleeding and gives time for future transplant if any.

Keywords: Surgery for Portal Hypertension, Shunt Surgery, Extrahepatic Portal Vein Obstruction, Non Cirrhotic Portal Hypertension.

INTRODUCTION

A large number of patients suffer from portal hypertension (PHT) related problems. Some have normal liver and can have a near normal life expectancy unless threatened by an emergency bleeding. Non-surgical treatment with endo therapy either variceal banding or injection of sclerosant into esophageal varices is often effective but requires repetitive follow up and treatment. This makes the patient and relatives anxious. Many of our patients come from villages with scarce medical facilities. One-time treatment with surgery where feasible is desired and accepted. Study aimed to evaluate the results of surgical treatment for portal hypertension at our center Karnataka Institute of Medical Sciences Hubli, Karnataka.

MATERIAL AND METHODS

Prospectively collected data of 34 patients who underwent surgical procedure for problems related to portal hypertension from September 2010 to May 2019 was analyzed. The demographic data and symptoms assessed. The imaging was done with Ultrasonography with Doppler study of the portal vein and hepatic veins and in few cases an additional CT scan or MRI scan was done. Gastroduodenoscopy was done to document varices. Patients had complete blood counts and peripheral smear, prothrombin time, renal and liver function tests and tests for Hepatitis B and Hepatitis C. Patients were given immunization against pneumococcal, meningococcal and H. Influenza B organisms.

All procedures were done using left thoracoabdominal incision through 8th or 9th intercostals space. The lone portacaval interposition graft was done through right subcostal incision. The incision deepened to divide abdominal muscles and intercostal muscles over the upper border of rib below. The diaphragm divided between ligatures. The lesser sac opened by dividing gastro colicomentum. The splenic artery ligated in continuity. The short gastric divided between ligatures. The linorenal ligament divided by thoroughly cauterizing with bipolar diathermy. The spleen lifted up. The Splenic vein mobilized for a length of approximately 4 cm. The spleen removed. Few small veins connecting the splenic vein to pancreas divided between 4-0 silk ligatures.

The renal vein explored in the renal hilum and circumferentially dissected. A side occluding vascular clamp applied in preparation for linorenal shunt. The end of splenic vein anastomosed to side of renal vein with 6-0 polypropylene suture continuous to complete the shunt.

When shunt is not planned or not feasible either because splenic vein is too small or friable, esophagogastric devascularization was done. All patients had liver wedge and needle biopsy. Aintercostals drain and abdominal drain routinely placed. Patients given active physiotherapy and ambulation and started orally on post-operative day one.

Patients had regular follow up at 15 days, one month and 3

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monthly for one year and later as clinically indicated.

STATISTICAL ANALYSIS

All data was entered into Microsoft excel worksheet. The results were tabulated for better presentation.

RESULTS

The clinical and laboratory parameters are as in Table 1. Majority were male young patients in their 20s. Variceal bleed was the most common presentation (58.8%) followed by painful splenomegaly (44%), anemia (20.5%) and

	n=34
Male: Female	24:10
Age	Mean=29.8 years (14 to 52 years)
Anemia without GI bleed needing transfusion	7 (20.5%)
Painful splenomegaly	15 (44%)
Variceal bleed (Hematemesis/Malena)	20(58.8%)
Gum bleed/ nasal bleed	7(20.5%)
Growth retardation	12(35.2%)
Hemoglobin	Mean= 6.7gm/dl) (Range 4 to 9 gm/dl)
Platelet count	Mean =50,000/mm ³ (Range (24000 to 1.4 Lakh)
Leucocyte count	Mean 3200 cells/mm ³ (Range 1200 to 4000)
Pancytopenia	32(94%)

Table-1: Clinical and lab character

Cause of portal hypertension	n	Type of procedure
Extrahepatic portal vein obstruction (EHPVO)	16	Splenectomy and Linorenal shunt=12 Splenectomy and devascularization=4
Non cirrhotic portal fibrosis (NCPF)	11	Splenectomy and Linorenal shunt=10 Splenectomy and devascularisation= 1
Cirrhosis Child A	2	Splenectomy and Linorenal shunt=2
Cirrhosis Child B	1	Splenectomy and devascularization=1
Budd Chiari syndrome	2	Splenectomy and Linorenal shunt=1 Portacaval 'H' Graft=1
Left sided portal hypertension	2	Splenectomy alone=1 Distal pancreatectomy with splenectomy=1

Table-2: The Etiology and the surgical procedures.

Operative time	Mean 300 min (200 min to 480 min)
Blood loss	Mean 1200 ml (Range 500 to 2000 ml)
Blood transfusion	Needed in 12 patients
Hospital stay	Mean 10 days. (5 days to 15 days)

Table-3: Operative Characters

Complications	n	Comments
Operative Mortality	1	One patient with portacaval 'H' graft died from severe hypotension
variceal bleed	4	2-Had bleed during hospital stay and managed with banding. 2-Had variceal bleed after more than one year. One was following shunt for EHPVO, one following shunt for Child B cirrhosis
encephalopathy	2	Shunt was done for cryptogenic cirrhosis with massive variceal bleed in both one in emergency setting.
Incisional hernia	1	Underwent mesh repair.
Progression to CML	1	This patient had high platelet count and needed hydroxyurea to control platelet count. She had one episode of pulmonary thromboembolism despite platelet control and later diagnosed as CML
fever	12	5- due to basal atelectasis 5- transfusion related 2- canula site thrombophlebitis
Follow up	Mean=12months (Range 0 to 8 years)	Patients with EHO and NCPF have good relief of symptoms in the follow up and generally can be followed less frequently.
Lost to follow up after discharge	12	
Lost to follow up after 6 months	6	

Table-4: Complications and follow up

mucosal bleed. Stunted growth was noted in 35% patients however it was not the presenting complaint. Pancytopenia involving two or all three cell lines was common. None of the patients were positive for Hepatitis B or Hepatitis C.

The operative procedure varied as in Table 2. Splenorenal shunt was the most common procedure (73.5%) followed by splenectomy and esophagogastric devascularization (17.6%). Of the 14 shunt procedures two were done in emergency for ongoing uncontrolled variceal bleeding. One patient had portacaval interposition 'H' graft with autologous internal jugular vein graft. One patient with left sided portal hypertension with phlegmon in the tail of pancreas from underlying pancreatitis had distal pancreatectomy with splenectomy.

The surgical procedures were generally long and lasted 4 to 6 hours. Most patients tolerated blood loss well and transfusions were needed in 35% of patients. (Table 3)

Postoperative fever was the most common complication (35%). Two patients who had undergone shunt had variceal bleed before discharge and had endoscopy and band ligation. In the later follow up they had significant variceal regression and no rebleed.

Twelve patients were lost to follow up after discharge. Six patients have been lost to follow up after 6 months. Among

14 patients who had followed with endoscopy after 6 months twelve had regression of varices with only few residual reticular varices. All these twelve patients had linorenal shunt surgery. All had good Hemoglobin and normalization of blood counts. They did not need repeat hospitalizations and were very satisfied with surgery and returned to gainful occupations. One patient who had splenectomy and devascularization for EHPVO without shuntable splenic vein had repeat variceal bleed after one year and had multiple sessions of band ligation. One patient who had splenectomy and devascularization for cryptogenic cirrhosis had no bleed for 7 years and later presented with variceal bleeding and is now on regular endotherapy. Two patients who had shunt surgery with cirrhosis went on to develop encephalopathy and died at two years follow up (Table-4).

DISCUSSION

The management of portal hypertension depends to the most part on the status of liver. Those with liver cirrhosis especially late child B and C are generally considered poor risk cases for any surgical intervention other than liver transplant. They are managed with medical therapy in addition to endoscopic band ligation or sclerotherapy for esophageal varices. A group of patients with portal hypertension are having normal functioning liver and are candidates for surgical intervention. The common among them are Extrahepatic portal venous obstruction (EHPVO or in short EHO), Non cirrhotic portal fibrosis (NCPF), Hepatic vein outflow obstruction (HVOTO, or Budd Chiari syndrome). Splenic vein thrombosis from pancreatitis, Arteriovenous malformation from splenic artery, and some indolent idiopathic or cryptogenic cirrhosis also contribute to this list.

EHPVO is thought to arise from portal vein thrombosis sometimes in infancy or childhood.¹ Although umbilical sepsis is held to be one of the reasons many patients lack history of umbilical sepsis and hence may happen denovo due to some coagulation abnormalities.² Portal vein cavernoma is also postulated to develop as a congenital malformation of portal vein.³ Clinically they are usually young in their teen age and have moderate to very large spleen. They have usually history of very well tolerated variceal bleed. some of them have history of jaundice from unconjugated hyperbilirubinemia probably some form of Gilbert syndrome.

Non cirrhotic portal fibrosis is a condition where in the liver is having normal functions and on imaging has altered echo texture although liver size is normal. The spleen is often very large or massive [Figure 1]. They are middle aged with fairly normal liver function including normal prothrombin time and normal serum albumin. Only intra op assessment and liver biopsy with histopathology help to confirm the diagnosis.

Proximal splenorenal shunt (PSRS) (Figure 2) gives relief from recurrent variceal bleed and from painful splenomegaly. It also helps recover some of stunted growth and delay in sexual maturation usually seen in EHO patients.⁴ Portal biliopathy is a dreaded complication of EHO where in

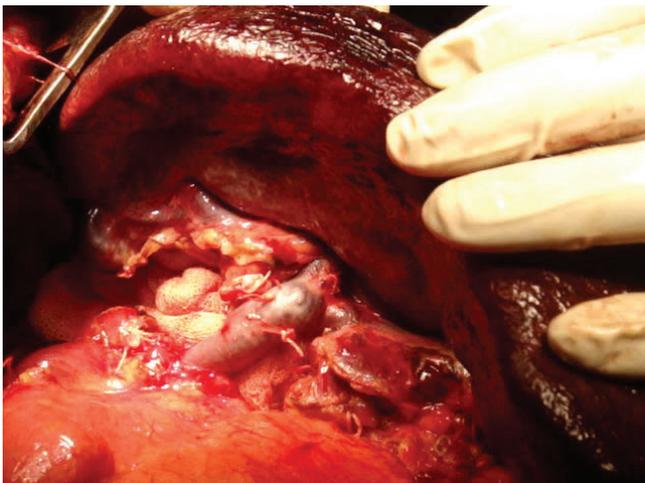


Figure-1: Massive splenomegaly

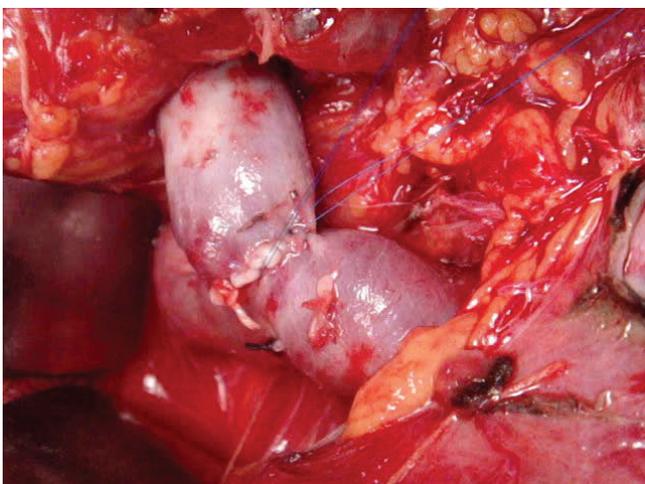


Figure-2: Proximal Linorenal Shunt.

there is obstructive biliopathy from portal cavernoma and ischemic changes in bile ducts and can only be palliated to some extent with shunt surgery.^{5,6} Lack of shuntable veins due to splenic vein thrombosis precludes possibility of lienorenal shunt in some EHO patients. TIPS or trans jugular portosystemic shunt is a radiological procedure but needs frequent reintervention in order to prolong shunt patency⁷ and largely used for temporary respite from bleeding and ascites and buy time till transplant is arranged. Thus, it is not advisable in NCPF patients because they will live near normal lifespan without need for transplant. Shunt surgery provides them one time and permanent solution.

Devascularisation is less effective in preventing variceal bleed compared to shunt. devascularisation is to be considered if patient has high risk of encephalopathy due to cirrhosis or has low grade varices and has never bled previously as in some NCPF patients. Whenever shunt is not feasible, either due to technical reasons like splenic vein thrombosis, not finding a renal vein for shunting or damage to splenic vein preventing safe shunt surgery one has to go for devascularisation.

In our series two cirrhotics had shunt surgery because they had recurrent massive hemorrhage and were unwilling to go to higher center for either TPS or transplant, One was 65 year old male with cryptogenic cirrhosis or possibly arising from steatohepatitis and had no family support. Another was 16-year-old boy and again found to have cryptogenic cirrhosis and had to undergo surgery in emergency because he had in hospital massive bleeding despite endotherapy. Both had good control of variceal bleed following shunt surgery. However, they developed encephalopathy at two years. One patient was 12-year-old and had underlying Budd Chiari syndrome and underwent shunt because he was having ongoing bleed and was in hypotension. With no resources for TIPS or transplant and nearest high-end facility being at least 400 Km away we had no options but to operate. Shunt surgery can be done safely in early cirrhotics and buys time for future transplant similar to TIPS.

CONCLUSION

Portal hypertension is a heterogenous disease. Proximal lienorenal shunt is a useful procedure to address both hypersplenism and portal hypertension. In selected good risk patients with cirrhosis especially Child A and early ChildsB, with recurrent variceal bleeding despite endotherapy, surgery remains an option especially in our patients with no access to TIPS or transplant although devascularization is another option with lesser efficacy in control of bleeding.

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