

*Indexed Journal***International Journal Of Medical Case Reports****Doppler Evaluation of Patency of LR Shunt in Extra-Hepatic Portal Venous Obstruction**

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E-mail- [mkkhare69@gmail.com](mailto:mkkhare69@gmail.com), Mobile-91-9425282782**ABSTRACT**

In western countries, cirrhosis of the liver accounts for more than 90% cases of portal hypertension. In India, extrahepatic portal venous obstruction (EHPVO) is responsible for about one third cases of adults and more than half of the cases in children as a cause of portal hypertension. EHPVO is an important cause of non-cirrhotic portal hypertension in third world countries. The most common site of block is at the portal vein formation [90%] and total block of spleno-portal axis is seen in 10% of cases. The high incidence of mortality and morbidity associated with the disease in spite of surgery, necessitates that a regular follow up of the patients for shunt patency is needed to plan out remedial measures.

**KEYWORDS:** Extrahepatic portal venous obstruction, Doppler Sonography, LR Shunt, Portal hypertension, Shunt Patency

## INTRODUCTION

EHPVO is the commonest cause of portal hypertension in children and young adults, presenting as unexplained gastro-intestinal bleeding. Other features include normal liver texture in USG with obstructive jaundice due to extra-hepatic compression of bile duct by cavernous collaterals, splenomegaly, splenic hilar collaterals & ascites. Cavernous transformation of portal vein usually occurs to maintain the flow to liver.

With the availability of diagnostic facilities and effective endotherapy, the mortality due to EHPVO related emergencies has become rare. But with increasing survival, the sequelae and related morbidities are rising. The evolving surgical interventions have raised the hope of averting the long term complications of EHPVO.

## CASE REPORT:

A Female child of 8 years, was admitted with complaints of abdominal pain. The

last episode of hematemesis was one year back, total 6 episodes so far, She has received EVBL twice. On Admission Her GC was fair, pulse 80/minute, regular; BP 100/60 mm Hg, Respiration rate was 26/minute, Physical examination revealed that CVS, RS & CNS were normal, Her body weight was 20 kg, Splenic enlargement (10 cm) was present. Hemoglobin was 8.8 gm%, RBC  $3.67 \times 10^6/\text{mm}^3$ , Leucocytes  $11 \times 10^3/\text{mm}^3$ , Differential WBC N-56%, L 40%, E-2%, M-2%, BT 2 min 15 sec, CT 5min 35sec, platelets  $143 \times 10^3/\text{mm}^3$ , Prothrombin time: control 13 sec, Test 18 Sec, Ratio 1.38.

Blood group O +ve, Sickling was negative.

Total bilirubin : 0.5 mg/dL, Direct 0.25 mg/dL, Indirect 0.25 mg/dL; Total proteins 7.33 Gm/dL, Alb 4.3 Gm/dL, Globulin 3.02 Gm/dL, AG ratio 1.42. SGOT 30 IU/L, SGPT 26 IU/L.

Stool test was normal; Occult blood in stool was negative. Urinalysis was normal.

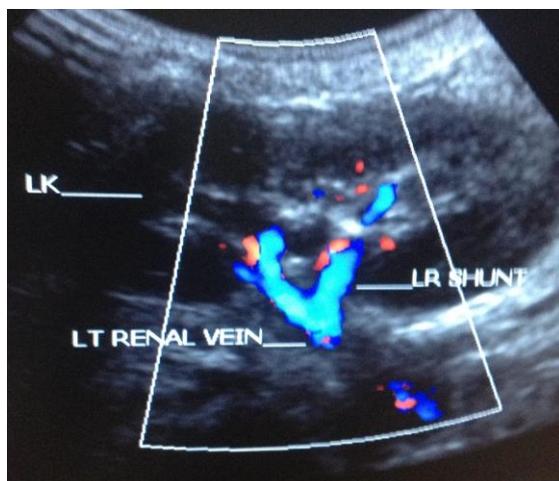
Pre-operative abdominal ultrasound

revealed splenomegaly (16 x 7.9 cm) with dilated splenic vein measuring 8 mm in diameter.

During surgery, splenic vein was harvested from the hilum up to the length 7 cm, Renal vein was isolated. Retro-peritoneal End to side splenorenal anastomosis was done.

Postoperative Doppler evaluation revealed patent LR shunt( Fig 1).

**Fig 1: Patent LR shunt on colour flow mapping**



With normal flow direction & velocity of blood flow 19.1 cm/sec (Fig 2).

**Fig 2 : Patent LR Shunt 7<sup>th</sup> post-operative day with mean velocity of 19.1 cm/sec.**



### DISCUSSION:

Extra-hepatic portal venous obstruction is one of the most common entities wherein shunt surgery is performed with success.

EHPVO in India is usually found in young patients from lower socio-economic strata. These children mainly present with a massive upper GI bleed, a big spleen or hypersplenism<sup>1</sup>. The aim of surgical porto-systemic shunts is to reduce the portal venous pressure to maintain hepato-petal blood flow and above all not to have a high incidence of the feared complication of encephalopathy<sup>1</sup>.

In India, the expertise to provide effective variceal obliteration is more widely

available than that for shunt surgery. The choice of surgical procedure depends on the pathological process and its effect on the child. Even when indicated, all children cannot be subjected to shunt surgery. About 20% are unfit for a shunt surgery<sup>2</sup>.

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Different types of shunt surgery procedures are available.

Proximal spleno-renal shunt (Linton): The splenic vein is divided close to the spleen and the mesenteric vein is sutured to the side of the left renal vein; so that all blood from the SMV and IMV is shunted into the systemic circulation through the left renal vein. It invariably includes splenectomy. Hence it is a popular choice in India

particularly for patients with EHPVO with large symptomatic splenomegaly and hypersplenism<sup>2</sup>.

A.K. Sharma et al<sup>3</sup> in a series of 98 patients between the age of 4 and 12 years performed splenectomy and proximal end to side Lieno-renal ( Linton's) shunt provided the splenic vein available was <4mm in diameter and the liver function was not deranged. A wedge and needle biopsy of the liver was done only if there was any gross evidence of nodularity of liver at operation.

Excellent long term results of proximal lieno-renal shunt (PLRS) with splenectomy in 160 children was reported with re-bleeding rate of 11% and 95% actuarial survival at 15 years by life-table analysis<sup>2,4</sup>.

Imaging of spleno-portal axis is the mainstay for the diagnosis of EHPVO. Ultrasound (US) is a reliable non-invasive diagnostic tool with a high degree of

accuracy for the detection of blockage in splenoportal axis and portal portal cavernoma, and is the investigation of choice. Ultrasound may also indicate about the liver pathology and portal biliopathy.

USG in 90% children reveals a block at the formation of the portal vein. In the remaining, either the entire spleno-portal axis is thrombosed or the block lies in the hilum of the spleen, giving rise to left sided or “segmental” portal hypertension<sup>4</sup>.

Doppler Sonography<sup>5</sup> is the best method for determining shunt patency during follow-up of such patients. Prior to development of Doppler system, shunt patency was documented by selective angiographic studies. The newer diagnostic tools such as CECT, DSA and MRI have reduced the impact of angiography. However, the high costs, skilled technicians and back-up team required to handle these sophisticated gadgets may not be available in all hospitals even in urban areas. Doppler

sonography is an excellent tool for routine follow-up of post-operative patients of porto-systemic shunts<sup>5</sup>.

The shunt anatomy i.e. site, size and function is very well demonstrated on ultrasonography. Shunt patency, however, should not be inferred without direct visualization of the shunt<sup>6</sup>.

Patriquin et al<sup>7</sup> compared Color Doppler study (CDS) with clinical, angiographic and surgical findings in children with porto-systemic shunts. The presence and direction of flow in the splanchnic system were determined in all children obviating the need for further angiographic studies.

#### **CONCLUSION:**

Splenectomy & LR shunt is a safe and effective one-time treatment in children with EHPVO which deals with both GI bleeds and hypersplenism. Re-bleeding even after shunt blockage is rare. Doppler sonography is a safe & convenient tool to evaluate patients of EHPVO prior to surgery as well as to confirm shunt patency following surgery. It should be

used as the primary modality for follow-up such patients.

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