



Assessment of Quality of Life after Proximal Spleno Renal Shunt surgery for Non Cirrhotic Portal hypertension at a Tertiary care centre.

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Abstract

Background: Non-cirrhotic portal hypertension (NCPH) is a significant cause of portal hypertension in developing countries, commonly presenting with variceal bleeding and hypersplenism. Proximal splenorenal shunt (PSRS) is an established surgical option; however, data on postoperative quality of life (QOL) remain limited. **Aim:** To assess quality of life and incidence of rebleeding following PSRS in patients with NCPH at a tertiary care center. **Methods:** This retrospective observational study was conducted using a prospectively maintained database of 30 patients who underwent PSRS between 2011 and 2020. Patients with EHPVO and NCPF were included. Clinical outcomes, hematological parameters, and QOL were assessed. Quality of life was evaluated using the SF-36 questionnaire before surgery and during follow-up. Statistical analysis was performed using standard methods, with $p < 0.05$ considered significant. **Results:** The mean age of patients was 28 ± 10.5 years, with a female predominance. Following PSRS, there was complete resolution of hematemesis and melena, with no episodes of rebleeding during a median follow-up of 60 months. Significant improvement was observed in hemoglobin levels, leukocyte counts, and platelet counts ($p < 0.0001$). QOL assessment showed a highly significant improvement across all SF-36 domains, including physical functioning, emotional well-being, social functioning, pain, energy, and general health ($p < 0.0001$). **Conclusion:** PSRS is a safe and effective surgical intervention in patients with NCPH, resulting in excellent control of variceal bleeding and significant improvement in quality of life. It offers a durable, single-step therapeutic option in indicated patients.

Keywords: Non-cirrhotic portal hypertension; Proximal splenorenal shunt; Quality of life; SF-36; Variceal bleeding; Hypersplenism; EHPVO; NCPF.



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INTRODUCTION

Portal hypertension is defined as an elevation in portal venous pressure and typically results from obstruction to portal venous blood flow at the prehepatic, intrahepatic, or posthepatic level (1) In Western countries, cirrhosis is the most common underlying etiology. (2) In contrast, in the Indian setting, non-cirrhotic causes account for a substantial proportion (40–50%) of portal hypertension, particularly among younger patients. Important non-cirrhotic etiologies include extrahepatic portal venous obstruction (EHPVO), non-cirrhotic portal fibrosis (NCPF), and hepatic venous outflow tract obstruction (HVOTO), collectively grouped as non-cirrhotic portal hypertension (NCPH). (1)

This population represents a major economically productive age group and the disease burden is disproportionately higher in lower socioeconomic strata. Although patients with NCPH often tolerate variceal bleeding better than those with chronic liver disease (CLD) due to preserved hepatic function, mortality may still occur from complications such as recurrent rebleeding and hypovolemic shock. Proximal splenorenal shunt (PSRS) surgery for bleeding varices may offer an effective single-step strategy to prevent rebleeding while also correcting hypersplenism and splenomegaly, with acceptable

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morbidity and mortality.(3) Given the need to evaluate PSRS outcomes in our setting in a structured manner, this study was undertaken to assess postoperative outcomes and quality of life following PSRS.

Aim and Objectives

1. Assessment of Quality of Life after Proximal Spleno Renal Shunt surgery for Non Cirrhotic Portal hypertension at our centre which is a Tertiary care referral centre
2. To Assess the incidence of gastro intestinal bleed (Re bleed) after proximal spleno renal shunt surgery.

MATERIALS AND METHODS

This study was conducted after approval from the Institutional Ethics Committee of Nizam's Institute of Medical Sciences (NIMS), Hyderabad. A retrospective observational analysis was performed using a prospectively maintained database of patients who underwent proximal splenorenal shunt (PSRS) surgery in the Department of Surgical Gastroenterology between 2011 and 2020. A total of 30 patients were included in the study. Inclusion criteria comprised patients with non-cirrhotic portal hypertension due to extrahepatic portal venous obstruction (EHPVO), non-cirrhotic portal fibrosis (NCPF), or portal biliopathy who underwent elective or emergency PSRS. Patients with chronic liver disease and those who underwent mesocaval or distal splenorenal shunts were excluded.

Preoperative evaluation included detailed clinical history, physical examination, and laboratory investigations such as complete blood count, liver and renal function tests, coagulation profile, and imaging with abdominal ultrasound and Doppler studies to assess shunt patency. Upper gastrointestinal endoscopy was performed when indicated. Liver status was assessed using the Child–Turcotte–Pugh score. Clinical parameters of hypersplenism, growth indices (in patients <16 years), and comorbid conditions were recorded. Quality of life was assessed using the SF–36 questionnaire preoperatively and during follow-up. Standard postoperative outcomes were evaluated, and appropriate statistical analysis was performed.

Statistical analysis :

Statistical analysis was performed using Graph pad prism version 9.1.2 (226) and Microsoft Excel. Continuous variables were presented as mean $\pm$ standard deviation for normally distributed data and median with interquartile range for non parametric data and categorical variables were presented as absolute numbers and percentages. At first, univariate analysis was performed using unpaired t-test for normal data and Mann-Whitney test for non parametric data for all the continuous variables and Chi square test for the categorical variables. $P < 0.05$ considered as statistically significant. □ Wilcoxon signed rank test was used to compare the variceal grades before and after surgery.

RESULTS

In the present study, a total of 40 patients with NCPH were screened, to enroll 30 patients, who underwent PSRS from 2011 to 2020. All of them were operated for recurrent upper GI bleeding and for symptoms of splenomegaly and hypersplenism. The demographic and clinical profile of the study population is shown in Table.

The distribution of data was checked for normality before statistical analysis.

Baseline demographic profile of the study population

Sl: No	Parameter	Mean $\pm$ standard deviation /median (interquartile range)
1.	Age (years)	28 $\pm$ 10.5
2.	Gender Male, n (%) Female, n (%)	11 (36.6) 19 (63.3)
3.	Height (cms)	154 (143, 160)
4.	Weight (kg)	43 $\pm$ 12.3
5.	BMI (kg/m ²)	18.7 $\pm$ 2.7
6.	Diagnosis – NCPF, n (%) EHPVO, n (%)	5 (16.6) 25 (83.3)
7.	Duration of symptoms before surgery (years)	3 (2,4)
8.	Duration from shunt surgery (months)	60 $\pm$ 22.2
9.	Elective PSRS	28 (93.3%)
10.	Emergency PSRS	2 (6.67%)

- 1) Age distribution: The mean age of the study population was 28 ± 10.5 years.
- 2) Gender Distribution: There were 11 males and 19 females included in the study. There was a female preponderance (female: male = 1.7: 1).
- 3) BMI: The mean BMI of the study population was in the range of 18.7 ± 2.7 kg/m².
- 4) Type of Diagnosis: Out of the 30 patients included, 5 were diagnosed with NCPF and the rest 25 were having EHPVO.
- 5) Duration of Disease: The median duration from diagnosis of the disease to surgery was found to be 3 years.
- 6) Duration from shunt surgery: The median duration of post shunt surgery follow up in this study is 5 years (60 months).
- 7) Elective and Emergency surgeries: The elective surgeries accounted for the majority, 28 out of 30 cases (93.3%). Emergency surgeries accounted only for 2 cases (6.67%) which were indicated for massive uncontrollable gastrointestinal bleeding.

Pre-operative clinical profile of the study population

Sl:No	Parameter	Mean $\pm$ standard deviation / median (interquartile range)	Laboratory normal values (according to NIMS laboratory)
1.	Haemoglobin (g/dl)	6.7 (6.4,7.5)	13 - 17
2.	Total leucocyte count (per cumm)	1850 (1375, 3425)	4000 - 10000
3.	Platelet count (lakhs per cumm)	30000 (20000, 40000)	150000 – 400000
4.	Urea (mg/dl)	26.5 (24, 29.25)	13 -40
5.	Creatinine (mg/dl)	0.71 ± 0.24	0.7 – 1.3
6.	AST (U/L)	77.9 ± 18.4	≤ 35
7.	ALT (U/L)	77.9 ± 17.2	≤ 40
8.	ALP (U/L)	124.9 ± 30	≤ 130
8.	Total bilirubin (mg/dL)	0.9 (0.8, 1.1)	≤ 1.1
9.	Conjugated Bilirubin (mg/dl)	0.5 (0.4, 0.8)	≤ 0.2
10.	Total protein (g/dl)	7.2 (6.4, 7.3)	6 – 8.0
11.	Albumin (g/dl)	3.6 (3.2, 4.2)	3.5 – 5.2
12.	INR	1.05 (0.9, 1.1)	1.0
13.	Child – Turcotte – Pugh Score	6 (5,6)	Child A: score 5-6 (Well compensated) Child B: score 7-9 (significant functional compromise) Child C: score 10 -15 (decompensated)

PRIMARY OUTCOMES

- 1) HEMATEMESIS: All the 30 patients (100%) had hematemesis in the pre- operative period. After surgery none of the patients reported to have hematemesis.
- 2) MELENA.

Preoperatively, 26 (86.7%) of patients had complained of Melena. After PSRS, all the 30 patients reported relief from Melena. This improvement was found to be highly statistically significant. ($p < 0.0001$).

SECONDARY OUTCOMES

Hypersplenism Parameters

- a) Symptoms and signs: Before surgery, half of patients had massive splenomegaly and the other half had moderate splenomegaly and all had one or the other symptom or sign of hypersplenism namely, recurrent epistaxis, gum bleeding, menorrhagia, pallor etc. These symptoms improved drastically in all patients following splenectomy, which is performed as a part of PSRS. Pain relief: In the pre-operative period, all the 30 patients had pain due to moderate to massive splenomegaly. After PSRS, all the patients reported relief of pain.

- b) Improvement in the blood counts (Haemoglobin, Total leucocyte count and Platelet count) : Haemoglobin, total leucocyte count, platelet count were done for all the patients before and after surgery. Pre-operatively majority of the patients were having severe anemia, leucopenia and thrombocytopenia. Post-operatively, in all the patients, there was improvement of anemia and normalization of leucocyte count and majority showed normal platelet count. There was highly significant improvement in hemoglobin, total leucocyte count and platelet count, post shunt surgery

QUALITY OF LIFE ASSESSMENT BY SF – 36 QUESTIONNAIRE

Comparison of the quality of life scores before and after PSRS assessed by SF- 36 questionnaire is shown in Figure: 18 in the next page. It demonstrated highly significant improvement in the scores ($p < 0.0001^*$) post surgery in each of the domains namely physical functioning, role limitation due to physical health and emotional problems, energy/ fatigue, emotional well being, social functioning, pain and general health. This indicated that the quality of life of patients who underwent shunt surgery improved significantly compared to their pre – operative status.

DISCUSSION

EHPVO and NCPF constitute 20- 30% of cases of portal hypertension in developing countries like India (4). EHPVO is the most common cause of PHT in children from the developing world(5). The majority of patients with these conditions present with variceal bleeding. In addition, significant morbidities arise from hypersplenism, portal biliopathy, growth failure and ectopic varices. Management of these patients is therefore not restricted to treatment of variceal bleeding alone. Shunt surgery is a safe and effective procedure that not only prevents variceal bleeding but also takes care of other morbidities associated with EHPVO/NCPF. It is a good one time treatment option for patients with limited access to blood transfusion facilities and endoscopic therapy(4). PSRS has been shown to be effective in not only preventing variceal bleeding but also in managing associated hypersplenism and portal biliopathy(6). But at times, there can be some short term and long term complications reported to manifest after PSRS namely, infections (OPSI – Overwhelming Post Splenectomy Infection), recurrence of GI bleeding presenting as hematemesis and melena, shunt stenosis or thrombosis etc. Hepatic encephalopathy is a long term complication and rarely nephropathy and myelopathy can also occur, both of which are unpredictable and irreversible. According to Anand et al (3) , PSRS is more suitable in NCPH patients due to the associated massive splenomegaly causing discomfort, pain, and hypersplenism, which is not reversed completely after distal splenorenal shunts. Though the results of EVL / EST are good for oesophageal varices, endoscopically treating the gastric varices is a challenge for clinicians. Endoscopic variceal obliteration (EVO) requires 4 -10 sessions over 8 - 20 weeks for complete obliteration of varices. In many centers, there is a significant reduction in the number of patients undergoing glue therapy due to financial constraints and poor accessibility for patients from remote places. PSRS, being a single step procedure with minimal morbidity, can be a better alternative for these patients. Furthermore, EVO has many technical difficulties (para-variceal injection, intraperitoneal injection, leading to peritonitis etc) or complications (fever, bleeding, embolization into the renal vein or systemic vessels etc).(3)

In our study, we studied the outcomes of 30 patients who underwent PSRS in NIMS hospital in the past 10 years (2011 – 2020). The mean age of study population was found to be 28 ± 10 years, with female preponderance (63.3%). The median duration of symptoms before surgery was observed to be 3 years (range 2 – 8 years) and the median duration of follow up period, post surgery was observed to be 60 ± 22 months. In a study by Saluja et al, where 40 patients with NCPF were studied, the median age of the study population was 27.9 years (range 8-55 years) and there were 33 females (82.5% females). In this study, median duration of symptoms at time of presentation was 3 years (range 1-14 years) and median duration of follow up was 42 months (12 - 72 months). The age, median duration of symptoms before surgery and duration of follow up after shunt surgery, in our study corroborate with above results. However, we are unable to comment upon the gender distribution, because ours is a referral center (though it may give some clue regarding the gender pattern).

In our study, there were no episodes of hematemesis or melena after PSRS in any of the patients. According to Pande et al (33), the rebleeding rates of esophageal varices are low in patients of NCPH treated with proximal splenorenal shunts. In the study by Anand et al (5), in patients with a mean follow-up period of 3.4 years, the rebleeding rate was only 10% and was successfully managed by endoscopic therapy. It was concluded that, PSRS was effective in controlling gastric variceal hemorrhage in 92% (23 of 25) of patients with preserved liver function. Quality of life (QoL) has become an established endpoint of medical care , and the efficacy of a therapy must be assessed in terms of patient function, sense of well being and not only prolongation of life.(5).QOL assessment would help to direct specific intervention and select optimal therapy in these cases.

In our study, we assessed QOL of 30 patients before shunt surgery and after a median post surgery follow up of 3 years. To the best of our knowledge, this is first study using SF 36 questionnaire for assessment of QOL among patients undergoing PSRS. In our study, there was highly significant improvement in the SF - 36 scores ($p < 0.0001^*$) after shunt surgery in each of the domains compared to the pre – operative scores. The median scores of the domains were ranging between (15 – 45) pre – operatively, which increased significantly to scores ranging between (60 – 77.5), which indicates

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that there is great improvement in quality of life post shunt surgery. In children with EHPVO the quality of life is affected due to the following reasons. 1) Repeated episodes of bleeding 2) Associated complications and morbidities 3) Growth retardation 4) Undergoing diagnostic and therapeutic procedures.(7) Compared with controls, patients with EHPVO had lower median QOL scores in physical, emotional, social, and school functioning health domains.(5)

Children with EHPVO have a poor QOL that is not affected by variceal eradication. We have noticed repeated hospital admissions and multiple endoscopic procedures in these patients before surgical intervention. These patients had low QOL scores pre-operatively, which got improved significantly after PSRS. On multivariate regression analysis, splenic size and growth retardation were also found to be independent predictors that affect the QOL. After surgery, a trend toward improvement in physical, psychosocial, and total QOL scores was observed, but it was not significant(5). This could be due to a short time interval (median 1.0 year, range 0.1– 5.5 years) between surgery and QOL assessment, parental anxiety after a major surgery causing voluntary limitation of the child's activities, such as play and school attendance and smaller number of subjects in the post surgery group. Repeated assessment on a long term follow-up may help to clarify this aspect(5,7). This is a retrospective study, so there is always chance of recall bias while eliciting some pre – operative data which is unrecorded in the database. Therefore, the retrospective information given by patients in some aspects may not be accurate. Other limitation is smaller sample size of our study due to the ongoing covid pandemic during the study period. QOL assessment with larger numbers gives better results. There is separate tool to assess quality of life in paediatric patients which is parent proxy Paediatric Quality of Life Inventory (Peds QL) (7). In our study, although the surgery was done during pediatric age in a few patients, the assessment was done in the recent past when they have become adolescents. So we didn't use this specific pediatric QOL tool in our study.

CONCLUSION

In conclusion, PSRS significantly improved quality of life, as demonstrated by higher SF-36 scores across physical, emotional, and social domains, along with pain, energy, and general health. No recurrence of gastrointestinal bleeding was observed during follow-up, indicating durable efficacy. These outcomes likely reflect careful patient selection, meticulous surgical technique, and a multidisciplinary approach. PSRS thus represents a safe and effective treatment option for patients with NCPH when appropriately indicated.

Limitations of this study :

The small sample size and retrospective design may limit the generalizability of the findings and introduce potential bias. Being a single-center study, the results may not reflect the wider population. Additionally, the follow-up period may be insufficient to detect late complications, and the use of a generic quality-of-life tool may not capture disease-specific concerns.

REFERENCES

1. Shivraj Bahadur Singh, Vivek Mangla, Sujoy Pal. Non Cirrhotic Portal Hypertension. In: Textbook of Surgical Gastroenterology - P K Mishra. First Edition. NewDelhi: Jaypee Brothers Medical Publishers; p. 878–94.
2. Rajekar H, Vasishta RK, Chawla YK, Dhiman RK. Noncirrhotic portal hypertension. *J Clin Exp Hepatol*. 2011 Sep;1(2):94–108.
3. Anand U, Kumar R, Priyadarshi RN, Parasar K, John AG. Proximal Splenorenal Shunt Surgery for Bleeding Gastric Varices in Non-Cirrhotic Portal Hypertension. *Cureus*. 12(9):e10464.
4. Mishra PK, Patil NS, Saluja S, Narang P, Solanki N, Varshney V. High patency of proximal splenorenal shunt: A myth or reality ? – A prospective cohort study. *International Journal of Surgery*. 2016 Mar 1;27:82–7.
5. Krishna YR, Yachha SK, Srivastava A, Negi D, Lal R, Poddar U. Quality of life in children managed for extrahepatic portal venous obstruction. *J Pediatr Gastroenterol Nutr*. 2010 May;50(5):531–6.
6. Saluja SS, Kumar A, Govind H, Varshney VK, Khullar R, Mishra and PK. Splenectomy with endotherapy in non-cirrhotic portal fibrosis related portal hypertension: Can it be an alternative to proximal spleno-renal shunt? *Annals of Hepato-Biliary-Pancreatic Surgery*. 2020 May 31;24(2):168–73.
7. Dr Thanuja Anand S, Dr Dheivamani Nirmala, Dr Bavanandam Sumathi. Quality Of Life In Children With Extrahepatic Portal Venous Obstruction In A Tertiary Hospital, Paripex - Indian Journal Of Research(PIJR), PIJR | World Wide Journals [Internet]. [cited 2021 Dec 25]. Available from: <https://www.worldwidejournals.com/paripex/article/quality-of-life-in-children-with-extrahepatic-portal-venous-obstruction-in-a-tertiary-hospital/MTAxNTA=?is=1>.