Section: General Surgery

Case Series

A CASE SERIES ANALYSIS OF MODIFIED SAPHENOPERITONAL SHUNTING FOR REFRACTORY ASCITES: OUR CENTRE EXPERIENCE

Rajeshwar Yadav[1], Aditya Sharma[2], Swati Pathak[1]

[1]Assistant Professor, Department of Cardiothoracic & Vascular Surgery, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India.
[2]Junior Resident, Department of General Surgery, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India.

Received : 20/04/2024
Received in revised form : 04/06/2024
Accepted : 20/06/2024

Keywords:
Intractable Ascites, Peritoneovenous Shunts (PVS), Chronic Liver Disease, Peritoneovenous Shunts, Complications.

Corresponding Author:
Dr. Rajeshwar Yadav,
Email: yadav.rajeshwar@gmail.com

DOI: 10.47009/jamp.2024.6.3.142

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (3); 692-695

Abstract

Background: Intractable ascites has never been easy to manage. When it comes to the surgical management of intractable ascites in individuals with liver cirrhosis, peritoneovenous shunts (PVS) are crucial. Many shunting technique adjustments have been made over decades. Here, we discuss our experiences using this simple, safe, and efficient approach. The lengthy saphenous vein serves as a drainage system in this instance. The saphenous orifice contains a natural valve that ensures one-way ascites flow. The primary objective of this study was to evaluate the efficacy of modified peritoneovenous shunts for refractory ascites. **Materials and Methods:** A retrospective analysis of all patients admitted over a 6-year period between January 2013 to December 2019 for intractable ascites was done. We reviewed the clinical records of the patients who fell under the inclusion criteria; within this period, 18 patients were evaluated. Their routine investigations, liver function tests, ascitic fluid examination, doppler patency for checking the patency of the long saphenous vein, type of anesthesia, and the outcomes following the procedure were evaluated. **Result:** The patients had a mean age of 38.6 years with male preponderance (male: female ratio: 2:1), the surgical procedure was completed successfully in all the 18 patients. The reduction in the daily dose of diuretics was observed in all the patients over a median 6-month postoperative period. Three patients developed shunt occlusion and 2 patients developed infection at the local site following the procedure within the one week of the procedure. **Conclusion:** In majority of the patients, who underwent the procedure symptomatic relief was observed from ascites and three months after the operation, the urinary output, nutritional status and Child–Pugh scores had improved, with some patients developing complications following the procedure. Further studies will larger sample size may be required to substantiate the results of this study.

INTRODUCTION

Patients with decompensated liver cirrhosis may experience a hazardous complication termed refractory ascites.[1] Although saphenous-peritoneal shunting is a viable surgical option for its alleviation, it frequently results in an increased risk of groin infections. It is evident that PVS requires a one-way valve in the shunt to stop bleeding back into the peritoneal cavity in order to function properly.[2] This method depends on the long saphenous system's valves functioning properly. The mainstay is a one-way outflow of ascitic fluid into the venous circulation caused by a positive pressure gradient between the ascitic fluid and venous pressure.[2,3]

MATERIALS AND METHODS

Aims & Objectives

The primary objective of the present study was to evaluate the efficacy of modified peritoneovenous shunts for refractory ascites.

Study Design: This was a retrospective, descriptive case-series study.

Study Setting: The study was carried out in the Department of General Surgery, Mahamaya Rajkiya Allopathic Medical College, Ambedkarnagar a teaching hospital (Dr Ram Manohar Lohia Awadh University, Uttar Pradesh, India) from January 2013 to December 2019.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Study Population: A total of 18 patients with intractable ascites were evaluated. The medical records of the patients with intractable ascites of all age groups and genders who were admitted to the general surgical wards during the study period, including those who attended the emergency and surgical wards or had been transferred from other hospital wards during the study period, were analyzed.

Recruitment Procedure: A retrospective analysis of all patients admitted over a 6-year period between January 2013 to December 2019 for intractable ascites was done. We reviewed the clinical records of the patients who fell under the inclusion criteria; within this period, 18 patients were evaluated. Their routine investigations, liver function tests, ascitic fluid examination, doppler patency for checking the patency of the long saphenous vein, type of anesthesia, and the outcomes following the procedure were evaluated. The patients with malignant and chylous ascites were excluded.

Preoperative Assessment: The incidence of viral hepatitis, the use of diuretics, and the state of paracentesis were among the factors evaluated. Prior to surgery, Doppler ultrasonography was performed on each patient to confirm the patency of the long saphenous vein and saphenofemoral junction. Preoperative laboratory assessments comprise the following: bodyweight, abdominal circumference, hepatic coma grading, Child-Pugh score, daily urine production, urinary sodium output, total serum bilirubin and albumin concentrations, international normalized ratio, and activated prothrombin time. The ascites was partially drained the day before the surgery, leaving the abdomen lax but still partially filled with fluid. Perioperative antibiotics were given to every patient.

Modified Surgical Technique: General anesthesia was used for the procedures. Along the medial aspect of the thigh and the inguinal region, two incisions of about 5 cm in length were made. The exposed inguinal canal allowed for the identification and meticulous isolation of the protruding peritoneum at the inguinal ring. To make the following procedure easier, a cut was made in the muscle fibres lateral to the internal ring. All of the branches of the larger saphenous vein that drain at the saphenofemoral junction were split and ligated, and the vein itself was visible. Heparinized saline solution was then injected after the vein was examined to make sure there was no backflow from the femoral vein. There was a subcutaneous tunnel created in between the two lines of incision. The greater saphenous vein's cut end was directed upward and toward the internal ring via the subcutaneous tunnel. It was then anastomosed to the cut edge of the incision in the protruding peritoneum using continuous sutures made of 6/0 polypropylene. This process made it easier to conduct the anastomosis and stopped the peritoneum incision from enlarging in the event that the ascitic fluid was suddenly released. After herniorrhaphy, the external oblique aponeurosis was closed to restore hemostasis and reconstruct the inguinal canal. After that, the wound was closed [4].

Postoperative Assessment: Preoperative laboratory evaluations were carried out again in outpatient settings three months following the shunt placement. Percutaneous colour Doppler ultrasonography was used to track the patency of the shunt after surgery.

Ethical Considerations: Ethical approval for the retrospective studies is not required or waived off by the Institutional Ethical Board.

RESULTS

One week following implantation, thirteen individuals had patent shunts. The demographic profile of the patients has been shown in detail in [Table 1].

The remaining three patients experienced wound shunt occlusion, and two of them also experienced ascites leaking and localized infection. Five days was the average length of stay in the hospital (range: 4–9 days). Paracentesis had been needed three months before to the operation, on average every 12 days (range: 10–44 days). All patients received an immediate halving of their preoperative diuretic dosage as a matter of policy. Additional adjustments were made based on each patient's clinical reaction to diuretics.

Spironolactone was prescribed at a dose of 200 mg per day (range: 150–250 mg per day) for three months prior to surgery and 100 mg per day (range: 50–200 mg per day) for three months following the procedure. After a 12-month follow-up, seventeen patients were still alive. One patient died during follow-up, attributed to septicemia. After completing antiviral therapy successfully after eight months, one of these patients had a successful orthotopic liver transplant. Six months later, the patient was still doing well, and the modified saphenous peritoneal shunt did not jeopardize the treatment. Infections of the groin wound were observed in two patients. Ascites leaks and wound haemorrhages were the most common related problems. Seven days after the operation, three patients experienced ascites leaking due to the shunt blockage. For two to three days, all patients had their surgical wounds directly compressed using Gamjee pads and adhesive tapes. During follow-up, which occurs one week after the procedure, three patients had shunt obstruction observed. The details of post operative dose of diuretics required by patients has been elaborated in [Table 2].

In the current study, no patient experienced clinically significant coagulation abnormalities or thrombotic consequences. After the shunt was formed, no patient experienced bouts of systemic infection or leg edema at the surgical site. Three patients developed shunt occlusion and 2 patients developed infection at the local site following the procedure within the one week of the procedure. After a year, none of the

ISSN (O): 2687-5365; ISSN (P): 2753-6556

patients experienced an inguinal hernia. The details of complications have been mentioned in [Table 3]. Three months after the modified procedure, there was a rise in the amount of urine produced and the concentration of serum albumin. The comparison of various scores and biochemical parameters is shown in detail in [Table 4].

Table 1: Demographic profile of the studied population.

Age (years)	Number of Patients	Percentage (%)	Male: Female
<9	1	5.55%	1:0
10-19	2	11.11%	1:1
20-29	1	5.55%	1:0
30-39	7	38.88%	5:2
40-49	2	11.11%	2:0
50-59	3	16.66%	2:1
>60	2	11.11%	1:1

Table 2: Dose of diuretics required and adjusted for the patients after the procedure.

Post Operative Day	Dose of diuretics required and adjusted for the patients after the procedure Dose (mg/day)					
	50	100	200	300	400	Not Required
<2 weeks	*	01	02	11	04	*
2-4 weeks	*	02	10	06	*	*
1-2 month	06	08	02	02	*	*
3-4 month	08	08	02	*	*	*
3-6 month	14	02	02	*	*	*
6-8 month	15	02	01	*	*	01
8-12 month	15	01	*	*	*	02

[* No Observation]

Table 3: Types of complications associated with the procedure in our patients.

Complication	Number of Cases
Shunt Occlusion	03
Local Site Infection	02
Thrombotic Events	*
Systemic Infection	*
Limb Edema	*
Inguinal Hernia	*

[* No Observation]

Table 4: A table showing comparison of various biochemical parameters and scores in the treated patients before and after shunt placement.

Parameter	Before Shunt	After Shunt	P Value
Bodyweight (kg)	68.38 ± 8.13	71.43 ± 5.94	NS
Abdominal girth (cm)	97.47 ± 12.73	90.61 ± 11.09	<0.05
Total bilirubin (mg/dL)	2.48 ± 1.76	2.35 ± 1.64	NS
Serum albumin (g/dL)	2.61 ± 0.34	3.06 ± 0.32	<0.05
Daily urine volume (mL)	1467.5 ± 603.5	2182.5 ± 988.3	<0.05
International normalized ratio (INR)	1.24 ± 0.16	1.27 ± 0.19	NS
Child−Pugh score	8.14 ± 1.24	6.64 ± 1.15	<0.05
Activated prothrombin	11.34 ± 1.09	12.33 ± 1.13	NS

NS: Not Significant

DISCUSSION

One major issue is the management of ascites linked to chronic liver disease. Diuretics and therapeutic paracentesis are two common medical therapies for treating ascites, but they are ineffective in 5–10% of cases. Orthotropic liver transplantation is the most logical course of treatment and provides the biggest benefit. A surgical anastomosis of the greater saphenous vein to the peritoneal cavity is performed as the second line of therapy for the management of refractory ascites with PVS. PVS cannot function well without a one-way valve in the shunt and its competency.[5,6]

Prior to the procedure, this was evaluated using Doppler ultrasonography, which has an accuracy of roughly 88%. If back-bleeding in the long saphenous vein be detected during this assessment, building the shunt would be an unwise decision.[7] Inguinal hernias and refractory ascites are frequently linked. Herniorrhaphy should be done during the modified surgery so that no recurrence of hernia is observed during follow-up.[8,9] Perhaps as a result of the short follow-up period, the patients' liver and renal functions did not significantly improve in the current study after the treatment. Urine quantities increased markedly, and there was an improved trend in renal function.[10] This implies that renal function may benefit from the operation. After surgery, serum albumin concentrations rose three months later, suggesting short-term improvements in nutritional status.[11] At follow-up, there was a decrease in

ISSN (O): 2687-5365; ISSN (P): 2753-6556

bodyweight and belly circumference, which suggested improved quality of life due to fewer respiratory and gastrointestinal problems. Reduced Child-Pugh scores may also result from decreased ascites and increased albumin concentrations.[10,12,13] The most crucial elements in deciding on the best medical care are greater benefits and fewer drawbacks.[14] Refractory ascites can be released using a variety of shunt techniques.[15,16] Still, there aren't many issues with saphenous-peritoneal shunts, like infections in the groin area.[17] In addition to preventing this issue, our improved shunt helped the current patients' quality of life, nutrition, and urine output all significantly improve. This new method does, however, require more experience and practice.[18,19] To determine its genuine effectiveness, more randomized studies with a larger number of patients and comparisons with different peritoneum-venous shunt techniques are required.

CONCLUSION

In summary, the most crucial elements influencing the choice of medical treatment are more benefits and fewer side effects. PVS, which uses the patient's own saphenous vein, is a straightforward and advantageous procedure. Our patient's reduced dosage of diuretics, avoidance of paracentesis, and decreased body weight all showed that the ascites had been successfully controlled after the shunt. In order to determine its genuine effectiveness, studies on a larger scale will be required.

REFERENCES

1. Reichen J. Are diuretics in the treatment of portal hypertension rational? Schweiz Rundsch Med Prax 1997; 86: 583-589.
2. Vadeyar HJ, Doran JD, Charnley R, Ryder SD. Saphenoperitoneal shunts for patients with intractable ascites associated with chronic liver disease. Br J Surg 1999; 86: 882-885.
3. Gines P, Arroyo V, Vargas V, Planas R, Casafont F, Panes J, et al. Paracentesis with intravenous infusion of albumin as compared with peritoneovenous shunting in cirrhosis with refractory ascites. N Engl J Med 1991; 325: 829-835.
4. Chen, J.-H., Liu, H.-D., Yu, J.-C., Chen, C.-J., Shih, M.-L., Liu, Y.-C. and Hsieh, C.-B. (2005), Modified saphenous−peritoneal shunt in refractory ascites: new technique. ANZ Journal of Surgery, 75: 128-131.
5. Rosemurgy AS, Zervos EE, Clark WC, Thometz DP, Black TJ, Zwiebel BR, et al. TIPS versus peritoneovenous shunt in the treatment of medically intractable ascites: a prospective randomized trial. Ann Surg 2004; 239: 883-889.
6. Gines P, Uriz J, Calahorra B, Garcia-Tsao G, Kamath PS, Del Arbol LR, et al. Transjugular intrahepatic portosystemic shunting versus paracentesis plus albumin for refractory ascites in cirrhosis. Gastroenterology 2002; 123: 1839- 1847.
7. Thuluvath PJ, Bal JS, Mitchell S, Lund G, Venbrux A. TIPS for management of refractory ascites: response and survival are both unpredictable. Dig Dis Sci 2003; 48: 542-550.
8. LeVeen HH, Christoudias G, Ip M, Luft R, Falk G, Grosberg S. Peritonea-venous shunting for ascites. Ann Surg 1974; 180: 580-591.
9. Bernhoft RA, Pellegrini CA, Way LW. Peritoneovenous shunts for refractory ascites: operative complications and long-term results. Arch Surg 1982; 117: 631-635.
10. Stanley MM, Ochi S, Lee KK, Nemchausky BA, Greenlee HB, Allen JI, et al. Peritoneovenous shunting as compared with medical treatment in patients with alcoholic cirrhosis and massive ascites. Veterans Administration Cooperative Study on Treatment of Alcoholic Cirrhosis with Ascites. N Engl J Med 1989; 321: 1632-1638
11. Soderlund C. Denver peritoneovenous shunting for malignant or cirrhotic ascites. A prospective consecutive series. Scand J Gastroenterol 1986; 21: 1161-1172.
12. Gines A, Planas R, Angeli P, Guarner C, Salerno F, Gines P, et al. Treatment of patients with cirrhosis and refractory ascites using LeVeen shunt with titanium tip: comparison with therapeutic paracentesis. Hepatology 1995; 22: 124-131.
13. Fishman AP. Endothelium: a distributed organ of diverse capabilities. Ann NY Acad Sci 1982; 401: 1-8.
14. Pang AS, Low JM, Ng BK. A successful peritoneovenous shunting of ascites using the great saphenous vein. Ann Acad Med Singapore 1992; 21: 701-704.
15. Deen KI, de Silva AP, Jayakody M, de Silva HJ. Saphenoperitoneal anastomosis for resistant ascites in patients with cirrhosis. Am J Surg 2001; 181: 145-148.
16. Utikal P, Drac P, Bachleda P, Klein J, Kral V, Hrabalova M. Peritoneovenous shunt - modification with the use of long saphenous vein. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub 2004; 148: 89-90.
17. Vizsy L, Beznicza H, Batorfi J. [Experience with saphenousperitoneal shunts in the treatment of intractable ascites] Orv Hetil 2004; 145: 479.
18. Chen JH, Liu HD, Yu JC, Chen CJ, Shih ML, Liu YC, et al. Modified saphenous-peritoneal shunt in refractory ascites: new technique. ANZ J Surg 2005; 75: 128-131.
19. Bara T, Bancu S. [Peritoneo-saphenous shunt for the treatment of ascites] Chirurgia (Bucur) 2004; 99: 567-569.

ISSN (O): 2687-5365; ISSN (P): 2753-6556