Peritoneovenous Shunt in Treatment Of Intractable Ascites Due to Liver Cirrhosis

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Contents

Abstract

Intractable ascites carries great morbidity. Management of intractable ascites has always been a challenge. Peritoneovenous shunt (PVS) plays a major role in the surgery for intractable ascites in patients with liver cirrhosis. Positive pressure gradient between the ascitic fluid and venous pressure leading to one-way drainage of ascitic fluid into venous circulation is the mainstay.

Because of significant expenses and complication rates of traditional pumps (Le Veen, Denver) used in the surgical treatment of refractory ascites a simple and cheap operative method has to be found. In saphenoperitoneal shunts the one-way flow is maintained by biologically given double saphenous valves. Peritoneovenous shunt is not only improving the nutritional status of cirrhotic patients with refractory ascites but also improving their quality of life. Infections and obstructions decreased in the short term. However, long-term follow up is mandatory.

The aim of this study is throwing light on the current situation of the controversial issue of surgical treatment of ascites. The points to be covered include indications, contraindications, preparation, technique, post operative care and results. Key words: ascites, cirrhosis and peritoneovenous shunt.

Keywords:

Peritoneovenous Shunt
Intractable Ascites
Liver Cirrhosis

List of abbreviations

- BUN: Blood urea nitrogen.
- CM: Centimeter.
- CRE: Creatinine.
- DIC: Disseminated intravascular coagulopathy.
- EACA: Epsilon amino caproic acid.
- ECG: Electrocardiography.
- LMWH: Low molecular weight heparin.
- MAA: Macro-aggregated albumin.
- MCI: Millicuries.
- PC: Prothrombin concentration.
- PSC: Post-shunt coagulopathy.
- PT: Prothrombin time.
- PTT: Partial thromboplastin time.
- PVS: Peritoneovenous shunt.
- Tc: Technetium.
- TIPS: Trans-jugular intrahepatic porto-systemic shunt.

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INTRODUCTION AND AIM OF WORK

Introduction

Ascites is the most common complication in patients with decompensated liver cirrhosis. Approximately 50% of patients with compensated liver cirrhosis will develop ascites over a 10 year period. This occurrence is an important milestone in the natural history of end stage liver disease because only 50% of patients survive 2-5 years after the onset ***(Saadah and Davis, 2004).***

In patients with ascites due to liver cirrhosis salt restriction and diuretics are the mainstays of therapy and these measures are effective in approximately 90% of patients. Large volume paracentesis can be used in patients with refractory ascites ***(Saadah and Davis, 2004).***

About 5% of patients with liver cirrhosis develop massive refractory ascites. These patients cease to respond to diuretic therapy. There is a small but definite role for Peritoneovenous shunt in these patients ***(Marimuthu et al., 2004).***

Denver peritoneovenous shunt seems to have a lower failure rate and a lower incidence of complications than LeVeen peritoneovenous shunt. Thus the Denver shunt offers advantages in the treatment of intractable ascites ***(Lund and Moritz, 1982).***

Peritoneovenous shunt might be beneficial in patients with refractory ascites waiting for liver transplantation and could prevent acute renal failure ***(Dumortio et al., 2005).***

Because of significant expenses and complication rates of the traditional pumps (LeVeen and Denver) used in treatment of refractory ascites, a simple and cheap operative method is used by doing saphenoperitoneal shunt which improves the quality of life with minimal negative operative effects without the adverse effects of insertion of a foreign material ***(Vizsy et al., 2005).*** Creating a saphenoperitoneal shunt with a skin graft tube interposition is a novel, safe and cost-effective technique of resolving the problem of refractory ascites ***(Lasheen et al., 2007).***

In 1984 Scholz et al., said that placement of the peritoneovenous shunts for refractory ascites has a high morbidity and mortality in patients with advanced liver disease, and doesn't support their use in the management of refractory ascites, on the contrary***, Abbas et al., in 2007*** proved that Denver shunt offers a good palliation as it increases urine output, decreases abdominal girth and body weight with more patient fitness and satisfaction.

Aim of the work

This will be a review of literature that aims at throwing light on the current situation of the controversial issue of surgical treatment of ascites. The points to be covered include indications, contraindications, preparation, technique, post operative care and results.

REVIEW OF LITERATURE

CHAPTER 1

ASCITES

Pathophysiology of Ascites

Ascites is the end result when the rate of conversion of plasma to peritoneal fluid exceeds the rate of reabsorption from the peritoneal cavity; physiologic therapy demands the return of this fluid to the plasma volume ***(Le Veen, 1985).***

In cirrhotic patients, altered renal function plays a key role in the production of cirrhotic ascites. Internists have long been aware that the renal excretion of sodium is impaired in these patients. Such renal retention of sodium is thought to precede the development of ascites ***(Le Veen, 1985 and Wapnick et al., 1979).***

Lieberman et al. in 1969 postulated that the renal retention of sodium occurred prior to any hemodynamic changes that could account for salt retention by the kidney. On the other hand, ***Epstein in 1979*** proved that hemodynamic changes are the real cause of salt retention and that these hemodynamic changes are secondary to a deficit in the circulating blood volume. Volume receptors in the right atrium are stimulated by stretch. This stimulation causes diuresis.

Prognosis in ascites

There is real concern about surgery in cirrhotic patients since it can precipitate liver failure. Without surgery, patients usually succumb to renal failure with rising blood urea nitrogen and creatinine. In cirrhotic ascites, the medical mortality has improved only slightly since 1948 when ***Ratnoff & Patek*** in 1942 predicted that 70% of the patients would be dead in less than two years.

Death in cirrhosis with ascites is caused by renal failure rather than liver failure. About 71% of cirrhotics with ascites succumb to renal failure. The failure rate is not improved by intermittent volume expansion brought about by infusions of plasma or ascitic fluid ***(Clermont et al., 1967).***

The cause of death in many patients with ascites is iatrogenic. Diuretics permit the physician to so reduce the plasma volume that renal function undergoes irreparable damage caused by under-perfusion. Hepatorenal syndrome is a type of functional renal failure that progresses rapidly to acute tubular necrosis from which recovery is unlikely ***(Le Veen, 1985 and Vesin, 1975).***

The depressing prognosis of ascites is really the expression of the excessive conversion of body plasma into ascitic fluid; volume depletion then becomes inevitable, and logic suggests that this fluid be returned to

the plasma from whence it arose. This is the primary object of the peritoneovenous (PV) shunt. All patients with ascites, regardless of etiology, respond to peritoneovenous shunt. The correction of ascites is life-saving and not only cosmetic. If the mortality rate from surgery is minimal, it is better to err on the side of surgery rather than risk a nearly certain mortality from medical therapy ***(Le Veen, 1985).***

Refractory Ascites

Definition

The term refractory ascites was introduced in the 1950s as a general term defining ascites that could not be satisfactorily managed by medical therapy; it was better defined approximately a decade later with the introduction of loop diuretics and spironolactone.

Arroyo et al. in 1996 said that a proposed definition of refractory ascites is as follows: ascites that cannot be mobilized or the early recurrence of which (after therapeutic paracentesis) cannot be satisfactorily prevented by medical therapy. It was then further proposed that refractory ascites includes 2 different subtypes.