

Laparoscopic Ventral Hernia Repair in Patients with Child C Cirrhosis: Our Experience

Bharati V Hiremath, Nitin Rao, Bharathi Raja

ABSTRACT

Cirrhosis with refractory ascites was considered a contraindication to laparoscopic surgery,¹ until recently. However, current literature has shown the efficacy and safety of various laparoscopic procedures in the diagnosis and management of surgical conditions in cirrhotic patients. The incidence of ventral hernias in cirrhotic patients with tense ascites is high. It is well known that open hernia repair in patients with ascites is associated with high morbidity and mortality due to ascitic leak from wound site, wound infection and high recurrence rate.^{2,3} In view of high complication rate for surgical repair in these patients most surgeons defer elective repair of hernias in these patients. But, left alone ventral hernias in such patients may undergo complications, such as rupture, obstruction, strangulation, which are life-threatening. Hence, elective surgical repair of ventral hernias in these patients should be considered. Laparoscopic ventral hernia repair in these patients helps to overcome the complications and allows earlier recovery. There have been very few studies to evaluate the efficacy of laparoscopic ventral hernia repair in patients with child A cirrhosis. However, there is no literature on efficacy of this procedure in child C cirrhotic patients. This is a retrospective study to evaluate the efficacy of laparoscopic repair using a dual mesh in child C cirrhotic patients with tense ascites and complicated ventral hernias.

Keywords: Laparoscopic ventral hernia, Cirrhosis, Mesh repair.

How to cite this article: Hiremath BV, Rao N, Raja B. Laparoscopic Ventral Hernia Repair in Patients with Child C Cirrhosis: Our Experience. *World J Lap Surg* 2012;5(2):59-62.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Cirrhosis is a chronic progressive condition which is characterized by fibrosis and the replacement of normal hepatic architecture by abnormal nodules.⁴ The physiologic and metabolic changes in these cirrhotic patients lead to coagulation defects, fluid retention, poor resistance to infections, hypoproteinemia, poor wound healing which in turn lead to increased perioperative morbidity and mortality. Though several indices have been proposed for estimating the risk in cirrhotic patients the child classification modified by Pugh et al is the most widely accepted and commonly used in practice.⁵

The incidence of ventral hernia is high in patients with cirrhosis due to weak abdominal musculature and raised intra-abdominal pressure due to ascites. Umbilical hernias are more common due to transmission of additional pressure

to the umbilicus via portosystemic venous communication.⁶ The incidence of ventral hernias in cirrhotic patients with tense ascites is around 20%.⁷

Studies have shown that open repair of ventral hernias in these patients is associated with a high rate of recurrence in the era of only suture repair. However, in the present era of prosthetic mesh though the recurrence rate has decreased the rate of wound complications still remains high.⁶

Hence, the routine repair of these hernias is usually avoided due to the dreaded complications such as postoperative ascitic fluid leak, wound infection and subsequently high recurrence rate. But when these patients present with complications, such as obstruction or imminent rupture surgery become inevitable and the rate of postoperative complications in such situations remains very high.

In order to overcome these complications, we subjected these patients to intraperitoneal laparoscopic hernia repair with the use of a dual mesh.

The advantages of this procedure are as follows:

- Not extending the existing defect in the fascia as is required in the open repair.
- The use of intraperitoneal dual mesh prevents leakage of ascitic fluid.
- The large collateral veins over the anterior abdominal wall in these patients are not interrupted.
- Prevention of exposure of viscera prevents losses of electrolytes and proteins.
- There is minimal intraoperative blood loss.

PATIENTS AND METHODS

Retrospective analysis was done in three patients, two with ascites due to cirrhotic liver disease (child C) and in one patient with Budd-Chiari syndrome. Patients who were included were those with tense ascitis and symptomatic hernias which required surgical intervention (Fig. 1).

These patients had symptoms in the form of pain, obstruction, large hernia with skin excoriation with imminent rupture (Fig. 2).

Technique

Preoperatively the patients were optimized with:

1. Mannitol infusion
2. Correction of prothrombin time with vitamin K and fresh frozen plasma.



Fig. 1: Ventral hernia



Fig. 3: Laparoscopic ports

Single incision laparoscopic surgery (SILS) technique was used in one patient. Only two ports were used in two of the cases.

First, a 10 mm port was inserted in the left hypochondrium (palmas point)–by open technique and ascitic fluid was completely drained (Fig. 3). This was compensated with intraoperative albumin infusion. After draining the ascitic fluid pneumoperitoneum was created. A second 5 mm port was inserted in the left iliac fossa. Intraoperatively, the hernia was identified, contents were reduced and the sac was left *in situ*. The defect was measured intraoperatively and a dual mesh was placed. In our study, the defect size ranged from 2 to 8 cm. The mesh was sized to be 4 cm beyond the defect on all sides.

Dual mesh was used in all the cases. The mesh was secured using polygalactol sutures at the center and polypropylene sutures at the four corners by transfascial

stitches using a Gucci needle and rest of the mesh was fixed using tackers. Meticulous closure of the 10 mm port site was done under vision, using Gucci needle. Prophylactic and postoperative antibiotics were used to prevent infection. Strict aseptic precautions were followed which included use of antimicrobial incise drape in all cases and change of gloves prior to mesh insertion. None of the cases required conversion to open repair.

DISCUSSION

The incidence of ventral hernias in patients with cirrhosis is high accounting to around 20%.⁷ This is due to increased intra-abdominal pressure exerted against an attenuated umbilical ring and fascia.⁸ In patients with chronic liver disease the immune response is poor and the presence of foreign body may cause increased rate of postoperative wound infections. The extension of the defect, high infection rate due to decreased immune response and increased intra-abdominal pressure in the immediate postoperative period due to refilling of ascites all leads to high leak rates, nonhealing of wounds and high chances of recurrence.

The elective repair of umbilical hernia in cirrhotic patients with tense ascites has long been a subject of debate.⁹

In a study conducted by Telem et al to determine optimal management and outcome after umbilical herniorrhaphy in patients with advanced cirrhosis and refractory ascites, a total of 21 patients were included. Mortality rate was 5%, and morbidity was 71%, and follow-up at 36 months showed a 20% mortality rate.

Another study conducted by Youssef YF et al evaluated the outcome of elective mesh repair of umbilical hernia in cirrhotic ascitic patients. There was a postoperative ascitic



Fig. 2: Marking of the margin

leak rate of 15%, wound infection of 25% and recurrence rate of 10%.

These studies quoted above show that the morbidity and mortality of open hernia repair in cirrhotic ascetic patients is high.

When ventral hernias in patients with ascites have been left untreated there have been reports of rupture and evisceration of omentum due to massive ascites. A sudden increase in intra-abdominal pressure due to vomiting, coughing or even straining at stools can cause the rupture of an umbilical hernia.¹⁰ Signs of discoloration, ulceration or sudden rapid increase in size of the umbilical hernia are features of impending rupture. Hence, to avoid this dreaded life-threatening⁷ complication elective hernia repair should be planned in all cirrhotic ascitic patients with umbilical hernia.

Safety of laparoscopic surgery is still a debate in cirrhotic patients and was previously considered a contraindication due to associated coagulation defects, portal hypertension immunosuppression and technical difficulties due to massive ascites.

However, a few recent studies have shown that laparoscopic ventral hernia repair is safe in cirrhotic ascitic patients with lesser morbidity and mortality as compared to open method.

The minimally invasive and tension-free technique decreases the postoperative pain, shortens recovery and reduces postoperative morbidity and recurrence.¹¹

Laparoscopy has the added advantages of avoiding large incision, and postoperative ascitic leak, preservation of abdominal wall avoids interruption of large collateral veins,

use of dual mesh prevents ascitic leak and decreases the recurrence rate. It also avoids exposure of viscera reducing the electrolyte and protein losses in cirrhotic patients and perioperative blood loss is minimal.¹¹

In a study done by Belli G et al, 14 patients with child A cirrhosis with umbilical/incisional hernia underwent laparoscopic mesh hernia repair. There was no conversion to open method with a minor complications rate of 78% (seroma, postoperative ileus, skin breakdown etc). There were no recurrences in the follow-up period of 8 months.

Another study was conducted by Jitea N et al to evaluate the efficacy using prolene mesh in laparoscopic umbilical hernia repair. A total of 21 patients were included of which five patients had cirrhotic ascites. There were no recurrences and morbidity was around 38%. This study has showed that laparoscopic repair using prolene intraperitoneal mesh is a safe and efficient method and helps to avoid infections and complications in cirrhotic patients.¹¹

In our study, a total of three patients with child C cirrhosis were included, and all had massive refractory ascites with symptomatic umbilical hernia (Table 1).¹²

In one patient, SILS technique was used and laparoscopic mesh hernia repair was done using parietex mesh (lightweight monofilament polyester mesh). In the other two patients, two-port technique was used 10 mm port in the left hypochondrium and 5 mm port in the left iliac fossa. Omega (the omega-3 fatty acid coated polypropylene mesh exhibited significantly less inflammatory cell recruitment) and proceed (large-pore, monofilament mesh) mesh were used in these patients respectively.

Table 1: Ventral hernia in cirrhotic patients

Age/sex	55 years/M	40 years/M	18 years/M
Diagnosis	CLD, HBV cirrhosis, refractory ascites, umbilical hernia, portal hypertension	CLD, cirrhosis, ascites, umbilical hernia	Chronic Budd-Chiari syndrome, refractory ascites, cirrhosis, IVC stent block, portal HTN, post TIPPS, impending rupture umbilical hernia
LFT	Total bilirubin: 3.5, direct bilirubin: 0.3	Total bilirubin: 2.8, Direct bilirubin: 1.7	Total bilirubin: 3.3 Direct bilirubin: 1.8
INR	Inr: 1.69	Inr: 1.8	Inr: 1.8
Albumin	Total protein: 4.0, S. albumin: 2.06	Total protein: 3.2 S. albumin: 0.8	Total protein: 4.5 S. albumin: 2.0
Child score	Child C category	Child C category	Child C category
Procedure	Laparoscopic umbilical hernia mesh repair	Laparoscopic umbilical hernia mesh repair	Laparoscopic umbilical hernia mesh repair
Ports	SILS port	Two-port technique, one in left hypochondrium (palmas point) One in left iliac fossa	Two-port technique, one in left hypochondrium (palmas point) One in left iliac fossa
Mesh	Parietex	Omega	Proceed
Hospital stay	5 days	6 days	25 days
Complications	None	Seroma	Subcutaneous wound hematoma

All patients were optimized preoperatively with mannitol and correction of coagulation defects.

Ascitic leak was overcome by the use of a dual mesh. It is a soft polypropylene mesh encapsulated with polydioxane (PDS) and oxidized regenerated cellulose (ORC) which is a plant material and helps to minimize tissue attachment. The absorbable PDS creates a flexible and secure bond between the mesh and the ORC layers. This helps to effectively separate the mesh from the underlying viscera. It also has the added advantage of not harboring bacteria and reduces the chances of mesh infection to minimal. Parietex mesh is a composite dual-sided mesh, provides optimal tissue in-growth and fewer visceral attachments. The skirt on parietal side provides accessible, secure fixation points. Increased rigidity during implantation allows superior handling. The polyester material softens and conforms to the anatomy once implanted. It also protects the viscera from fixation points. Omega mesh is made up of polypropylene with a tissue separating film layer of all-natural, pharmaceutical grade omega-3 fatty acid.

Infection was prevented by strict asepsis during the procedure by use of antimicrobial incise drapes in all patients, change of gloves before insertion of mesh and the use of prophylactic antibiotics intraoperatively and postoperatively.

RESULTS

In all patients the ascitic fluid recollected back within 48 hours, to the preoperative volume. However, none of them had ascetic leak through the operative site. None of the patients had wound infection. There were no recurrences during 6 months follow-up period.

COMPLICATIONS

One patient with Budd-Chiari syndrome had postoperative bleeding from the wound edges resulting in hematoma formation. This patient was on oral anticoagulants which was stopped and converted to intravenous heparin in the preoperative, intraoperative and 24 hours postoperative period. The hematoma was evacuated and the wound was dressed with a Botroclot (aqueous solution of hemocoagulase isolated from *Bothrops atrox*) soaked dressing. There was no further recurrence of hematoma. One patient had a seroma in the region of the umbilicus which was managed conservatively.

CONCLUSION

Our study has shown that laparoscopic repair of ventral hernia in cirrhotic patients with tense ascites is technically feasible and safe. Our study is comparable with the two

previous studies for similar situation. However, unlike these studies which were in patients with child A cirrhosis our patients were those with child C cirrhosis. To the best of our knowledge, this is the first study reported for patients with child's cirrhosis.

Though we selected only patients with complicated hernias, our results encourage us to advocate this procedure for prophylactic repair of ventral hernias in all cirrhotic patients with tense ascites.

REFERENCES

1. Adisa AO, Mishra RK. Changing role of laparoscopy in the management of patients with cirrhosis. *J Min Access Surg* 2008;4:63-70.
2. Lindenmuth WW, Eisenberg MM. The surgical risk in cirrhosis of the liver. *Arch Surg* 1963;86:77-84.
3. Doberneck RC, Sterling WA, Alison DC. Morbidity and mortality after operation in nonbleeding cirrhotic patients. *Am J Surg* 1983;146:306-09.
4. Anthony PP, Ishak KG, Nayak NC. The morphology of cirrhosis. *J Clin Pathol* 1978;31:395-414.
5. Child CG, Turcotte JF. The liver and portal hypertension. Philadelphia; WB Saunders 1964.
6. McAlister V. Management of umbilical hernia in patients with advanced liver disease. *Liver transpl* 2003;9:623-25.
7. Triantos CK, Kehagias I, Nikolopoulou V, Burroughs AK. Surgical repair of umbilical hernias in cirrhosis with ascites. *Am J Med Sci* 2011 Mar;341(3):222-26.
8. Fitzgibbons RJ, Greenburg AG. Nyhus and Condon's Hernia.
9. Youssef YF, El Ghannam M. Mesh repair of noncomplicated umbilical hernia in ascitic patients with liver cirrhosis. *J Egypt Soc Parasitol* 2007;37(3 Suppl):1189-97.
10. Good DW, Royds JE, Smith MS, et al. Umbilical hernia rupture with evisceration of omentum from massive ascites. *J Med Case Rep* 2011;5:170.
11. Belli G, D'Agostic O-A, Fantinic, Cioffi L, Belli A, Russolillo N, et al. Laparoscopic incisional and umbilical hernia repair in cirrhotic patients. *Surg Laparosc Endosc Percutan Tech* 2006;16(6):330-33.
12. Jitea N, et al. Umbilical hernia in adults: Laparoscopic approach with prolene mesh—is it a safe procedure? *Chirurgia (Bucht)* 2008;103(2):175-79.

ABOUT THE AUTHORS

Bharati V Hiremath

Professor, Department of General Surgery, MS Ramaiah Hospital Bengaluru, Karnataka, India

Nitin Rao

Associate Professor, Gastroenterologist, Department of Surgical Gastroenterology, MS Ramaiah Hospital, Bengaluru, Karnataka, India

Bharathi Raja

Postgraduate Student (Final Year), Department of General Surgery MS Ramaiah Hospital, Bengaluru, Karnataka, India