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Anatomical Repair Versus Intra Peritoneal Mesh Repair of Umbilical and Paraumbilical Hernia in Ascitic Patients: Randomized Controlled Study

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ABSTRACT

Background: Umbilical hernia occurs in 20% of the patients with liver cirrhosis complicated with ascites, having a tendency to enlarge rapidly and to complicate. The treatment of umbilical hernia in these patients is a surgical challenge. Ascites control is the mainstay to reduce hernia recurrence and postoperative complications, mesh repair is associated with lower recurrence rate, but with higher surgical site infection when compared to conventional fascial suture. Intraperitoneal mesh repair has advantages of avoiding recurrence, decreasing ascetic leak and wound infection.

Objective: The purpose of this study was to compare the safety and effectiveness of surgical management of umbilical and paraumbilical hernia via anatomical repair and intraperitoneal mesh repair in relation to conservative treatment in ascetic patients.

Patients and methods: This randomized controlled study included 94 patients presented with umbilical and paraumbilical hernia with ascites. The study was conducted in Mansoura University Hospitals through the period from 2016 to 2018. The patients were divided randomly into 3 groups; Conservative treatment group (28 cases), anatomical repair group (36 cases) and intraperitoneal mesh repair via composite mesh group (30 cases). Comparison was done for effectiveness and complications.

Results: Conservative treatment had high rate of complications (60%) and deterioration of hepatic condition (18%), elective surgical correction appeared more safe, intraperitoneal composite mesh repair decreased leak and significantly reduced recurrence and associated complications compared to anatomical repair (17% versus 3%).

Conclusion: Both elective anatomical repair and intraperitoneal mesh repair of umbilical and paraumbilical hernia in ascetic patients were safer and better than conservative treatment. Intraperitoneal mesh repair has advantages of avoiding recurrence and decreasing ascetic leak.

Keywords: Anatomical repair, Intra peritoneal mesh repair, Umbilical and paraumbilical hernia, Ascitic patients.

INTRODUCTION

Ascites is a common problem because Egypt has the highest prevalence of hepatitis C virus (HCV). A recently published survey in 2015 showed that 10% of Egyptians between 15 – 59 years of age had been infected with HCV, while 7% are chronic active hepatitis C patients [(1)]. Patients with liver cirrhosis complicated with ascites have a risk of 20% of developing an umbilical hernia in the course of their disease [(2)]. The factors that contribute to the development of umbilical hernia in these patients are variable such as increased intra-abdominal pressure from the ascites , weakness of the abdominal fascia and muscle wasting as a result of hypoalbuminemia and the dilated umbilical vein enlarging the pre-existent supra umbilical fascial opening in patients with portal hypertension [(3)].

Anesthesia in chronic liver disease is a scary and pretty challenging condition for every anesthesiologist that could be diminished by meticulous attention on optimizing the patient's condition preoperatively and choosing appropriate anesthetic regimen and drugs in this setting. Careful monitoring and considering the proper anesthetic rules achieve a safe anesthesia in these patients [(4)].

Non-operative management of umbilical hernia in patients with liver cirrhosis and ascites leads to a higher risk of complications such as bowel incarceration or strangulation, ascetic fluid leakage and spontaneous rupture with subsequent hernia repair in an emergency setting and therefore is not preferred [(5)]. Ruptured umbilical hernia in ascetic patients with umbilical hernia primarily complicated with peritonitis. Staphylococcus aureus was the predominant organism cultured from ascetic fluid, occurring in 46% of the patients with peritonitis [(6)]. Anatomical repair of umbilical hernia in cirrhotic patients may cause expressive morbidity, such as wound infection and dehiscence, ascetic drainage through the incision, peritonitis, liver failure, and hernia recurrence [(7)].

Prosthetic mesh reinforcement of abdominal wall hernias gained acceptance as a result of its easy placement and a lower incidence of hernia recurrence [(8)]. There has been reluctance to use synthetic mesh for the repair of hernia in ascetic patients for fear of seroma, hematoma, and deterioration of general condition, wound dehiscence, infection, and mesh removal [(9)].

The use of composite mesh provides good quality prosthesis. The mesh is well tolerated and integrated, because it does not allow the formation of adhesions or bacterial infection. By intraperitoneal placing, the wound is protected against ascetic leak and postoperative complications (dehiscence, infections and relapse) [(10)]. However, mesh is a foreign substance, which may increase the risk of repair-related complications, including hematoma, seroma, foreign

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body reaction, organ damage, infection, mesh rejection, and fistula formation. Among these complications, mesh migration is relatively rare [(11)]. Elective umbilical hernia mesh repair is a feasible and safe approach in selected non-complicated cirrhotic patients with ascites. A prospective randomized clinical trial is needed to support this and thereby reach a greater level of evidence to encourage implementation of this treatment strategy [(12)].

PATIENTS AND METHODS

This randomized controlled study included 94 patients presented with umbilical and paraumbilical hernia with ascites. The study was conducted at Mansoura university hospitals through the period from June 2016 to September 2018

Inclusion criteria: Ascetic patients presented with umbilical and paraumbilical hernia, leaking umbilical hernia treated with simple sutures at emergency department and reoperated after subsidence of inflammation, and irreducible umbilical hernia without gangrenous content.

Exclusion criteria:

Strangulated hernia with gangrenous content, recurrent cases, recurrent attacks of hepatic encephalopathy, infected hernia and patients with advanced coagulopathy.

Ethical consent:

An approval of the study was obtained from Mansour University Academic and Ethical Committee. Every patient signed an informed written consent for acceptance of participation in the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

All patients were subjected to the following:

(1) Full history taking: Demographic data (age, gender, occupation and address), onset, course, duration, manifestations of liver condition, manifestations of hepatic encephalopathy or variceal bleeding and manifestations of hernia and its complications.

(2) Clinical examination:

Complete general examination for manifestations of liver cell failure as well as abdominal examination for ascites, peritonitis, intestinal obstruction, leaking ascites, strangulation and the hernia for irreducibility. Full preoperative investigations including complete blood count, liver function tests (liver enzymes, serum albumin, serum bilirubin and coagulation profile), kidney function tests, blood glucose level, ECG, viral markers and abdominal ultrasound. After the preoperative evaluation, all patients were classified according to Child-Pugh-Turcotte score. Patients were divided randomly to 3 groups: (1) Conservative treatment and follow up for presence of complications (28 cases), (2) Anatomical repair (36 cases), and (3) Intraperitoneal mesh repair via composite mesh (30 cases).

Preoperative preparation:

1-Preoperative optimal management of ascites by diuretics (spironolactone and furosemide), early nutritional support, intravenous albumin and /or paracentesis.

2-Intravenous antibiotics (e.g., 3rd generation cephalosporin) were prescribed for all cases preoperatively, and these antibiotics continued till 3rd post-operative day in patients who did not experience complications. However, in complicated cases, antibiotic administration was continued according to patient's condition. Additionally, culture and sensitivity test were done if needed.

3- Fresh frozen plasma and cryoprecipitate were used for correction of preexisting coagulopathy.

Type of anaesthesia:

Either general, local or spinal anaesthesia according to patient's condition and preference of anesthetist.

Operative steps:

The patient was placed in supine position on the operating table and the arms were positioned at the patient’s sides to facilitate access. Elliptical incision around the hernial sac, identification, dissection of the sac with treatment of the content, when necessary, followed by the preparation of the aponeurotic margins.

Repair:

A) Anatomical repair: Primary umbilical hernial repair was performed by conventional interrupted technique using non-absorbable suture material.

B) Mesh repair: Intraperitoneal repair with mesh (Double face mesh, proceed™ mesh or parietex™ composite mesh) was performed after reduction of the hernia sac contents. The mesh was tailored to exceed at least 5 cm the detect. Then mesh was placed intraperitoneally and fixed by interrupted preplaced polyprolene sutures.

Intra-operative monitoring:

- Operative time was recorded and adequate hemostasis was ensured.
- Plasma and albumin were given.
- Intraoperative complications (Bowel injury and hematemesis).

Post-operative care:

- Care of fluids, electrolytes and analgesics.
- Postoperative control of ascites by plasma, albumin, diuretics and paracentesis if needed.
- Antibiotics used only with wound infection according to culture and sensitivity test.

Post-operative follow up:

(A) For early complications: Patients were followed up 2- and 4-weeks post-operative to assess: (1) Seroma formation, (2) Hematoma, (3) Wound dehiscence. (4) Paralytic ileus, (5) Wound infection, (6) Transient ascites leak, (7) Hepatic coma, (8) Hematemesis and (9) Deterioration of liver function tests.

(B)

(B) For late complications: Recurrence assessed every 3 months for at least 6 months by clinical examination, ultrasonography and CT scan of the abdomen.

Conservative group: Patients were assessed every 3 months for at least 6 months for presence of: (1) Strangulation, (2) Obstruction, (3) Infection and (4) Leaking ascites.

Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 22.0. Number and percent were used to describe qualitative data. Quantitative data were described using median (minimum and maximum) & inter quartile range for non-parametric data and mean and standard deviation for parametric data after testing normality using Kolmogorov-Smirnov test/ Shapiro–Wilk test. The Spearman's correlation rank-order correlation was used to determine the strength and direction of a linear relationship between two non-normally distributed. Chi-Square test was used for comparison of 2 or more groups. Fischer Exact test was used as correction for Chi-Square test when more than 25% of cells have count less than 5 in 2*2tables. P value $\leq$ 0.05 was considered significant.

RESULTS

As regards patient characteristics, the majority of cases were males. there was no significant difference between cases managed operatively and those managed conservatively (80.6% of anatomical repair, 80% mesh repair group compared to 71.4% of conservative group). The mean age in anatomical repair group was 57.5 ± 6.1 years, mesh repair was 56.35 ± 9 years and 55.4 ± 6.02 years in conservative group. As regards the preoperative clinical data, the majority of cases were child B. They represented 18 (64.3%), 28 (77.8%) and 21 (70%) patients respectively for conservative, anatomical repair and mesh repair. While child C represented 10 (35.7%), 8 (22.2%) and 9 (30%) patients respectively for conservative, anatomical repair and mesh repair.

Regarding laboratory data, serum albumin levels were 2.4 ± 0.46, 2.47 ± 0.52 and 49 ± 0.48 g/dl for conservative, anatomical repair and mesh repair respectively. Serum bilirubin levels were 2 ± 0.9, 1.7 ± 0.7 and 1.98 ± 0.98 mg/dl for conservative, anatomical repair and mesh repair respectively. INR levels were 1.6 ± 0.6, 1.45 ± 0.35 and 1.65 ± 0.41 for conservative, anatomical repair and mesh repair respectively (Table 1).

According to sonographic data, for conservative group 9 patients (32.1%) showed minimal to mild ascites, 10 patients (35.8%) showed moderate ascites and 9 patients (32.1%) showed marked ascites. For anatomical repair group, 14 patients (39%) showed minimal to mild ascites, 11 patients (30.5%) showed moderate ascites and 11 patients (30.5%) showed marked ascites. for mesh repair group 13 patients (43.3%) showed minimal to mild ascites, 12 patients (40%) showed moderate ascites and 5 patients (16.7%) showed marked ascites (Table 1).

Table (1): Laboratory and sonographic data of cases

	Conservative treatment	Anatomical repair	Mesh repair	Test of significance
S. albumin (g/dL)	2.4±0.46	2.47±0.5	2.49 ± 0.48	F=0.14 P=0.86
S. bilirubin (µmol/L)	2±0.4	1.7±0.4	1.98 ± 0.28	F=0.39 P=0.67
INR	1.6±0.16	1.45±0.3	1.65 ± 0.4	F=1.2 P=0.29
Ultrasound				
Mild	9(32.1)	14(39)	13 (43.3)	χ^2 P=0.15
Moderate	10(35.8)	11(30.5)	12 (40)	
Marked	9(32.1)	11(30.5)	5 (16.7)	

F: one-way ANOVA test for continuous data. χ^2: chi square for categorical data. P value < 0.05: statistically significant.

There was no significant difference in laboratory and sonographic data in the three groups. In conservative group, 17 patients developed complications (60.7%); 7 cases (25%) presented by incarceration, 4 (14.3%) patients presented with infection and 6 (21.4%) patients presented with ruptured and leaking hernia (Table 2).

Table (2): Complications in the conservative group

	N	%
Incarceration	7	25
Infection	4	14.3
Rupture	6	21.4
Mortality	5	17.9

In the operative groups, the mean operative time for the anatomical repair group was 56.7 ± 12.3 minutes which was significantly shorter than that of mesh repair group (73 ± 8.3) minutes. The mean hospital stay for

anatomical repair group was 2.8 ± 1.2 days and 3.25 ± 1.68 days for mesh repair group with no significant difference (Table 3).

Table (3): Comparison between Hospital stay and Operative time in anatomical and mesh repair groups

	Anatomical repair	Mesh repair	Test of significance
Hospital stay	2.8±1.2	3.25±1.68	T=0.8 P=0.4
Operative time	56.7±12.3	73±8.3	T= 4.8 P<0.001

In the present series, 5 patients (17.8%) of conservative group were shifted from child B to child C, while 2 (5.5%) patient of anatomical repair group, 3 (10 %) of mesh repair group were shifted from child B to child C after 6 months (Table 4).

Table (4): patients shifted from child B to child C

	Conservative group		Anatomical repair		Mesh repair		Test of significance
Shifted from child B to child C	5	17.8%	2	5.5%	3	10 %	P=0.06

As regards postoperative complications, in the anatomical repair group, 4 cases (11.1%) were complicated by wound infection, 3 cases (8.3%) with seroma, 2cases (5.6%) with hematoma, 7 cases (19.4%) with ascetic leak, 19 cases (52.8%) showed recurrence and 2 cases (5.6%) showed hepatic encephalopathy.

In mesh repair group, 6 cases (20%) showed wound infection, 6 cases (20%) with seroma, 5 cases (16.7%) with hematoma, 4cases (13.3%) with ascetic leak, 5 cases (16.7%) showed recurrence and 3 cases (10%) showed hepatic encephalopathy. Cases complicated by wound infection were managed by antibiotics according to culture and sensitivity test. None of the cases needed mesh removal. Cases complicated by seroma were managed by aspiration. Mortality in conservative group recorded 5 patients (17.9%), 3 cases (8.3%) in anatomical repair group and 3 patients (10%) in mesh repair group (Table 5).

Table (5): Postoperative complications in operated groups

Post-operative complication	Anatomical repair		Mesh repair		Test of significance χ^2
	N	%	N	%	
Infection	4	11.1	6	20	P=0.04*
Seroma	3	8.3	6	20	P=0.03*
Hematoma	2	5.6	5	16.7	P=0.049*
Leak	7	19.4	4	13.3	P=0.4
Recurrence	19	52.8	5	16.7	<0.001*
Encephalopathy	2	5.6	3	10	P=0.06
Mortality	3	8.3	3	10	P=0.66

χ^2: chi square for categorical data. * P value < 0.05: statistically significant.

Follow up of the recurrent cases for complications showed that after anatomical repair 19 cases (52.8%) showed recurrence from which 5 cases were complicated by incarceration, 1 case by intestinal obstruction and 2 cases by leaking ascites. After mesh repair, 5 cases (16.7%) showed recurrence from which 2 cases were complicated by incarceration, 1 case by intestinal obstruction and 2 cases by leaking ascites (Table 6).

Table (6): Complications in recurrent cases

	After anatomical repair		After mesh repair	
Number of cases	19/36		5/30	
Incarceration	5	13.8%	2	6.6%
Intestinal obstruction	1	2.8%	0	0
Ascetic leak	2	5.55%	0	0

DISCUSSION

The optimal management of umbilical hernia in patients with liver cirrhosis with ascites remains a matter of debate and poses unique and specific management problems due to the pathophysiology of cirrhosis. If left without treatment, abdominal wall defects in cirrhotic patients may grow to large sizes and can be associated with life threatening complications that demand urgent surgical intervention [(13)]. Cirrhotic patients with umbilical hernias have an increased risk of complications following surgical repair for hernia. These complications include wound infection combined with ascitic fluid leakage and impending liver cell failure or hernial recurrence [(14)]. Higher morbidity and mortality rates are expected in cirrhotic patients undergoing surgery under general anesthesia. These rates are positively correlated with the severity of existing liver disease. Some improved outcomes have been reported by some studies that recommended elective umbilical hernial repair in cirrhotic patients [(15, 16)]. Nevertheless, patient selection, optimal surgery

timing, and technique used for repair are still controversial [17].

Application of prosthetic mesh in surgical hernial repair has become popular among hernial surgeons as it is associated with decreased recurrence rates [8]. In the past, application of prosthetic material in hernial repair was unfavourable as it was associated with wound infection that may lead to mesh removal eventually. However, some surgeons found that hernial repair using non-absorbable mesh in complicated hernias in non-cirrhotic patients led to decreased rate of recurrence [9].

The present study represents our experience with the management and outcome after umbilical hernia management in patients with cirrhosis. The majority of cases were males and there was no significant difference between cases managed operatively and those managed conservatively. Males represented 80.6% of anatomical repair, 80% of mesh repair group compared to 71.4% of conservative group. The mean age in anatomical repair group was 57.5 ± 6.1, in mesh repair was 56.35 ± 9 and in conservative group was 55.4 ± 6.02 years with no significant. These results are comparable to those reported by **Choi *et al.*** [17] who reported that of the 44 patients, there were 33 (75%) men and 11 (25%) women, with a mean age of 56 years (range, 35–78 years). There was no significant difference between operative and conservative groups in their work.

Patients with poorer liver functions were preferred to be managed conservatively and thus, the non-operative group had lower albumin level, higher bilirubin, more ascites and more child C score when compared to the operative group.

In the present work, there was significant increase of complications in conservative group; 7 cases (25%) presented by incarceration that needed emergent surgical interference, 4 (14.3%) patients presented with infection, and 6 (21.4%) patients presented with rupture. (i.e., about 60.7 % of conservative cases had complications during the follow up period). These results are in agreement with previous retrospective studies that have demonstrated that conservative treatment of umbilical hernia in cirrhotic patients is associated with considerable morbidity and mortality [5, 16]. As a result, it was recommended to perform elective surgery to avoid the potential consequences of emergency operations. However, surgical intervention is still avoided in many cases due to risk of post-operative complications and high recurrence rates [18]. Conversely, lower morbidity and mortality rates were reported by many recent studies. The cause of that decrease is marked development in the surgical techniques as well as perioperative care [19]. It is reported that patients' mortality rates showed marked decrease after elective repair whereas emergency hernial repair due to complications had significantly higher morbidity and mortality rates [6].

Regarding mortality rate in this study, it was 11 cases (11.7%). This coincides with reports from other series such as **Habib *et al.*** [20] (11.9%). Mortality in conservative group was 5 patients (17.9%). In anatomical repair group showed 3 cases (8.3%) and mesh repair group showed 3 patients (10%). It was higher in conservative group than surgical groups that showed non-significant difference. This result is similar to that reported by **Marsman *et al.*** [5] who found that mortality in conservative group was 15.4%. In the literature published between 1956 and 1995, elective surgery was reported to have mortality rate of 2% while emergency surgeries had 14% mortality rate [21]. **Mackay and his associates** [19] also reported 2.7% mortality rate based on a review of the literature published since 1980. Thus, it is clear that conservative treatment of umbilical hernia in patients accompanied by liver cirrhosis is associated with marked morbidity and mortality.

In the present series, 5 patients (17.8%) of conservative group were shifted from child B to child C, while 2 (5.5%) patient of anatomical repair group and 3 (10 %) of mesh repair group were shifted from child B to child C after 6 months. In conservative group, this can be explained by appearance of hernia complications that deteriorate the general condition of the patient, while it can be explained by operative stress, anesthesia exposure in operative groups and postoperative ascites leakage. **Park *et al.*** [22] reported that 3.7 % were shifted from child B to child C in the first 3 days postoperative after anatomical repair.

In the operative groups, the mean operative time for the anatomical repair group was 56.7 ± 12.3 minutes while it was 73 ± 8.3 minutes for mesh repair group. The operative time was significantly longer in mesh repair group due to the more complexity of the mesh insertion procedure. These results are near to that done by **Hassan *et al.*** [12], in which sub lay mesh inserted and the mean operative time was 67.45 minutes. **In Yu *et al.*** [23], the operative time was longer (100 minutes) which is due to laparoscopic procedure performed in 12 from 18 patients that takes longer time.

The mean hospital stay for anatomical repair group was 2.8 ± 1.2 and 3.25 ± 1.68 days for mesh repair group. It is slightly longer in mesh repair group due to increased incidence of wound complications related to mesh insertion but without statistical significance.

4 cases (11.1%) with wound infection in the anatomical repair group compared to 6 cases (20%) with wound infection in the mesh repair. However, all cases were managed conservatively without need for mesh removal. Prosthetic mesh repair was associated with 2-fold increased risk for infection when compared to suture repair and that could explain the longer hospital stay in the hernioplasty group. In the study done by **Ammar** [24], the surgical site infection was reported to be 8.5% and 16.2% in conventional fascial repair and mesh repair respectively, but he excluded child C patients from his study that may explain the higher rate of infection in our study. In a study performed by **Gurita *et al.*** [10], the incidence of wound

infection in ascetic patients managed by intraperitoneal mesh was 16.6% but also, they operated only on minimal ascetic patients with no other comorbidities. In relation to study performed by **Hassan *et al.*** [12], the rate of wound infection after sub lay mesh was 3% but he excluded all cases with complicated hernias at presentation.

According to absence or presence of risk factors, surgical site infections after umbilical hernia repair have ranged from 1.8 to 19%. Cirrhosis is considered as a risk factor for infection. Our study is comparable or may be more than other reports, due to the presence of liver cirrhosis and complicated hernias [25].

As regards the intraperitoneal mesh insertion in ventral hernias in ascetics, by the results we found, they were very satisfactory taking in mind the general conditions of our patients and presentation of some cases with complications. In the anatomical repair group, 3 patients (8.3%) developed postoperative seroma while in mesh repair group, 6 cases (20%) were complicated with seroma. These results are compatible with results by **Yu *et al.*** [23] despite they performed laparoscopic repair in 67% of cases. The higher incidence of seroma with mesh repair despite being intraperitoneal may be due to much dissection needed for mesh insertion.

In our study in the anatomical repair group, 19 patient (52.8%) developed recurrence while in mesh repair group, 5 cases (16.7%) were complicated with recurrent hernia. Recurrence in the anatomical repair group coincides with that reported from other series such as **Habib *et al.*** [20] (11.9%). After umbilical herniorrhaphy, the rate of recurrence was estimated to be 0 to 4**%.** A previous randomized trial reported that mesh could be applied in the management of complicated hernias in cirrhotic patients with 16.2% incidence of wound-related morbidity and a significantly lower recurrence rate (2.7%) [5, 24]. The high rate of hernia recurrence in anatomical repair group over 2 years follow up is markedly improved with mesh insertion, as demonstrated in other studies [26, 27, 28]**.** The rate of recurrence in mesh repair group is comparable to the study by **Yu *et al.*** [23] who reported 22.2% recurrence rate in 18 patients treated for umbilical hernia from which 15 patients managed by intraperitoneal mesh.

In the anatomical repair group, 7 patients (19.4%) developed postoperative ascetic leak while in mesh repair group, 4 cases (13.3%) were complicated with ascetic leak which is reduced by intraperitoneal mesh repair. These results are near to that by **Ammar** [24] who found 14 % transient leak for anatomical repair and 11% for mesh repair, and results of **Habib *et al.*** [20] who reported 13.2% for mesh repair and 10.4 % for anatomical repair. It had been reported that the outcome of surgical hernial repair relies mainly on the post-operative management [2]**.** Optimal control of ascites postoperatively is crucial to achieve successful outcomes and to decrease recurrence rates [19]**.**

Alternatively, insertion of peritoneovenous shunt at the time of hernial repair is an effective method for preventing ascitic fluid accumulation postoperatively [29]**.** Other may prefer to insert preoperative TIPS, especially for ascitic cirrhotic cases who have spontaneous rupture of umbilical hernia [30]**.**

In the present study, although both peritoneovenous shunts and TIPS were not performed, good control of post-operative ascites was achieved via plasma, albumin and diuretics (spironolactone and frusemide) in addition to intermittent paracentesis in some cases. The efficacy of temporary peritoneal dialysis catheter to control postoperative ascites has been reported by many authors. This approach has many advantages, including outpatient management and easy removal of the catheter [31]**.** In conclusion, elective umbilical hernia repair is a safe approach and seems preferable over conservative treatment in selected cirrhotic patients. Permanent mesh application in the management of hernias in ascitic cases could be achieved with minimal post-operative wound related morbidity. Moreover, it is associated with significantly decreased recurrence rates.

CONCLUSION

Both elective anatomical repair and intraperitoneal mesh repair of umbilical and paraumbilical hernia in ascetic patients are safer and better than conservative treatment. Intraperitoneal mesh repair has advantages of avoiding recurrence compared to anatomical repair and decreasing ascetic leak and wound infection in comparison to on lay mesh repair.

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Author contribution: Authors contributed equally in the study.

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