

## HERNIA REPAIR IN PATIENTS WITH CHRONIC LIVER DISEASE

Muhammad Farooq Dar, Muhammad Qasim Butt, Salman Najam Sheen\*, Zunera Tariq\*\*, Umar Fayyaz Ghani\*,  
Irfan Qadir\*

Combined Military Hospital Rawalpindi Pakistan, \*Combined Military Hospital Multan Pakistan, \*\*Ghazi Khan Medical College Dera Ghazi Khan Pakistan

### ABSTRACT

**Objective:** To investigate the safety of hernia repair operation by quantifying the postoperative mortality, postoperative hepatic functional deterioration, and early wound complication among patients in different Child–Turcotte–Pugh (CTP) class groups.

**Study Design:** Retrospective study.

**Place and Duration of Study:** CMH Multan from July 2013 to July 2015.

**Material and Methods:** This is a retrospective review of 277 patients with documented liver cirrhosis who underwent hernia repair (including inguinal, para-umbilical and ventral wall hernia) at the combined Military Hospital Multan between July 2013 and July 2015. Morbidity and mortality was compared in three sub-groups based on Child's classification.

**Results:** The present study consisted of 219 males and 58 females with an average age of  $46.18 \pm 12.76$ . Mean child score was 7.66 (125, 101 and 51 patients in CTP Class A, B and C respectively). Of the present cohort, 173 patients required inguinal hernia repair with a mean Child score was 7.52 (92, 53 and 28 patients in CTP Class A, B and C respectively). Para-umbilical hernia repair was done in 68 patients with a mean Child score of 7.84 (20, 31 and 17 patients in CTP Class A, B and C respectively). Thirty six patients were operated for ventral wall hernias. Their mean Child score was 7.99 (13, 17, 6 patients in CTP Class A, B and C respectively). In the 30 day post-operative period, two patients in CTP class A changed to class B. One patient in CTP class B progressed to class C. Complications occurred in 37 patients (13.36%) but all of these complications resolved by conservative management. Three patients died during the 30-day postoperative period.

**Conclusion:** We conclude that hernia repair in cirrhotic patients is not associated with an increased risk of postoperative complications and recommend elective surgery.

**Keywords:** Cirrhosis, Chronic liver disease, Hernia repair, Inguinal, Pakistan, Umbilical, Ventral.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### INTRODUCTION

The prevalence of chronic liver disease and cirrhosis has continued to rise in recent years, especially with the epidemic of obesity, alcohol abuse, and viral hepatitis. Patients with liver cirrhosis and ascites exhibit peritoneal distension and frequently have subsequent herniation of the weakest structures in the abdominal wall<sup>1</sup>. Indeed, umbilical hernias, which occur in 3% of the population at large, are present in 20% of

patients with cirrhosis and ascites<sup>2,3</sup>. Although the incidence of inguinal hernia in patients with liver cirrhosis has not been well documented, it is expected to be higher than general population<sup>2</sup>.

Elective abdominal procedures have traditionally been widely discouraged because of the high mortality, risk of post-operative liver decompensation and poor wound healing. However the watchful waiting approach, on the other hand, may result in emergency surgery which is associated with probably even higher morbidity and mortality for this vulnerable group of patients<sup>4-6</sup>. Moreover, cirrhotic patients have been shown to undergo emergency surgery

**Correspondence:** Dr Muhammad Farooq Dar, Classified Surgical Specialist, Dept of General Surgery CMH Rawalpindi, Pakistan  
Email: [farooqdar@live.com](mailto:farooqdar@live.com)  
Received: 18 Mar 2016; revised received: 21 Mar 2016; accepted: 04 Apr 2016

more often than patients without cirrhosis and about 10% of all cirrhotic patients will require surgery, both elective and emergency in the last years of their life<sup>6,7</sup>.

There is therefore a need for a risk-stratifying strategy by which patients with acceptable operative risk can be identified and undergo hernia repair in an elective setting<sup>8</sup>. There are no high-quality randomized studies (Level I evidence to guide decision-making in this complex situation. Retrospective studies have utilized Child-Pugh classification and Model for End Stage Liver disease for risk stratification in

investigate the safety of hernia repair operation by quantifying the postoperative mortality, postoperative hepatic functional deterioration, and early wound complication among patients in different Child–Turcotte–Pugh (CTP) class groups.

## MATERIAL AND METHODS

The present study was based on retrospective chart review of 277 consecutive patients with documented liver cirrhosis who underwent hernia repair (including inguinal, para-umbilical and ventral wall hernia) at the combined Military Hospital Multan between July

**Table-1: Characteristics of patients with chronic liver disease undergoing surgery.**

		Total	PUH	IH	Ventral
No. of Patients		277	68	173	36
Age		46.18 ± 12.76	54.8 ± 10.6	42.4 ± 12.5	48.1 ± 9.1
Gender					
	Male	219	30	167	22
	Female	58	38	6	14
Etiology of Cirrhosis					
	HBV	44	8	31	5
	HCV	229	59	139	31
	Others	4	1	3	
Child–Turcotte–Pugh class					
	A	125	20	92	13
	B	101	31	53	17
	C	51	17	28	6
Mean Child–Turcotte–Pugh score		7.66	7.84	7.52	7.99
Total Bilirubin		2.2	2.36	2.15	2.13
Serum Albumin		3.39	3.28	3.47	3.22
INR		1.52	1.51	1.51	1.58
Refractory Ascites					
	Yes	10	2	7	1
	No	267	66	166	35
Surgery					
	Elective	271	67	168	36
	Emergent	6	1	5	
Type of Anaesthesia					
	Spinal	202	44	155	3
	General	75	24	18	33

these patients<sup>9</sup>. In the present study, we aimed to investigate the safety of hernia repair operation by quantifying the postoperative mortality, postoperative hepatic functional deterioration, and early wound complication among patients in different Child–Turcotte–Pugh (CTP) class groups. The demographic data and

clinical characteristics of the study population were acquired from patient's medical records. Pre-operative laboratory investigations including complete blood count, liver function test, renal function test, coagulation profile and serum albumin were recorded.

All patients underwent surgery after correction of coagulopathy by intramuscular vitamin K or fresh frozen plasma (FFP) transfusion until preoperative prothrombin time was within or near the normal range. Platelet transfusions were performed when necessary. All patients were given cefazolin 1 gm intravenously 1 hour before the operation. Anesthesia type was determined by an anesthesiologist after individual patient evaluations.

Patients were divided into three groups according to the Child's classification. We compared 30-day mortality among the different CTP classes. We analyzed liver function the day before the operation and in 30 day postoperative period. Categorical variables are presented as percentages and continuous variables are presented as mean  $\pm$  standard deviation. All statistical analysis was done using SPSS version 20.

## RESULTS

The present study consisted of 277 patients of which 219 were males and 58 were females with an average age of  $46.18 \pm 12.76$ . Most common cause of cirrhosis was chronic hepatitis C infection in 82.7% of patients followed by hepatitis B infection in 15.9%. Only four patients had liver cirrhosis resulting from non-viral hepatitis (alcohol abuse in 2, Dubin Johnson syndrome and idiopathic in one patient each). The severity of liver cirrhosis was assessed based on the Child-Pugh classification. Mean child score was 7.66 (125, 101 and 51 patients in CTP Class A, B and C respectively). The characteristics of the patients and their baseline liver function values are shown in table-1.

Of the present cohort, 173 patients required inguinal hernia repair. Of these 58.9% had right-sided hernia, 34.7% had left-sided hernia and

6.4% had bilateral hernia. Mean Child score was 7.52 (92, 53 and 28 patients in CTP Class A, B and C respectively). Para-umbilical hernia repair was done in 68 patients with a mean Child score of 7.84 (20, 31 and 17 patients in CTP Class A, B and C respectively). Thirty six patients were operated for ventral wall hernias. Their mean Child score was 7.99<sup>13,17,6</sup> patients in CTP Class A, B and C respectively). Refractory ascites was present in 10 patients. All patients, except six, underwent hernia repair electively. Of these five patients presented with incarcerated inguinal hernias. Two of patients required concurrent small bowel resection anastomosis. One patient underwent emergent surgery for incarcerated para-umbilical hernia. This patient required omentectomy in addition to hernia repair.

In the 30 day post-operative period, only two patients out of 125 in CTP class A (one patient in para-umbilical hernia and ventral wall hernia group each) changed to class B. Only one patient in CTP class B, belonging to para-umbilical hernia group, progressed to class C.

Complications occurred in 37 patients (13.36%) but all of these complications resolved by conservative management. Details of post-operative outcomes are enlisted in Table-2. Three patients died during the 30-day postoperative period. There was no mortality in CTP class A and B. The cause of death in one patient (57 year old male, CTP class C) was septic shock related to strangulated hernia. Despite having received emergent herniorrhaphy and small bowel resection anastomosis, he died on 3rd post-operative day. Two patients of CTP class C died in the postoperative Period. Both of these patients were more affected by progression of the underlying decompensated liver disease than by the hernia operation per se.

The mean postoperative length of hospital stay was 2.2 days. Majority of patients with inguinal hernia were discharged on first post-operative day whereas patients with para-umbilical and ventral hernia stayed in hospital till second third post-operative day respectively.

Patients having prolonged hospital stay invariably had refractory ascites.

**DISCUSSION**

In the present study, we have shown that hernia repair could be done safely in patients with chronic liver disease in CTP class A and B. More importantly, there was no definitive increase in the operative risk in CTP class C.

Traditionally, it has been accepted that hernia surgery in patients with cirrhosis and ascites results in high morbidity and mortality. A study from 1960s showed mortality rate of 31% in patients with cirrhosis and umbilical hernia<sup>10</sup>. O’Hara et al.<sup>11</sup> reported morbidity and mortality in 22% and 16%, and concluded that surgical repair should be delayed in simple herniations. Results of a study based on Danish nationwide database showed an adjusted odds ratio for 30-day mortality of 4.4 in cirrhotic patients

non-cirrhotic patients. Conversely, expectant management resulted in higher mortality compared to elective repair. Moreover, patients operated in emergent setting fared poorly<sup>6</sup>. Relative risk of recurrence was 8.51 in patients with umbilical hernia and uncontrolled ascites<sup>9</sup>. Overall complication rates after inguinal hernia repair ranged between 6.3% and 10.9% for cirrhotic patients compared to 6.8% for non-cirrhotic patients. Overall mortality ranged between 0% and 0.8%<sup>6</sup>. Elective repair of symptomatic inguinal hernia in patients with cirrhosis was recommended. Inguinal hernia repair outcomes were relatively unaffected by the presence of ascites<sup>5,6</sup>.

Stratification of surgical risk in patients with cirrhosis is necessary for preoperative preparation and patient’s counseling. Risk stratification can be performed in variety of ways. The Child’s classification was originally devised

**Table-2: Outcomes of surgery.**

		Total	PUH	IH	Ventral
Post-operative Child–Turcotte-Pugh class	A	123	19	92	12
	B	102	31	53	18
	C	52	18	28	6
Wound Infection (%)		10 (3.6)	2 (2.9)	5(2.9)	3 (8.3)
Wound Seroma n (%)		18 (6.5)	6 (8.8)	5 (2.9)	7 (19.4)
Wound Hematoma (%)		9 (3.2)	3 (4.4)	2(1.1)	4 (11.1)

undergoing inguinal hernia repair<sup>12</sup>.

On the other hand, several studies on the treatment of hernias in patients with decompensated cirrhosis have suggested that hernias may be safely repaired without increased surgical risk or any undue increase in recurrence<sup>1,5,13</sup>. Optimizing the patients with liver cirrhosis before elective surgery is crucial to minimizing postoperative complications<sup>8</sup>. A systematic review on abdominal wall surgery in cirrhotic patients<sup>6</sup> has shown that overall morbidity after elective umbilical hernia repair ranges between 7% and 20%. Overall mortality ranges between 0% and 5.5%<sup>3,6,9</sup>. Elective umbilical hernia repair in cirrhotic patients did not result in complication rates higher than in

to categorize patients who were candidates for portosystemic shunts and to assess their perioperative risk. However it is also found to correlate with postoperative mortality<sup>1</sup>. Model of End Stage Liver Disease (MELD) was originally developed to predict 3-month mortality following a transjugular intrahepatic portosystemic shunt procedure. Its success led to its application as a predictor of perioperative mortality for non-transplant surgery<sup>3</sup>.

Park et al<sup>1</sup> published a study of 53 cirrhotic patients undergoing abdominal wall hernia (17 Child A, 27 Child B and nine Child C) of which 17 had refractory ascites. There was one death from sepsis after hernia incarceration in patient Child C. There was only one recurrence in a

Child B patient after a mean follow up of 24 months. Almost all the patients reported improvement in quality of life after surgery. Ecker et al<sup>3</sup> found that MELD is an objective tool for stratifying surgical risk in case of ventral, umbilical and inguinal hernias not only in terms of mortality but also morbidity. They found that the relationship of MELD with morbidity was not linear. Morbidity was relatively constant for patients with MELD scores between 6 and 15. Above a MELD of 15, however, the morbidity increased 3% for each additional MELD point. Similar findings were reported by Northup et al<sup>7</sup>.

In recent times, quality of life has become a very important aspect of patient care. Patti et al.<sup>13</sup> report improvement in quality of life after hernia repair, especially in patients in Child's class C and/or those with refractory ascites. Therefore surgery is recommended on grounds of symptomatic relief. Although not specifically assessed using quality of life assessment tools, our patients also reported subjective improvement in quality of life.

Mesh repair has become standard surgical technique in hernia repair. However, in CLD patients use of mesh is considered a relative contraindication by some because of poor tissue incorporation of mesh and risk of infection. On the other hand, simple suture repair may result in higher recurrence rate. In a randomized trial, authors found that in patients with cirrhosis, recurrence of umbilical hernia was lower after mesh repair (2.7%) compared to suture repair (14.2%). However, mesh repairs were more likely to become infected (16.2% vs. 8.5%) but the results were statistically insignificant<sup>6,14</sup>. In this study, we report successful use of mesh in all the patients without increase in infection rate.

## CONCLUSION

The present study shows that hernia repair in cirrhotic patients is not associated with an increased risk of postoperative complications.

Elective surgery is indicated on grounds of symptomatic relief, improvement in quality of life and to avoid risk of emergency surgery.

## CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

## REFERENCES

1. Park JK, Lee SH, Yoon WJ, Lee JK, Park SC, Park BJ, et al. Evaluation of hernia repair operation in Child-Turcotte-Pugh class C cirrhosis and refractory ascites. *J Gastroenterol Hepatol*. 2007;22(3):377-82.
2. Belghiti J, Durand F. Abdominal wall hernias in the setting of cirrhosis. *Semin Liver Dis*. 1997;17(3):219-26.
3. Ecker BL, Bartlett EK, Hoffman RL, Karakousis GC, Roses RE, Morris JB, et al. Hernia repair in the presence of ascites. *J Surg Res*. 2014;190(2):471-7.
4. Silva FD, Andraus W, Pinheiro RS, Arantes-Junior RM, Lemes MP, Ducatti Lde S, et al. Abdominal and inguinal hernia in cirrhotic patients: what's the best approach? *Arq Bras Cir Dig*. 2012;25(1):52-5.
5. Oh HK, Kim H, Ryoo S, Choe EK, Park KJ. Inguinal hernia repair in patients with cirrhosis is not associated with increased risk of complications and recurrence. *World J Surg*. 2011;35(6):1229-33; discussion 34.
6. de Goede B, Klitsie PJ, Lange JF, Metselaar HJ, Kazemier G. Morbidity and mortality related to non-hepatic surgery in patients with liver cirrhosis: a systematic review. *Best Pract Res Clin Gastroenterol*. 2012;26(1):47-59.
7. Northup PG, Wanamaker RC, Lee VD, Adams RB, Berg CL. Model for End-Stage Liver Disease (MELD) predicts nontransplant surgical mortality in patients with cirrhosis. *Ann Surg*. 2005;242(2):244-51.
8. Cho SW, Bhayani N, Newell P, Cassera MA, Hammill CW, Wolf RF, et al. Umbilical hernia repair in patients with signs of portal hypertension: surgical outcome and predictors of mortality. *Arch Surg*. 2012;147(9):864-9.
9. McKay A, Dixon E, Bathe O, Sutherland F. Umbilical hernia repair in the presence of cirrhosis and ascites: results of a survey and review of the literature. *Hernia*. 2009;13(5):461-8.
10. Baron HC. Umbilical hernia secondary to cirrhosis of the liver. Complications of surgical correction. *N Engl J Med*. 1960;27:263:824-8.
11. O'Hara ET, Oliai A, Patek AJ, Jr., Nabseth DC. Management of umbilical hernias associated with hepatic cirrhosis and ascites. *Ann Surg*. 1975;181(1):85-7.
12. Hansen JB, Thulstrup AM, Vilstrup H, Sorensen HT. Danish nationwide cohort study of postoperative death in patients with liver cirrhosis undergoing hernia repair. *Br J Surg*. 2002;89(6):805-6.
13. Patti R, Almasio PL, Buscemi S, Fama F, Craxi A, Di Vita G. Inguinal hernioplasty improves the quality of life in patients with cirrhosis. *Am J Surg*. 2008;196(3):373-8.
14. Ammar SA. Management of complicated umbilical hernias in cirrhotic patients using permanent mesh: randomized clinical trial. *Hernia*. 2010;14(1):35-8.