World Journal of Gastroenterology

Submit a Manuscript: http://www.wjgnet.com/esps/
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
DOI: 10.3748/wjg.v21.i10.3109

World J Gastroenterol 2015 March 14; 21(10): 3109-3113
ISSN 1007-9327 (print) ISSN 2219-2840 (online)
© 2015 Baishideng Publishing Group Inc. All rights reserved.

CASE REPORT

Successful surgical management of ruptured umbilical hernias in cirrhotic patients

Nikolaos A Chatzizacharias, J Andrew Bradley, Simon Harper, Andrew Butler, Asif Jah, Emmanuel Huguet, Raaj K Praseedom, Michael Allison, Paul Gibbs

Nikolaos A Chatzizacharias, J Andrew Bradley, Simon Harper, Andrew Butler, Asif Jah, Emmanuel Huguet, Raaj K Praseedom, Michael Allison, Paul Gibbs, Department of HPB and Transplant Surgery, Addenbrooke's Hospital, Cambridge CB2 0QQ, United Kingdom
J Andrew Bradley, NIHR Cambridge Biomedical Research Centre, Cambridge CB2 0QQ, United Kingdom
Michael Allison, Department of Hepatology, Addenbrooke's Hospital, Cambridge CB2 0QQ, United Kingdom
Author contributions: All authors contributed in the writing of the manuscript; Chatzizacharias NA also accumulated and analysed the data.
Open-Access: This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/
Correspondence to: Mr. Paul Gibbs, Consultant HPB and Transplant Surgeon, Department of HPB and Transplant Surgery, Addenbrooke's Hospital, Hills Road, Cambridge CB2 0QQ, United Kingdom. paul.gibbs@addenbrookes.nhs.uk
Telephone: +44-1223-257074
Fax: +44-1223-216015
Received: August 2, 2014
Peer-review started: August 2, 2014
First decision: August 15, 2014
Revised: September 11, 2014
Accepted: November 18, 2014
Article in press: November 19, 2014
Published online: March 14, 2015

Abstract

Acute umbilical hernia rupture in patients with hepatic cirrhosis and ascites is an unusual, but potentially life-threatening complication, with postoperative morbidity about 70% and mortality between 60%-80% after supportive care and 6%-20% after urgent surgical repair. Management options include primary surgical repair with or without concomitant portal venous system decompression for the control of the ascites. We present a retrospective analysis of our centre's experience over the last 6 years. Our cohort consisted of 11 consecutive patients (median age: 53 years, range: 36-63 years) with advanced hepatic cirrhosis and refractory ascites. Appropriate patient resuscitation and optimisation with intravenous fluids, prophylactic antibiotics and local measures was instituted. One failed attempt for conservative management was followed by a successful primary repair. In all cases, with one exception, a primary repair with non-absorbable Nylon, interrupted sutures, without mesh, was performed. The perioperative complication rate was 25% and the recurrence rate 8.3%. No mortality was recorded. Median length of hospital stay was 14 d (range: 4-31 d). Based on our experience, the management of ruptured umbilical hernias in patients with advanced hepatic cirrhosis and refractory ascites is feasible without the use of transjugular intrahepatic portosystemic shunt routinely in the preoperative period, provided that meticulous patient optimisation is performed.

Key words: Umbilical hernia; Rupture; Cirrhosis; Ascites; Transjugular intrahepatic portosystemic shunting

© **The Author(s) 2015.** Published by Baishideng Publishing Group Inc. All rights reserved.

Core tip: Acute umbilical hernia rupture in patients with hepatic cirrhosis and ascites is an unusual, but potentially life-threatening complication, with high morbidity and mortality. Management options include surgical repair with or without concomitant portal venous system decompression. Recent data suggested that the routine use of transjugular intrahepatic portosystemic shunt (TIPS) preoperatively in selected patients conferred improved perioperative and longer-

term results. We present the successful management of 11 consecutive cases with only minor postoperative complications and no mortality. Based on our experience, the management of such cases is feasible without the use of TIPS routinely in the preoperative period, provided that meticulous patient optimisation is performed.

Chatzizacharias NA, Bradley JA, Harper S, Butler A, Jah A, Huguet E, Praseedom RK, Allison M, Gibbs P. Successful surgical management of ruptured umbilical hernias in cirrhotic patients. *World J Gastroenterol* 2015; 21(10): 3109-3113 Available from: URL: http://www.wjgnet.com/1007-9327/full/v21/i10/3109.htm DOI: http://dx.doi.org/10.3748/wjg.v21.i10.3109

INTRODUCTION

The prevalence of umbilical hernias in patients with hepatic cirrhosis and ascites can be as high as 20%[1,2]. Aetiology includes increased intra-abdominal pressure associated with ascites, attenuation of the anterior abdominal wall musculature due to poor nutritional status, as well as the potential restoration of the pre-existing supraumbilical fascial defect by the recanalized umbilical vein[1-4].

First described in 1901[5], acute umbilical hernia rupture in these group of patients is an unusual, but potentially life-threatening complication. Published reports on patients with hepatic cirrhosis and ascites presenting with complicated paraumbilical hernias (including incarceration, strangulation and rupture) evaluated postoperative morbidity as high as 71%, while the mortality rate varies between 60%-80% after supportive care and 6%-20% after urgent surgical repair[6-8]. The use of concomitant portal venous decompression with the surgical management has been supported by the increase in risk of postoperative complications and recurrence by the presence of uncontrolled ascites[2]. The most favourable method is the transjugular intrahepatic portosystemic shunting (TIPS)[2,8,9], while the use of peritoneovenous shunting (PVS) has also been reported[2,10].

This paper presents our centre's experience on the management of ruptured umbilical hernias in patients with advanced hepatic cirrhosis and refractory ascites.

CASE REPORT

Eleven consecutive patients with advanced hepatic cirrhosis and refractory ascites were treated in our institution for ruptured umbilical hernias over the last 6 years. The median age of the group was 53 years (range: 36-63 years). Further demographics, including gender, aetiology and complications of hepatic cirrhosis and comorbidities, as well as the relevant blood results on the day of admission are shown on Tables 1 and 2.

Table 1 Patient characteristics *n* (%)

Characteristic	Patients
Gender	
Male	9 (81.8)
Female	2 (18.2)
Aetiology of cirrhosis	
ALD	8 (72.7)
ALD + HCV	2 (18.2)
NASH	1 (9.1)
CTP class	
B	8 (72.7)
C	3 (27.3)
Complications of cirrhosis other than ascites	
Oesophageal varices	2 (18.2)
SBP	2 (18.2)
Oesophageal varices + SBP	1 (9.1)
Comorbidities	
DM2	2 (18.2)
Chronic pancreatitis	1 (9.1)
DM2 + CVA + HTN	1 (9.1)
On liver transplant waiting list	8 (72.7)

ALD: Alcoholic liver disease; HCV: Hepatitis-C virus; NASH: Non-alcoholic steatohepatitis; CTP: Child-Turcotte-Pugh; SBP: Spontaneous bacterial peritonitis; DM2: Diabetes melitus type 2; CVA: Cerebrovascular accident; HTN: Hypertension.

All patients were managed for refractory ascites (defined as ascites that was unresponsive to sodium-restricted diet and high-dose diuretic treatment or that recurred rapidly after therapeutic paracentesis[8]) with regular paracentesis, while 7 were also on high dose diuretics. The median follow-up was 8 mo (range: 0-54 mo).

In the initial phase of this 6-year period, 1 female patient with hepatic cirrhosis due to alcoholic liver disease was managed conservatively for a ruptured umbilical hernia. Portal hypertension was reduced with TIPS and a long course of prophylactic antibiotics, including meropenem and cephalexin, was prescribed. She was discharged on day 29, but readmitted 81 d later with necrotic skin around the umbilical hernia. She underwent an emergency debridement and hernia repair with interrupted, non-absorbable Nylon sutures, but no mesh, and was discharged 14 d later after an uneventful recovery. No further complications or recurrence were recorded during a 54-mo follow-up period.

One case was managed electively. This was a patient referred to our centre with intermittent ascitic fluid leak many years after a primary repair of a non-ruptured umbilical hernia. Initial conservative management with diuretics and regular paracentesis was successful and the patient was discharged 4 d later. Unfortunately, the ascitic fluid leak persisted and therefore the patient had an elective repair with the use of an on-lay polypropylene mesh. The postoperative course was uneventful, with a 4-d hospital stay. No complications or recurrence were recorded during a 9-mo follow-up period. This was the only case in our cohort were a mesh was used.

Table 2 Relevant blood results on the day of admission

	INR	Bilirubin (μmol/L)	ALT (U/L)	ALP (U/L)	Albumin (g/L)	Creatinine (μmol/L)	MELD score
Patient 1	1.50	44	7	139	38	111	17
Patient 2	2.3	50	39	144	25	101	21
Patient 3	1.4	32	17	306	34	66	13
Patient 4	1.5	50	22	134	25	204	28
Patient 5	1.7	38	22	49	50	176	22
Patient 6	1.6	50	26	117	31	71	16
Patient 7[1]	1.5	13	19	79	33	120	14
Patient 8[1]	1.3	15	13	67	31	89	9
Patient 9[1]	1.2	6	37	146	22	76	8
Patient 10[1]	1.4	34	31	181	24	69	13
Patient 11[2]							
Admission 1	1.5	12	11	93	23	48	11
Admission 2	1.4	8	8	105	27	54	10

[1]Cases referred from other hospitals; [2]Admission 1: Failed initial conservative management; admission 2: Successful surgical management. MELD: Model for end-stage liver disease; INR: International normalized ratio; ALT: Alanine aminotransferase; ALP: Alkaline phosphatase.

Of the remaining cases, 3 were referrals to our centre from other hospitals, including a patient with an immediate leak and recurrence after primary repair. All patients were optimised with intravenous hydration, nutritional support and broad spectrum antibiotics, mainly piperacillin/tazobactam with or without vancomycin. No portal venous decompression procedure was performed prior to surgery. The timing of the operation was decided upon the urgency of each individual case and the patient's overall condition. With the exception of 2 cases where the operation was performed within 48 h of admission, a longer period of optimisation (between 6 and 14 d) was considered necessary. In all cases a primary repair with non-absorbable Nylon, interrupted sutures was performed. No mesh was used.

No mortality was observed in the postoperative or follow-up period (median: 8 mo, range: 0-54 mo). Post-operative complications included 2 cases of wound infection, treated with antibiotics, 1 case of mild allergic reaction to the antibiotics used and 1 case of prolonged ileus and encephalopathy, which was managed conservatively. The median length of hospital stay was 14 d (range: 4-31 d). Five patients received a liver transplant shortly after their hernia operation (one on the same admission), while 1 patient also had TIPS procedure prior to transplantation. During the follow-up period, censored for liver transplantation, 1 patient had a non-complicated umbilical hernia recurrence, which was repaired electively.

In summary, 11 cases of primary or recurrent ruptured umbilical hernias in patients with hepatic cirrhosis and refractory ascites were managed in our institution over the last 6 years. One failed attempt for conservative management was followed by a successful primary repair. Our perioperative complication rate was 25% including minor complications (Table 3), with median length of hospital stay of 14 d (range: 4-31 d) and recurrence rate of 8.3%. No mortality was recorded during a median follow-up period of 8 mo (range: 0-54 mo).

DISCUSSION

In the absence of prospective clinical trials and results on large series, there has been a considerable debate in the existing literature with regards to the management options of umbilical hernias in patients with hepatic cirrhosis and refractory ascites. While elective repair of non-complicated hernias in suitable candidates with extensive preoperative optimisation and successful postoperative management of the ascites is gaining more supporters[1,9,11], the management of ruptured hernias is still controversial. Current published series concur that the exact timing of the operation is of no great importance[2,8,9]. As long as appropriate patient resuscitation and optimisation with intravenous fluids, prophylactic antibiotics and local measures, such as non occlusive dressings, is ensured, no increase in morbidity and mortality has been observed. In our cohort antibiotics were used in all cases to prevent or treat the contamination of the ascitic fluid. With regards to intravenous fluid management, a combination of crystalloids and human albumin solution were used for hydration and volume replacement due to the loss of ascitic fuid. The 25% perioperative morbidity rate in our cohort, in combination with the minor character of the complications recorded, supports this observation and highlights the value of optimising each patient.

With regards to the surgical technique, all published reports suggest the use of primary closure with non-absorbable sutures[2,6,8,9,12,13]. Similar approach was used in our unit with the exception of one case, where a Prolene on-lay mesh was used to repair a recurrent ruptured umbilical hernia in an elective setting. However, we would agree that the safest approach in the urgent setting is primary closure with sutures, as the use of a mesh would increase the risk of infection and potential serious and life-

Table 3 Postoperative complications *n* (%)

Complication	Patients
Recurrence	1 (8.3)
Wound infection	2 (16.7)
Ileus	1 (8.3)
Encephalopathy	1 (8.3)
Allergic reaction to antibiotics	1 (8.3)

threatening complications. The use of absorbable meshes, like Vicryl® or Permacol®, could be utilised in the rare cases with inability for primary closure due to a large abdominal wall defect. Nonetheless, no such experience has been recorded.

Finally, one of the most important aspects of the management of these patients is the effective management of the ascites. Uncontrolled ascites increases the risk of complications and recurrence up to 73%[2,14]. The use of PVS has been previously reported, conferring a lower recurrence rate compared to cases where primary hernia repair was solely performed[2,10]. However, PVS has been largely abandoned due to the high complication (40%-60%) and mortality (50%) rates[14]. On the other hand, surgical portosystemic shunts have proven effective to control refractory ascites, although they have been associated with high mortality rate (10%), high incidence of associated encephalopathy (50%) and negative impact on a potential subsequent liver transplantation[2,14]. A recently published algorithm[9], which was also supported by subsequent series[8,15], suggested that the use of TIPS in the preoperative setting in patients without severe hepatic or renal insufficiency confers improved perioperative and longer-term results. Our unit reports comparable results without the routine use of preoperative TIPS. TIPS procedure has been shown to control refractory ascites in up to 92% of the cases[16]. However, no consensus has been reached with regards to any benefit on transplant free survival, while it has been associated with less favourable results in Child-Pugh class C patients with increased risk of hepatic encephalopathy (25%). Based on our experience, the management of ruptured umbilical hernias in these patients is feasible without the use of routine TIPS in the preoperative period, provided that meticulous patient optimisation is performed.

Despite the small size, the study reports the largest published cohort in the "TIPS era". The infrequent nature of the condition limits the feasibility of randomised prospective studies and, taking into consideration the limitations of our study, our experience shows that successful primary repair of ruptured umbilical hernias in cirrhotic patients is feasible after meticulous optimisation and satisfactory control of the ascites.

COMMENTS

Case series characteristics

Eleven consecutive patients with advanced hepatic cirrhosis and refractory ascites were treated for ruptured umbilical hernias.

Clinical diagnosis

Ruptured umbilical hernia in the background of hepatic cirrhosis and refractory ascites.

Laboratory diagnosis

Full blood count and biochemistry on the day of admission confirming liver dysfunction.

Treatment

Successful primary repair of the ruptured umbilical hernias after meticulous optimisation with intravenous fluids, prophylactic antibiotics, local measures and satisfactory control of the ascites with regular paracentesis with or without high dose diuretics.

Related reports

In the absence of prospective clinical trials and results on large series, there has been a considerable debate in the existing literature with regards to the management options of umbilical hernias in patients with hepatic cirrhosis and refractory ascites.

Experiences and lessons

Successful primary repair of ruptured umbilical hernias in cirrhotic patients is feasible after meticulous optimisation and satisfactory control of the ascites.

Peer-review

The infrequent nature of the condition limits the feasibility of randomised prospective studies or large series. Despite the small size, the study reports the largest published cohort in the "transjugular intrahepatic portosystemic shunt era".

REFERENCES

1 **Dokmak S**, Aussilhou B, Belghiti J. Umbilical hernias and cirrhose. *J Visc Surg* 2012; **149**: e32-e39 [PMID: 23122832 DOI: 10.1016/j.jviscsurg.2012.04.002]

2 **Belghiti J**, Durand F. Abdominal wall hernias in the setting of cirrhosis. *Semin Liver Dis* 1997; **17**: 219-226 [PMID: 9308126]

3 **Baron HC**. Umbilical hernia secondary to cirrhosis of the liver. Complications of surgical correction. *N Engl J Med* 1960; **263**: 824-828 [PMID: 13687191]

4 **Shlomovitz E**, Quan D, Etemad-Rezai R, McAlister VC. Association of recanalization of the left umbilical vein with umbilical hernia in patients with liver disease. *Liver Transpl* 2005; **11**: 1298-1299 [PMID: 16184595]

5 **Johnnson JT**. Ruptured umbilical hernia. *Trans South Surg Assoc* 1901; **14**: 257-268

6 **Lemmer JH**, Strodel WE, Knol JA, Eckhauser FE. Management of spontaneous umbilical hernia disruption in the cirrhotic patient. *Ann Surg* 1983; **198**: 30-34 [PMID: 6859990]

7 **Kirkpatrick S**, Schubert T. Umbilical hernia rupture in cirrhotics with ascites. *Dig Dis Sci* 1988; **33**: 762-765 [PMID: 3286159]

8 **Telem DA**, Schiano T, Divino CM. Complicated hernia presentation in patients with advanced cirrhosis and refractory ascites: management and outcome. *Surgery* 2010; **148**: 538-543 [PMID: 20346479 DOI: 10.1016/j.surg.2010.01.002]

9 **Fagan SP**, Awad SS, Berger DH. Management of complicated umbilical hernias in patients with end-stage liver disease and refractory ascites. *Surgery* 2004; **135**: 679-682 [PMID: 15179375]

10 **Leonetti JP**, Aranha GV, Wilkinson WA, Stanley M, Greenlee HB. Umbilical herniorrhaphy in cirrhotic patients. *Arch Surg* 1984; **119**: 442-445 [PMID: 6703901]

11 **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**: 461-468 [PMID: 19652907 DOI: 10.1007/s10029-009-0535-9]
12 **Good DW**, Royds JE, Smith MJ, Neary PC, Eguare E. Umbilical hernia rupture with evisceration of omentum from massive ascites: a case report. *J Med Case Rep* 2011; **5**: 170 [PMID: 21539740 DOI: 10.1186/1752-1947-5-170]
13 **Choo EK**, McElroy S. Spontaneous bowel evisceration in a patient with alcoholic cirrhosis and an umbilical hernia. *J Emerg Med* 2008; **34**: 41-43 [PMID: 17976794]
14 **Maniatis AG**, Hunt CM. Therapy for spontaneous umbilical hernia rupture. *Am J Gastroenterol* 1995; **90**: 310-312 [PMID: 7847308]
15 **Ginsburg BY**, Sharma AN. Spontaneous rupture of an umbilical hernia with evisceration. *J Emerg Med* 2006; **30**: 155-157 [PMID: 16567249]
16 **Moore KP**, Aithal GP. Guidelines on the management of ascites in cirrhosis. *Gut* 2006; **55** Suppl 6: vi1-v12 [PMID: 16966752]

P- Reviewer: Akyuz U, Frider B, Satapathy SK **S- Editor**: Gou SX
L- Editor: A **E- Editor**: Zhang DN

Published by **Baishideng Publishing Group Inc**
8226 Regency Drive, Pleasanton, CA 94588, USA
Telephone: +1-925-223-8242
Fax: +1-925-223-8243
E-mail: bpgoffice@wjgnet.com
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
http://www.wjgnet.com

ISSN 1007-9327

© 2015 Baishideng Publishing Group Inc. All rights reserved.