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Flood Syndrome as a Complication of Umbilical Hernia in a Cirrhotic Patient: Surgical Timing Considerations

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ABSTRACT

Introduction: The incidence of umbilical hernia (UH) in cirrhotic patients with ascites is approximately 20%, which is ten times higher than in the general population, and can reach up to 40% in cases of large-volume ascites. These patients often present with systemic complications associated with cirrhosis, significantly increasing their risk of infections and necessitating close monitoring. Although uncommon, rupture of an umbilical hernia represents a serious and potentially life-threatening complication in patients with massive ascites and advanced liver disease. This event leads to spontaneous leakage of ascitic fluid, known as Flood syndrome. This condition poses a considerable clinical challenge due to the lack of clear guidelines for its management and ongoing controversy regarding the optimal therapeutic approach.

Keywords: Flood Syndrome, Umbilical Hernia, Liver Cirrhosis, Ascitic Fluid Leak, Hernia Rupture, Surgical Timing.

INTRODUCTION

Umbilical hernias (UH) are a common manifestation in patients with decompensated liver cirrhosis, particularly those with large-volume ascites. The incidence of UH in cirrhotic patients is approximately 20%, which is nearly ten times higher than in the general population, and this rate may rise to 40% in the presence of uncontrolled or recurrent ascitic accumulation [1,6,8]. Chronic intra-abdominal pressure, fascial weakening due to malnutrition, and repeated paracenteses contribute to hernia formation and eventual complications. In rare but severe cases, the hernia can rupture spontaneously, leading to massive ascitic fluid leakage through the abdominal wall—a condition termed Flood syndrome [1,2,7].

This syndrome represents a clinical emergency with a high risk of morbidity and mortality. Management strategies remain controversial due to the limited number of cases reported in the literature and the absence of standardised protocols [3,4,7]. The therapeutic dilemma centres around whether conservative management or early surgical intervention offers better

outcomes, especially in patients with poor hepatic reserve, coagulopathy, and other complications of advanced liver disease. Elective repair of UH is generally preferred over emergency surgery due to better outcomes and fewer complications. However, spontaneous rupture demands immediate attention and a well-individualised approach [3,6,8].

CLINICAL CASE

A 37-year-old female patient with a history of long-standing liver disease secondary to chronic alcoholism, decompensated; arterial hypertension diagnosed 5 years ago, adequately controlled; and chronic kidney disease diagnosed 4 years ago, managed with haemodialysis, presented to the emergency department. She reported the onset of a protrusion at the umbilical level approximately 4 years prior, initially measuring about 1 cm, which gradually increased in size until reaching dimensions of 25 x 30 cm. The lesion exhibited evident cutaneous changes, was painless and irreducible. Laboratory tests showed no elevation of inflammatory or infectious markers. A non-contrast CT scan revealed significant ascitic fluid and an umbilical hernia defect measuring 20.8 mm, with a sac size of 18.4 x 7.4 x 13.8 cm, containing multiple internal septa.

The patient was taken to the operating theatre, where a transverse 18 cm fusiform incision was made around the hernia defect using a No. 20 scalpel. Dissection was continued in layers with monopolar electrocautery until a 3 cm umbilical defect was identified, associated with a sac measuring 20 x 20 cm, which was sealed. The sac was resected without complications and sent for histopathological examination. Approximately 8 litres of ascitic fluid were aspirated, and a catheter was placed in the left flank using the Seldinger technique. Aponeurotic closure was performed employing the Mayo technique, followed by surgical wound and umbilical scar remodeling. The skin was approximated with simple nylon 3-0 sutures, with the procedure completed successfully and without incident."

DISCUSSION

The primary challenge in managing Flood syndrome lies in balancing surgical risks against the imminent dangers posed by spontaneous rupture. The sudden release of ascitic fluid through the herniated umbilicus not only leads to fluid and electrolyte imbalance but also creates a potential entry point for pathogens, increasing the risk of peritonitis and sepsis [1,2,7].

"The characteristic presentation of Flood syndrome has been described in the literature as involving high-volume, spontaneous drainage of ascitic fluid through a necrotic or ulcerated umbilical hernia. [1] [2] Their case reports emphasise the need for prompt stabilisation, control of ascites, and consideration of surgical repair once the patient's condition allows. contributed significantly to this understanding by reporting a series of successful surgical repairs performed under controlled conditions. [3] Their results showed that careful perioperative management, including the use of perioperative diuretics, albumin, and antibiotic prophylaxis, improved surgical outcomes even in patients with advanced liver disease.

Delaying surgical intervention often leads to worse outcomes, including wound dehiscence, re-accumulation of ascites, and sepsis.[7] On the other hand,. [7] et al. [8] compared different surgical approaches and concluded that tension-free mesh repair after preoperative ascitic control yielded the lowest recurrence rates. However, they also emphasised that patient selection and timing of intervention were critical to success.

The literature suggests that elective repair of umbilical hernias in cirrhotic patients—ideally performed before rupture occurs—significantly reduces the risk of complications such as evisceration, bleeding, and secondary infections [6,8]. Nonetheless, a subset of patients presents with emergency rupture, as detailed in the reports by Nguyen [1] and Jawed [7], requiring urgent but cautiously executed intervention. There is consensus that conservative management alone is rarely sufficient once rupture has occurred, and surgical treatment, although high-risk, remains the definitive approach.

A common recommendation across studies is to prioritise the optimisation of hepatic function and ascitic control before attempting any surgical repair [3,5,6]. This includes strict sodium restriction, judicious use of diuretics, large-volume paracentesis with albumin supplementation, and possibly transjugular intrahepatic portosystemic shunt (TIPS) in selected cases. Preventive strategies, such as early hernia repair in compensated patients and close monitoring of those with decompensation, may ultimately reduce the burden of emergency presentations.

CONCLUSIONS

Flood syndrome remains a rare but serious complication of umbilical hernias in cirrhotic patients with refractory ascites. The syndrome's clinical course is often unpredictable and potentially fatal if not promptly recognised and treated. Current evidence suggests that successful management hinges on a multidisciplinary approach involving hepatology, surgery, and critical care.

Stabilisation of the patient's condition, effective control of ascites, and a timely decision for surgical intervention are key pillars in improving outcomes. While elective surgery in optimised patients yields the best results, emergent surgical repair—though riskier—can be performed safely in experienced centres with rigorous perioperative care. As literature on Flood syndrome remains limited to case series and reports, further multicentre studies and clinical guidelines are urgently needed to standardise care and improve prognosis for these high-risk patients.

References

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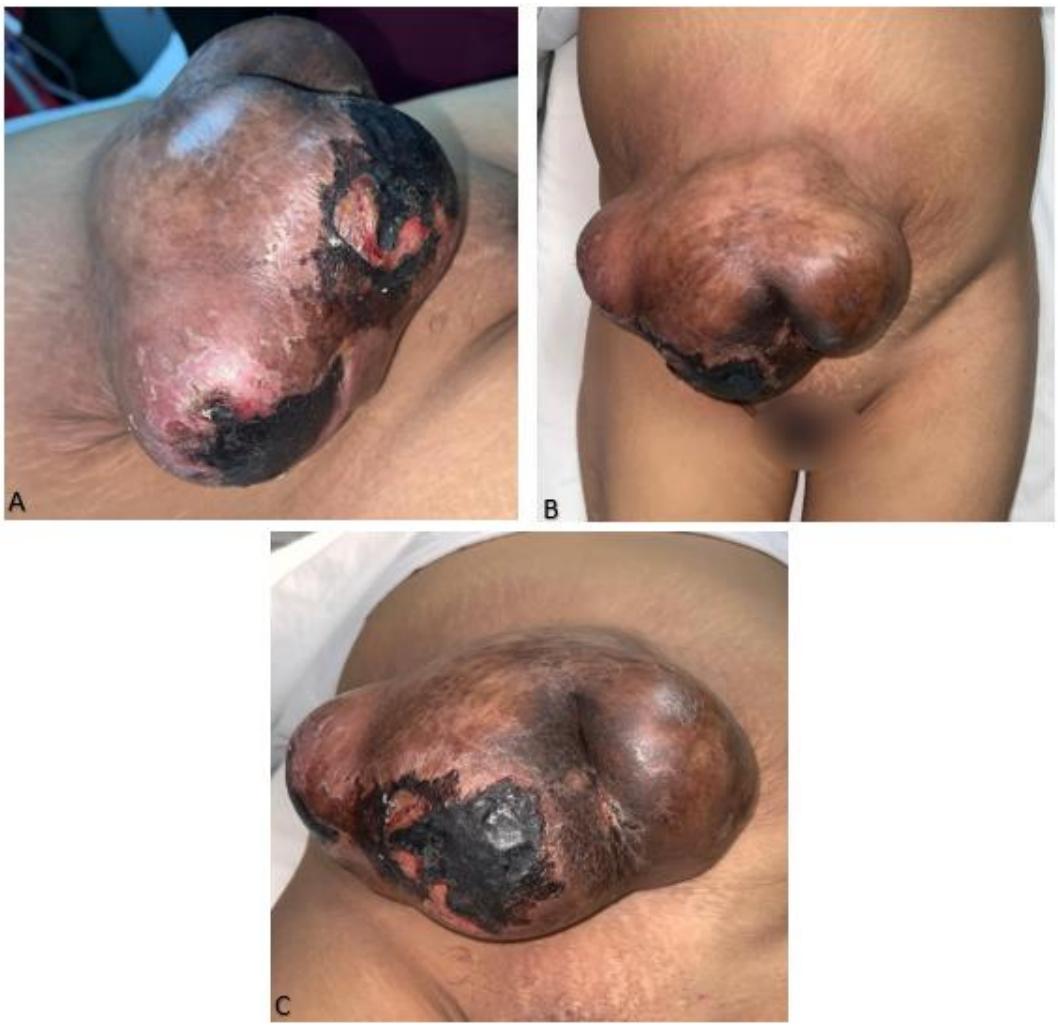
Table 1: Overview of Flood syndrome cases, highlighting management strategies and outcomes in cirrhotic patients.

Therapeutic Approach	Main Indications	Advantages	Disadvantages	References
Conservative management	Unstable patients or those with contraindications to immediate surgery	Avoids early surgical risks	High rate of complications, infections, and recurrence	Nguyen and Tudtud-Hans; Jawed et al.
Elective surgical repair	Stable patients with well-controlled ascites	Definitive treatment, lower long-term mortality	Requires multidisciplinary management and strict ascites control	Chatzizacharias et al.; Long and Hayden
Emergency surgery	Active rupture with massive leakage and haemodynamic compromise	Rapid control of leakage and repair	High risk of postoperative morbidity and mortality	Chatzizacharias et al.; Long and Hayden
Endovascular management	Patients with absolute surgical contraindications or critical condition	Minimally invasive procedure, temporary stabilisation	Limited evidence, not definitive	Jawed et al.; Elshaarawy et al.



A) *Lateral preoperative view of the umbilical mass, demonstrating cutaneous distension and asymmetry,* B) *Anterior view of the lesion, showing central thinning of the skin and protrusion of intra-abdominal contents,* C) *Inferior view of the mass, revealing dependent contour and signs of skin compromise.*

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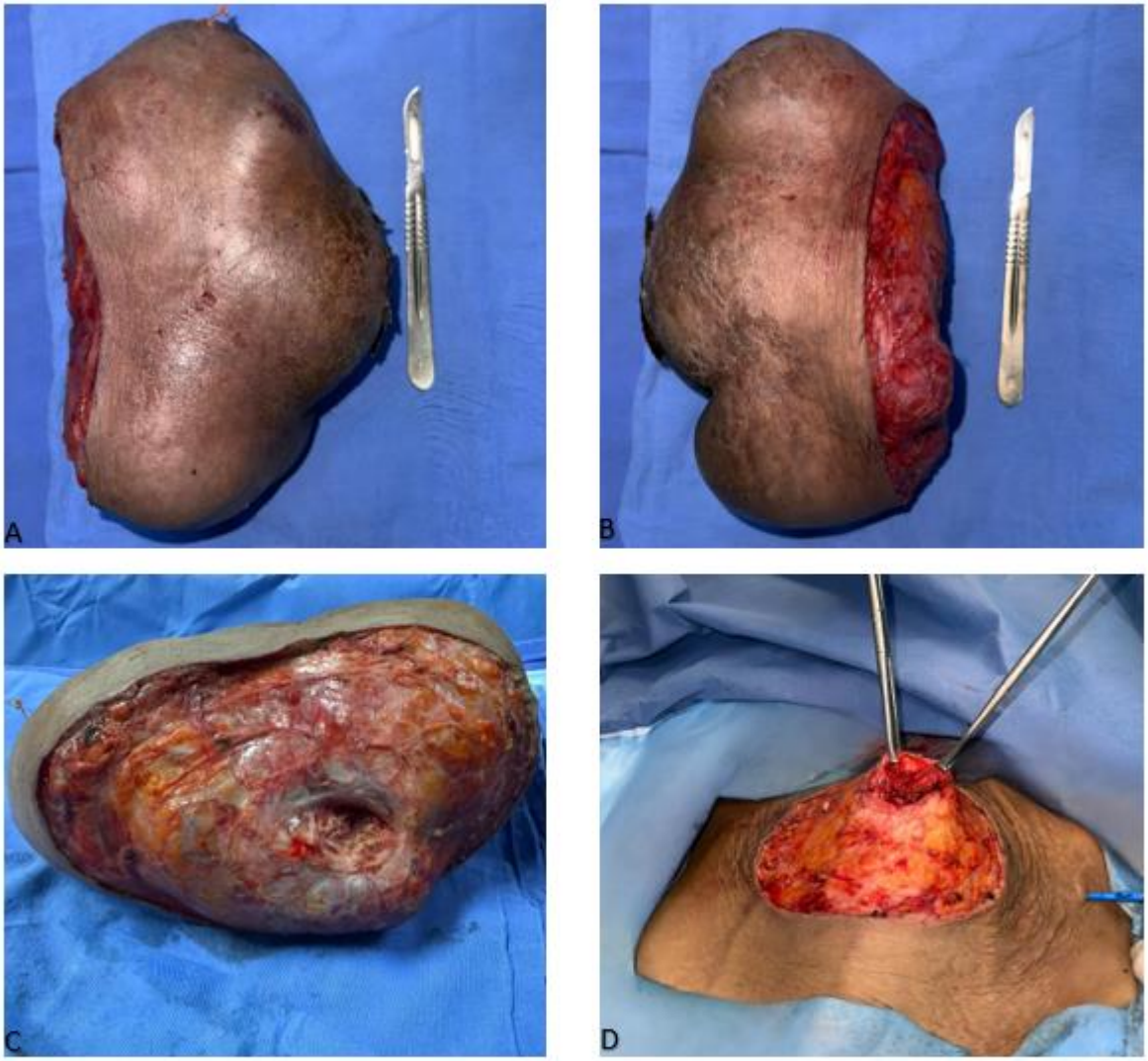
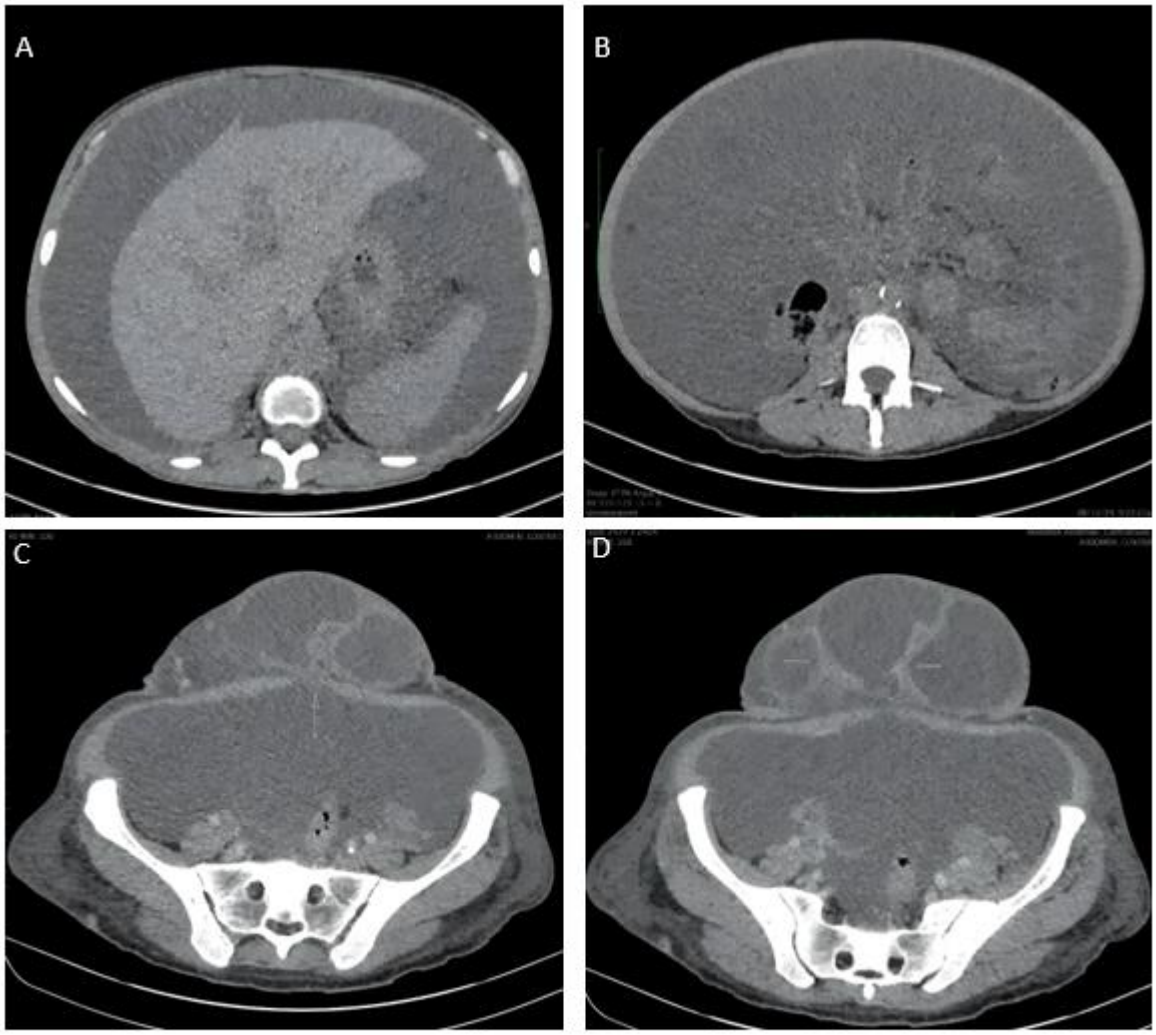


A) *Macroscopic superior view of the resected umbilical mass,* B) *Inferior surface of the excised lesion, showing the hernia sac and underlying tissue interface,* C) *Posterior aspect of the mass, highlighting the peritoneal attachment and ascitic fluid contact area,* D) *Intraoperative repair of the hernia defect using the Mayo overlapping suture technique.*



A) *Significant ascitic fluid with clustering of solid viscera and intestinal loops towards the midline,* B) *Generalized ascites occupying the entire abdominal cavity,* C) *Well-defined 30 mm hernia defect (arrow), with no direct communication to the external mass,* D) *Hernial sac containing internal septations (arrow), consistent with chronicity and fluid compartmentalisation.*

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