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Strangulated Small Bowel Obstruction in an Umbilical Hernia: A Case Report of Surgical Misadventure with a Positive Surgical Outcome

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Abstract

Strangulated small bowel obstruction (SBO) is a life-threatening surgical emergency associated with bowel ischemia, necrosis, and perforation. Umbilical hernias, although commonly benign, may rarely progress to incarceration and strangulation, significantly increasing patient morbidity and mortality. We present the case of a 33-year-old morbidly obese female with acute umbilical pain, bilious vomiting, and an irreducible umbilical mass. Clinical findings, elevated inflammatory markers, and computed tomography imaging confirmed an incarcerated umbilical hernia with suspected bowel strangulation. Emergency laparotomy revealed strangulated small bowel within the hernia sac, requiring bowel resection and a surgical anastomosis. The abdominal wall was closed primarily with non-absorbable suture. This case highlights the diagnostic and operative challenges associated with strangulated SBO, particularly in obese patients and in the presence of iatrogenic complications. It also emphasizes the importance of early diagnosis, prompt surgical intervention, and the role of advanced imaging modalities such as CT in improving patient outcomes.

Keywords: Bowel strangulation; Strangulated hernia; Umbilical hernia

Introduction

Strangulated small bowel obstruction (SBO) represents a critical surgical emergency characterized by compromised blood flow to the affected bowel segment. The resultant ischemia, necrosis, and perforation are significant sequelae, if not promptly diagnosed and managed. It accounts for a significant proportion and involves 15- 20 % of all abdominal emergencies [1]. Gomez et al documented substantial risk to patient outcomes with delayed surgical intervention [2]. Umbilical hernias, though generally benign, can occasionally lead to strangulation and small bowel obstruction particularly in certain high risk patient populations. The strangulation risk has been reported at 1 to 3 percent [3].

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Strangulated hernias require emergency surgical intervention due to compromised blood flow and tissue necrosis. The 30-day mortality rate after urgent hernia surgery ranges from 2.8 to 3.1 percent, compared to 0.1 percent for elective surgery [4]. Internal hernias, both congenital and acquired, are another cause of small bowel obstruction. They account for approximately 0.5–3 percent of all cases of intestinal obstruction [5]. Strangulated small bowel obstruction comprises 10-25 percent of all intestinal obstructions [6]. The surgical management is expedited in the presence of iatrogenic complications. Laparoscopic and robotic techniques have introduced potential new complications, including Richter's hernia and port site hernias [7]. Surgical management of a strangulated small bowel, in the presence of an umbilical hernia and surgical complications, requires a high degree of clinical suspicion, precise radiological imaging, and meticulous surgical technique.

This article discusses a case of strangulated small bowel obstruction secondary to an umbilical hernia complicated by an iatrogenic umbilical tear and bowel perforation. We discuss the current body of literature surrounding strangulated SBO. We examine diagnostic challenges, the role of imaging, surgical management, and the implications of an iatrogenic injury in patient management.

Case Presentation

A thirty-three-year-old female presented to the emergency room with an acute onset of umbilical pain. The pain began a few hours prior and was 9 out of 10 on the pain analogue scale. She had an umbilical hernia for many years and had a previous open surgical repair 5 years ago. There were no previous episodes of incarceration and the hernia remained reducible prior to this episode. She was unsure if her previous repair was a tissue repair or involved a synthetic mesh. She had episodes of bilious vomiting since the onset of the pain. She had passed stools the day before but was obstipated since the onset of the pain.

Her medical history was significant for an appendicectomy and open cholecystectomy as well. Clinical examination showed severe tenderness over the umbilicus with an irreducible umbilical mass. The rest of her abdominal examination was uneventful. She was morbidly obese with a body mass index of 40. Relevant laboratory investigations showed a leucocytosis of 11.9 and a lactate level of 3.1. She remained haemodynamically stable throughout.

Computerised tomography scan showed an incarcerated small bowel umbilical hernia with a radiological suspicion of bowel ischaemia (Figure 2 and 3). Her disproportionate umbilical pain on palpation added to the clinical and radiological picture of bowel necrosis. An attempt was made to reduce the hernia in the emergency room but unfortunately, the skin over the hernia ruptured along with the necrotic bowel within (Figure 1). The iatrogenic injury to the hernia skin and bowel expedited her surgical management. After an informed consent for emergency surgery, she was taken to the operating room.

At laparotomy we discovered full thickness strangulated small bowel in the umbilical hernia (Figure 1). This was resected (Figure 4) and a side-to-side surgical anastomosis performed. The rest of the small bowel was unremarkable. There were no signs of intra-abdominal sepsis. She remained haemodynamically stable throughout the surgery and was transferred to the surgery floor for recovery. The hernia was closed primarily with non-absorbable sutures. There was no obvious synthetic mesh in situ from her previous hernia repair.

She made an uneventful recovery and was discharged home. At her follow-up three weeks later, the wounds had healed, and she had no hernia recurrence. She tolerated a regular diet and was passing regular stools. She was advised about a weight loss program and the high risk of a hernia recurrence if she remained morbidly obese with a body mass index of 40. The patient did not attend any further surgery clinics and was lost to surgical follow up.

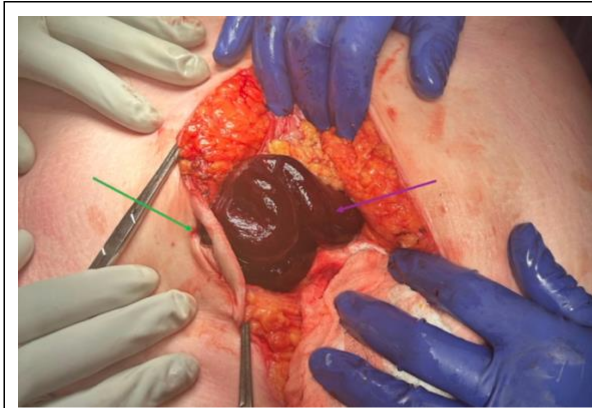

Figure 1: Strangulated bowel (purple arrow) and the skin tear in the umbilical hernia (green arrow).

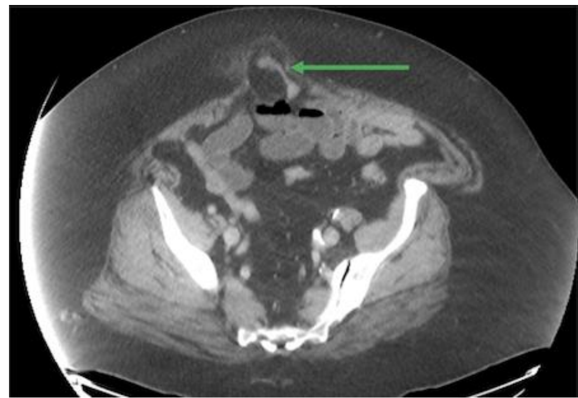

Figure 2: CT scan axial view showing the strangulated bowel (green arrow).

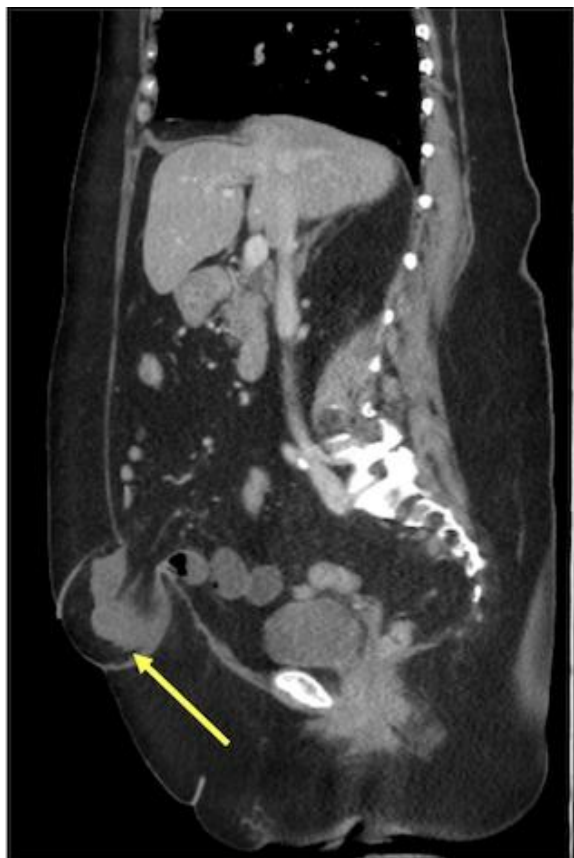

Figure 3: CT scan coronal view with the strangulated bowel (yellow arrow).

Figure 4: Resected small bowel specimen showing full bowel wall necrosis.

Discussion

Small bowel strangulation, secondary to an umbilical hernia with an iatrogenic injury demonstrates the complexity and urgency associated with this surgical emergency. Published guidelines emphasize the critical need for prompt diagnosis and intervention to prevent ischemic complications such as necrosis, and perforation. The anaerobic metabolites lead to splanchnic vasodilatation, hypovolaemic shock and eventually multi-organ failure. Umbilical hernias account for approximately 6 to 14 percent of all abdominal wall hernias in adults. Umbilical hernias as a cause of small bowel obstruction can present atypically. Disproportionate pain particularly in obese patients, makes clinical recognition challenging [8].

Open hernia surgery is the common approach with 60 percent of repairs as opposed to 40 percent for a laparoscopic approach [9]. Robotic surgery has not yet been well elucidated in the acute care setting, especially in the presence of bowel necrosis. A key takeaway from this case was the iatrogenic tear to the umbilicus, which introduced an additional layer of complexity to the patient's management. The skin and bowel rupture in the emergency room could have released the trapped anaerobic metabolites with a resultant toxic shock and multi-organ failure. In hindsight this may not have been the most prudent approach. That decision was made on the assumption that the bowel was still viable and would benefit from the physiological benefits of circulatory restoration to the bowel wall. We now advocate for early surgical intervention in the face of radiological signs of bowel ischaemia.

Hernial reduction pre-operatively can lead to complications such as skin rupture, bleeding or bowel perforation. An attempt at reduction can be made intra-operatively as you have better control of the surgical milieu than in the emergency room. This complication highlights the necessity for meticulous surgical technique and heightened vigilance during both the operative and pre-operative phase. As surgical procedures evolve, particularly with the increasing use of minimally invasive approaches, the potential for complications such as Richter's hernia or iatrogenic injuries must be considered. The growing body of literature suggests that laparoscopic interventions, while minimally invasive, may introduce sites of weakness in the abdominal wall, predisposing patients to port site or Richter's hernias [7]. Richters hernia, a partial necrosis of the bowel wall, remains the common clinical presentation in strangulated abdominal wall hernias [10]. Closure of the fascia for port sites greater than 10 millimetres is the current recommendation.

Our presentation of a full thickness small bowel necrosis is an extremely rare finding. We did not attempt to warm up the bowel as is often performed in cases of ischaemia and incarceration. This is thought to restore the circulation and treat the ischaemia. The entire thickness of the bowel wall appeared necrotic when visualised in the emergency room. Bowel resection and a surgical anastomosis remained our only recourse. We did not employ a synthetic mesh, and a biological mesh was not available at our institution. In the present of bacterial translocation across the necrotic bowel, we felt this a prudent decision. Diagnostic imaging incorporating advanced imaging modalities such as abdominal computer tomography (CT) scans, can assist in patients with non-specific symptoms [11]. Ultrasound (US) has a sensitivity of 85–90 percent and specificity of 80–85 percent for detecting umbilical hernias but is less reliable in cases of strangulation due to limitations in assessing bowel wall viability [12]. Computed tomography (CT) is more efficient, with a sensitivity of 95 percent and specificity of 90–95 percent and the preferred modality for diagnosing strangulated umbilical hernias by identifying bowel ischemia and obstruction [13]. Magnetic resonance imaging has a similar sensitivity and specificity to CT scan but rarely used in the acute care setting [14].

Conclusion

This case report contributes to the growing recognition that clinical suspicion, comprehensive imaging, and surgical precision collectively serve as cornerstones in optimizing patient outcomes in cases of strangulated small bowel umbilical hernias. The type of surgical repair depends on the surgical skill set and availability of advanced surgical tools. Pre-operative hernia reduction in the presence of radiological signs of bowel ischaemia, is not recommended.

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