

An uncommon case of lucid Interval- bowel perforation

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ABSTRACT

Hollow viscus injuries (HVI) following blunt abdominal trauma are rare and diagnostically challenging, especially when early signs are absent or minimal. We report the case of a 17-year-old male who presented 24 hours after a bicycle handlebar injury with two episodes of vomiting and no abdominal tenderness or peritoneal signs. Initial imaging, including E-FAST and plain abdominal radiography, was unremarkable. During a period of observation, isolated tachycardia developed, prompting contrast-enhanced computed tomography (CE-CT), which revealed free fluid in Morrison's pouch, paracolic gutters, pelvis, and intermesenteric spaces without solid organ injury. Based on imaging and clinical suspicion, diagnostic laparoscopy was performed, revealing a 2.5 × 2.5 cm jejunal perforation approximately 15 cm distal to the duodenojejunal flexure along with an associated mesenteric rent. Both defects were repaired laparoscopically. The patient's postoperative recovery was uneventful, and he was discharged on postoperative day nine. This case highlights the diagnostic difficulty posed by the "lucid interval" phenomenon—where early clinical and imaging findings appear benign despite underlying bowel injury. It emphasizes the importance of continuous monitoring and low threshold for advanced imaging when subtle physiological changes occur. Furthermore, it demonstrates the feasibility and efficacy of minimally invasive surgery in managing isolated jejunal perforations in stable patients. Early detection and timely intervention are essential to prevent morbidity and improve outcomes in patients with blunt abdominal trauma and suspected hollow viscus injury.

KEYWORDS: Blunt abdominal trauma, Jejunal perforation, Hollow viscus injury, Laparoscopy, Delayed diagnosis.

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INTRODUCTION

Hollow viscus injuries (HVI) are uncommon but serious complications of blunt abdominal trauma (BAT), representing less than 1% of all trauma admissions but carrying a high risk of morbidity and mortality when diagnosis is delayed [1]. Among the hollow organs, the jejunum is the most frequently affected, likely due to its anatomical position and fixed points in the abdomen [2,3]. The diagnosis of HVI can be challenging, particularly in hemodynamically stable patients, because early clinical signs are often subtle or absent [4].

Mechanisms contributing to bowel injury include sudden compression between the abdominal wall and spine, rapid deceleration causing shear forces, and a transient increase in intraluminal pressure, resulting in a "blowout" perforation [5]. Delayed perforations can also result from mesenteric ischemia, with symptoms manifesting more than 24 hours post-injury [6]. The limitations of early imaging modalities like E-FAST and plain radiography often lead to false reassurance during the initial assessment [7]. While CT scans with IV and oral contrast increase diagnostic sensitivity, findings may still be equivocal in early phases [8]. In such scenarios, repeated clinical examinations and a low threshold for surgical exploration are critical [9].

Minimally invasive surgery, such as diagnostic laparoscopy, has emerged as both a diagnostic and therapeutic tool in select cases, particularly when contamination is limited and the patient is stable [10]. This evolving approach improves outcomes by enabling early repair and reducing postoperative complications. Overall, timely recognition and intervention remain vital, and clinicians should maintain a high index of suspicion even when initial findings are deceptively benign.

CASE REPORT

A 17-year-old male presented to the emergency department 24 hours after sustaining blunt abdominal trauma from a bicycle handlebar impact. He reported two episodes of non-bilious, non-projectile vomiting but had no abdominal pain or other symptoms. On initial clinical evaluation, he was hemodynamically stable with a benign abdominal examination, showing no signs of tenderness, guarding, or peritonitis. Initial imaging, including an Extended Focused Assessment with Sonography in Trauma (E-FAST) and erect abdominal radiography, was unremarkable, showing no evidence of free fluid or pneumoperitoneum. Given the delayed presentation and reassuring findings, the patient was admitted for observation. Approximately four hours into observation, he developed isolated tachycardia, without any overt clinical signs of peritoneal irritation. This subtle physiological

change raised concern, prompting further evaluation with contrast-enhanced computed tomography (CE-CT). The CT scan revealed moderate free fluid in Morrison's pouch, bilateral paracolic gutters, pelvis, and intermesenteric spaces, without solid organ injury, findings suspicious for hollow viscus or mesenteric injury. Based on these findings and persistent concern despite minimal clinical signs, an urgent diagnostic laparoscopy was performed. Intraoperatively, a 2.5×2.5 cm perforation was identified in the jejunum approximately 15 cm distal to the duodenojejunal flexure, along with a mesenteric rent. The perforation was closed primarily with intracorporeal sutures, and the mesenteric defect was also repaired laparoscopically. The procedure was completed without complications. Postoperatively, the patient recovered well, with gradual reintroduction of oral intake and mobilization. He was discharged on the ninth postoperative day in stable condition and without complications. This case underscores the importance of maintaining a high index of suspicion for hollow viscus injury in patients with blunt abdominal trauma, even when initial clinical findings and basic imaging are unremarkable. The development of subtle physiological signs such as isolated tachycardia should prompt escalation to advanced imaging and surgical evaluation. Moreover, it highlights that laparoscopic management is a feasible and effective approach in isolated jejunal perforations with limited contamination, especially in hemodynamically stable patients. The transient "lucid interval" observed in this case illustrates the potential for delayed manifestation of intra-abdominal injuries and the critical role of vigilant monitoring and timely diagnostic intervention in trauma care.

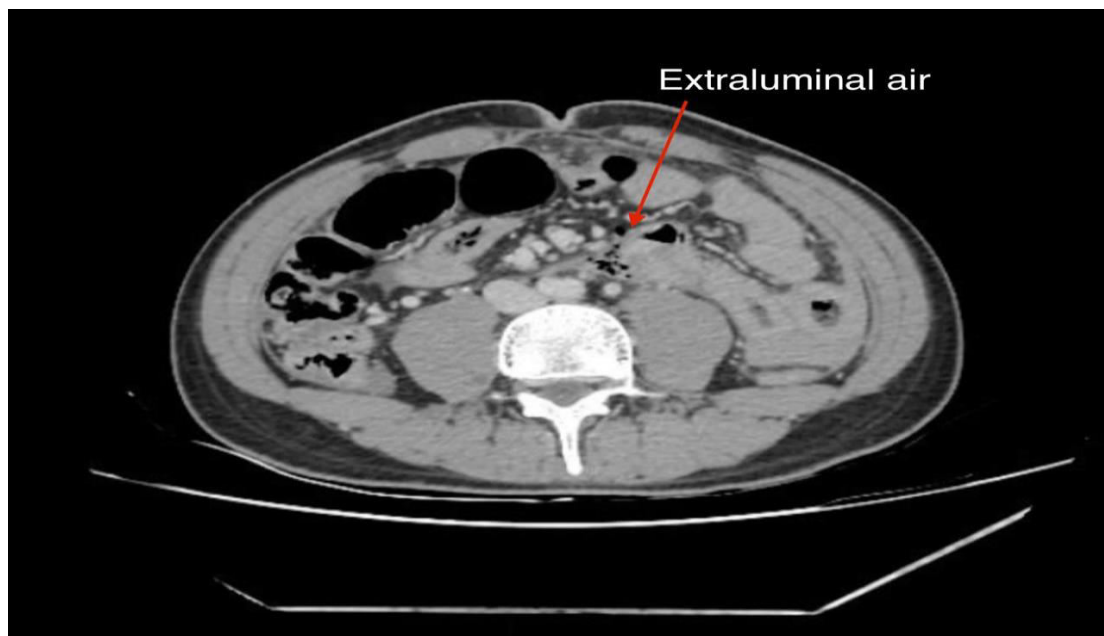


Figure 1: Axial contrast-enhanced CT image of the abdomen demonstrating pockets of extraluminal air (marked by red arrow) in the mesenteric region, suggestive of a jejunal perforation. The presence of free air without pneumoperitoneum is a key radiological clue in blunt hollow viscus injury



Figure 2: Axial contrast-enhanced CT scan of the abdomen demonstrates free fluid accumulation in both right and left paracolic gutters (indicated by arrows), without evidence of solid organ injury. This pattern is highly suggestive of

hollow viscus or mesenteric injury, particularly in the setting of blunt abdominal trauma



Figure 3: Erect Chest X-ray in Suspected Hollow Viscus Injury

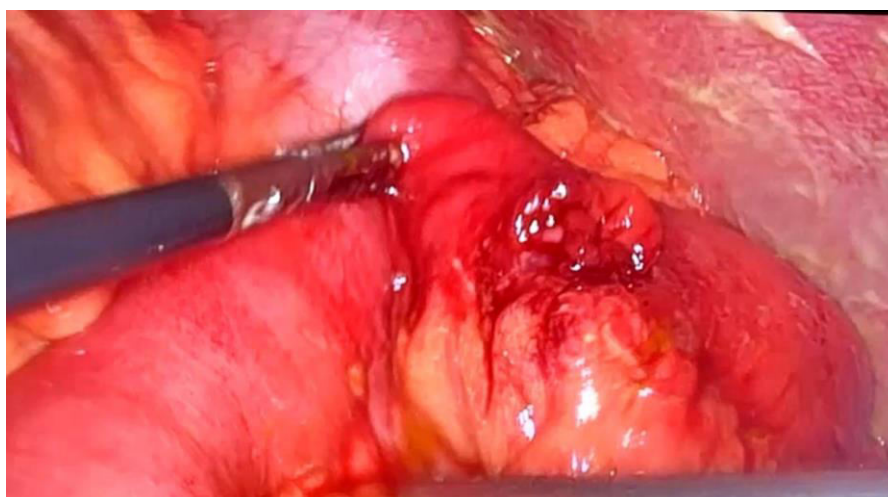


Figure 4: Laparoscopic image showing a clearly visualized jejunal perforation with surrounding inflammatory changes and ecchymosis. The defect is located on the antimesenteric border of the jejunum, approximately 15 cm distal to the duodenojejunal flexure

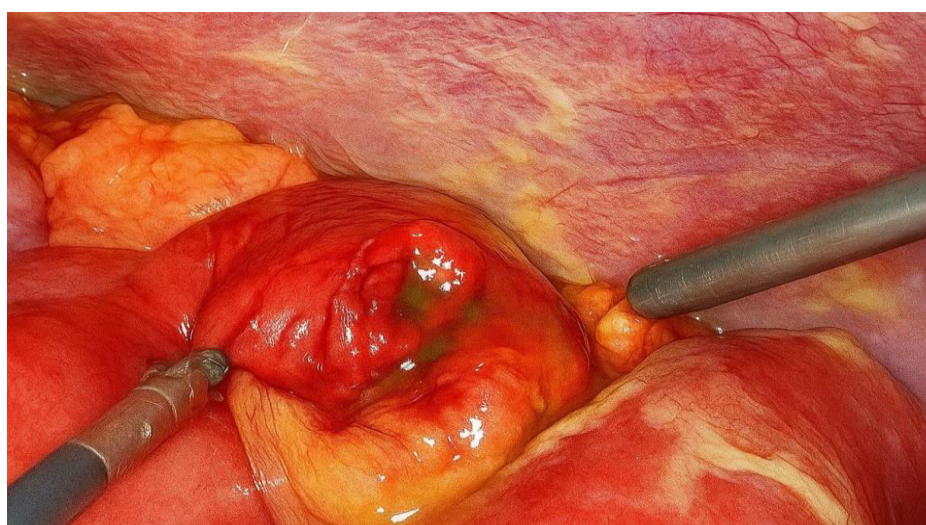


Figure 5: High-definition laparoscopic image revealing a clearly demarcated jejunal perforation with surrounding bile staining and inflammation. The inflamed edges and greenish bile indicate active leakage, necessitating prompt surgical repair. This image highlights the utility of laparoscopy in both diagnosis and management of hollow viscus injuries

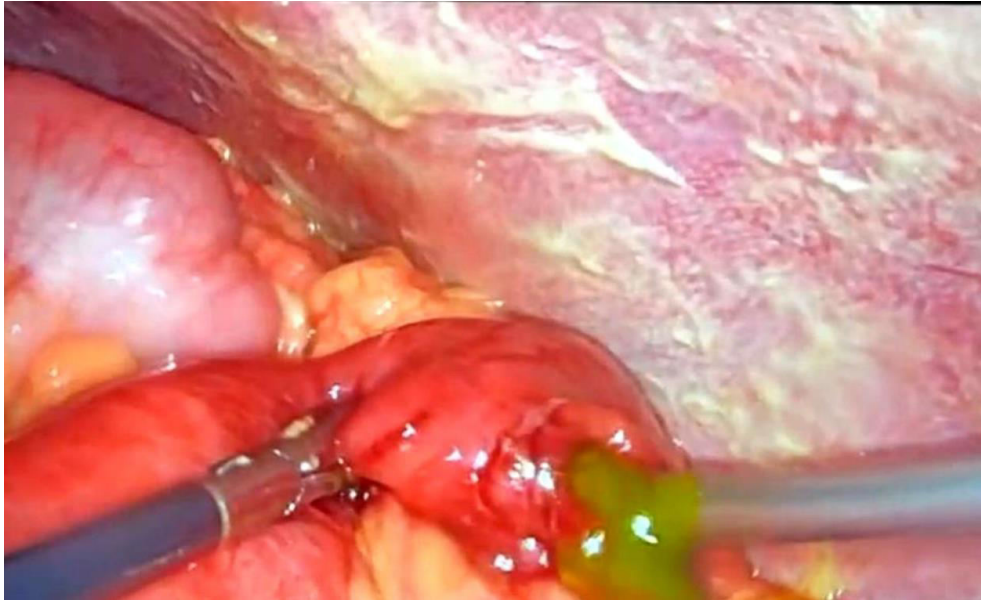


Figure 6: Intraoperative laparoscopic image showing a 2.5×2.5 cm perforation in the jejunum with active bilious leakage, approximately 15 cm distal to the duodenojejunal flexure. The perforation margin appears inflamed, and bile staining is visible, confirming hollow viscus injury requiring surgical repair.

DISCUSSION

This case illustrates a classic diagnostic challenge in blunt abdominal trauma: the delayed recognition of hollow viscus injury (HVI), particularly jejunal perforation, due to an initial “lucid interval” with nonspecific or absent clinical signs. While early imaging was unremarkable, subtle physiological changes during observation prompted escalation to contrast-enhanced CT (CE-CT), which eventually led to the diagnosis and timely laparoscopic intervention. In comparison to broader published series, this case aligns with findings that jejunum is the most commonly affected segment in blunt HVI, often due to its anatomical position and susceptibility to shearing forces or intraluminal pressure spikes. Elian et al. (2022) reported jejunal involvement in over 56% of their cases, reinforcing its predominance in such injuries [2]. Similarly, Ammar et al. (2022) found the jejunum to be the most commonly affected hollow viscus in blunt trauma, accounting for 19.4% of all cases [3].

Notably, the absence of early peritoneal signs and negative initial imaging is not uncommon. Ulman et al. (1996) emphasized that classic radiographic signs such as free air were present in only 25% of their pediatric HVI cases, and sonographic detection of free fluid was similarly limited [4]. Gunturi et al. (2017) echoed this in adult patients, stating that careful serial examinations and CT findings like isolated free fluid were key to diagnosis in equivocal cases [7].

The use of laparoscopic repair in this patient is also noteworthy. While open laparotomy remains the standard in unstable patients or with diffuse contamination, minimally invasive techniques are gaining acceptance. Rodriguez et al. (2024) and Wadhwa et al. (2021) both support early surgical intervention tailored to physiological stability and contamination level, with primary repair being the most common procedure in isolated perforations [1,9]. In contrast to earlier decades where diagnostic delays frequently resulted in septic complications and higher mortality, this case reflects the improved outcomes possible with vigilant observation, timely imaging, and minimally invasive surgery.

CONCLUSION

Early diagnosis of hollow viscus injury following blunt abdominal trauma remains challenging due to initially subtle or absent signs. Vigilant observation, timely imaging, and a low threshold for surgical evaluation are critical. Minimally invasive repair offers effective management in stable patients with isolated jejunal perforation.

REFERENCES

1. Rodriguez VI, Perez B, Fernandez A, Varela C, Terán A. Hollow viscus perforation in blunt abdominal trauma: A 14-year experience from a trauma center. *World J Surg*. 2024.
2. Elian M, Elhiny A, El Rahman A, El Aziz A. Hollow viscus injuries after blunt abdominal trauma in children and adults in a comparative study. *Egypt J Surg*. 2022;41:542–547.
3. Ammar A, Hadi A, Anwar U, Nawaz H, Batool S, Naqi S. Spectrum of hollow visceral injury due to isolated blunt trauma abdomen presented to a tertiary care trauma hospital of Pakistan. *J Pak Med Assoc*. 2022.
4. Ulman I, Avanoğlu A, Ozcan C, Demircan M, Ozok G, Erdener A. Gastrointestinal perforations in children: a continuing challenge to nonoperative treatment of blunt abdominal trauma. *J Trauma*. 1996;41(1):110–113.
5. Das BM, Kar S, Behera T. Hollow viscus injury following blunt abdominal trauma: A retrospective study. *Ann Int Med Dent Res*. 2017;4(1):SG32–SG36.

6. Yang SM, Tseng H, Ouyang A, Chen CF. Delayed jejunal perforation from blunt abdominal trauma: An unusual case report. *J Trauma Crit Emerg Med*. 2011;3:129–133.
7. Gunturi SRV, Thumma V, Bathalapalli JR, Kunduru N, Bishnoi KK, Rakesh N, et al. Hollow viscus injury due to blunt abdominal trauma. *Int Surg J*. 2017;4(3):861–865.
8. Al-Ajrash A. Clinical vigilance overcomes imaging limitations in jejunal perforation: A case report. *Cureus*. 2025;17.
9. Wadhwa M, Kumar R, Trehan M, Singla S, Sharma R, Ahmed A, Sharma R. Blunt abdominal trauma with hollow viscus and mesenteric injury: A prospective study of 50 cases. *Cureus*. 2021;13(6):e13321.
10. Mica L, Jensen K, Pothmann C, Simmen H, Hierholzer C. Isolated jejunal perforation after blunt trauma: Report of three cases. *Tech Emerg Care*. 2016;2:1–3.