Section: General Surgery

Case Series

LARGE BOWEL PERFORATION IN CASES OF BLUNT TRAUMA ABDOMEN: A CASE SERIES OF 9 CASES

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ABSTRACT

Background: Although large bowel perforation is an exceptionally uncommon occurrence in conjunction with blunt abdominal trauma, it is life-threatening and constitutes a fraction of hollow viscus injuries. A diagnostic challenges and complications in management can be attributed to the multifaceted nature and clinical presentation ranging in its signs and symptoms as well as the variability of the injury site, which is often missed during the primary assessment or examination. In these cases, we find the clinical picture to be more chaotic, as the therapeutic approach is dictated by a combination of clinical, imaging, and laboratory findings. The objective is to characterize the clinical presentation, imaging findings, intraoperative features, and short-term outcomes of patients with blunt trauma–induced large bowel perforation. **Materials and Methods:** This retrospective case series analyzed nine patients with blunt abdominal trauma induced large bowel perforation and subsequent emergency laparotomy performed between January 2022 and June 2024 in a Tertiary Care hospital in India. Patients were identified through surgical records and electronic hospital data. Inclusion criteria were large bowel perforation as the primary surgical diagnosis while excluding penetrating or iatrogenic injuries. Mechanism of injury, clinical presentation, imaging studies, surgical approach (primary repair, resection-anastomosis or stoma), postoperative complications, and survival were recorded. Patients were followed for a duration of 1 to 6 months. **Case Details:** Within the nine cases, the sigmoid colon was the most commonly affected (n=3), followed by transverse colon (n=2), cecum (n=2), and descending colon (n=2). Surgical approaches included primary repair (n=3), segmental resection with anastamosis (n=3), and Hartmann's procedure (n=3). Two patients were septic on presentation, both progressing to multi-organ failure in the postoperative period. The most frequent complications observed included superficial wound infections and delayed bowel function. Survivors demonstrated no late complications or recurrence during the follow-up period. **Conclusion:** It is important to have an accurate diagnosis along with prompt surgical treatment when managing blunt abdominal trauma with large bowel perforations. The outcome is improved with tailored operative approaches depending on the site and degree of contamination. There is a direct link between delayed presentation and poor prognosis. Careful clinical monitoring combined with prompt imaging aids in the early diagnosis.

INTRODUCTION

Blunt abdominal trauma continues to be a significant concern worldwide due to its substantial contribution to morbidity and mortality particulalry when it involves injuries to vital abdominal organs including intestines. The diagnosis of intestinal injuries remains challenging because of nonspecific nature of the symptoms. These injuries are often not immediately diagnosed making timely recognition essential to prevent further complications. Intestinal injuries are responsible for a significant share of operative emergencies. The early detection of these injuries is key to improving patient outcomes in cases of blunt abdominal trauma. Delays in diagnosis can lead to catastrophic consequences such as peritonitis, sepsis and multi-organ failure which significantly increases mortality rates.[1-3]

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Injuries to the colon resulting from blunt trauma can result in life-threatening complications. If colon perforation is not diagnosed in time and appropriate interventions are done promptly it can result in serious septic complications which can lead to increased morbidity and increased surgical risks. The severity of these complications makes it imperative that these injuries are recognised immediately and appropriate surgical interventions are done. Timely intervention can significantly reduce the likelihood of septic shock and other severe complications as well as may reduce mortality.[4-6]

Global guidelines are evolving towards a more standardized, systematic approach to both the diagnosis and management of blunt abdominal trauma. This approach is not only aimed at ensuring proper diagnosis but also at minimizing unnecessary delays in treatment. These management strategies recognise that delay in the diagnosis and intervention in these cases can have catastrophic consequences. Effective management strategies involve a multidisciplinary approach that includes imaging studies, clinical evaluation and timely surgical intervention.[7,8]

Cases involving unusual combinations of injuries continue to be. For example, reports of cases with gastric and duodenal perforations resulting from blunt trauma shows the complexity and unpredictability of the injuries that may arise in these situations. These cases demonstrate that blunt trauma can affect multiple areas of the gastrointestinal tract, requiring clinicians to remain vigilant for a broad range of possible injuries.[9,10]

Advances in diagnostic imaging such as use of cross sectional imaging is becoming increasingly valuable in the assessment of blunt abdominal trauma. Computed tomography and magnetic resonance imaging provides a non-invasive, detailed view of the abdominal cavity. This allows clinicians to identify injuries to the gastrointestinal tract, mesentery and other organs with greater accuracy. The ability to detect even small perforations and other subtle injuries in real time has revolutionized the management of blunt abdominal trauma.

This case series presents nine cases of large bowel perforation resulting from blunt abdominal trauma details the clinical presentation, diagnostic challenges, and management strategies. The aim of this study is to emphasize the importance of early detection and timely surgical intervention in such cases to prevent life-threatening complications like peritonitis and sepsis.

MATERIALS AND METHODS

The retrospective case series was done in the Department of General Surgery of a tertiary care medical institute in India. The patients who had undergone surgeries for bowel injury secondary to blunt abdominal trauma between the period of 2 years from August 2022 and July 2024 were included in this study on the basis of a predefined inclusion and exclusion criteria. The study included 9 cases of large bowel perforation secondary to blunt abdominal trauma.

Patients' data was analysed using electronic records, surgical registers and data from operation theatres. The inclusion criteria consisted of patients of any demographic who sustained blunt abdominal trauma and had a confirmed large bowel perforation during surgery. Patients were excluded if they had penetrating injuries, iatrogenic bowel injuries, or incomplete clinical or surgical records.

Information gathered included patient age, clinical imaging data such as ultrasound and computed tomography reports, vital signs and symptoms secondary to blunt trauma such as pain or swelling. Patients' operative records were also checked for the location of bowel perforation, the kind of surgery done (primary repair, resection and anastomosis, or stoma formation) and any intraoperative findings such as presence of contamination or associated injuries, If available then the status of the resection margins was also documented. Records of inpatients and notes from outpatient consultations were used to evaluate postoperative outcomes.

Variables such as postoperative complications such as infections, longer than expected hospital stay, additional surgery and mortality were noted. Patients were followed for a period of one to six months.

The main aim of the study was to assess the patient's clinical presentation, intraoperative details, surgical management strategies and short-term outcome analysis for large bowel perforation secondary to blunt abdominal trauma.

CASE REPORT 1

Clinical Presentation: A 35-year-old male came to the emergency department 12 hours after a high energy motor vehicle accident. He had diffuse abdominal pain, distension and vomiting. He had no history of external injuries and no associated chest or limb trauma. On examination, he was afebrile but was found to be having tachycardic (HR 112/min). Abdominal guarding and rebound tenderness was noted and bowel sounds were absent.

Imaging Findings: An upright abdominal X-ray showed the presence of free subdiaphragmatic air. Focused Assessment With Sonography in Trauma (FAST) showed free fluid in pelvis. Abdominal CT showed the presence of pneumoperitoneum alongside thickening of the sigmoid colon wall with adjacent fat stranding suggestive of focal perforation.

Biochemical Analysis: Initial testing showed the presence of leukocytosis (TLC 14,200/mm³) and elevated CRP (38 mg/L). Other tests like electrolytes, renal, and liver function tests showed no abnormalities. Serum lactate was mildly elevated to 2.6 mmol/L.

Intraoperative Findings: Emergency laparotomy revealed the presence of a single perforation on the antimesenteric border of sigmoid colon measuring

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1.2 cm with fecal contamination in the left iliac fossa and pelvis. The perforation was seen covered by omentum. No other visceral injuries were noted. A two layered repair of the colon was done after complete peritoneal lavage and a pelvic drain was placed.

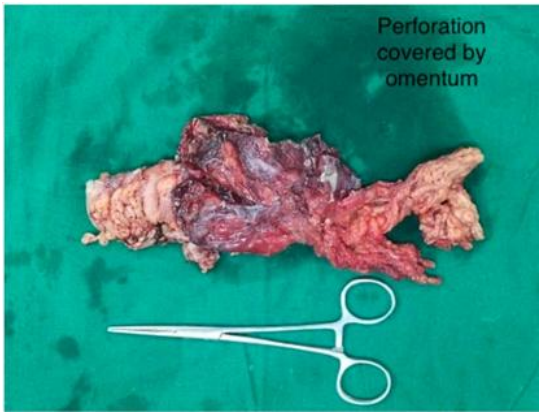

Figure 1: Perforation Covered by omentum.

Outcome: The postoperative recovery period was free of complications aside from a mild superficial wound that was managed conservatively. The patient was discharged on postoperative day 09. During the 6 month follow up, the patient remained asymptomatic and there was no evidence suggestive of recurrent infection or complication of the surgery.

CASE REPORT 2

Clinical Presentation: An Emergency Department was notified of a 28 year old woman who was brought to the ED 8 hours after a second floor fall from a building. She reported severe abdominal pain and was nauseated. Clinical examination showed that all the vitals were stable, but there was upper abdominal tenderness with guarding and some diffuse abdominal tenderness. There was no sign of trauma on the abdominal wall.

Imaging Findings: An erect abdominal x ray demonstrated free air beneath the diaphragm. Mild ascites was observed on ultrasound and was inconclusive otherwise. Pneumoperitoneum was confirmed by CT scan with localized discontinuity of the wall of the splenic flexure of colon and adjacent fluid collection.

Biochemical Analysis: The initial blood test showed abnormal values with white blood cell of 12000/mm^3 and hemoglobin of 11.4 g/dL. Serum lactate was 2.1 mmol/L which is mildly elevated. Other tests such as electrolyte level, renal and liver function tests showed normal values.

Intraoperative Findings: Emergent laparotomy exposed a perforation approximately one and a half centimeters splenic flexure of colon with only a small amount of fecal matter contaminating the area. Edema was present in the surrounding bowel, although it was still viable. A segmental colon resection with end-to-end anastomosis was performed. Peritoneal lavage was performed and a drain was situated in the subhepatic area.

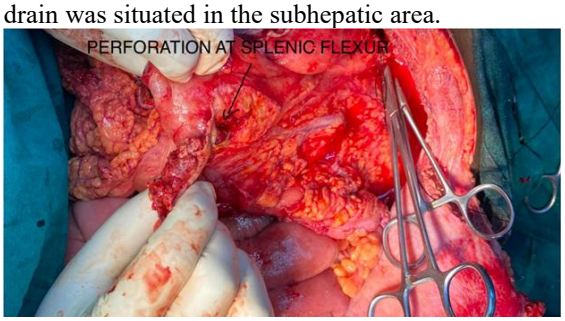

Figure 2: Intraoperative finding of perforation at splenic flexure of colon.

Current Status: Oral intake was reinitiated on postoperative day 4 and the drain was removed on postoperative day 6. The patient was discharged on postoperative day 8. During the 3-month follow-up there was no recurrence or complications.

CASE REPORT 3

Clinical Presentation: A 42-year-old male was admitted to the casualty department with a chief complaint of knee pain after being involved in a high-speed road traffic collision 18 hours prior. He presented to the clinic in an unconscious state, and appeared to be in a state of hypotension with a blood pressure of 80 on 50. On examination, the patient was found to have severe abdominal distension. Rigidity or sign of surgical abdomen with absent bowel sounds were also noted. The patient appeared to be in a state of hemodynamic instability.

Imaging Findings: Ultrasound of the patient showed free fluid in peritoneal cavity. An upright abdominal X-ray demonstrated large pneumoperitoneum as well. Due to an unstable blood pressure, CT scan was postponed in the interim. Clinically, the patient was extremely symptomatic and therefore underwent the corrective surgery immediately.

Figure 3: Intraoperative finding of perforation and secondary fecal contamination of omentum.

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Lab Tests: Laboratory tests indicated the presence of leukocytosis (WBC of 17,600/mm³), metabolic acidosis as evidenced by arterial blood gases, and an increase in serum lactate levels (5.2 mmol/L). Creatinine levels indicated a mild increase of 1.8 mg/dL which in the context of the other findings suggests early sepsis and renal function derangement.
Perioperative Findings: Exploratory laparotomy highlighted a significant perforation located in the anterior segment of the cecum, as well as copious amounts of feculent material within the right paracolic gutter and pelvis, indicating contamination. The surgical intervention done involved right hemicolectomy which was immediately followed by an ileocolic anastomosis. Extensive peritoneal lavage was also conducted. To facilitate the management of any possible postoperative complications two abdominal drains were placed.
Follow-Up: Given his hemodynamic instability patient was transferred to the surgical ICU with ongoing requirements for invasive mechanical ventilation and inotropic medications. Due to the severity of the septic condition and multi-organ failure, despite ongoing management, the patient succumbed on postoperative day 5.

CASE REPORT 4

Clinical Overview: This case involved a 50-year-old male patient who sustained frontobasilar trauma in a two wheeler collision, prompting a visit to the emergency department 10 hours post-accident. His primary complaints included progressive abdominal pain, distension and constipation. His overall mental status appeared to be within normal limits. On physical examination he was noted to be tachycardic (HR 106) and was mildly hypotensive. On abdominal examination he demonstrated tenderness, overall distension and guarding suggestive of peritoneal irritation.
Imaging findings: An erect abdominal X-ray showed free air underneath the right diaphragm. Another enhanced CT scan showed the wall discontinuity of the descending colon along with moderate peritoneal free fluid and neighboring fat stranding.
Biochemical Analysis: In this analysis, blood tests indicated that total leukocyte count was elevated (13,700/mm³) alongside a normal hemoglobin value (12.1 g/dL) and mildly elevated C-reactive protein (28 mg/L) levels. Furthermore, serum creatinine and liver enzymes were normal.
Intraoperative Findings: Exploratory laparotomy showed moderate fecal contamination that was localized to the left flank alongside a single descending colon perforation that was approximately 1 cm. A two-layer closure was followed by peritoneal lavage and drain placement in the left paracolic gutter.
Current status: After 6 days, the patient was diagnosed with a superficial postoperative wound that required secondary linear closure and frequent dressing changes. No intrabdominal complications were seen. He was discharged 14 days after the surgery. During the 6 month follow up, the patient did not report symptoms or complications, and there was no noted recurrence or hernia formation.

CASE REPORT 5

Clinical Presentation: A 30-year-old male patient came to the emergency department after sustaining blunt force trauma to the abdomen. He arrived approximately 6 hours after the injury, reporting lower abdominal pain, vomiting and poor recollection of the events surrounding his injury. His vital signs were stable. Abdominal examination revealed tenderness in the left iliac fossa and localized guarding. No signs of generalized peritonitis were noted.
Imaging Findings: An abdominal ultrasound demonstrated free fluid in the pelvis, and an erect abdominal x-ray demonstrated a crescent of free air under the left hemidiaphragm. These findings, along with pericolic fat stranding and minimal pneumoperitoneum, were indicative of a contained perforation of the sigmoid colon on contrast-enhanced CT imaging.
Biochemical Analysis: The patient's blood work up revealed a white blood cell count of 11,500/mm^3, a hemoglobin level of 12.9 g/dL, and an elevated C-reactive protein (CRP) of 32 mg/dL. These findings, in conjunction with his unremarkable renal and liver function tests, pointed toward a mild inflammatory response.
Intraoperative Findings: During the exploratory laparotomy a 1 cm perforation of the sigmoid colon was noted to have localized contamination. No other intra-abdominal injuries were found. Due to the local contamination found a Hartmann's procedure was performed which involved closing the distal stump and creating a colostomy on the proximal end. Peritoneal lavage was performed.
Current Status: Recovery following surgery was without significant incident. The patient was released on postoperative day 10. The reversal of colostomy was performed successfully 4 months later. At 6 months postoperative he is clinically stable with no recurrence or complications.

CASE REPORT 6

Clinical Presentation: A 24 year old male patient came to the emergency department with blunt abdominal trauma due to a road traffic accident 20 hours prior. He reported abdominal pain, fever, and vomiting. He was drowsy, febrile with a temperature of 101.4°F, and was hypotensive with a blood pressure of 90/60 mmHg. He was also found to have tachycardic with a heart rate of 118/min. Abdominal examination revealed gross distension with guarding and absent bowel sounds.
Imaging Findings: Erect abdominal x-ray revealed free intraperitoneal air underneath both

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hemidiaphragms. There was also large amounts of free fluid on ultrasound. Due to the instability of vitals imaging was withheld and the patient was brought for immediate exploratory laparotomy.

Biochemical Analysis: Laboratory results showed the following: leukocytosis with WBC 18,900/mm³, marked metabolic acidosis with elevated serum lactate of 6.1 mmol/L, mildly elevated creatinine of 1.7 mg/dL, and serum enzymes of the liver were within normal range.

Intraoperative Findings: Upon surgical exploration, there was a significant (around 2 cm) tear in the transverse colon alongside a considerable amount of fecal matter in the peritoneal cavity. The tissue surrounding the tear was swollen, and the bowel tissue was both edematous and friable. Following meticulous lavage of the peritoneal cavity segmental resection with anastomosis of the colon was performed. Two drains were positioned in the abdomen postoperatively.

Current Status: The patient was admitted to the surgical ICU immediately after the operation where he was placed on broad spectrum antibiotics, fluid resuscitation, and inotropic therapy. Unfortunately, even with aggressive management, the patient deteriorated and developed worse septicemia alongside acute respiratory distress syndrome (ARDS). He died from multi-organ failure on the 3rd day post-operatively.

CASE REPORT 7

Clinical Presentation: A 38-year-old man was brought to the hospital 14 hours after a high-energy motor vehicle collision. He described progressive worsening of abdominal bloating, diffuse discomfort, and constipation. He was febrile and tachypneic with a heart rate of 110 bpm. During the physical examination, the patient had a tense and diffusely tender as well as rigid abdomen. There were no bowel sounds.

Imaging Findings: Erect abdominal X-ray showed free air underneath the right hemidiaphragm. CT scan showed a focal defect in the cecal wall with extensive pneumoperitoneum and moderate ascitic fluid. There were no injuries to the solid organs.

Biochemical Analysis: Laboratory findings indicated leukocytosis with a WBC count of 16,200/mm³ alongside a modestly elevated serum urea level of 48 mg/dL and creatinine level of 1.5 mg/dL. Additionally, serum lactate was measured at 3.2 mmol/L. Liver function tests did not show any abnormalities.

Intraoperative Findings: The exploratory laparotomy revealed a 2 cm perforation of the cecum which had moderate fecal contamination in the right paracolic gutter. The surrounding tissues were inflamed yet viable. Hence, a right hemicolectomy was performed with an ileocolic anastomosis. Additionally, drains were placed in the pelvis and subhepatic space.

Current Status: The patient developed an initial delay in returning bowel function which led to persistent postoperative ileus. His management included conservative measures such as nasogastric aspiration, intravenous fluids and correction of electrolytes. Oral intake was possible on the 7th day and was discharged on day 12 postoperatively. At 6-month follow-up, he reported no discomfort and stable bowel movements.

CASE REPORT 8

Clinical Presentation: A 45-year-old male was brought to emergency department 7 hours after he fell from a ladder. He reported lower abdominal pain with progressive distension. His vitals were stable with BP 124/80 mmHg and HR of 96/min. He was clinically stable, however, localized tenderness with guarding was noted in the lower quadrant on the left side. There were no signs of external injuries.

Imaging Findings: An erect abdominal X-ray displayed free air underneath the left dome of the diaphragm. Ultrasonography revealed minimal free liquid in the pelvis. Contrast-enhanced CT scan demonstrated a focal wall defect in the descending colon, with adjacent fat stranding and pneumoperitoneum.

Biochemical Analysis: Investigated blood results indicate a total leukocyte count of 13,200/mm³ and CRP of 34 mg/L. Serum electrolytes, renal profile, and liver enzymes showed no abnormal findings.

Intraoperative Findings: Emergency laparotomy showed a single 1 cm perforation on the antimesenteric border of the descending colon with scant fecal soiling confined to the left iliac fossa. The wound was closed with a primary two-layer closure of the perforation, peritoneal lavage was performed, and a left pelvic drain was placed.

Current Status: Postoperative progress was unremarkable. The patient started oral intake by postoperative day 3, drain removal occurred on day 5, and discharge was on postoperative day 7. Symptom-free absence of recurrence or complications was noted through 6-month follow-up.

CASE REPORT 9

Clinical Presentation: A 29-year-old woman presented to the emergency department (ED) 9 hours after a high-speed road traffic accident (RTA). She expressed vague abdominal discomfort, difficulty passing gas, and vomiting. On physical examination, she was alert and had a temperature of 100.8°F. Moreover, she was having tachycardic with a heart rate of 102 beats per minute. Her abdomen demonstrated diffuse tenderness with guarding, with no bowel sounds present.

Imaging Findings: Pneumoperitoneum was evident beneath both diaphragms on erect abdominal X-ray. Ultrasonography revealed moderate free fluid in the abdominal cavity. Sigmoid colon wall discontinuity with surrounding fat stranding and

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pneumoperitoneum was seen on contrast enhanced CT scan.

Biochemical Analysis: Blood investigations revealed leukocytosis (WBC 14,600/mm3), hemoglobin level of 11.2 g/dL and raised C-reactive protein (45 mg/L). Other tests of serum electrolytes, renal function, and liver parameters were within normal limits.

Intraoperative Findings: Exploratory laparotomy exposed 1.5 cm perforation of sigmoid colon with moderate fecal contamination of pelvic cavity. Due to bowel edema and the surrounding inflammatory changes, Hartmann's procedure was deemed necessary. This entailed closing the distal stump and constructing a colostomy on the proximal end. A closed peritoneal lavage was performed with placement of a pelvic drain.

Current Status: The patient developed a superficial surgical site infection for which she was treated with dressings and antibiotics. She was discharged on the 11th postoperative day. At 5 months she was stable and had a successful colostomy reversal. There was no evidence of recurrence or complications 6 months after the reversal.

Table 1: Summary of Clinical, Surgical Profile and outcome of 9 Patients with Large Bowel Perforation

Case	Age/Sex	Key Symptoms	Imaging Findings	Histopathology (Intraoperative)	Surgery Type	Outcome
1	35/M	Abdominal pain, distension, vomiting	Pneumoperitoneum on X-ray and CT, sigmoid wall defect	Sigmoid perforation	Primary repair	Uneventful recovery
2	28/F	Peritonitis, abdominal pain	Transverse colon defect on CT	Splenic flexure of colon perforation	Resection & anastomosis	No recurrence at 3 months
3	42/M	Shock, altered mental status	Massive pneumoperitoneum on X-ray	Cecal perforation	Right hemicolectomy	Death due to sepsis (Day 5)
4	50/M	Pain, distension, rigidity	Descending colon defect on CT	Descending colon perforation	Primary repair	Wound dehiscence, no recurrence
5	30/M	Localized tenderness, stable vitals	Sigmoid defect with localized air on CT	Sigmoid perforation	Hartmann's procedure	Colostomy reversed at 4 months
6	24/M	Septic shock, abdominal rigidity	Pneumoperitoneum on X-ray (CT deferred)	Transverse colon perforation	Resection & anastomosis	Death due to septicemia (Day 3)
7	38/M	Distension, obstipation	Cecal wall defect with free air and fluid on CT	Cecal perforation	Right hemicolectomy	Prolonged ileus, full recovery
8	45/M	Pain, distension, localized guarding	Descending colon defect with pneumoperitoneum on CT	Descending colon perforation	Primary repair	Uneventful recovery
9	29/F	Pain, vomiting, peritonitis	Sigmoid perforation with pneumoperitoneum on CT	Sigmoid perforation	Hartmann's procedure	SSI; colostomy reversed at 5 mo

DISCUSSION

Large bowel perforation from blunt abdominal trauma is an infrequent but noteworthy clinical problem, In many cases it may cause significant diagnostic and therapeutic difficulties. In this case series of nine patients, the sigmoid, transverse, descending colon and cecum were the most commonly involved regions. Patient outcomes in this study were influenced by the early detection and the appropriate surgical management the patients received.

Isolated colonic injuries are uncommon and the diagnosis can often be postponed because of vague symptoms and non-specific imaging. Đat et al reported a blunt trauma case of isolated sigmoid colon disruption and highlighted the unusual difficulty in determining the injury's location preoperatively and the need for rapid surgical intervention.[11] In the same way Suzuki et al reported a case of simultaneously occurring perforation of the ileum and ascending colon showing the potential that numerous injuries may occur together and be missed without a critical level of suspicion.[12]

The postoperative outcomes associated with large bowel perforation depend both on the postoperative patient condition and the contamination level. As mentioned by Bielecki et al. regarding bowel injuries, delayed surgical intervention and fecal contamination are notable concerns.[13] Furthermore, Kriwanek et al. has attributed mortality in colonic perforation cases to systemic inflammatory response as well as underlying chronic illnesses.[14] Both of these observations resonate with two of our cases where patients presented with septic features and extensive contamination after 18 to 20 hours, which resulted in death.

While primary repair is applicable to hemodynamically stable patients with selective and well-defined contamination, other cases require to be diverted. In their recent case series, Srivastava et al highlighted the frequent use of Hartmann's procedure in patients with sigmoid perforations and bowel wall edema due to concerns regarding the safety and healing of future anastomoses.[15] Our case series also show that favorable outcome can be achieved by

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proactively managing stomas, with two patients successfully completing stoma reversals.

In majority of cases nature of the surgical approach is influenced by the site of perforation. In a textbook overview, Khokha noted that right-sided colon lesions usually require a hemicolectomy because of the tenuous blood supply and greater risk of anastomotic failure.[16] In our investigation, two patients with cecal perforation had undergone right hemicolectomy. Out of these two cases one completely recovered while the other succumbed to sepsis.

Spontaneous rectal and colon perforation, though rare, can occasionally be misdiagnosed as post-traumatic injuries. Gupta et al documented such a case of spontaneous rectal perforation, highlighting the importance of comprehensive clinical assessment even when a history of trauma is not present.[17] In addition, the presence of certain pathologies as reported by El-Diaz et al where inflammatory bowel disease was postulated to lead to bowel rupture following trauma also needs to be diagnosed and manages accordingly.[18]

Preoperative imaging is critical in all instances. Achatz et al in their study of the comparative value of different imaging techniques suggested that the presence of a bowel wall discontinuity and pericolic fat stranding in CT scans is diagnostic of perforation.[19] However, in unstable patients where CT cannot be performe clinical judgment and elementary x-ray findings, as illustrated by Abu-Zidan et al in their comparative study can guide surgical decisions.[20]

CONCLUSION

Large bowel perforation as a result of blunt trauma to the abdomen is a rare but a dangerous condition which if not diagnosed in a timely manner can result in high morbidity and mortality. The delay in surgical treatment may cause internal contamination of the abdominal cavity. Individualized surgical treatment should be tailored to the specific case which considers the degree of intestinal perforation and contamination as well as the overall condition of the patient. Primary repair, resection with anastomosis, or diversion procedures like Hartmann's can be performed based on the patient's condition. From our case series, it can be concluded that early clinical assessment, appropriate imaging and prompt surgical treatment can enhance clinical outcomes. Close monitoring is required to assess the risk of recurrence and long-term post-surgical complications.

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