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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19751
DOI URL: http://dx.doi.org/10.21474/IJAR01/19751

RESEARCH ARTICLE

SIGMOID COLON TRANSECTION FOLLOWING A SEAT BELT INJURY: A CASE REPORT

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Manuscript Info

Manuscript History
Received: 27 August 2024
Final Accepted: 29 September 2024
Published: October 2024

Key words:-
Seatbelt, Transection, Abdominal Trauma, Colon Injury, Hartmann's Pouch

Abstract

Background: Seatbelts have reduced the number of fatal head, chest and abdominal injuries. They have, however, introduced a set of injuries comprising abdominal wall bruising, Intra-abdominal injuries, and lumbar spine fractures collectively termed the seat belt syndrome.
Case presentation: A 60-year-old man who was transferred to our emergency department after sustaining a blunt abdominal trauma after a road traffic accident. An exploratory laparotomy was performed revealed a sigmoid transection that was treated by an Hartmann's pouch procedure. After further management, the patient was discharged with no further complaints.
Conclusion: The presence of a seatbelt sign should raise the suspicion of a significant intra-abdominal injury. Responding to clinical signs is critical and early diagnosis and management reduces morbidity and mortality.

Introduction:-

Most blunt injuries are due to falls and road traffic accidents [1]. Seatbelts, specifically three-point seatbelt systems that cover both chest and lap, have reduced mortality by 45% and the risk of serious injury by 50% [2]. Despite these protective qualities, seat belts have introduced a set of injuries called seat belt syndrome [3]. First described in 1962, it includes a constellation of injuries such as abdominal wall bruising, intra-abdominal injuries to solid and hollow organs [3].

We present the case of a sixty-year old male who was admitted to the emergency room for the management of a blunt abdominal trauma that occurred after a traffic accident.

Case Presentation :
We describe a case of a 60-year-old man admitted to our emergency department who was the victim of a road traffic accident.

On admission, the primary survey found an unstable patient with a tachycardia of 115 bpm, his blood pressure (BP) of 06/30 mmHg. The physical examination revealed seat belt abrasions and ecchymoses across her left lower and hypogastric quadrant, with an abdomen pain and a rebound tenderness.

We performed an emergency exploratory laparotomy which identified a complete sigmoid transection (figure 1 and 2) with gross spillage necessitating the resection of the involved segment followed by an Hartmann pouch procedure

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and an intra-abdominal irrigation . We did not identify any other injuries and had no concerns for intra abdominal vascular compromise.

Our patient had an uneventful postoperative course. He was discharged on postoperative day-ten. The closure of the colostomy was performed three months after the initial surgery.

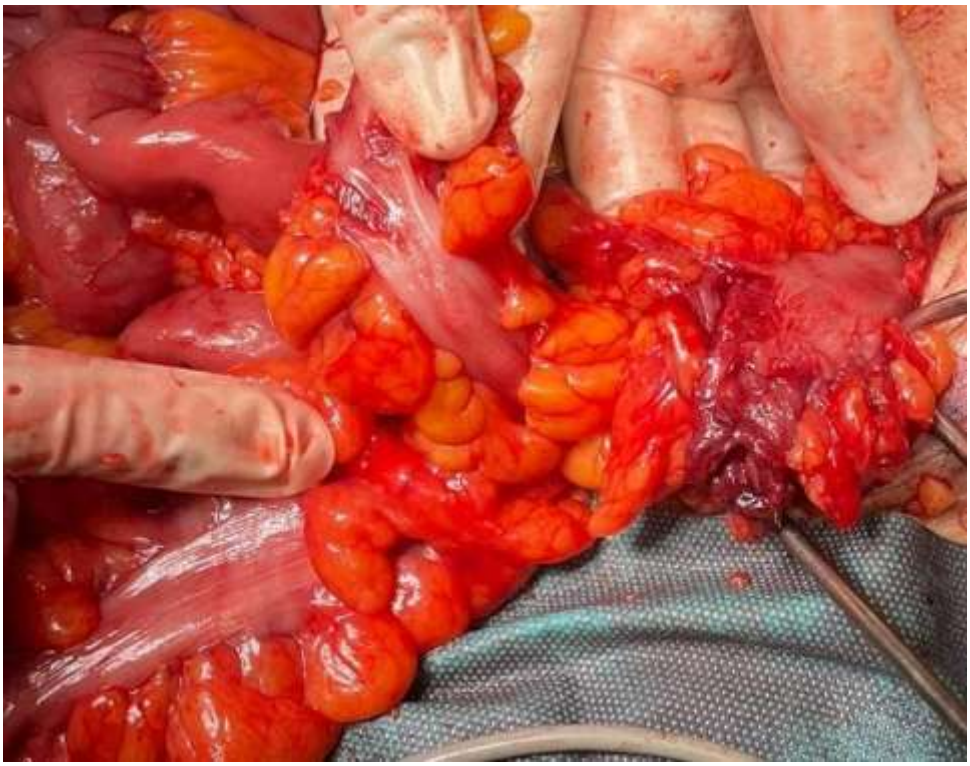

Figure 1:- Intraoperative photo reveal complete disruption of sigmoid colon.

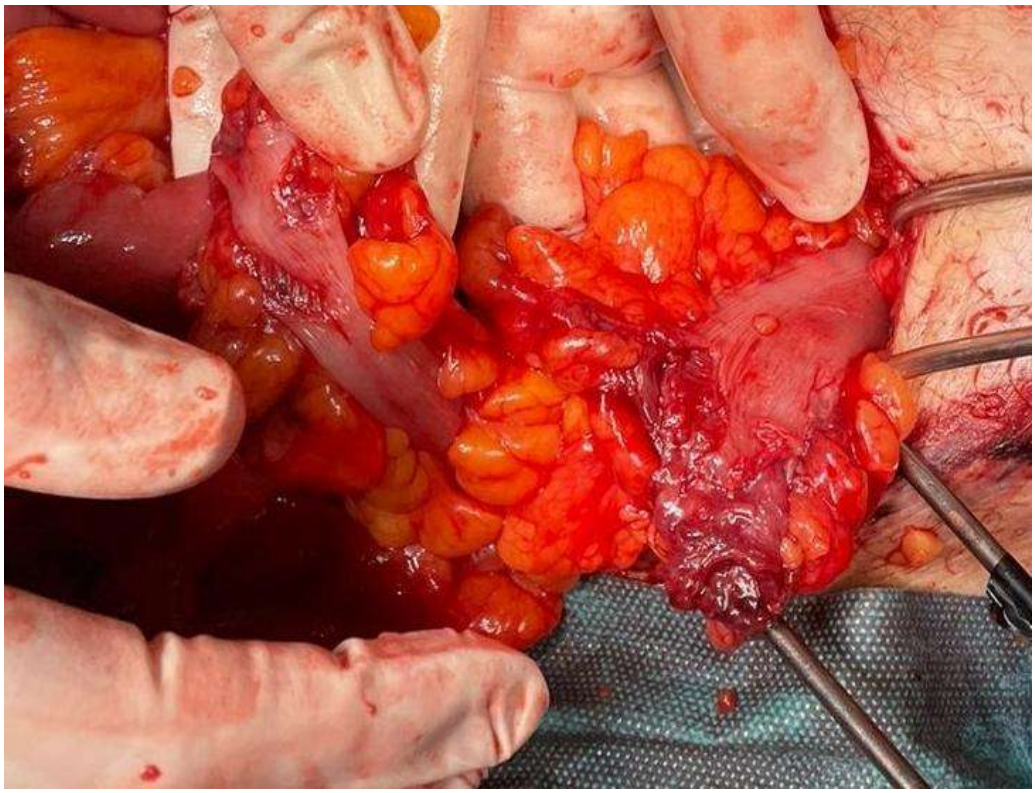

Figure 2:- Operative photo shows transection of sigmoid colon.

Discussion:-

The introduction of seatbelts in the 1960s, and increased compliance with their use [2,4], has reduced mortality and changed the injury profile associated with road traffic accidents. In addition, it decreased the number of fatal head and chest injuries [3] . However, it introduced a trifecta of injuries that make up seat belt syndrome. These include lumbar fractures, abdominal wall bruising, and intra-abdominal injuries, including solid and hollow [5,6].

In a retrospective study, the incidence of colon injuries due to blunt abdominal trauma has been reported to be 1.1% **.** Several mechanisms have been described for colon injuries occurring after blunt abdominal trauma. Crushing of the colonic segment between two objects (between the seat belt and vertebra or pelvis posteriorly) is the most widely accepted mechanism [7]. This results in local lacerations of the bowel wall, mural and mesenteric hematomas, transection of the bowel, localized devascularization and full-thickness contusions. Devitalization of the areas of contusion may subsequently result in late perforation. Rapid deceleration is the second mechanism. This creates shearing forces between the natural fixed points, which are the Treitz ligament, both ends of the sigmoid colon, and the ileocecal junction. The third mechanism is a burst injury, which occurs by the closure of the colonic segments during trauma. The bowel ruptures or bursts when the intraluminal pressure exceeds the tensile strength of the bowel wall [7].

The transverse colon is the most vulnerable colonic segment to blunt trauma due to its unprotected location [8]. The sigmoid colon is relatively less vulnerable and is generally exposed to closed-loop perforations [9,10]. Carrillo et al. reported sigmoid colon injury in 12 patients (44.4%), right colon and caecum injury in eight patients (29.6%), transverse colon injury in five patients (18.5%), and rectum injury in two patients (7.4%) [4,11].

In the present case our patient had a sigmoid colon injury. Isolated blunt trauma colonic injuries are rare [4,11,12] Colon injury is usually accompanied by other intra-abdominal organ injuries, with the small intestine, spleen, liver and pancreas being the leading areas. We found no accompanying further intra-abdominal organ injury in our patient's case. In a patient thought to have a colon injury caused by blunt abdominal trauma, the time between emergency department admission and surgery is of particular importance. A shorter duration minimizes the

morbidity and mortality that would be encountered in the postoperative period. The rate of complications associated with colon injury is significantly higher if the duration is longer than 24 h after the injury [10,13].

The most common postoperative complications were wound site infection, intra-abdominal abscess, intra abdominal sepsis, and post-operative bleeding. No morbidity or mortality was observed after the surgery in our patient's case.

The absence of clear signs like peritonitis and pneumoperitoneum does not rule out blunt trauma colon injury, so we recommend a high index of suspicion [7,10].

To intervene in blunt trauma abdominal injuries, surgeons perform exploratory laparotomies [14]. Our patient presented with abdominal injury and thus was hemodynamically unstable on presentation and may have benefitted from an initial exploratory laparotomy. Primary closure, resection with anastomosis, or colostomy are treatment options depending on the size of the colonic injury, gross contamination, and signs of ischemia or bowel necrosis [7,9]. We found a complete transection of the sigmoid colon,with a large fluid collection in our patient's pelvic cavity with a gross fecal contamination. Although we did not note any signs of mesenteric injury or ischemic bowel.

Conclusion:-

Intra-abdominal injuries sustained via seatbelt use in road traffic accidents can be life threatening and diagnostically challenging. The presence of a seatbelt sign should raise the suspicion of a significant intra-abdominal injury. Responding to clinical signs is critical and early diagnosis and management reduces morbidity and mortality.

Public health strategies should continue to advocate seatbelt use with an additional focus on the correct manner in which to use a seatbelt in order to reduce the mortality from road traffic accidents. Surgical repair remains the treatment for encountered bowel injuries.

Conflicts of interest statement:
The author has no conflicts of interest to declare. The author alone is responsible for the content of this manuscript.

Funding :
None.

Consent:
Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Ethical approval:
Ethical approval is not required at our institution for an anonymous case report.

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