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Trans-anal evisceration of small intestine following blunt abdominal injury in children: a report of two cases and review of literature.

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Abstract
Background*: Evisceration of small intestine through the anus following blunt abdominal injury is a rare occurrence in children. It is quite frightening and associated with parental anxiety.*
Objectives*: To report two cases of Trans-anal evisceration of small intestines, to describe the mechanisms of injuries and management and to review the literature.*
Case reports: *First case is a 7 year old girl presented at our trauma center with 2 hours history of evisceration of small intestine through her anus. She was hit by a fast moving vehicle while trying to cross the road. She had exploratory laparotomy, Segmental ileal resection and anastomosis as well as repair of rectal tear with sigmoid colostomy which was subsequently closed. Second patient is a 13 year old boy presented with 5 hours history of evisceration of small intestine through the anus. He was at a Quarry extracting stones when the roof of the pit he was in collapsed on him. He also sustained left diaphragmatic hernia and perineal laceration. He had exploratory laparotomy with repair of left diaphragmatic hernia, segmental ileal resection and anastomosis, repair of rectal tear and sigmoid colostomy as well as repair of perineal laceration. Colostomy was closed subsequently.*
Conclusion*: Trans-anal evisceration of small intestine following blunt abdominal injury is less common in children. One should not be carried away by the evisceration alone as other concomitant injuries may be present. All cases of trans-anal evisceration require exploratory laparotomy.*
Key words: *Blunt abdominal injury, Trans-anal and Evisceration, Children*

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I. INTRODUCTION

Evisceration of small intestine through the anus is a condition in which small intestine herniate through a breach in the anterior rectal wall and seen eviscerating through the anal canal[1]. It is quite frightening and associated with parental anxiety. This type of injury was first described by Benjamin Brodie in 1827[2]. Since then, many cases were reported in children and few out of these were due to blunt abdominal injury[3].

Trans-anal evisceration of small intestine can occur following penetrating[4-6], suction[7], and blunt abdominal injuries[8-14], and whenever there is doubt about the mechanism of injury; child abuse should be suspected [15]. In blunt abdominal injury, sudden increase in abdominal pressure leads to rupture of the intraperitoneal rectum or sigmoid colon at the vulnerable site. The reason why it commonly affects rectosigmoid is not known, however it is argued that there is probably a congenital defect at this site[16]. Other explanation for the weakness at this point may be recurrent rectal prolapse and proctocolitis[16]. The pressure pushes the small intestinal loop through the rent and eviscerate through the anus.

Presentation is with trans-anal evisceration of small intestine, but also depends on severity and associated injuries[14.]

Management follows advanced trauma life support protocol and all cases require exploratory laparotomy[1-16].

In this report, we discussed two cases of trans-anal small bowel evisceration managed at a tertiary institution in Northwestern Nigeria. We also reviewed literature on trans-anal evisceration of intestine following blunt abdominal injury in children.

II. CASE REPORTS

CASE 1

A 7-year-old girl presented at our trauma center with 2 hours history of evisceration of small intestine through her anus. She was hit by a fast-moving vehicle while trying to cross the road. On examination, apart from pulse rate of 120bpm she was clinically stable. Abdominal examination revealed bruises on her left flank with generalized tenderness and hypoactive bowel sounds. Perineal examination revealed a dusky small intestinal loop, 45cm long eviscerating through the anus (FIGURE 1). Other systems were essentially normal.

She was resuscitated, packed cell volume was 24% and abdominal USS revealed intraperitoneal fluid collection of 200mls with no evidence of solid organ injury. Nil abnormality detected on chest x-ray. She had exploratory laparotomy via midline incision. Intraoperative findings were: Hemoperitoneum of 400mls, vertical ileal mesenteric tear about 6cm located 25cm from ileocecal junction, longitudinal anterior rectal tear 5cm long located just above the peritoneal reflection (FIGURE 2) through which 45cm of nonviable loops of ileum passed and extruded through the anus. There was minimal faecal contamination in the pelvis. Extruded ileum was pulled back to the abdomen, resected and end to end ileoileal anastomosis done. Rectal tear repaired in single layer interrupted suture protected by a divided sigmoid colostomy; peritoneal cavity lavage and abdominal wound closed in layers. Post- operative period was uneventful (FIGURE 3). Colostomy was subsequently reversed.

CASE 2

A 13-year-old boy presented with 5 hours history of evisceration of small intestine through the anus. He was at a Quarry extracting stones when the roof of the pit he was in collapsed on him. He was immediately rescued, no loss of consciousness but he sustained multiple wounds on the chest, abdomen and perineum. On examination, he was in respiratory distress and pale. Respiratory rate, pulse rate and blood pressure were 60cpm, 110 bpm and 100/60mmHg respectively. Chest examination revealed a dull percussion and absent air entry on the left hemithorax. There was generalized abdominal tenderness and hypoactive bowel sound. Perineal examination revealed a deep laceration extending from right groin to the perianal area sparing the anal canal. There were dusky loops of small intestine protruding through the anus (FIGURE 4).

His packed cell volume was 19%; chest x-ray showed features of left diaphragmatic hernia (FIGURE 5); abdominal USS revealed ill define splenic margin with intra-peritoneal fluid collection.

He was resuscitated and had exploratory laparotomy. Intraoperative findings were: Hemoperitoneum of 500mls; Reversed C-shaped left diaphragmatic tear with herniation of the spleen and upper part of the stomach into the chest; Vertical terminal ileal mesenteric tear located 22 cm from ileocecal junction with adjacent 30 cm of gangrenous ileum; 5 cm longitudinal anterior rectal tear located just above the peritoneal reflection through which 30cm of nonviable loops of ileum passed and extruded through the anus. He had left diaphragmatic repair and left closed tube thoracostomy drained; Extruded ileum was pulled back to the abdomen, resected and end to end ileoileal anastomosis done. Rectal tear repaired in single layer interrupted suture protected by a divided sigmoid colostomy; peritoneal cavity lavage and abdominal wound closed in layers. Perineal laceration cleaned and repaired primarily. Post- operative period was uneventful. Colostomy was subsequently reversed.

III. DISCUSSION

Evisceration of small intestine through the anus following blunt abdominal injury is a rare occurrence in children. It is quite frightening and associated with parental anxiety.

Worldwide, there were several reports of trans-anal evisceration of small intestine. To the best of our research, there were eleven (11) reported cases of trans-anal evisceration of small intestine from blunt abdominal injury in children (Table 1). Eight patients were male and only one is female, this could be as a result of exposure of male to more risky behaviors than female. Youngest patient was two year while the oldest was 14 years.

In our patient the site of tear was the rectum and this was similar to eight patient reported in the literature, however this is in contrast with patient reported by Corduk et al[14], who had sigmoid perforation.

The cause of weakness at this point could be congenital weakness as none of our patient and the eleven patients reported had history of rectal prolapse or colorectal disease.

Management should follow advanced trauma life support protocol as there may be other associated injuries as in our second patient with coexisting left diaphragmatic hernia, this also the case in patient reported by Corduk et al[14], who had both diaphragmatic hernia and spinal cord injury.

As reported in all the eleven cases, treatment require laparotomy, in addition it also depends on the viability of the herniated bowel, present of peritonitis, other associated injuries as well as general condition of the patient. Our patients had segmental resection of small intestine and anastomosis, repair of rectal tear and diverting sigmoid colostomy and this was the procedure done in three (3) patients[11-13], three (3) patients had ileostomy [3,18], while the remaining 6 patients had no stoma[8,9,10,14 ,17]. We avoided ileostomy in our patients because we are certain about the viability of the resected margins also because of ileostomy complications such

as fluid and electrolyte as well as skin problems. Diverting sigmoid colostomy was done because we are not convinced about the blood supply to the repaired area also because of pelvic faecal contamination.

With adherence to ATLS Protocol, the outcome is good. Mortality was recorded in one patient[3], and is due to multiple organ failure.

IV. CONCLUSION

Trans-anal evisceration of small intestine following blunt abdominal injury is less common in children. One should not be carried away by the evisceration alone as other concomitant injuries may be present. All cases of trans-anal evisceration require exploratory laparotomy.

Figures and Tables

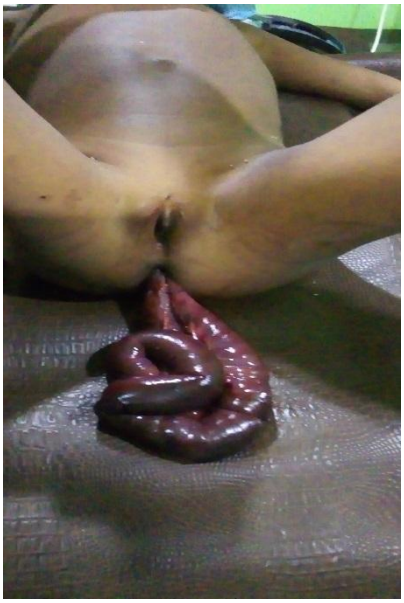

FIGURE 1**:** Gangrenous small bowel loop eviscerated through the anus

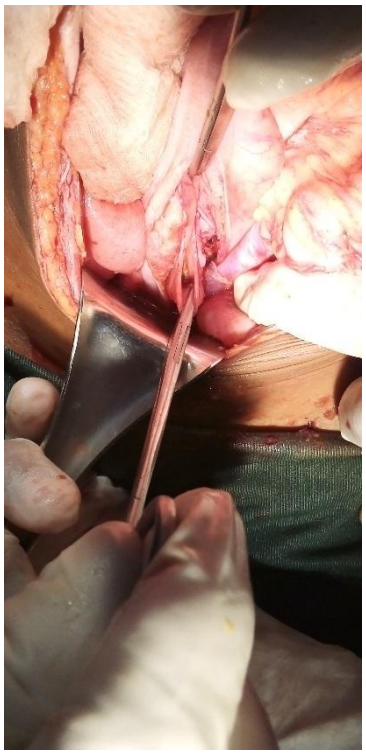

FIGURE 2 : Intraoperative photograph with an artery forceps pointing at rectal tear

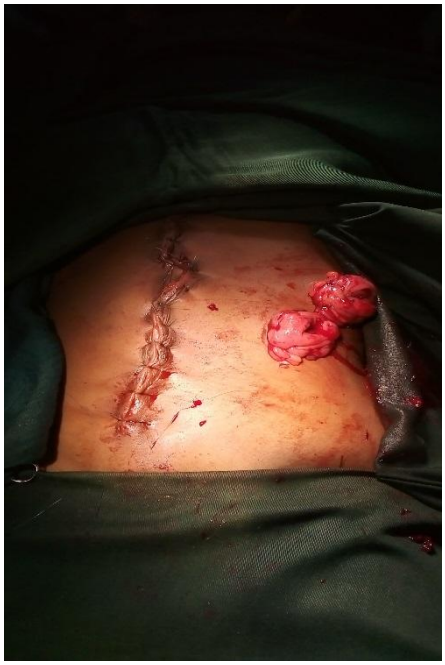

FIGURE 3 : Immediate post-operative photograph with protective colostomy

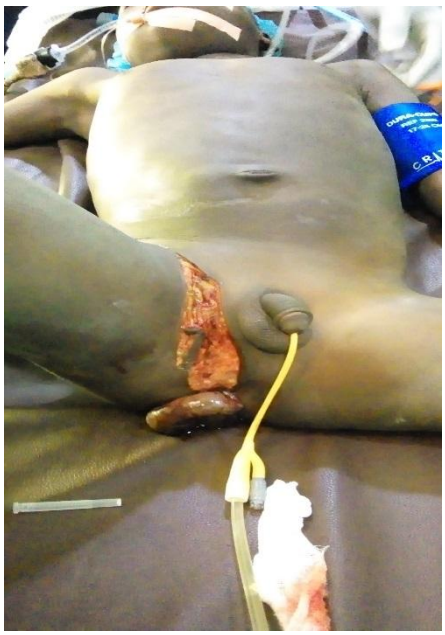

FIGURE 4: Photograph of second patient with associated perineal laceration

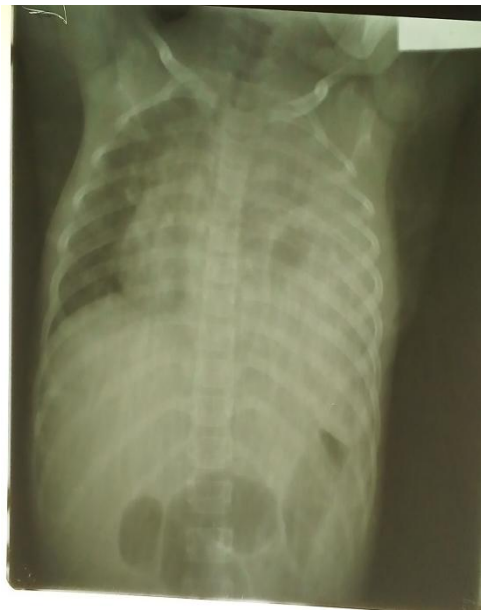

FIGURE 5: chest radiograph of second patient showing left sided diaphragmatic hernia

Table 1: Cases of transanal small bowel evisceration caused by blunt abdominal trauma in children

Case	Reference (Year)	Age in years	Sex	Procedure	Protective colostomy	Length of the resected bowel	Outcome
1	Qureshi 1977[8]	9	M	Resection and anastomosis	No	N/A	survived
2	Vesey and Shine 1984[9]	7	M	Small bowel resection and anastomosis, repair of rectal tear	NO	45 cm	survived
3.	Ellul et al. 1995[10]	14	F	Partial resection of the rectum	No	None	survived
4.	Ellul et al. 1995[10]	9	M	Small bowel resection and anastomosis, repair of rectal tear	No	N/A	survived
5.	Rechner and cogbill 2001[11]	9	M	Small bowel resection and anastomosis, repair of rectal tear	Yes	Remai-ning 220cm	survived
6	Quraishi 2007 [12]	5	M	Small bowel resection and anastomosis, repair of rectal tear	Yes	30 cm	survived
7	Roy et al 2009 [13]	10	M	Small bowel resection and anastomosis, repair of rectal tear	Yes	50cm	survived
8	Corduk et al 2011 [14]	2	M	Small bowel and anastomosis, sigmoid resection and anastomosis and repair of bilateral diaphragmatic hernia, second look: small bowel resection.	No	215 cm	survived
9	Papa et al 2011 [3]	7	M	Ileal resection , repair of rectal tear	Ileosto-my	70 cm	Died
10	Gelas et al 2012 [17]	4	M	Ileal resection and anastomosis, repair of rectal perforation	No	N/A	survived
11	Bhosale et al 2021 [18]	3	M	Ileal resection and repair of rectal tear	Ileostomy	40 cm	survived
12	present case 1	7	F	Ileal resection and anastomosis, repair of rectal tear	Yes	45 cm	survived
13	present case 2	13	M	Ileal resection and anastomosis, repair of rectal tear, repair of the left diaphragmatic hernia, repair of perineal laceration	Yes	30 cm	survived

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