

Severe blunt extraperitoneal rectal trauma in a 6 year old female: Case report and review of the literature

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Abstract

¹ Anorectal Traumas (ART) are rare injuries in children. Reports from developing countries are also rare. Their etiologies are variable. A case of penetrating anterior extraperitoneal rectal trauma with transanal surgical approach was presented. The patient was successfully managed without a colostomy and without complication. Her anal function was almost perfectly preserved.

Key words: Anorectal trauma; Child, Primary repair.

¹ INTRODUCTION

Anorectal Traumas (ART) are rare injuries in children^[1,2]. Many publications are case reports^[3,4], or limited series of cases^[2,5]. Cause is frequently accidental impalement^[1,2,3], sexual assault or road traffic accident^[1,3]. Intra-pelvic^[6] and intra-abdominal injuries^[4] can be associated with ART, and threaten the life of the child. The right diagnosis of the ART and its associated injuries is not easy, but must be done in emergency, in order to avoid especially septic complications.

⁴ The management of rectal trauma has evolved substantially, guided largely by experiences in military settings. These experiences led to standard recommendations for all traumatic rectal injuries combining fecal diversion, distal rectal washout, presacral drainage, and rectal injury repair when feasible^[7]. Intra-peritoneal rectal injuries are managed as are most other proximal large bowel injuries with primary repair as the only maneuver necessary for an optimal outcome. Primary repair of extraperitoneal injuries is often difficult, because of the confined pelvic space, adjacent sacral venous plexus and adjacent urogenital structures^[8,9].

³ Penetrating extraperitoneal rectal injuries are difficult to access and contemporary guidelines recommend proximal diversion, no presacral drainage, and no distal rectal washout^[9]. Optimizing access to extraperitoneal rectal injuries may enable primary repair and avoid the need for diversion^[10].

CASE REPORT

6-year-old female presented following ³rectal bleeding from transanal penetration with a steel rod after falling on a steel fence. ³The patient had a laceroincontus wound perianally and a ³hematoma in the gluteus area. On arrival, the child was in a good general condition with normal vital signs; laboratory studies revealed a drop of hematocrit to 28.4% with hemoglobin of 10.4 g/dL. On physical examination the abdomen was soft without any clinical signs of peritoneal irritation; a rectal examination was performed that revealed fresh blood in the rectum indicative of active bowel bleeding and a feeling of disruption of anterior bowel wall integrity. Due to high suspicion of colorectal injury ⁸an abdominal X-ray was performed free intraperitoneal air in ileocecal region (Figure 1). ¹⁰Abdominal computed tomography (CT) revealed full-layer perforation in the anterior rectal wall and perirectal air with no intraperitoneal fluid (Figure 2). ¹⁰Patient was scheduled and taken to theatre as soon as possible. Rectosigmoidoscopy (Proctoscopy) at the operation theatre under ⁴general anesthesia identified defect in the rectal anterior wall, without vaginal and bladder injury. A full-thickness anterior ⁴extraperitoneal rectal perforation was identified 4 cm from the anal verge affecting less than 50% (Figure 3) of the circumference of the lumen without devitalized tissue (Rectal Injury Score, RIS, II) ¹¹. The rectum was irrigated and the laceration was primary repaired ³transanally with a running self-locking suture (with monofilament thread 4/0). Debridement was required. Control Proctoscopy in general anesthesia was performed after transanal primary repair rectal perforation (⁴Figure 4). ³Bleeding was stopped with tamponade (gauze applied to the rectum), without drainage. ³The patient's postoperative course was uncomplicated, antibiotics were given for a total ³duration of 9 days and he was discharged home well on postoperative day 9. She ³was having bowel movements by postoperative day 2. ³Postoperatively an echo of the small pelvis was done which was neat (did not show the collection in the extraperitoneal space).

DISCUSSION

²The management of civilian rectal injuries is primarily based upon experience from wartime conflict. The landmark paper by Lavenson and Cohen originated from the Vietnam War experience with penetrating rectal injuries ¹². This created the framework from which civilian penetrating rectal injuries are managed today. Lavenson and Cohen purported four basic

tenets for the successful management of penetrating rectal injuries: diverting colostomy, rectal injury repair (when feasible), presacral drainage, and distal rectal washout.

Depending on the anatomical location of the rectal injury, such injuries can be classified as intraperitoneal and extraperitoneal rectal injuries (Table 1). The former can be treated with the standard treatment for colon injuries, which is the primary repair, while the latter may be treated with the primary repair without proximal diversion, and no anastomotic leakage has been reported [13,14,15]. In cases of destructive rectal injuries, where the presacral area is severely contaminated, presacral drainage PSD would be the effective treatment [16]. Cleary et al. [16] proposed a treatment algorithm for penetrating trauma cases; in this algorithm, when the rectal injury site cannot be treated with the primary repair or cannot be identified in cases of destructive extraperitoneal rectal injuries, the proximal colon diversion and PSD seem to be the appropriate treatments. However, in less severe cases without serious associated injuries or with no underlying medical diseases, the primary repair without proximal colon diversion is the more appropriate treatment.

The frequency of ART is variable. It is not a common trauma; few series of over 10 years collected more than 10 cases: 13 cases for Vincent MV et al., [2], 12 cases for Beiler et al. [5]. In West Africa, the most important published series is that of Ameh et al., [1] 7 cases over 10 years. The distribution according to the sex changes from one series to another. Some series found male predominance [2], while others found female predominance [1,5].

Etiologies are multiple. Impalement or falling upon an offending objet is the most frequent mechanism [2,5]. The nature of the offending objet is variable; in the series of Vincent et al., [2], there were metal objects in 12 cases over 13, and those objects are part of malfunctioning bicycles. The offending object can be sharp stumps or picket of wood, and in 2 cases of the series of Ameh E [1]. Other objects can cause impalement: fence [5], cow horn [1]. Road traffic accident was reported [1,5]. Sexual assaults are rare mechanism of ART in children [2]; but they were the main mechanism in the series of Black et al. [17].

The diagnosis of ART ought to be done early after the trauma. In developed countries, patients are seen quickly in emergency after trauma. But in developing countries, poverty and low medical cover of population explain the delay to consultation. The delay can allow development of septic complications, and complicate the management. In the series of Ameh E [1], one patient was admitted after 24 hours, and 6 within 6 hours. Our patient was admitted 1 hours after trauma.

At admission, hemodynamic parameters must be checked and resuscitation started if necessary. A clear description of the mechanism is important; it informs on the gravity of the

trauma, and the organs that can be damaged. Rectal bleeding is the most frequent presentation [1,2,4]; it was seen in our case. Vaginal bleeding is associated in girls when the rectovaginal septum is hurt [1,2]. Urethral bleeding informs about associated bladder or urethral bleeding [1].

The perforation of the bladder can result in out-flow of urines through the rectum after a suprapubic pressure during exam [6]. Rectoscopy and vaginoscopy (in girls) permit to precise the local extent of the injury. Clinical examination with rectoscopy / vaginoscopy and abdominal findings permit to classify the injury, and choose the adapted management. Our patient was admitted 1 hour after the trauma, had a “primary” repair without colostomy. With early admission, primary repair can be done in quite all cases, for accessible injuries. Non accessible injuries of rectum can heal with rectal drainage instead of to colostomy [1].

Many authors in the recent past have questioned the benefits and efficacy of presacral drainage. Several authors have retrospectively evaluated the efficacy of presacral drainage and have concluded that presacral drainage was an unnecessary adjunct in the management of penetrating rectal injuries [8,9].

In the recent past, several authors have suggested that colostomy is unnecessary for the management of penetrating rectal injury when the extraperitoneal injury is not repaired [18,19]. Haas and Fox have reported successful management of extraperitoneal and Fox have reported successful management of extraperitoneal rectal injuries without operative intervention [18]. Burch has suggested that many extraperitoneal penetrating rectal injuries can heal satisfactorily without surgery, but selecting the appropriate patients may be difficult [19].

Colostomies in patients experiencing traumatic injury are associated with stoma-related complications, as well as psychosocial burden and reduced quality of life [20]. As such, avoiding unnecessary stomas is important to patients. To avoid pelvic sepsis, diverting stomas certainly have a role in more extensive rectal injuries including blunt trauma, destructive pelvic injuries with associated pelvic fractures, and large or devitalized rectal defects when primary repair is not possible [21]. Unlike in intraperitoneal colorectal injuries where primary repair of nondestructive injuries and resection and primary anastomosis in selected destructive injuries is recommended without diversion, complex dissection to expose extraperitoneal rectal injuries to facilitate primary repair or resection increases morbidity and should not be done [10].

Given that proximal diversion is the current recommendation for extraperitoneal rectal trauma, little evidence exists investigating transanal primary repair in the absence of fecal diversion. A retrospective cohort study of 30 patients with extraperitoneal rectal injuries reported that five patients had injuries that were accessible for transanal repair [15]. These five

patients did not require fecal diversion and no complications or deaths were reported. A case report describes the successful primary repair an impalement injury with transanal operation without complications ^[15]. Our current report adds to the limited literature available on transanal repair of extraperitoneal rectal injuries. The case presented here would suggest treating extraperitoneal rectal injuries in a similar manner as intraperitoneal injury with a focus on primary repair without diversion.

Today, the reported mortality rates in civilian injuries to the rectum range from 0 % to 10 % with an associated morbidity of 10 % to 45 % ^[15,18].

In the last 20 years, primary repair has assumed an increasingly important role for the treatment of rectal injuries ^[23,24], but the friability of the repair, in view of serosal absence and technical difficulties and the prolongation of the operative time due to injury localisation and precise suturing, make the value of primary rectal repair even more questionable ^[25]. McGrath et al ^[26], in their study of adult patients reported that most intraperitoneal injuries and injuries in selected patients with extraperitoneal wounds to the upper two thirds of the rectum can probably be managed with primary repair in a similar fashion to colon injuries.

Our data suggest that it may be feasible to manage certain extraperitoneal rectal injuries without diversion.

CONCLUSION

Primary repair of extraperitoneal rectal perforation can be safely carried out without colostomy as an alternative in patients presenting with hemodynamic stability. The optimum approach should be individualized and fecal diversion should be avoided where possible to reduce morbidity.

Figure Legend



Figure 1. X-ray image demonstrating free intraperitoneal air in ileocecal region.



Figure 2. CT image demonstrating free fluid and free air in rectovaginal space and rectouterine space of the right (A) axial view; (B) coronal view



Figure 3. Proctoscopy



Figure 4. Control proctoscopy

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Table 1. Rectum Injury Scale From the American Association for the Surgery of Trauma (AAST)

Grade	Type of Injury	Description of Injury
Ia	Hematoma	Contusion or hematoma without devascularization
Ib	Laceration	Partial thickness laceration
II	Laceration	Laceration < 50% of circumference
III	Laceration	Laceration > 50% of circumference
IV	Laceration	Full-thickness laceration with extension into the perineum
V	Vascular	Devascularized segment

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