

Case Report

Severe Blunt Extraperitoneal Rectal Trauma in A 6 Year Old Female: Case Report and Review of The Literature

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Abstract: Anorectal Traumas (ART) are rare injuries in children. Therefore, reports from developing countries are also rare. Their etiologies are variable. We present a case of penetrating anterior extraperitoneal rectal trauma with transanal approach was used to access, and primarily repair, full-thickness rectal lacerations. The female patient was successfully managed without a colostomy and without complications. Her anal function was almost perfectly preserved.

Keywords: Anorectal trauma; Child, Primary repair.

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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]. Such injuries are frequently due to accidental impalement [1-3], sexual assault or road traffic accident [1, 3]. Intra-pelvic [6] and intra-abdominal injuries [4] can be associated with ART, and can even threaten the life of the child. The right diagnosis of the ART and its associated injuries is not easy, but must be carried out promptly in order to avoid further complications, especially septic complications.

The field of rectal trauma management has advanced considerably, where experiences in military settings have contributed the main part in its advancement. 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]. Intraperitoneal rectal injuries are managed like most other proximal large bowel injuries with primary repair as the only procedure necessary for an

optimal outcome. However, because of the confined pelvic space, adjacent sacral venous plexus and adjacent urogenital structures [8, 9], primary repair of extraperitoneal injuries is often difficult.

Penetrating extraperitoneal rectal injuries is difficult to access and contemporary guidelines recommend proximal diversion as opposed to presacral drainage and 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 the following rectal bleeding from transanal penetration with a steel rod after falling on a steel fence. 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 an abdominal X-ray was performed free intraperitoneal air in the ileocecal region (Figure 1). Abdominal computed tomography (CT) revealed full-layer perforation in the anterior rectal wall and perirectal air with no intraperitoneal fluid (Figure 2). Patient was scheduled and taken to the theatre as soon as possible. Proctoscopy at the operation theatre under general anesthesia identified defect in the rectal anterior wall, without vaginal and bladder injury. A full-thickness anterior extraperitoneal 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 primarily repaired transanally with a running self-locking suture. Debridement was required. Control Proctoscopy in general anesthesia was performed after transanal primary repair rectal perforation (Figure 4). The patient's postoperative course was uncomplicated, antibiotics were given for a total duration of 9 days and he was discharged home well on postoperative day 9. She was having bowel movements by postoperative day 2.

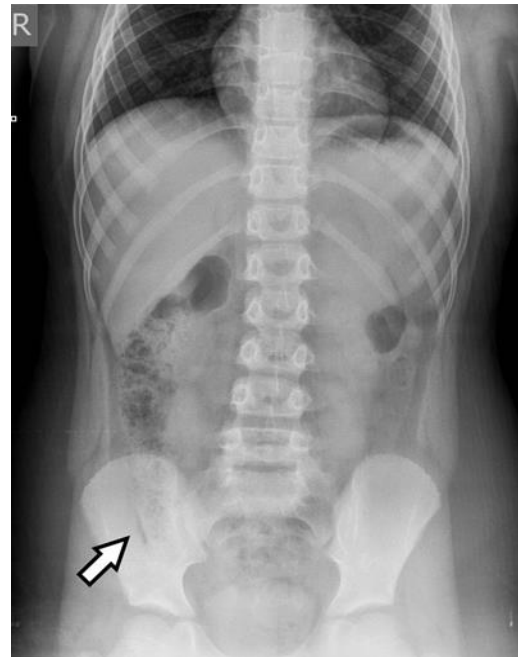


Figure 1: X-ray image demonstrating free intraperitoneal air in ileocecal region



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

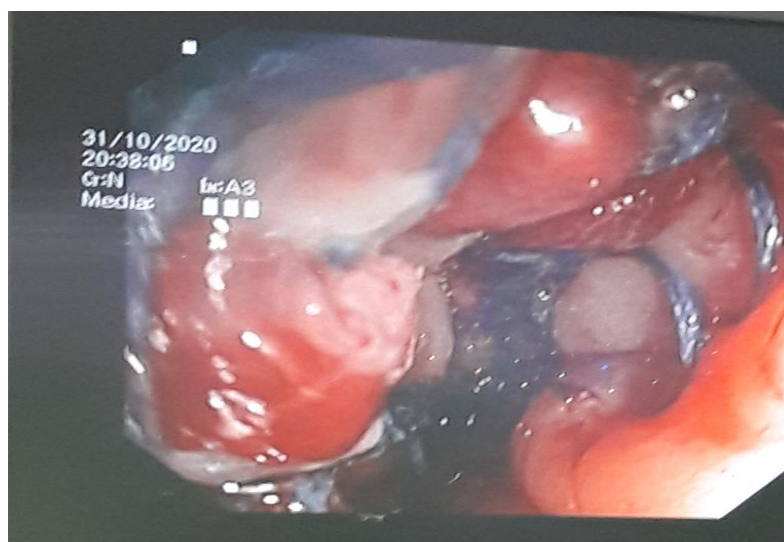


Figure 4: Control proctoscopy

DISCUSSION

The management of civilian rectal injuries is primarily based upon experience from wartime conflict. The landmark paper by Lavenson and Cohen originated from the experiences in the Vietnam War with regards to penetrating rectal injuries [12]. This would then create the framework from which civilian penetrating rectal injuries are managed today. Lavenson and Cohen established 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 divided into two categories: intraperitoneal and extraperitoneal rectal injuries. 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. Additionally, no anastomotic leakage has been reported for the latter [13]. In cases of destructive rectal injuries, where the presacral area is severely contaminated, presacral drainage PSD would be considered to be an effective treatment [14]. Cleary *et al.*, [14] proposed a treatment algorithm for trauma cases; the proximal colon diversion and PSD seem to be the appropriate treatments in cases where the rectal injury site cannot be treated with the primary repair or where it cannot be identified in the event of destructive extraperitoneal rectal injuries. 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; some 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] with 7 cases over 10 years. The distribution according to the sex changes from one series to the other. Some series found male predominance [2], while others found female predominance [1, 5].

Etiologies responsible for these injuries are multiple. Impalement or falling upon an injurious object is the most frequent cause [2, 5]. The nature of the injurious object is variable; in the series of Vincent *et al.*, [2], there were metal objects in 12 out of 13 cases, and those objects were part of malfunctioning bicycles. The injurious objects may be sharp stumps or picket of wood, and in 2 cases of the series of Ameh E [1]. Other objects can cause impalement, such as fences [5] and cow horns [1]. Furthermore, road traffic accidents were also reported [1, 5]. Sexual assaults are a rare occurrence of ART in children [2]; but they were the main type of injuries in the series of Black *et al.*, [15].

The diagnosis of ART ought to be done early after the trauma. In developed countries, patients are immediately checked in emergency after trauma. In contrast to this, the situation looks different in developing countries where poverty and low medical cover of population contribute to the delay to consultation. The delay may advance the development of septic complications, and complicate the overall medical care. In the series of Ameh E [1], one patient was admitted after 24 hours, and 6 within 6 hours. Our patient was admitted 1 hour after her trauma.

At admission, hemodynamic parameters must be checked and resuscitation started if necessary. A clear description of the whole mechanism is important; it informs on the gravity of the trauma, and the organs that may have been damaged. The most frequent consequence of this trauma is rectal bleeding [1, 2, 4]; that was the case for our patient. Vaginal bleeding is associated in girls when the rectovaginal septum is hurt [1, 2]. Urethral bleeding informs on bladder or urethral injury associated [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) allow to precisely find the local extent of the injury. Clinical exams with rectoscopy / vaginoscopy and abdominal findings permit to classify the injury and choose the adapted and appropriate 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 almost all cases for accessible injuries. Non-accessible injuries of the rectum can heal with rectal drainage associated to colostomy [1].

The benefits and the efficacy of presacral drainage have been questioned by many authors in the recent past. 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 [16]. Burch has suggested that many extraperitoneal penetrating rectal injuries can heal adequately without the need for surgery, but selecting the appropriate patients may be difficult [16].

Colostomies in patients experiencing traumatic injury are associated with stoma-related complications as well as psychosocial burdens and a reduced quality of life [17]. 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 [18]. Unlike in intraperitoneal colorectal injuries, where primary repair of non-destructive 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 in 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 [14]. These five patients did not require fecal diversion and no complications or deaths were reported. A case report describes the successful primary repair of an impalement injury with transanal operation without complications [14]. 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 % [14, 16]. In the last 20 years, primary repair has assumed an increasingly important role for the treatment of rectal injuries, 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 [14, 15]. McGrath *et al.*, [19] 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 and that these can possibly 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.

The authors declare that there is no conflict of interest.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms

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