

Unusual extraperitoneal rectal injuries: a retrospective study

M. Gümüş · A. Büyük · M. Kapan ·
A. Onder · F. Taskesen · İ. Aliosmanoğlu ·
A. Tüfek · M. Aldemir

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Abstract

Purpose Rectal injuries, which are rarely encountered because of the anatomic characteristics, occur due to penetrating traumas. In the current study, we aimed to present experiences gleaned from our clinic concerning rarely encountered unusual rectal injuries, including those cases presented for the first time.

Methods Eleven patients who had been treated for unusual rectal injuries in the General Surgery Clinic of Dicle University between 2004 and 2011 were retrospectively reviewed.

Results The reasons for rectal injuries included foreign bodies in four cases, sexual intercourse in three cases, iatrogenic injuries in two cases, electric shock in one case, and animal horns in one case. All cases had extraperitoneal rectal injuries and all injuries were grade 2 injuries, except for the electrical burn. Primary repair was adequate for the treatment of six patients. Four patients underwent primary repair and ostomy, whereas one of the patients underwent debridement and an ostomy. The patients recovered without complications, except for one patient with sphincter insufficiency.

Conclusion The results of the current study suggested that primary repair is adequate in the patients with low-energy injuries and early presentation, whereas an ostomy

is required for those with late presentation and for those with high-energy and destructive injuries.

Keywords Rectum · Injuries and wounds · Trauma

Introduction

Rectal injuries generally occur due to penetrating traumas and are rarely encountered because of the anatomic characteristics. Experiences with rectal injuries have generally been gained during wartime [1, 2]. The majority of the rectal injuries in civilian life are caused by firearms [3–5]. Other causes include penetrating injuries, blunt traumas, traffic accidents, sexual abuse, foreign body injuries, and iatrogenic injuries [3]. There are limited publications in the literature involving unusual rectal injuries, most of which are case reports. In the current study, we aimed to present experiences gleaned from our clinic concerning rarely encountered unusual rectal injuries, including those cases presented for the first time.

Methods

Eleven patients who had been treated for unusual rectal injuries in the General Surgery Clinic of Dicle University between 2004 and 2011 were evaluated. The patients' data were retrospectively obtained from the hospital records.

Results

The reasons for rectal injuries included foreign bodies in four cases, sexual intercourse in three cases, iatrogenic

M. Gümüş · A. Büyük · M. Kapan · A. Onder ·
F. Taskesen (✉) · İ. Aliosmanoğlu · M. Aldemir
Department of General Surgery, Faculty of Medicine,
Dicle University, 21280 Diyarbakir, Turkey
e-mail: drftaskesen@hotmail.com

A. Tüfek
Department of Anesthesiology and Reanimation,
Faculty of Medicine, Dicle University, Diyarbakir, Turkey

injuries in two cases, electric shock in one case, and animal horns in one case. Primary repair was adequate for the treatment of six patients. Four patients underwent primary repair and ostomy, whereas one of the patients underwent debridement and an ostomy. Presacral drainage was performed in two patients (one foreign body, one iatrogenic) and distal rectal washout was performed in four patients (one foreign body, one iatrogenic, one postcoital, one electric shock). All cases had extraperitoneal rectal injuries and all injuries were grade 2 injuries, except for the electrical burn. The primary repair of the rectal injury was performed via the anal route in seven of the patients. The injury was repaired via the abdominal route in three patients, in whom the laparotomy was required for the ostomy and in whom the rectal injury was just below the peritoneal reflection and could be accessed easily through the abdomen (Fig. 1). Although an ostomy had been applied in one patient, the injury was repaired via the anal route because it was easier to access the rectal injury through the anal route as compared to the abdominal route (Fig. 2). In one patient, wound debridement and dressings were performed following the ostomy because of extensive tissue burns caused by the electrical shock. An ostomy was performed in the form of a bipolar sigmoidostomy with a closed distal end. The patients recovered without complications, except for one patient with sphincter insufficiency. The stoma was closed after 2 months in three patients, except for one patient with electrical burns. The characteristics of the patients are summarized in Table 1.

Foreign bodies were the most common cause of rectal injuries among the present cases, most of which occurred accidentally. Among these cases, the 15-year-old male patient with mental retardation was injured by falling down on a toilet brush when he lost his balance. Rectal and anal canal injuries occurred in a 32-year-old female patient who

had fallen down on a mop stick in a bucket while standing on a ladder and cleaning windows. A 33-year-old male patient working as a construction worker was admitted to our clinic with a rectal perforation which occurred by falling down on an upright construction iron bar. The rectal and anal canal injuries were sustained in a 68-year-old female patient due to an animal horn when she bent forward while feeding her animals. The patient who had inserted a cucumber into the anal canal for autoeroticism tried to remove the cucumber from the anal canal with a skewer, thus, causing rectal perforation. Although it was possible to remove the foreign body without a surgical procedure, an ostomy was performed due to rectal perforation (Fig. 3).

Rectovaginal fistulas occurred due to sexual intercourse in three female patients following the first sexual intercourse. Of these patients, two underwent primary repair, whereas an ostomy was performed on the other patient who had fecal contamination and presented late. The two patients with iatrogenic rectal injuries were extraordinary cases that are not typically encountered in the literature. Necrosis of the rectal wall developed in one patient after the sclerotherapy performed due to internal hemorrhoids. An ostomy was performed on this patient. The other patient was a 68-year-old male patient with a rectal injury that occurred during cystoscopy, which was performed because of benign prostatic hypertrophy. This patient, who also had a urethral injury, was treated by primary repair. An electrician had a rectal injury because of an electric shock while straddling on an electricity pylon for work. A vertebral fracture also occurred in this patient due to a high fall. The patient underwent an ostomy because of a third-degree burn extending into the rectum, involving the anal sphincter. Since the patient had sphincter insufficiency in the fourth month of follow-up, a stoma closure could not

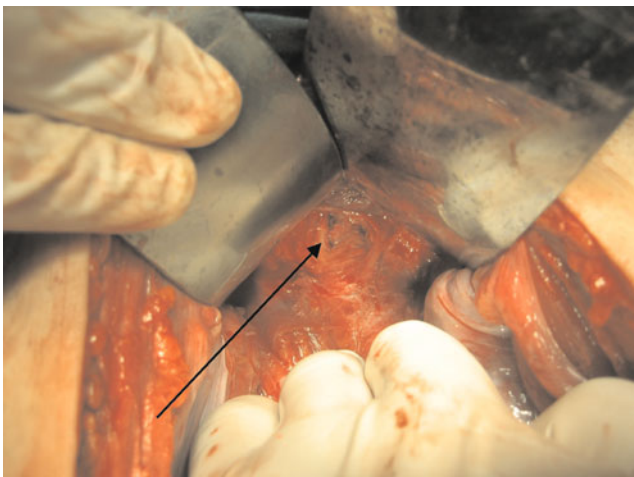


Fig. 1 The rectal injury which was repaired through the abdominal route

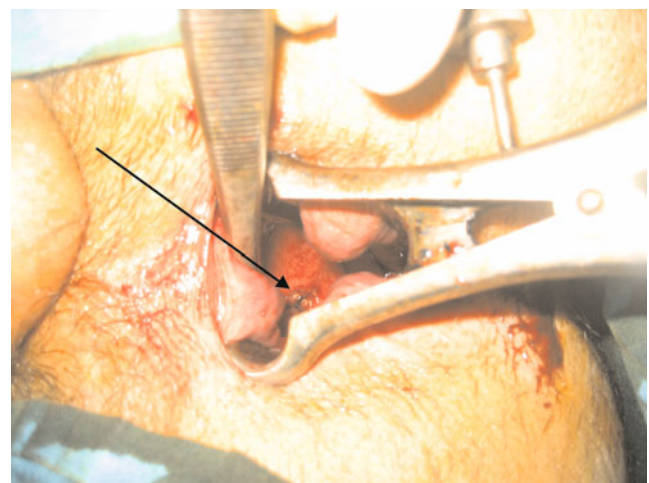


Fig. 2 The rectal injury which was repaired through the anal route

Table 1 Characteristics of the study patients with unusual rectal injuries

Reasons for injuries	Age (years)	Gender	Treatment	Grade	Concomitant injury
Foreign body (brush)	15	M	Primary repair + ostomy	2	Anal canal
Foreign body (brush)	32	F	Primary repair	2	Anal canal
Foreign body (iron bar)	33	M	Primary repair	2	None
Foreign body (cucumber + skewer)	19	M	Primary repair + ostomy	2	None
Animal horn (bull)	68	F	Primary repair	2	Anal canal
Coitus	35	F	Primary repair	2	Vagina
Coitus	25	F	Primary repair + ostomy	2	Vagina
Coitus	24	F	Primary repair	2	Vagina
Iatrogenic (hemorrhoidectomy)	31	F	Primary repair + ostomy	2	Anal canal
Iatrogenic (cystoscopy)	68	M	Primary repair	2	Urethra
Electric shock	32	M	Debridement + ostomy	4	Anal canal, anal sphincter, vertebra

M male; *F* female

**Fig. 3** The rectal injury which was caused by a skewer

be performed, and he was referred to a specific center for the repair of the sphincter insufficiency.

Discussion

Although unusual rectal injuries are rarely encountered, they are likely to cause considerable problems. Because of the fact that these injuries, even when accidental, are embarrassing and unacceptable from a social perspective, admissions to hospital are usually delayed, and this leads to injuries necessitating surgery and long-term hospital care because of infections that occurred due to the delay. Indeed, even simple initial injuries can result in deaths, although such injuries can sometimes be treated by simple interventions.

Concomitant organ damage can complicate rectal injuries [6, 7]. Death, even though rare, has been reported in patients with anorectal injuries [8]. Delay in admission, in

particular, may cause death due to infections and complications [9].

Anorectal injuries in children are not common in civilian life. Anorectal injuries primarily occur due to sexual abuse, gunshot injuries, motor vehicle accidents, or falling down on an object [10–14]. The 15-year-old patient evaluated in the present study had been injured by falling down on a foreign body. Similarly, anorectal injuries are rare among adults, and case reports constitute most of the publications. In the current study, in which 11 cases consisting mostly of adults were evaluated, certain causes of unusual rectal injuries that have not been reported before or that are rarely encountered in the literature were reported.

In the case series consisting of 22 cases, Marti et al. [15] reported the causes of rectal injuries as sexual trauma ($n = 8$), road accident ($n = 5$), impalement ($n = 5$), polypectomy ($n = 2$), and gunshot ($n = 2$). Colostomy was required in 14 patients, and the mortality was reported to be 9% due to the death of two patients. Shatnawi and Bani-Hani [16] reported 23 cases with rectal injuries within 9 years; penetrating injuries in 11 cases (gunshot wound, iron rod, tree branch), blunt trauma in six cases, impalement injuries in three cases, and iatrogenic injuries in three cases. Primary repair was performed in 17 cases, whereas colostomy was performed in 15 cases; death was reported in three patients (13%).

In addition to rectal injuries occurring due to the foreign bodies inserted into the rectum either for assaults or erotic purposes, there were also accidental rectal injuries due to falling down on foreign bodies. Three of the present cases had accidental rectal injuries due to falling down on foreign bodies, whereas one of the cases had a rectal injury because of a skewer used to remove a foreign body inserted into the rectum. If this patient had presented to a health care unit before self-intervention, the foreign body could have been removed by a simple procedure; however, he had to

undergo a colostomy because the rectum was penetrated. Ruiz del Castillo et al. [17] reported 17 patients with rectal trauma caused by foreign bodies due to unusual sexual experiences. In ten of these patients, the foreign bodies were removed by specific equipment, such as forceps or Foley catheters, whereas surgical intervention was required in seven patients (simple suturing in two and colostomies in five patients). Neither complications nor death was reported in any of the patients. El-Ashaal et al. [18] presented 12 cases between 20 and 64 years of age with trans-anal rectal injuries. The causes of the injuries were falling down on a sharp object in five cases, foreign bodies (brush and neon lamp) in two cases, compressed air hose in two cases, sexual abuse in two cases, and rectal cleansing enema in one case. Colostomy was performed in five of the cases, whereas primary repair was performed in six patients, and no deaths were reported. Huang et al. [19] presented 12 retained rectal foreign bodies in ten males within approximately 20 years; glass bottles and vibrators were reported to be the most common objects encountered. In these series by Huang et al. [19], in which no deaths occurred, most of the foreign bodies were removed by colonoscopy and forceps without a surgical procedure. Laparotomy was required in four patients because of infections or distally located foreign bodies.

Injuries caused by animal horns are rarely encountered in urban areas. Injuries due to animal horns are generally encountered in rural areas and usually occur in the abdominal area [20, 21]; injuries in unusual areas have rarely been reported. Pal et al. [22] reported a case with a bull horn injury causing urethrorectal fistula and in whom lacerations of the anus and anterior wall of rectum was noted. The case evaluated in the present study had rectal and anal canal injuries caused by an animal horn when the female patient bent forward while feeding animals.

Although rectovaginal fistulas due to sexual abuse have been reported in children [11], rectovaginal fistulas in adults without anatomic anomalies or assaults have rarely been reported [23]. Vaginal bleeding is the most common presentation of vaginal injuries [24]. The risk factors for vaginal injuries include rape, first sexual intercourse, nulliparity, penile-vaginal disproportion, use of aphrodisiacs as vaginal lubricants, puerperium, a low level of education, and inadequate emotional and physical preparation for sexual intercourse [23, 24]. Singhal et al. [25] reported a rectovaginal fistula after normal sexual intercourse in a married 27-year-old woman having three children. In this patient, weak vaginal tissue due to malnutrition, lactational amenorrhea, anemia, and minimal foreplay were considered to be risk factors. No anatomic anomalies existed in the three patients evaluated in the present study, and they were sexually mature individuals owing to their ages. An injury due to normal sexual intercourse without any sexual

assault or violence was in question. The rectal injuries resulted in rectovaginal fistulas in all three cases. The predisposing factors were considered as follows: (1) both the man and the woman had their first sexual intercourse, (2) inadequate foreplay, and (3) stress.

Rectal injuries due to rectal endoscopic or surgical procedures are rarely encountered. Rectal injury is always a potential complication during laparoscopic radical prostatectomy. Rectal injuries were reported between 2 and 8% among those undergoing laparoscopic radical prostatectomy [26, 27]. Rectal injuries due to urethral instrumentation have rarely been reported [28]. In the present study, one of the two patients with iatrogenic rectal injury had benign prostatic hypertrophy and the rectal injury occurred during cystoscopy. Necrosis of the rectal wall developed in the other patient after sclerotherapy performed for internal hemorrhoids. To our knowledge, no similar case has been previously reported.

Electrical burns are high-energy and destructive injuries. The case with rectal injury due to electric shock is also unique in the literature, with no similar reported cases.

Individualized treatment options should be developed for each patient with rectal injuries. The location and the degree of the injury and the presence of contamination, as well as other factors such as the general status of the patient and concomitant injuries, are evaluated and different treatment combinations, including primary repair, diversion, presacral drainage, distal washout, and antibiotherapy are applied [4, 16]. It has been reported that the wound site can be identified in only one-half of the cases with extraperitoneal rectal injuries and primary repair is recommended if possible [5]. It has been suggested that primary repair without diversion is feasible in selected patients [29]. However, the repair of extraperitoneal rectal perforations is sometimes technically impossible, and there is little evidence to support the primary repair of these injuries. Because of the anatomic considerations and technically difficult dissections, fecal diversion without primary repair can be considered as a safe procedure. Those who support fecal diversion have suggested that diversion is associated with a lower incidence of septic complications or have demonstrated that the incidence of stoma closure is associated with acceptable morbidity [30].

Conclusion

In conclusion, unusual rectal injuries may result in death in the event of complications, although they are rarely encountered. While primary repair is adequate in the patients with low-energy injuries and early presentation; an ostomy is required for those with late presentation and for those with high-energy and destructive injuries. Distal

washout and presacral drainage should be applied in selected cases.

Conflict of interest The authors have no conflicts of interest or competing financial interests with regards to this manuscript.

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