

# Trans-anal rectal injuries

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## ABSTRACT

**Introduction:** The diagnosis of trans-anal rectal injuries is usually delayed because of the patient's denial. Some of these injuries are self-inflicted or caused by criminal assault, leading to delayed presentation. We aimed to study the causes, clinical presentation, management and clinical outcome of trans-anal rectal injuries.

**Methods:** The records of 12 patients (nine males) with a median age of 36.5 (range 20-64) years, had trans-anal rectal injury and were treated between 1993 and 2006 at Al-Ain Hospital, were reviewed.

**Results:** Injury was caused by a fall on a sharp object in five patients, by a rectal foreign body in two patients, by a compressed air hose in two patients, by sexual assault in two patients, and by rectal cleansing enema in one patient. Seven patients presented two hours after the injury, four patients within 8-24 hours, and one sexually-assaulted patient presented after seven days. Injuries were in the anterior rectal wall in seven, in the rectosigmoid junction in three, and in the anorectal region in two patients. Ten patients presented with peritonitis, four were in shock, seven had bleeding per rectum, and two had a weak sphincter. The complication rate was significantly higher in the colostomy patients compared with primary repair (5/6 compared with 0/6, p-value is less than 0.02, Fisher's exact test). All patients survived. The median (range) hospital stay was ten (9-72) days.

**Conclusion:** Diagnosis of trans-anal rectal injuries is usually delayed because of late presentation. Sexual assault should be suspected following rectal injuries. Colostomy is not always mandatory.

**Keywords:** anal injuries, foreign body, rectal perforation, trans-anal rectal injuries

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## INTRODUCTION

Rectal injuries due to penetrating trauma are more common than blunt trauma.<sup>(1)</sup> Early diagnosis and aggressive treatment result in good prognosis, regardless of the patients' age and previous medical condition.<sup>(1,2)</sup> Trans-anal rectal injuries are uncommon. Out of 54 cases of penetrating rectal trauma treated over eight years at a Level I trauma centre in the USA, there was only one case of trans-anal rectal perforation.<sup>(3)</sup> In contrast, the trans-anal traumatic route constitutes almost 40% of the colorectal perforations in our community.<sup>(4)</sup> This is possibly because of the very low incidence of gunshot and stab wounds in our community, compared with the USA. The diagnosis of trans-anal rectal injury is usually delayed because of the patient's denial and late presentation. Although uncommon, rectal injuries are dangerous and should be taken seriously. A high index of suspicion is essential for its diagnosis. We aimed to study the causes, clinical presentation, management and clinical outcome of trans-anal rectal injuries.

## METHODS

The records of 12 patients (nine males and three females, median age 36.5 [range 20-64] years), who had trans-anal rectal injuries and were treated between 1993 and 2006 at Al-Ain Hospital, were reviewed. Al-Ain Hospital serves a multinational population of about 300,000 inhabitants. Due to the small number of patients, data was presented as median (range). The local ethics committee of Al-Ain Health District Area approved this study.

## RESULTS

Injury was caused by a fall on a sharp object in five patients, by a foreign body in two patients, by a compressed air hose in two patients, by sexual assault in two patients, and by rectal cleansing enema in one patient. Injuries were in the anterior rectal wall in seven patients (Fig. 1), in the rectosigmoid junction in three, and in the anorectal region in two. Rectosigmoid junction injuries were possibly caused by an increased intraluminal pressure. This was caused by an air hose in two patients and rectal cleansing enema in one. The two anorectal injuries were caused by falling on a sharp object. The anterior rectal wall injuries were caused by a fall on a sharp object in three patients, by a foreign body in two patients and by sexual assault in two patients. Seven patients presented two hours after the injury, four

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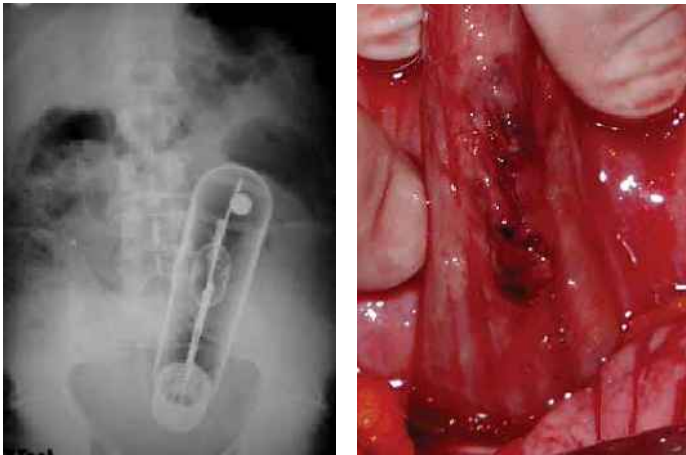
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**Fig. 1** A 60-year-old man presented complaining of a vague abdominal pain. The patient was diabetic and had ischaemic heart disease. Abdominal examination revealed tenderness all over the abdomen with a relatively soft abdomen. (a) Abdominal radiograph shows a long neon light bulb projected over the pelvic cavity. Chest radiograph (not shown) revealed air under the diaphragm. (b) Laparotomy photograph shows a tear of the anterior rectal wall. The rectal wound was débrided and closed in one layer. The patient had a sigmoid loop colostomy, which was closed after 12 weeks. Both postoperative periods were smooth.

patients presented within 8–24 hours of the injury, and one female, who was sexually assaulted and was locked in a house, presented seven days after injury. Ten patients presented with peritonitis, four were in shock, seven had bleeding per rectum, and two had a weak sphincter. Diagnosis was based on abdominal and rectal examination, proctoscopy and radiological studies.

Erect chest radiographs were done in 9/10 of the patients who had intraperitoneal perforation, and showed free air under the diaphragm in seven cases. Computed tomography was useful to detect free air in the remaining three patients. All ten patients who had peritonitis due to intraperitoneal perforation underwent laparotomy. Five of them had primary repair without colostomy, while five had repair and defunctioning colostomy (three had transverse colostomy, one had a loop sigmoid colostomy and one had Hartmann's procedure). One of these patients had through and through injury to the urinary bladder which was also primarily repaired. Two patients had extraperitoneal injuries. One patient had extensive anorectal injury with complete anal sphincter tear. The injury of the lower rectum involved all layers. The patient was treated with primary repair of the anal sphincter and Hartmann's procedure. The other patient had an anorectal tear involving the mucosa, which was primarily repaired without a colostomy.

Those patients who had colostomy had significantly delayed presentation, compared with those who had primary repair (median 20 [range 2–168] hours vs. two [range 2–3]

hours,  $p < 0.03$ , Mann-Whitney test). Delay of more than eight hours occurred in five patients who had colostomy. Two were due to sexual assault, two used a foreign body for sexual satisfaction and one elderly woman had perforation due to a cleansing enema. Five patients had complications, all of whom had colostomy. Complications included wound infection in four patients, ileus in two and colonic leakage in one. The complication rate was significantly higher in the colostomy patients (5/6 compared with 0/6,  $p < 0.02$ , Fisher's exact test). All of our patients survived. The median hospital stay was ten (range 9–72) days. Colostomy closure was done in 8–12 weeks.

## DISCUSSION

Rectal injuries can result from pelvic trauma,<sup>(5)</sup> ingestion of a foreign body<sup>(6)</sup> or introduction of a foreign body through the anus.<sup>(7)</sup> Foreign bodies can be introduced into the rectum for diagnostic and therapeutic procedures, self-administered treatment, autoeroticism, accidental introduction, and criminal assault.<sup>(7–9)</sup> Foreign bodies inserted into the rectum to enhance sexual stimulation are a common cause of rectal injuries. There is a wide variety of reported foreign bodies that can cause colorectal injuries.<sup>(7)</sup> A brush and neon light caused rectal injuries in two of our patients. Those foreign bodies that settle in the sigmoid colon usually need surgery for removal.<sup>(10)</sup> Five of our patients reported falling down on a sharp object. Only three had evidence of anal injury. The mechanism of injury in the other two cannot be clarified and we cannot completely rule out insertion of a trans-anal foreign body as a cause of injury. The mechanism of injury determined the site of injury in our study. High intraluminal rectal pressure resulted in rectosigmoid junction injury, while falling on a sharp object caused the anorectal injuries. The predominance of the anterior wall rectal injuries can be explained by the anatomical posteroanterior direction of the anorectal canal.

Diagnostic problems can occur with trans-anal rectal injuries, because of the natural hesitancy of the patient to describe what might have been a very embarrassing and socially unacceptable incident. Trans-anal high hydrostatic pressure may cause severe colorectal injury, necessitating resection of the blown injured segment. The firm lateral support of the rectum makes the rectosigmoid junction the first part to be hit by the pressure column, which acts as a solid body as it opens the anal sphincter.<sup>(11)</sup> Shiels et al found that colonic perforations with hydrostatic enemas occurred at approximately 120 mmHg.<sup>(12)</sup> This occurred in two of our patients by compressed air hose directed at the anus as a joke. A 60-year-old woman had rectal injury

caused by a water-soap enema to relieve constipation. We were unable to determine whether perforation in this patient occurred as a result of direct trauma or because of hydrostatic pressure. Rectal perforation due to retrograde irrigation enema is possibly the most common cause of rectal injury in old patients; the majority of whom live in nursing homes.<sup>(13)</sup> The possibility of rectal injury should be considered in old, constipated patients who use retrograde irrigation enemas. Sexual assault should be suspected following rectal injuries. This occurred in two women in our study. Both had delayed presentation for more than three days. Orr et al reported three fatal anorectal injuries due to sexual abuse and a fourth homicidal case caused by rectal impalement of a threaded pipe.<sup>(9)</sup>

A decision for faecal diversion was made because of delayed presentation of more than eight hours associated with significant peritoneal soilage and shock in four patients, associated diabetes mellitus and ischaemic heart disease in one patient, and extensive anorectal injury in one patient.<sup>(14)</sup> All operations were performed by experienced senior consultants and we think that the decision was not biased by this factor. One of our patients had a Hartmann's procedure for an extensive anorectal injury involving all layers. There is a universal agreement that there should be complete diversion of faecal stream with rectal injuries involving all layers.<sup>(14)</sup> Hartmann's procedure is ideally suited for extensive rectal injuries.<sup>(14)</sup>

The complication rate was significantly higher in patients who had colostomy in our study. This may be due to a selection bias. Nevertheless, there is clear evidence supporting primary repair of colorectal injuries. Curran and Borzotta, in a systematic review of the literature, have clearly demonstrated that civilian colonic perforations can be safely primarily repaired.<sup>(15)</sup> Factors contributing to wound infection in our study included delayed presentation with presence of extensive faecal peritonitis in three patients, and old age associated with diabetes mellitus in another patient. Ileus was attributed to delayed peritonitis in one patient and leakage from loop transverse colostomy in another patient. Finally, postoperative aggressive support

is important for a good outcome.<sup>(1)</sup> We had no mortality in our series, possibly because of the young age, low energy trauma, aggressive resuscitation, and critical care management of our patients. In summary, diagnosis of trans-anal rectal injuries is usually delayed because of late presentation. Delayed presentation was a major contributing factor for morbidity. Sexual assault should be suspected following rectal injuries. Colostomy is not always mandatory and should be performed for those who present with delayed peritonitis or shock.

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