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Case Report

Penetrating Rectal Trauma: Laparoscopic Management without Fecal Diversion

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Introduction

Rectal injuries caused by rectal foreign bodies are an uncommon entity in the adult and pediatric population. Most literature is limited to case reports or single-center studies. The majority of cases happen in adults and it has been estimated to occur at one case per month [1]. In the pediatric population, a recent single-center review over a 10-year period of anorectal trauma in children estimated the incidence as 0.2% [2].

Rectal trauma can be subdivided into extraperitoneal and intraperitoneal injuries. Intraperitoneal perforations by definition violate the peritoneal cavity and may be associated with other traumatic injuries and have thus historically been managed with open exploration. Trauma intervention continues to evolve, however, and minimally invasive strategies are becoming more frequently cited in the literature [2-9]. In this report, we present the case of an isolated rectal perforation with both intraperitoneal and extraperitoneal components successfully treated with minimally invasive techniques.

Case Report

A 4-year-old boy presented in transfer to a level one trauma center after sustaining a rectal injury while playing in a swimming pool. Eyewitnesses report the patient jumped into the pool and was impaled trans-anally with the handle of a plastic toy fish net. When the patient stood, the handle was spontaneously expelled followed by bloody discharge. He was taken to an outside hospital initially where a CT of the abdomen and pelvis demonstrated pneumoperitoneum. Upon arrival to our facility the patient was hemodynamically stable. On physical exam, he had mild abdominal distension with diffuse tenderness and voluntary guarding. Laboratory values were significant only for a very mild leukocytosis. Further review of the CT demonstrated retroperitoneal air and thickening of the soft tissues in the left perirectal area consistent with a rectal perforation (Figure 1).

Figure 1: CT abdomen and pelvis demonstrating perirectal soft tissue thickening and retroperitoneal air.

The patient was taken to the operating suite. An exam under anesthesia demonstrated a traumatic fissure at the 7 o'clock and 11 o'clock location in dorsal lithotomy position. A rigid proctoscopy identified a low anterior rectal perforation. The patient was repositioned and a diagnostic laparoscopy was performed through one 5-mm port at the umbilicus and two additional trochars in the bilateral lower quadrants. Upon exploration of the abdominal cavity the only injury identified was an elliptical tear in the peritoneal reflection anterolateral to the rectum (Figure 2).

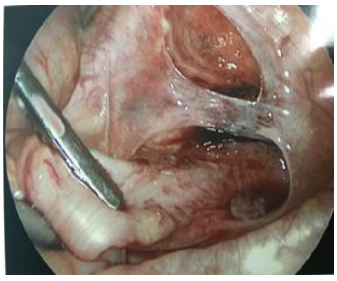

Figure 2: Diagnostic laparoscopy demonstrating elliptical tear in the peritoneal reflection anterior to the rectum

The laparoscope was inserted through the elliptical opening in the peritoneal reflection providing visualization of the rectal mucosa and a large tear in the anterior portion of the rectum. The rectum was grasped and retracted to allow visualization of the distal aspect of the rectal injury (Figure 3).

Figure 3: Grasping of the rectum through the peritoneal defect to allow visualization of the rectal injury.

The rectum was repaired primarily using 3-0 Vicryl suture in an interrupted fashion with extracorporeal knots seated using a knot pusher. Saline irrigation was placed into the pelvis and the rigid proctoscopy was re-inserted. The rectum was insufflated and the repair was visualized and noted to be intact; there was no evidence of a leak intra abdominally. A drain was placed in the pelvis. The umbilical port site fascia was reapproximated with interrupted figure-of-eight 2-0 Vicryl suture. The skin was closed with 5-0 Monocryl in an interrupted subcuticular fashion at all port sites. Post-operative recovery was uneventful. Given the strange circumstances surrounding the reported incident, a Pediatric Forensic medicine physician was consulted to review the case. It was determined that there was no evidence of sexual abuse. Bowel function returned on post-operative day three with advancement to a regular diet by postoperative day four. The JP drain was removed prior to discharge on post-operative day five. In follow-up, the patient has remained well without reports of constipation, lower gastrointestinal symptomatology, or fecal incontinence.

Discussion

Diagnosis of rectal injury relies on a detailed history and physical exam, radiographic studies (plain x-ray or CT scan) to denote presence of free air, and rigid proctoscopy [2-10]. While an open repair through a generous vertical midline incision has conventionally been used, recent studies in adult and pediatric literature suggest diagnostic laparoscopy with minimally invasive interventions can be safely performed with minimal complications [4,5].

Traditional management strategies for rectal injury include: (a) fecal diversion with primary repair, (b) fecal diversion without primary repair, (c) fecal diversion with presacral drainage and without primary repair [5,10,11,12]. Recently, however, these concepts have been called into question with studies evaluating both the use of drainage and the need for fecal diversion. In one randomized trial, no benefit was established for presacral drainage in patients whose fecal stream was diverted [5]. A more recent retrospective review had similar findings with an equal rate of infectious complications in drained and non-drained patients who underwent fecal diversion [5,6]. In a review of the literature, no study could be identified that addressed drainage in patients that did not undergo diversion. Current literature for adults and pediatrics has also called into question the need for fecal diversion in select patient populations [7,8]. Outcomes in patients not receiving diversion appear to have similar length-of-stay, complications, and outcomes [8,9]. A recent retrospective review suggested that early presentation and low-energy injuries are criteria to trigger consideration for management without fecal diversion [8,9]. Conversely, for cases with other associated injuries and concern for gross contamination, fecal diversion is still recommended [12].

Conclusion

In conclusion, pediatric penetrating rectal trauma with perforation represents a complicated entity with treatment that continues to evolve. Diagnostic laparoscopy is gaining favoritism in managing rectal trauma in both the adult and pediatric patient populations. While the literature remains limited to case reports and retrospective reviews, findings suggest that withholding fecal diversion in isolated, low-energy rectal perforations is feasible and safe. Our case in particular demonstrates successful minimally invasive management of a rectal perforation without fecal diversion.

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