CLINICAL CASE

COMPLEX PELVIC FRACTURES ASSOCIATED WITH ANORECTAL LESIONS

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Abstract

Traumatic lesions of the rectum, perineum and anus are rare but difficult to treat, requiring experience in terms of trauma and colorectal surgery. Case report and electronic search of the U.S. National Library of Medicine National Institutes of Health PubMed/MEDLINE, EMBASE, Google Scholar, ISI Web of Knowledge, to identify original articles and reviews about the subject. Case 1 - Male patient, 31 years old, victim of a car accident, transferred to our hospital from a lower level trauma center, with cranial, abdominal and extremity trauma (ISS = 29). On FAST there was free peritoneal fluid. The patient was transported to the operating room. Abdominal exploration revealed a grade IV laceration of the sigmoid colon and upper rectum, with diffuse fecaloid peritonitis and middle hemoperitoneum. Hartmann type colorectal resection was performed. Postoperative whole body Computed Tomography detailed the complex type C pelvic fracture, immobilized with an external fixator during initial surgical approach. The clinical evolution was favourable, the patient being referred to a lower level local center for rehabilitation. Case 2 - Male patient, 27 years old, bicyclist victim of a car accident, admitted to our hospital in emergency setting for right inguinal open wound with extension to anorectal region and pelvis-subperitoneal space, complex pelvic trauma and lower limb fractures (ISS = 29). The patient was transported to the operating room. Perineal packing was performed with external pelvic fixation and lower limb fractures reduction along with external fixation. The clinical evolution was favourable, the patient being referred to a lower level local center for continuation of the therapy. Significant injuries to the pelvic ring, most commonly the result of high energy trauma, carry with them high rates of both morbidity and mortality, and only prompt diagnosis and treatment are the key to success.

Keywords*: anorectal injuries, trauma center, pelvic fractures*

Introduction

Traumatic lesions of the rectum, perineum and anus are rare but difficult to treat, requiring experience in terms of trauma and colorectal surgery. Anorectal injuries may be the result of a penetrating injury of the pelvis and perineal area, or to a severe blunt trauma with concomitant pelvic fracture. The aim of the therapy is to control the rectal laceration, to drain the pelvis-subperitoneal space, and to divert the digestive stream, in order to allow healing of the injury with minimal morbidities.

Material and Methods

Case report of 2 patients with anorectal injuries, associated with complex pelvic fractures, managed in a level I trauma center. For literature review, we have undertaken an electronic search of the U.S. National Library of Medicine National Institutes of Health PubMed/MEDLINE, EMBASE, Google Scholar, and ISI Web of Knowledge, to identify original articles and reviews about the subject. The terms "trauma", "pelvic fracture", and "rectal injury" were used in various combinations. The key words were identified as truncated words in the title, abstract or in medical subject heading (MeSH).

Case 1

Male patient, 31 years old, victim of a car accident, transferred to our hospital from a lower level trauma center, with cranial, abdominal and extremity trauma (Injury Severity Score = 29). In the emergency department, on primary survey the patient was hemodynamically unstable. On FAST there was free peritoneal fluid. The hemoglobin level equal 8.8 g/dl.

Figure 1 - Thoracic CT, axial image, showing bilateral lung contusion.

The patient was transported to the operating room. Abdominal exploration revealed a grade IV laceration of the sigmoid colon and upper rectum, with diffuse fecaloid peritonitis and middle hemoperitoneum. Hartmann type colorectal resection was performed. Postoperative whole body Computed Tomography detailed the complex type C pelvic fracture, immobilized with an external fixator during initial surgical approach (Figure 1, 2, 3). In the early postoperative period the patient developed acute renal failure due to rhabdomyolisis, necessitating hemodyalisis for 10 days. Admission in ICU for 35 days. The clinical evolution was favourable, the patient being referred to a lower level local center for rehabilitation.

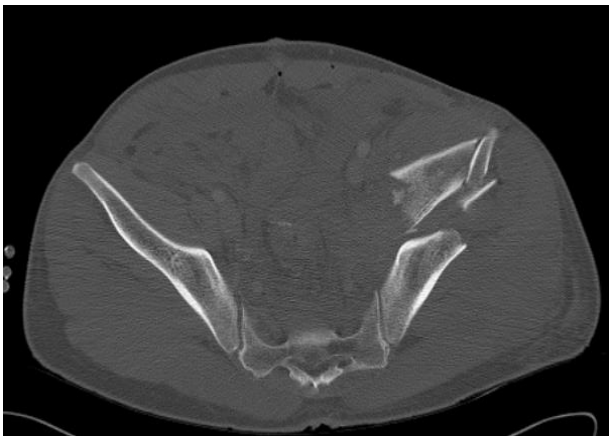

Figure 2 - Pelvic CT, axial image, showing fracture of the left iliac bone.

Figure 3 - Pelvic CT, axial image, showing the external fixator of the pelvic fracture.

Case 2

Male patient, 27 years old, bicyclist victim of a car accident, admitted to our hospital in emergency setting for right inguinal open wound with extension to anorectal region and pelvis-subperitoneal space, complex pelvic trauma and lower limb fractures (Injury Severity Score = 29). In the emergency department, on primary survey the patient was in hypovolemic shock. FAST was negative and the hemoglobin level equal 10,5 g/dl. The patient was transported to the operating room. Perineal

packing was performed with external pelvic fixation and lower limb fractures reduction along with external fixation (Figure 4, 5, 6).

Figure 4 - Pelvic Xray with disjunction of the pubic symphysis.


Figure 5 - Intraoperative aspect of the anterior perineal wound.


Figure 6 - Intraoperative aspect of the anterior perineal wound.

In the early postoperative period the patient developed wound infection with Pseudomonas aeruginosa and Staphiloccocus Aureus. Admission in ICU for 10 days, with 65 days of hospital stay. The clinical evolution was favourable, the patient being referred to a lower level local center for continuation of the therapy.

Discussions

Around 3% of all skeletal injuries are pelvic injuries, occurring in 4-18% of those sustaining high energy injuries (ISS>12)[1-3]. Compared to females, males are twice as likely to suffer a pelvic injury (66% vs. 34%, respectively) [1,4]. Injuries to the rectum and genitourinary tract and pelvic fractures are often associated to blunt pelvic injuries. More than this, because of the close anatomic proximity, bony pelvis, rectum, and genitourinary tract can be injured by a penetrating pelvic trauma. Demetriades et al., during an evaluation of the risk factors associated with severe pelvic injuries (AIS>4), concluded that injuries produced in motorcycle accidents result in the highest occurrence of pelvic fractures (15.5%) followed by pedestrian injuries (13.8%), falls from height 415 ft (12.9%) and car occupants (10.2%) [5].

Pelvic injuries are grouped into three main divisions, according to the Orthopaedic Trauma Association classification: A-type injuries, which have a stable pelvic ring, B-type, which have a partial posterior disruption and C-type injuries, which have a complete posterior disruption [6]. There have also been described classification systems for open pelvic fractures. According to Jones et al., open pelvic injuries can be classified into three major categories: class 1 injuries are open pelvic fractures with a stable pelvic ring, class 2 are injuries in which the pelvic ring is either vertically or rotationally unstable and no rectal or perineal wound exists with fecal contamination risks and class 3 are open pelvic fractures that are either rotationally or vertically unstable, with a rectal or perineal wound identified with potentially fecal contamination [7].

Injuries to other organ systems are often determined by high energy pelvic ring injuries. The occurrence of associated injuries varies with reports ranging from 30% to 93% [8-10]. Anorectal injuries are encountered with an incidence of 0.95–2.3% [11,12]. Even if the

appearance it is not frequent, they are a considerable source of morbidity and mortality [13]. Based on the reviews of open fractures, it was concluded that rectal and perineal injuries will occur in 23–64% of patients with open pelvic injuries [7, 11, 14, 15]. The presence of perineal injuries derives in a high rate of sepsis—up to 77% in some studies [7].

These complex patients should be managed by a trauma team, composed of emergency medicine physicians, urologists, trauma and critical care surgeons, interventional radiologists, and orthopedic surgeons, just like in a well-orchestrated play.

Open pelvic fractures are often associated with urogenital and intra-abdominal injuries, having high mortality rates [16]. In order to avoid missing the diagnosis, there should be performed a careful initial inspection of the perineum for open wounds. In case of association with rectal laceration, mortality is especially high [17]. Early diverting colostomy, external fixation, and aggressive serial debridement should be performed; wound packing for hemorrhage control should be performed for open pelvic fractures [18]. Injuries to the rectum occur in most of the cases, with penetrating rather than blunt pelvic trauma. In any case, injury to the rectum may occur with significant pelvic fractures.

It has to be mentioned that the management of colon and rectal injuries is often combined in the literature. More proximal injuries are managed as a colon or intraperitoneal bowel injury. Traditionally, the rectal trauma is managed according to the principle of the four Ds: divert, drain, direct repair, and distal washout [19]. These management principles were developed during the Vietnam War.

Any penetrating injury to the pelvis or significant pelvic fracture should raise concern for a rectal injury. As mentioned previously, rectal trauma requiring surgical intervention is not often seen with a blunt trauma. In contrast, the rectum must be evaluated when a penetrating injury traverses the pelvis. Relevant in maximizing the diagnostic accuracy of CT in anorectal trauma, are the use of oral, rectal, and intravenous contrast, as necessary.

The extraperitoneal rectum is not easily mobilized, and mobilization, resection, and anastomosis are difficult in the elective setting and even more so in trauma. Therefore, the current standard of care is the diversion of the fecal stream with a proximal colostomy with or without presacral drainage and primary repair. Regardless of the size of the rectal injury, primary diversion is the most prudent and conservative management option. In contrast, intraperitoneal rectal injuries should be treated in a similar fashion to left colon injuries with either primary repair or resection and anastomosis with or without diversion.

Conclusions

Significant injuries to the pelvic ring, most commonly the result of high energy trauma, carry with them high rates of both morbidity and mortality, and only prompt diagnosis and treatment are the key to success.

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