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Case Report & Review of the Literature

Anorectal Avulsion: Reporting a Rare Case of Rectal Trauma and Review of the Literature

Konstantinos Bouliaris^{1,2*}, Evangelos Alexiou³, Konstantinos Malizos⁴, Panagiotis Papamichalis², Dimitrios Papadopoulos², Ioannis Staikos², Antonios Koutalos⁴, Paraskevi Hatzikomnitsa¹, Anna Ziogkou⁴ and Matthaïos Efthimiou¹

¹Surgical Department, General Hospital of Larissa, Larissa, 41221, Greece

²Intensive Care Unit, General Hospital of Larissa, Larissa, 41221, Greece

³CT-MRI Department, General Hospital of Larissa, Larissa, 41221, Greece

⁴Orthopaedic Department, University Hospital of Larissa, Larissa, 41500, Greece

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ABSTRACT

Background: Anorectal avulsion is a rare rectal injury and it is the result of severe blunt pelvic trauma. In this type of injury, the anus and sphincters are detached from the perineum and are displaced cranially and ventrally. Treatment is challenging and only a few reports are available.

Case presentation: We report a case of 49-year-old male patient who was referred to our hospital in a septic condition 10 days after a complex crush pelvic trauma with anorectal avulsion. The treatment included external pelvic fixation, control of the pelvic sepsis, sigmoidostomy and negative-pressure therapy of the perineal wound. Salvage of the anus could not be done. The patient was discharged after 90 days suffering from neurologic deficits of both lower extremities and he followed a long-term rehabilitation program.

Conclusion: Severe perineal injuries with anorectal avulsion are associated with significant morbidity and mortality. Due to the rarity of this entity treatment is not standardised and requires a multidisciplinary approach involving general surgeons, orthopaedics, intensivists and rehabilitators. Any effort for anal reconstruction should be done, if possible, early in the treatment course.

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Background

Rectal injuries are relatively uncommon with a reported incidence of approximately 1% -3% in civilian trauma centers. The majority (80%) are cases of penetrating trauma while blunt rectal trauma accounts for 5%-10% [1]. Anorectal avulsion is a rare rectal trauma where the anus and sphincters are detached from the perineum because of divarication of the levator ani and are displaced cranially and ventrally. It is associated with high-energy transfer injury resulting in severe multiple traumas. Treatment is challenging and often demands multidisciplinary approach because of the complexity of the trauma. We report a new case of anorectal avulsion with multiple and severe pelvic fractures due to pelvic crush injury.

Case Presentation

A 49-year-old male was admitted to a regional hospital after a work-related pelvic crush injury. According to the reported medical history, the patient arriving at the hospital was already on haemorrhagic shock. He was intubated and resuscitation with crystalloids and blood transfusions was started immediately. A FAST examination was positive for free intraperitoneal fluid. A retrograde urethrography revealed no urinary injury and a 16 Fr Foley catheter was easily passed through the urethra into the bladder. Clinical examination revealed unstable pelvis and perineal soft tissue loss with complete avulsion of the anorectal complex. Pelvic X-rays showed a combined vertical shear and lateral compression open pelvic ring injury with fracture of the sacral bone

*Correspondence to: Konstantinos Bouliaris, Surgical Department, General Hospital of Larissa, Larissa, 41221, Greece; Tel: +302413504366; Email: kwstisbool@yahoo.com

through the right foramina. There were additional fractures of the right transverse process of the fifth, fourth and third lumbar vertebra. Subsequently, the patient was transferred to the operating room for pelvic stabilization with external fixation and pelvic trauma exploration. A midline exploratory laparotomy was also performed. The laparotomy revealed a large retroperitoneal haematoma, predominantly on the right side and low volume haemoperitoneum. No other intraperitoneal pathology was found. A diverting loop sigmoid colostomy was performed to prevent contamination of the perineal wound. The distal rectum and the peritoneal wound were abundantly irrigated and two pelvic drainage tubes were inserted. No attempt for reimplantation of the anus was performed.

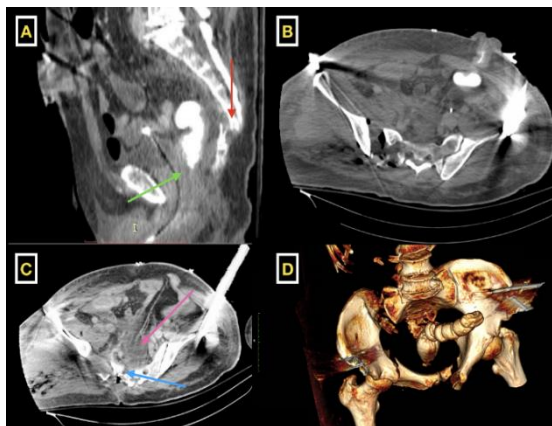


Figure 1: A. CT image reformatted on sagittal plane showing dislocated coccygeal fracture with anterior displacement (red arrow), cranial retraction of the anorectal stump (green arrow). B. CT image reformatted on oblique axial plane showing the distal stump of the diverting loop sigmoidostomy filled with Gastrografin, retroperitoneal haematoma, multiple complex pelvic fractures, soft tissue haematomas and free gas. C. CT image reformatted on oblique axial plane showing Gastrografin leak (blue arrow), diffuse oedema of the mesorectal fat (purple arrow), low volume haemoperitoneum and external pelvic stabilization. D. 3D Volume Rendered CT image portraying the complex and extensive pelvic fractures which resulted in unstable pelvis and external stabilization metalworks.

Following the operation, the patient was transferred to the ICU. As soon as the patient was haemodynamically stabilized a contrast enhanced CT scan of the abdomen and pelvis was performed (Figure 1). During his stay in the ICU he received multiple blood transfusions and he was on mechanical ventilation. On the 10th postoperative day he was transferred to the ICU of our hospital. Upon admission the patient was haemodynamically unstable, septic and in need for mechanical respiratory support. Blood and respiratory secretions cultures were obtained, and broad-spectrum antibiotics were administered. The circulation was supported with crystalloids and vasopressors. Clinical examination of the perineum showed signs of infection with soft tissue necrosis (Figure 2). After haemodynamic stabilization another CT of the abdomen and pelvis was performed which showed decrease in the volume of the retroperitoneal haematoma and no signs of intraperitoneal abscess. Perineal examination at the operating room revealed a large cavity extending cranially beyond the coccyx and laterally up to the ischiopubic ramus on the right and deep into the subcutaneous tissues in

the ischioanal fossa on the left. The anorectal stump was retracted upward and ventrally along with injured tissues in a distance of about 8cm (Figure 3). There was also a detachment of the gluteus muscles from the right ilium. Due to the extent of tissue destruction and necrosis any attempt for reimplantation of the anus stump was impossible. An extended necrosectomy was performed, the traumatic cavity was irrigated and tube drains were inserted in the ischioanal fossa. In light of these findings a relaparotomy was performed and the loop sigmoidostomy was divided. The central stump was externalized as end-colostomy and the distal stump as mucous fistula.



Figure 2: Inspection of the perineum at the ICU arrival in our hospital 10 days after the trauma. A. Perineal wound with signs of soft tissue infection and necrosis B. Big loss of substance with complete avulsion of anorectal complex.

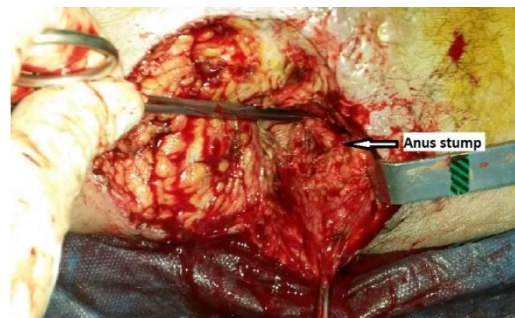


Figure 3: Intraoperative view of the perineal trauma on first surgical procedure in our hospital. The anus stump was deeply retracted in the pelvis (arrow).

In the following days surgical debridements were repeated and the trauma was managed with negative pressure wound therapy as well as saline instillation in the beginning and afterwards without. Gradually the dead space was reduced, and the trauma could be closed (Figure 4). The patient remained in the ICU for almost 2 months and then he was transferred to the Orthopaedic department of the University Hospital of Larissa where he was hospitalized for another 1 month. After that he was transferred to a rehabilitation centre where he stayed for 4 months. The last 17 months is at his home in a good condition walking with a Zimmer frame. From the orthopaedic standpoint the external fixation was revised several times. Definite internal fixation was not considered because of extensive soft tissue damage and signs of infection in the area. An ischaemia of the right gluteus maximus muscle was also developed which was managed with surgical debridements and negative pressure wound therapy. In addition, the patient suffered from neurologic deficits of both lower extremities that confirmed with electromyography. These involved axonal damage of both peroneal and right tibial nerve together with paresis of the left femoral nerve, resulting in reduced mobility.



Figure 4: A. Perineal trauma after several debridements B. Apply of negative pressure wound therapy with saline instillation C. Trauma closure D. Final result after 24 months. Atrophy of the right gluteus maximus.

Discussion

The anorectal avulsion represents a rare rectal injury. Only 9 cases have been described in the medical literature (Table 1). It is usually the result of severe crush pelvic trauma and it is associated with high morbidity. The first case was reported in 1965 by Mathieson and since then only 8 more case reports have been described [2-10]. Due to the rarity of this entity, treatment is not standardised. In this kind of injury, fractures of the pelvis can cause secondary lesions of the rectum, urethra and other

organs. The main goals of treatment should be adequate resuscitation, bleeding control and sepsis prevention. In most cases and especially in haemodynamically unstable patients, haemorrhage due to pelvic fractures is treated by preperitoneal packing, external pelvic fixation and/or angioembolization [11]. Management strategies for preventing sepsis include early repair of the intestinal and urinary tract lesions, diverting sigmoidostomy, rectal irrigation, presacral drainage, debridement and treatment of the open wounds [1, 12, 13]. Faecal diversion with presacral and perirectal drainage is best suited for patients with destructive extraperitoneal rectal injuries and associated pelvic fractures, given the concern for open fractures and pelvic sepsis [1]. Another issue is the salvage or not of the anus. In anal avulsion, the anus and sphincters may remain functionally intact because this type of injury is the result of the disrupting effect of the trauma in the surrounding loose connective tissue while the pelvic musculature and sphincters are tightly contracted. In 7 out of the 9 cases of anorectal avulsion described in the literature a successful reimplantation was made with good functional results (Table 1). In the remaining other 2 cases the extent of the damaged tissues prevented any attempt for reconstruction (Table 1). However, in the cases with a favourable outcome most of the patients were haemodynamically stable and the reattachment of the anorectum was performed early in the first 48 hours after the injury. In our case, on the contrary, no attempt for anal reimplantation was done in the first days probably due to patient's hemodynamic instability. When the patient was referred to our hospital the anal reconstruction could not be done for two reasons. Firstly, there was excessive perineal tissue necrosis and concurrent sepsis and secondly, the anorectal stump was contracted deeply into the pelvis precluding any attempt for reimplantation.

Table 1: Systemic review of the English language literature regarding anorectal avulsions and their management.

| Case Reports | Management of the anorectal avulsion | Timing of anal reconstruction | Outcome |
|------------------------------|--|---|---|
| Mathieson and Mann, 1965 [2] | Primary repair + presacral drainage + sigmoid loop colostomy | Primarily at the first surgery (hemodynamically unstable) | At 12 months, complete continence for stool and flatus |
| Sharma et al., 2000 [3] | Primary repair + presacral drainage + sigmoid loop colostomy | At the first surgery, in the first 48h (hemodynamically stable) | Discharged after 7 months. Normal continence |
| Terrosu et al., 2011 [4] | Anal reimplantation + pelvic drainage tubes + loop transverse colostomy | In the first 24h (hemodynamically stable) | At 24 months complete continence |
| Rispoli et al., 2012 [5] | Direct suture not possible, sigmoid loop colostomy + presacral drainage + traction of the anus with a Foley catheter | Delayed at a second surgery, in the first 36h (hemodynamically stable) | At 34 months, no incontinence. Anal canal with normal tone but dislocated cranially |
| Hassani et al., 2013 [6] | Primary repair + presacral drainage + sigmoid loop colostomy | Primarily at the first surgery (hemodynamically stable) | At 6 months, no physiologic dysfunction on anorectal manometry; anal stenosis requiring dilatations |
| Gomes et al., 2013 [7] | Direct repair not possible Sigmoid loop colostomy + distal loop washouts | Delayed at 72h | On 1 month, no tone of the anal sphincter, then loss to follow-up |
| Barni et al., 2015 [8] | Anal reimplantation + subcutaneous suction drainage + sigmoid loop colostomy | Primarily at the first surgery (hemodynamically stable) | Anal stenosis requiring perineal rehabilitation and repetitive anal dilatation |
| Page et al., 2015 [9] | Reimplantation not possible Diverting colostomy + perineal washout | At 5th day, completion proctectomy and rectus abdominis myocutaneous flap | Permanent stoma |
| Cruceru et al., 2016 [10] | Anal reimplantation + pelvic drainage + sigmoid loop colostomy | Delayed at 48h (hemodynamically stable) | At 6 months no impairment of the anal continence. |

Conclusion

In summary, we reported a rare case of anorectal avulsion secondary to crush pelvic injury. This kind of injury is associated with significant morbidity and mortality. The severity and complexity of the trauma requires a multidisciplinary approach involving general surgeons, orthopaedics, intensivists and rehabilitators. Any effort for anal reconstruction should be done, if possible, early in the treatment course.

Abbreviations

CT: Computed Tomography

FAST: Focused Assessment with Sonography for Trauma

ICU: Intensive Care Unit

Author's Contribution

KB and ME designed the study, performed the surgeries and provided the original pictures. KB is the first author of this manuscript and the corresponding author. EA provided the radiological images. PP, DP, IS and PH managed the perioperative course. KM, AK and AZ managed the orthopedics injuries. All authors have read and approved the final version of the manuscript.

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Ethics Approval and Consent to Participate

Not applicable.

Consent for Publication

Written informed consent for the publication of this case report was obtained from the patient.

Conflicts of Interests

The authors declare that they have no competing interests.

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