

## Perineal trauma with anal avulsion: case report

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### Abstract

Anorectal avulsion is an exceptional rectal trauma. In this kind of lesions, the anus and the sphincter no longer join the perineum and are pulled upward. We present a case of 34-years-old patient who was admitted because of a pelvic-perineal trauma, presenting a partial anorectal avulsion, exposed femoral fracture with thigh's lacerated-contused wound. Our treatment included primary plastic of the internal anal sphincter with replanting of the rectum on the anal canal and a diverting loop sigmoid colostomy (SCS), so as to prevent sepsis. Closure of the protective SCS was performed four months after the trauma. *Clin Ter 2020; 171(1):e1-6. doi:10.7417/CT.2020.2180*

**Key words:** perineal trauma, anorectal avulsion, primary treatment, sigmoid colostomy, fecal incontinence evaluation

### Introduction

Traumatic injuries of the rectum are unusual even though their treatment is challenging and often lead to high morbidity and mortality rate (1).

Anorectal avulsion is an exceptional rectal trauma. In this kind of lesions, the anus and sphincter no longer join the perineum and are pulled upward (2).

The most extensive retrospective review article in the literature, published by Petrone et al.(3) in 2009, covers 13 years (1992–2005) and included 53 244 civil trauma victims admitted to a level 1 trauma center in the United States. The incidence of perineal injuries was 0.1% (69/53 224), with an average age of 30. Perineal injuries can frequently be associated with open pelvic fractures (1%–4%).

In the series by Petrone et al., penetrating mechanisms of injury were more frequent at 56%, with a predominance of knife wounds and gunshots. Blunt trauma was observed in 44%, most of which were due to falls, motorcycle accidents, car accidents, car–pedestrian collisions, and foreign bodies. According to published series (3,4–17) about blunt pelvic trauma, automobile–pedestrian collisions are responsible for

41% of perineal injuries, followed by motorcycle accidents (22%), car accidents (20%), falls (16%) and other (1%). Injuries can range from soft tissue lacerations, low- or high-energy penetrating injuries and impaling, to extensive and devastating injuries associated with complex pelvic fractures due to explosions.

The management of penetrating rectal trauma invokes a complex decision tree that has been established based on lessons learned in wartime. The classic teaching for the management of penetrating rectal trauma advocates the principles of proximal diversion (diversion) of the fecal stream, irrigation of stool from the distal rectum (DRW), and presacral drainage (PD). Today, these techniques are used variably by clinicians based on the available literature that has been published during the last 40 years (18).

A multidisciplinary approach is mandatory and it has to involve general surgeons, anesthesiologists and rehabilitators (19,20). The main difficulties encountered when treating these lesions are: to prevent sepsis and to preserve anal sphincter functions at the same time.(20) In 1989, Burch et al. (21) recommended fecal diversion and presacral drainage for rectal injury management. If local condition allow it a primary repair of a rectal lesion should be always tried. Presacral drainage is believed to prevent perirectal infections due to fecal contamination and has been used widely to reduce abscess formation in extraperitoneal rectal trauma. Diverting colostomy has been demonstrated safe and effective in reducing the infection rate associated with rectal trauma (8) and a valid tool to perform rectal wash-out. However, in a study by Gonzales, fourteen patients suffering from non-destructive penetrating extraperitoneal rectal injuries were treated without fecal diversion or direct suture repair. Infectious complications didn't occur in any of these patients. Furthermore, from their retrospective review, Navsaria and colleagues concluded that extraperitoneal rectal injuries caused by low-velocity penetrating trauma could be treated only by fecal diversion (22).

Table 1. Reported cases of anorectal avulsion

Authors	Year	Title	Management of the anorectal avulsion
Mathieson, A. J et al.	1965	Rupture of the posterior urethra and avulsion of the rectum and anus as a complication of fracture of the pelvis	Primary repair + presacral drainage + sigmoid loop colostomy
Sharma D. et al	2000	Anorectal avulsion: an unusual rectal injury	Primary repair + presacral drainage + sigmoid loop colostomy
Terrosu G. et al	2011	Anal avulsion caused by abdominal crush injury	Anal reimplantation + pelvic drainage tubes + loop transverse colostomy
Rispoli C. et al.	2012	Anorectal avulsion: Management of a rare rectal trauma	Direct suture not possible sigmoid loop colostomy + presacral drainage + anoperineal reparation 10 weeks later
R. M. Gomesa et al	2013	Anorectal avulsion: report of a rare case of rectal injury	diverting sigmoid loop colostomy (primary repair not possible)

### Case report

A 34-years-old patient was admitted to the Emergency Room of the University Hospital Policlinico Umberto I of Rome after having an accident which resulted with a pelvic-perineal trauma, presenting a partial anorectal avulsion, exposed femoral fracture with leg's lacerated-contused wound. At the arrival to emergency room the patient was awake and conscious, pulse rate of 90 beat per minute; normal thorax physical examination, abdominal examination showed minimal tenderness in the hypogastrium, the perineal exam revealed a massive perineal injury with anal avulsion (fig. 1-2). The patient was hemodynamically stable and in the range of normality, blood test showed hemoglobin 13.3 g/dl, white blood cell count of  $18.41 \times 10^3/\mu\text{l}$ .



Fig. 1



Fig. 2

A contrast-enhanced computed tomography (CT) was performed in emergency and showed a pelvic trauma with compound fracture of S5 and coccyx bone, left subtrochanteric compound and pluri-frammentary femoral fracture. CT scan also showed a left hemibacine subcutaneous and muscular soft tissues clean wound and perineal laceration with ventral shift of rectum and endoluminal blood (Fig. 3-4).

The patient was taken to the operating room. On the leg's wound was performed necrosectomy, several debridements, massive irrigation (8 liters) and surgical suture in vicryl (Fig 5). Moreover we performed a plastic of the internal anal sphincter with replanting of the rectum on the anal canal in vicryl, with wet gauzes rectal probe (Fig. 6). A loop SCS (Mikulicz) was performed through an elective laparotomy in the left iliac area. No presacral drainage was placed. In a second time, patient's femoral fractures were stabilized with Hoffmann external fixation. In fourth postoperative day SCS stool production began.





Fig. 3



Fig. 6

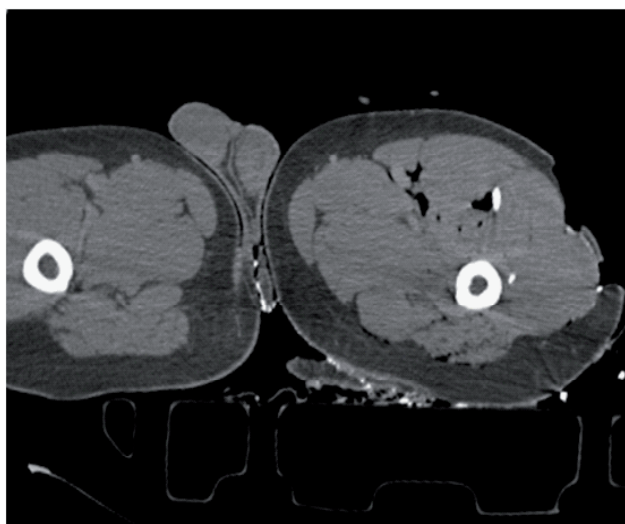


Fig. 4



Fig. 5

The postoperative course was characterized by leg's wound dehiscence, treated with VAC therapy. The patient was discharged after 28 days, in which he performed autonomous pelvic rehabilitation due to help prevent transitory incontinence.

ARM, performed after 2 months, showed anocutaneous reflex, squeezing pressure and a straining pressure lower than average. No transrectal echography was performed because anal muscles were intact. Although these bewildering results, we based our evaluation about sphincteric function on clinical evidence. We performed some clinical tests who have shown good performance of enema's holding capacity and an anal Digital Rectal Exam (DRE) by senior examiner.

SCS was closed after 4 months, associated to the removal of Hoffmann femoral external fixation. The patient was discharged in fifth postoperative day, good recovery of the bowel and the sphincters function (Fig. 7-8). Seen at short term follow-up, didn't show any evidence of fecal incontinence and/or defecatory disorders.

### Discussion

In an update Bharucha et al. Anorectal Manometry (ARM), rectal sensation, and rectal balloon expulsion, are useful initial tests.

In selected patients with reduced anal pressures, anal imaging and/or anal sphincter Electromyography (EMG) are useful (23-26).



Fig. 7



Fig. 8

Table 2. Evidence-based summary of the utility of commonly performed diagnostic tests in fecal incontinence. (23-26)

Test	Clinical utility		Evidence	Recommendation	Comments
	Strengths	Weaknesses		(Grade)	
<b>Physiologic tests:</b>					
-Anorectal Manometry	Quantifies sphincter pressures, rectal sensations and compliances and rectoanal/reflexes	Lack of standardization	Good	B2	Widely used. Facilitates diagnosis of incontinence and dyssynergic defecation
-Needle EMG	Quantifies spike potentials and reinnervation pattern indicating neuropathy or myopathy	Invasive, painful, not widely available	Fair	B3	Only used in research labs
-Surface EMG	Displays EMG activity and can provide information on normal or weak muscle tones	Inaccurate, artifacts	Fair	B3	Largely used for Biofeedback
-Pudendal nerve terminal motor latency	Measures latency of terminal portion of pudendal nerve, Simple	Minimally invasive, low sensitivity, interobserver differences	Fair	B3	Conflicting recommendations
-Translumbar and trans sacral motor evoked potentials	Quantifiers spino-anal and spino-rectal nerve conduction, Minimally invasive.	Lack of training and controlled studies, availability	Fair	B3	Promising non invasive objective tests

In a debate by Bharucha et al. (27), ARM reveals that a reduction of anal resting and squeeze pressures, predominantly reflect impaired internal and external anal sphincter function, respectively, in a majority of women with fecal incontinence (28). There is a modest, statistically significant correlation between anal resting and squeeze tone assessed by DRE and by ARM in healthy subjects and in fecal incontinence (29). Indeed, experienced and meticulous clinician scan probably permitted an accurately gauge of an anal resting pressures and contraction of the puborectalis muscle in patients with normal or markedly abnormal (i.e. reduced or increased) functions. In addition to quantifying pressures as a continuous rather than a discrete (i.e. , normal, reduced, or increased) variable, ARM is probably more accurate than a DRE for: (a) identifying minor abnormalities in anal pressures; (b) measuring anal pressures when the clinical examination is painful, e.g. , in patients with an anal fissure ; and (c) identifying increased anal pressures with impaired sphincter relaxation in a subset of patients, predominantly men, with fecal seepage (30). Though the puborectalis “lift” can be readily discerned by a clinical examination, it is more difficult to appreciate contraction of the external sphincter. Moreover, considering that anal pressures decline with age even in asymptomatic subjects, it can be challenging to gauge if anal tone is normal or reduced in older people by a DRE alone.

The study by Pint et al. found a moderate to a strong agreement between the DRE performed by more experienced examiners and the values obtained in ARM in the analysis of anal resting pressures and a strong correlation of the squeeze pressures and DRE by senior examiner. However, the DRE of the beginner examiner agreement was lower for the evaluation of both sphincter pressures in comparison to the ARM. Therefore, similar to previous studies, this study highlights the greater accuracy of DRE performed by professionals more skilled with anorectal physiology and pelvic floor disorders evaluation than by physicians not so qualified in this analysis (31-32).

## Conclusions

The anorectal avulsion is a rare rectal trauma, in which treatment is not standardized (4).

A multidisciplinary approach is mandatory in this kind of lesions (5,6) and it involves orthopedic and general surgeons, anesthetists and rehabilitators. The main difficulties encountered in treating traumatic lesions of pelvic-perineal concerns to prevent sepsis and to preserve anal sphincter functions. Despite the variability of proposal to treat penetrating rectal trauma described by literature, our experience guide ourselves to choose early repair of the rectum, diverting SCS, distal rectal washout and wound debridement and massive irrigation to prevent sepsis. Diverting SCS has been demonstrated safe and effective in reducing infection rate associated with rectal trauma and surgical site wash-out. In this case it was also useful wet gauzes rectal probe. From the discharged to the SCS closure was performed pelvic rehabilitation due to help prevent fecal incontinence.

To evaluate the risk of fecal disorder, we performed: -ARM, showed anocutaneous reflex, squeezing pressure and straining pressure lower than average; -Clinical tests, showed good performance of enema's holding capacity and DRE by senior examiner, didn't show significant anal sphincter tone loss of function. Despite ARM result and a pool of discordant studies about the appropriate evaluation method of fecal incontinence risk, we choose to planning SCS closure on our clinical evidence.

Seen at short term follow-up, no fecal incontinence and/or defecatory disorders.

Table 3. Assessment of anorectal functions by clinical assessment and diagnostic testing (27).

Parameter	Clinical examination vs diagnostic testing
Anal resting and squeeze pressures	Manometry is more precise than a clinical examination
Anal structural injury	Imaging is more sensitive than a clinical exam for identifying sphincter defects and can also characterize location and nature (e.g. defect, atrophy) of sphincter injury
Neurogenic sphincter injury	Location and severity only identifiable by anal EMG
Rectal sensation and compliance	Can be assessed by rectal balloon distention only
Pelvic floor motion	Clinical assessment is reasonably correlated to pelvic MRI



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