

Traumatic posterior anal injury requiring a sphincteroplasty without diversion.

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Case report

Traumatic posterior anal injury requiring a sphincteroplasty without diversion.

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Abstract

The anal sphincters may be divided by direct anal trauma or by severe pelvic injuries. The preoperative clinical assessment may correlate well with intra-operative assessment. As long as about half the sphincter ring remains active there is a good chance of restoring satisfactory faecal continence following a sphincteroplasty.

Keywords : Anus, sphincter, trauma, clinical assessment, repair

Background

The anal sphincter is anatomically well protected by the fat tissue in the ischiorectal fossa and by the gluteal muscles and pelvic structures [1]. The injuries are thus not frequent, and are mostly caused iatrogenically (surgery, childbirth), or by sexual injuries, or war injuries from bullets, fragments, etc [2-4]. The commonest cause of anal sphincter damage is child birth injury and the site is always the anterior midline and easily treated as the external anal sphincter muscles are mainly shifted laterally [4]. Complete division of the sphincter ring is followed by retraction of the cut ends to about half a circle and, during the subsequent healing the gap is filled by fibrous tissue which only contracts a little and leaves a long non-contractile segment. Clinical assessment of traumatic anal injury may suffice in determining the sphincter defect in resource-limited settings where endoanal ultrasonography is not available [5, 6]. The aim of surgical repair is to remove this segment and recreate a long anal canal surrounded by active sphincter muscle [5]. Traumatic

perineal injuries resulting in anal sphincter disruption often occur with severe associated life-threatening injuries. Once stabilized, assessment during the secondary survey will identify perineal and/ or anal injuries. The general principles of injury prioritization, perineal debridement and diversion of the faecal stream in cases of associated rectal laceration are important [2, 3].

Case presentation

A 25-year- old heterosexual African man was admitted as an emergency following a gun-shot to the abdomen and another to the pelvis. He was resuscitated in the emergency unit with intravenous fluids and underwent an urgent laparotomy. The findings included multiple perforations of the small bowel requiring small bowel resection. The entry site of the second bullet was in the left iliac fossa but caused no pelvic injury. The exit point was through the perineum for which he sustained perineal injury affecting the external anal sphincters (figure 1). On digital examination, there was no loss of rectal or anal mucosa. He had normal rectal and anal sensation but loss of anal tone on squeeze and loss of active anal control. He had a high Cleveland clinic incontinence score of 18/20 i.e., solids (always) 4, liquids (always) 4, flatus (sometimes) 2, use of pad (always) 4, lifestyle alteration (always) 4. He recovered from his abdominal surgery but continued to have severe urge incontinence. On examination following referral, there was mild faecal soiling, the anal canal was scarred at 3 and 9 o'clock from the mid anal canal extending posteriorly. This was associated with a palpable defect in the posterior external anal sphincter complex. There was palpable fibrous tissue adjoining the underlying separated ends of the posterior anal sphincter complex (Figure 1). Clinically, a diagnosis of 50% posterior anal sphincter complex damage (grade 3b) was made. He consented for a repair but without a defunctioning stoma. Routine blood tests were normal. The patient received no mechanical bowel preparation and following a spinal anaesthesia he was placed in the lithotomy position. The first step entailed the excision of all the secondary epithelium and underlying scar tissue surrounding the margins of the anus from the midline and extending posteriorly. This created a large wound which was essential to allow exposure of the disrupted muscle ends for opposition without tension (Figure 2). The next step involved mobilizing the normal mucosa of the anal canal and lower rectum by dissecting it about 1 cm free from the muscle wall. This would later allow mucosal reconstruction without tension. The third and difficult step was sorting the disrupted muscle ends without cleaning off all the fibrous tissue which will aid holding the sutures. No attempt was made to identify separately the internal and external sphincters. It was necessary to dissect on the lateral surface of the sphincter for a short distance to free fibrous tissue that may be tethering the muscles and allow repair without tension, but not extensively which may damage the laterally placed neurovascular bundle. Posteriorly, the insertion of all the muscles attached to the coccyx are divided to allow the posterior limb of the sphincter to be lifted forwards without tension. This leaves a cavity between the coccyx and the rectum. Horizontal mattress sutures with absorbable 2.0 vicryl were used in the overlapping repair of the remnant external anal sphincter but tied lightly to avoid muscle necrosis (Figure 3). The anal tone on palpation following the repair was satisfactory. The perineal skin was closed in an inverted "Y" (Figure 4) and a compression dressing applied. He was administered three perioperative doses of antibiotics (ceftriaxone and metronidazole) and allowed an elemental diet for 2 weeks. His bowels moved the following day with no urge incontinence and an excellent Cleveland clinic incontinence score of 1/20 i.e., solids (never) 0, liquids (never) 0, flatus (rarely) 1, use of pad (never) 0, lifestyle alteration (never) 0. He had no faecal incontinence at six months, and long-term follow-up was planned.

Discussion

This case presented sphincter damage from a gun-shot that was not total but sufficient to cause appreciable loss of anorectal control. There was fibrous tissue joining the widely separated ends of anal sphincter (Figure 1). The case demonstrated the successful management of a traumatic anal sphincter injury following clinical assessment without the use of endoanal ultrasound to delineate the sphincter defect [6-8]. The novelty of this case were (1) the uncommon presentation of a discrete posterior anal injury involving more than 50% of the external anal sphincter caused by direct penetrating trauma. (2) With about half the sphincter ring remaining active there was satisfactory restoration of anal control without the need for a diverting stoma. Following section of the posterior sphincter muscles by the bullet, the wound had healed with much secondary

epithelium and underlying scar tissue, and the sphincters had retracted to about half their circumference i.e. third degree (3b) perineal injury (Figure 2, table 1). The preoperative clinical assessment correlated well with the intra-operative assessment of the sphincter injury. Haque et al [6] had presented a similar experience following simply clinical assessment of 29 patients. Specific features in the history may point to the underlying aetiology of faecal incontinence. Often the history will give some indication as to whether the problem lies primarily within the rectum or the sphincter apparatus. There may be seepage of faeces due to sensory inattention in a proportion of patients with abnormalities purely of anal canal sensation. Patients in whom the primary presenting complaint is one of urgency of defaecation have deficiency of external anal function as in this case [8-10]. Unlike external anal sphincter injury from obstetric trauma which is always anterior and in the midline, external anal sphincter muscle injury in other sites are not so easily treated as the retracted ends are difficult to define with confidence. In addition, because of their disrupted nature any suture placed in them will tend to cut out. Thus, although the excision of the scarred tissues is essential for the mobilization of the remnant external anal sphincter muscle for an overlapping repair, it is important not to clean off all the fibrous tissue on the remnant sphincter muscle [4, 5]. At a mean follow-up of 84 months, Lamblin et al [11] reported 48% of patients maintaining good faecal continence with a satisfaction rate of 85% using the overlapping sphincteroplasty technique. Failure was attributed to mechanical dehiscence, progressive muscular atrophy or occult neuropathy. Extensive perineal injuries resulting in anal sphincter disruption often require diversion and sphincter reconstruction. However, after clear tissue viability has been established as in this case and, there was no rectal laceration, the defect can be repaired primarily without diversion of the faecal stream [2-4]. In a randomized trial to assess the need for faecal diversion at the time of sphincteroplasty, Hasegawa et al [12] concluded that there was increased morbidity from a stoma with no difference in functional outcome or wound healing. Anal stenosis requiring repeated self-dilatation was a common complication from anal disuse.

Conclusion

Following detailed clinical assessment, a traumatic posterior anal sphincter injury can be successfully managed with an overlapping repair without a diverting stoma. As long as about half the sphincter ring remains active there is a good chance of restoring satisfactory faecal continence.

Declarations

Ethics approval and consent to participate: not applicable

Consent for publication: Written informed consent from the patient was granted to write and publish the paper and associated images.

Availability of data and materials: Data sharing is not applicable to this article as no datasets were generated or analysed during the current study

Competing interests: The authors declare no competing interests.

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Authors' contributions: EPW was the main author and surgeon, NN, assisted in surgery and did some literature search.

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Legends

Table 1: Classification of perineal tear [4] (with permission)

Figure 1: Traumatic perineal wound with secondary epitheliasation and scarred tissue

Figure 2: Excision of scar tissue prior to anal sphincter repair

Figure 3: Posterior overlapping sphincteroplasty

Figure 4: Perineal wound closure in inverted ‘Y’

Table 1: Classification of perineal tear [4] (with permission)

First degree	Injury to perineal skin
Second degree	Injury to perineum involving perineal muscles but not involving the anal sphincters
Third degree	Injury to perineum involving the anal sphincter complex: 3a: <50% of ext anal sphincter(EAS) thickness 3b: >50% of ext anal sphincter(EAS) thickness
Fourth degree	Involves anal sphincter complex (EAS and IAS) and anorectal mucosa.

Figures



Figure 1: Traumatic perineal wound with secondary epitheliasation and scarred tissue

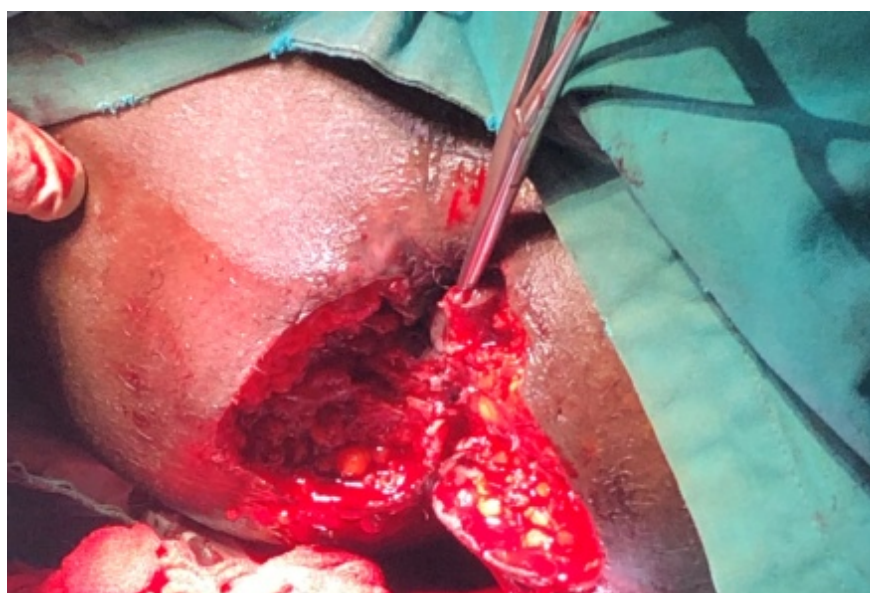


Figure 2: Excision of scar tissue prior to anal sphincter repair

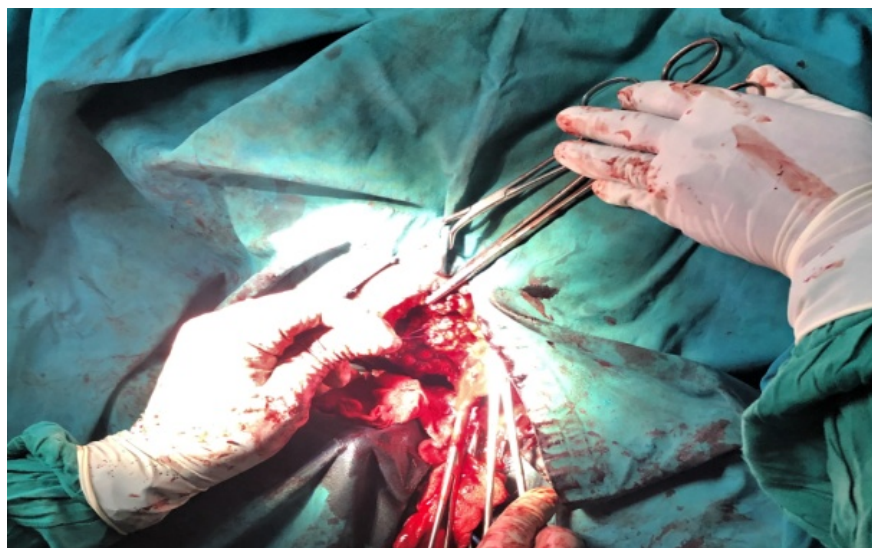


Figure 3: Posterior overlapping sphincteroplasty



Figure 4: Perineal wound closure in inverted 'Y'