



## Reconstructive Surgery of the Perineal and Anal Area after Trauma with Lower Extremity Flap

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### Abstract

**Introduction:** Traumatic wounds to the perineal and perianal area are associated with a high degree of morbidity and mortality. Patients remain at high risk for infection and manipulation of the anus and perianal tissue can lead to significant scarring and future functional impairment.

**Case Presentation:** A 32-year-old male presents status motorcycle crash resulting in penetrating trauma to the perineum. After stabilization and primary anal repair, the patient's perianal wound was left open leading to painful dressing changes and anal retraction. Reconstruction was performed without complication using a combination of local muscle and fasciocutaneous flaps.

**Discussion:** A wide range of treatment options are used to treat traumatic wounds of the perineal and perianal area. The best reconstructive plans address the risk for anal scarring, retraction and subsequent impairment by filling the dead space while providing well-vascularized support to the anal verge during wound closure.

**Conclusion:** Reconstruction after fecal diversion with combined local muscle and fasciocutaneous flaps provides opportunity for wound closure and simultaneously prophylaxes against infection and anal retraction.

**Keywords:** Perineal wound; Muscle flap; Reconstruction; Trauma

### Introduction

Traumatic wounds to the perineal and perianal area are associated with a high degree of morbidity and mortality, yet little consensus remains on optimal clinical management [1]. These wounds often occur with serious concomitant injuries including perianal avulsion, intestinal and/or urethral injury, pelvic fractures, life-threatening hemorrhage and even limb loss, which make them even more challenging to treat [1-7]. Management is further complicated by significant infection risk and temporary fecal diversion is frequently recommended [1,4,6-10].

Once stabilized and all life-threatening injuries have been addressed, patients undergo debridement of the wound followed by perineal and perianal reconstruction. Reconstructive options include healing by secondary intention, delayed primary closure, negative pressure therapy, skin grafting, local and free flap reconstruction [1,2,4,7,10,11]. No matter the management, patients remain at high risk for infection and manipulation of the anus and perianal tissue can lead to significant scarring and future functional impairment [5,10]. In the case described below, we utilize a technique for perianal reconstruction that provides well-vascularized support for the anus while simultaneously closing the wound and eliminating dead space through use of combined local muscle and fasciocutaneous flaps.

### Case Presentation

#### Presentation

The patient is a 32-year-old male involved in motorcycle crash resulting in penetrating trauma to the perineum. The patient sustained a right pubic rami fracture and traumatic arthrotomy of the right knee with ligamentous injury. The patient was taken to the operating room for debridement of the perineal wound and underwent primary anal repair. The perineal wound was left partially open. Given the extent of the injury, the patient returned to the operating room the next day for diverting loop colostomy. He also underwent incision and drainage of the right knee joint at that time. The patient did well post-operatively and was subsequently transferred to an inpatient rehabilitation

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**Figure 1:** A deep wound of the right buttock is noted extending in the anteroposterior direction with significant retraction of the anus.



**Figure 3:** The gracilis muscle was inset in the perianal defect, simultaneously filling the dead space and providing additional support for the mobilized anus.



**Figure 2:** A pedicled gracilis flap was dissected and then tunneled to the perineum for use in reconstruction.



**Figure 4:** On-table result after elevation, advancement and inset of the gluteus maximus rotation flap.

hospital where he worked on ambulation and underwent daily packing of the perineal wound. The patient progressed from a rehabilitation standpoint; however, he continued to require high doses of pain medication during dressing changes. Plastic Surgery was consulted for wound evaluation and management. On exam, the patient was noted to have a deep laceration of the right buttock extending in the anteroposterior direction, just lateral to the anus, greater than eight cm deep (Figure 1). Significant retraction of the anus was noted. The patient also had surrounding hyperpigmentation of the skin consistent with superficial fungal infection. Given the patient's inability to tolerate dressing changes, the size and location of the wound and the anal retraction, reconstruction was recommended. Moreover, closure of the wound would decrease the patient's risk of infection/seeding before definitive ligamentous reconstruction of the knee.

**Operative technique**

The patient was brought into the operating room, intubated on the gurney and then placed prone on the operating table. We began the case with debridement of the wound down to healthy bleeding tissue. We excised a band of scar tissue along the right side of the anus and proceeded to dissect the anus from the surrounding tissue. We were able to mobilize the anus, approximately three cm, back to a normal position. We then turned our attention to the muscle flap reconstruction.

We began with a longitudinal incision of the right medial thigh and dissected through the subcutaneous fat down to the underlying gracilis muscle. We dissected the gracilis muscle first distally and



**Figure 5 and 6:** Four weeks after reconstruction the patient is noted to be well healed without further evidence of anal retraction.

transected it at the musculotendinous junction. We proceeded with circumferential and proximal dissection of the muscle, taking care to preserve the pedicle, which was readily identified (Figure 2). We then created a tunnel from the medial thigh to the perineal wound, two finger breadths in size, and passed the gracilis through it and into the base of the wound. The muscle was inset in the perianal defect, simultaneously filling the dead space and providing additional support for the mobilized anus (Figure 3).

We then proceeded to elevate a partial gluteus maximus rotation flap to provide coverage for the gracilis and to close the wound. The

flap was incised and dissected down to and through the fascia of the posterior thigh. The flap was elevated from caudal to cranial at this level to allow for medial advancement and wound closure (Figure 4). Two drains were placed and the rotation flap was inset to the anal verge and surrounding tissue. We proceeded with primary closure of the donor site. The surgical site was dressed with bactroban, xerforom, gauze and abdominal pads secured with silk tape.

### Outcome

The patient was maintained on bed rest for four weeks post-operatively on a specialty air-fluidized bed. The surgical site and anal opening were inspected and dressed with bactroban and xeroform twice weekly. Drains were removed on post-operative day eight, and sutures were removed two weeks after surgery. The patient's superficial fungal infection improved throughout his stay with topical and oral fungal treatment. The surgical site went on to heal without complication (Figure 5 and 6). At the end of his four-week stay, the patient was started on a physical therapy assisted ambulation program before transfer to inpatient rehabilitation. He went on to heal without evidence of dehiscence, infection or recurrent anal retraction.

### Discussion

A wide range of treatment options are employed to treat traumatic wounds of the perineal and perianal area, ranging from delayed closure to complex flap reconstruction [2,4,10,11]. Management is primarily dictated by the extent of injury and presence of concomitant injuries [1,2,6]. Early treatment algorithms were largely conservative, focusing on the debridement of necrotic tissue and fecal diversion [1,4,7,8]. Soft tissue avulsions were closed loosely or left open for later repair in an effort to mitigate infection risk [3,7,8,10]. However, infection rates remained high and the desire to decrease pelvic sepsis and to maintain anal sphincter function have since led to more aggressive treatments consisting of wound closure with complex soft tissue reconstruction [2,4,11].

In the case of isolated sphincter injury, sphincteroplasty is the preferred method of repair [4]. In the case presented above, however, the patient also sustained a large soft tissue avulsion lateral to the anus. Though the anus was repaired primarily early in his hospital course, the patient was left with a large open avulsion wound requiring painful daily dressings. As time progressed, moreover, scarring lateral to the anus began to cause retraction of the anorectal ring.

The best reconstructive options address the risk for scarring, retraction and subsequent impairment by filling the dead space while providing well-vascularized support to the anal verge during closure of the wound. In the case described above, we utilized a combination of local muscle and fasciocutaneous flaps to achieve these reconstructive goals with good result.

The postoperative care is as important as the surgery itself, and should include strict bed rest for four to six weeks with continuous pressure offloading. Other important factors include prevention of stricture with anal packing and nutrition optimization. The authors recommend protein supplementation throughout the duration of recovery.

### Conclusion

Though rare, traumatic perineal and perianal wounds remain difficult to manage and to treat. Delayed closure is likely to be painful and cumbersome to the patient and their caregivers. Success, moreover, with conservative management is mixed with high risk for infection. Reconstruction after fecal diversion with combined local muscle and fasciocutaneous flaps provides a unique opportunity for wound closure and prophylaxes against infection and anal retraction.

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