

# Gracilis Flap Restoring Quality of Life in a Patient with Non Functional Anal Sphincter

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## ABSTRACT

An excellent technique for reconstructing the perineum following extensive perineal resection for restoration of a traumatised anal sphincter is the Gracilis myocutaneous flap. Direct anal trauma or pelvic injuries can separate the anal sphincters. An overlapping sphincteroplasty has a fair possibility of regaining acceptable fecal continence if roughly half of the sphincter ring is still functional. A case of a 22-year-old male who underwent Gracilis myocutaneous flap reconstruction after being diagnosed with a non functioning anal sphincter is reported. A free muscle transplant was done to repair the sphincter, utilising denervated muscle with an intact blood supply. New muscle was attached to those sphincter muscles which were still functional. The transplanted muscle receives new muscular fibers, enabling the repaired sphincter to contract voluntarily in addition to reflexively. The surgical approach is determined based on the presented sphincter defect. Free muscle transplantation can be preferred in cases where the external sphincter has some degree of functionality.

**Keywords:** Anal continence, Colorectal repair, Myocutaneous flap, Sigmoidoscopy, Sphincteroplasty, Sphincter defect

## CASE REPORT

A 22-year-old male patient with no major medical history underwent surgery following a road traffic accident caused by a collision. He had emergency repair of a main perineal tear with diversion colostomy at a private tertiary care centre [Table/Fig-1]. Postoperative anorectal manometry indicated low rectal sensation, low resting pressure, and an abnormally long squeeze. The right testis was found in the medial portion of the upper thigh after an inguinoscrotal ultrasound revealed the right scrotal sac was empty. The patient was referred to another tertiary care centre for further evaluation. Magnetic Resonance Imaging (MRI) was conducted to assess the extent of sphincter damage, revealing a Type 3B complex trans-sphincteric left perianal fistula.



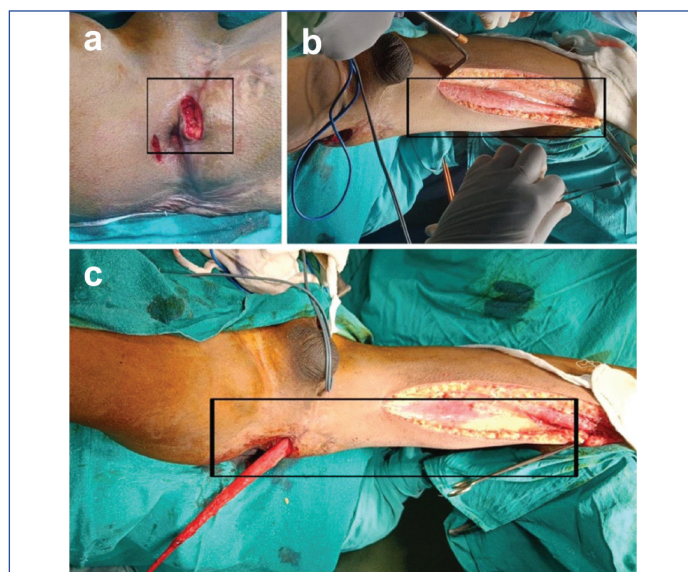
[Table/Fig-1]: Post primary repair of perineal tear.

Medical examination showed a decrease in the size of the left levator ani and left transverse perineal muscles. Sigmoidoscopy was performed to visualise the colon, which was found to be normal, and the left gracilis myocutaneous flap was scheduled. A line was drawn from the gracilis origin to the medial femoral condyle along the abductor longus, as the medial aspect of the thigh was the location of the incision, which was made 1 cm below this line; the vascular pedicle was found around the muscular belly. The pubic tubercle was 10 cm away from the pedicle. Following the dissection, a resulting flap was tunneled under the skin to the perineal defect. The repair was carried out by attaching separate sutures to the ischial tuberosity. Both intraoperative and postoperative procedures were uneventful. The preoperative condition is depicted in images [Table/Fig-2].



[Table/Fig-2]: A Gracilis myocutaneous flap preoperative image.

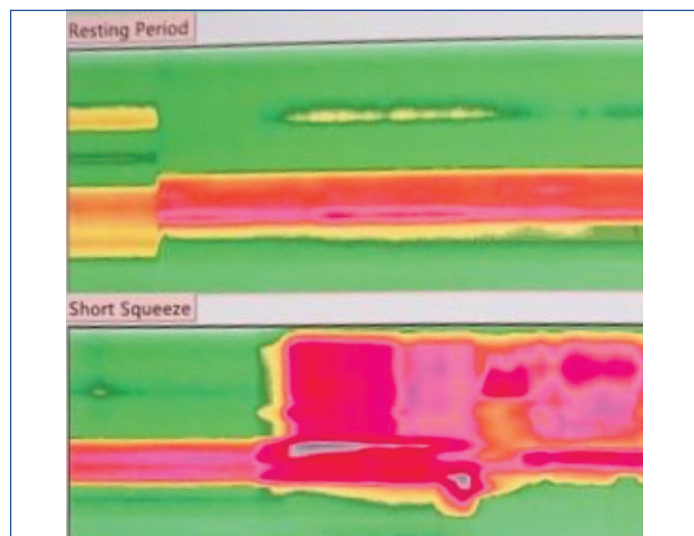
Intraoperative images of dissected gracilis muscle and gracilis myocutaneous flap repair have been shown [Table/Fig-3]. The patient was followed-up after two months of the Gracilis flap repair. Positive changes were noted, as indicated by the differences in pre- and postrepair manometry reports. The patient was better



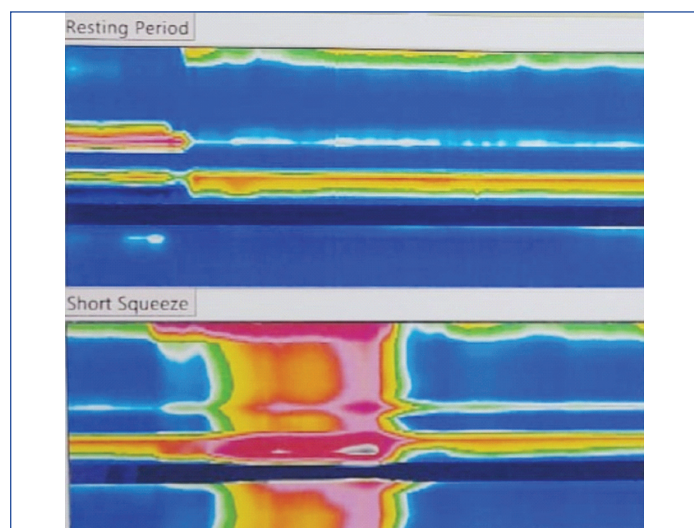
[Table/Fig-3]: Intraoperative images for Gracilis myocutaneous flap repair for perianal region; a) Showing circular incision taken in the perianal region; b) Dissected Gracilis muscle; c) Dissected gracilis muscle pulled out as a sling.



able to control his anal reflexes and was continent [Table/Fig-4,5]. Postoperative Gracilis flap repair, anal manometry was suggestive of adequate anal squeeze pressure, lower increment in rectal pressure with a lower decrease in anal pressure during the push, with a normal report for anal continence on dye study [Table/Fig-6]. The patient underwent colostomy closure, which had positive outcomes. The patient had normal passage of stools from his anal opening with adequate anal continence.



[Table/Fig-4]: Pre Gracilis flap repair manometry.



[Table/Fig-5]: Post Gracilis flap repair manometry.



[Table/Fig-6]: Dye study showing anal continence before colostomy closure.

## DISCUSSION

Fecal incontinence is a common morbidity experienced by perineal and anorectal trauma victims [1]. The sphincter can be reinforced by using translated adjacent muscles or employing an artificial sphincter if the degree of sphincter disruption or weakening prevents restoration of function through direct means [2,3].

Though there are certain complications and morbidities associated with gracilis free flap- such as wound healing, flap loss, skin necrosis, flap wound edge separations, infections at the recipient site, thrombus in the flap and rare cases, temporary sciatic nerve palsy, but no such complication was noted in present case and the patient returned to his normal life. The gracilis muscle is a small adductor of the lower limb that inserts on the medial tibial condyle and originates in the pubic bone. It is vascularised by the medial circumflex branch of the deep femoral artery. While the lower limb typically becomes functionally disabled due to the flap's transposition, insertion of a vascular pedicle can significantly reduce the degree of flap rotation. The gracilis muscle, a small adductor of the lower limb, is a suitable reconstructive technique for medium-sized lesions resulting from anal-rectal, vaginal, or vulvar resection, such as the gluteal and gracilis flap [4,5]. Similar to Ruiz and Kaiser, present study also utilised the puborectalis sling to contribute to anal resting tone, with the gracilis muscle augmenting the external anal sphincter [6].

Harvesting the myocutaneous flap paddle may cause a minor functional deficit in the gracilis muscle, the thigh's most superficial adductor. It is recommended to dissect the branches of the medial circumflex femoral artery to ensure proper vascularisation of the flap. The transplanted muscle can adapt to its new function due to altered innervation. The gracilis flap can be harvested as a muscle, musculocutaneous complex, or conjoint flap, depending on the required components [7,8]. In the current case, the incision was made on the medial aspect of the thigh, 1 cm below this line, revealing a vascular pedicle around the muscular belly, contrary to the method used by Walega et al., following a single large mid-thigh incision and dissection, the resulting flap was tunneled under the skin to a perineal defect, with separate sutures attached to the ischial tuberosity for repair, unlike in this case [9].

The gracilis flap has been considered a secure and reasonably effective option for the treatment of recurrent rectovaginal fistulas, especially as a second or third-line therapeutic approach [10,11]. Despite specific scenarios for the use of the gracilis flap, the limited reliability of the distal skin component of the gracilis musculocutaneous flap has hindered its efficacy [12].

Although complications and morbidities are associated with the gracilis free flap, such as wound healing issues, flap loss, skin necrosis, infections at the recipient site, and rare cases of temporary sciatic nerve palsy, no such complications were noted in present case, and the patient returned to normal life. The cost involved can be a constraint in this procedure, attributed to the aforementioned morbidities. Other options, such as intrasphincteric injectable drugs, are under development with promising initial outcomes [13]. There have been instances of flap failure in a few cases due to primary or secondary thrombosis. Further research is needed on gracilis myocutaneous flaps to assess their efficacy and gain a more comprehensive understanding of the effectiveness of this particular flap and potential strategies to mitigate complications [14].

## CONCLUSION(S)

The gracilis myocutaneous flap can be considered an efficient and practical technique for sphincter reconstruction. After dissection, the myocutaneous flap can be tunneled subcutaneously or across the adductor muscles to reach the perineal defect and effectively cover the wound. This can be followed by colostomy closure. In this case, the patient underwent gracilis myocutaneous flap repair to improve anal sphincter functionality, resulting in normal stool

passage and improved quality of life. Therefore, perineal tear repair using a gracilis flap for positive outcomes in patients with anal continence and sphincter tone control is recommended.

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