Gluteal-fold adipofascial perforator flap transposition for rectourethral fistula reconstruction

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Keywords: Rectourethral fistula, reconstruction, gluteal-fold perforator flap, adipofascial flap, perforator flap

Abstract: Objective: If a rectourinary fistula does not close spontaneously, it requires surgical closure. We present our experience of rectourethral fistula reconstruction using a gluteal-fold perforator flap, resulting in a successful outcome. Patient and Methods: The present was a 64-year-old man with prostate cancer who underwent radical prostatectomy. However, he developed rectourinary fistula, which required surgical closure. A dissection was undertaken to divide the fistula tract, and the rectal and urethral defect were closed. A 12.0x3.0-cm gluteal-fold adipofascial perforator flap was harvested and placed in the space between the rectum and urethra. Results: The viability of all flaps was favorable, without infection or necrosis. The patient could walk the next day, and was discharged two weeks later without fecaluria or liquid stool. Conclusions: We conclude that the gluteal-fold adipofascial perforator flap offers excellent functional advantages in rectourethral fistula reconstruction with minimal morbidity at the donor site.
Abstract

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The patient was a 64-year-old man with prostate cancer who underwent radical prostatectomy. However, he developed rectourinary fistula, which required surgical closure. A dissection was undertaken to divide the fistula tract, and the rectal and urethral defect were closed. A 12.0x3.0-cm gluteal-fold adipofascial perforator flap was harvested and placed in the space between the rectum and urethra. Results:

The viability of all flap was favorable, without infection or necrosis. The patient could walk the next day, and was discharged two weeks later without fecaluria or liquid stool. Conclusions: We conclude that the gluteal-fold adipofascial perforator flap offers excellent functional advantages in rectourethral fistula reconstruction with minimal morbidity at the donor site.
Key words:

Rectourethral fistula reconstruction, gluteal-fold perforator flap, adipofascial flap
Rectourethral fistula reconstruction using gluteal-fold flap

Introduction

Rectourinary fistula develops in 0.6 to 9% of patients after radical prostatectomy, and seldom spontaneously heals. Generally, initial treatment required colostomy, but this fails in more than 50% and these patients require surgical fistula closure [1]. Various surgical procedures have been suggested for the repair of these fistulas [2]. A major technique to prevent recurrent rectourinary fistula has been with gracilis muscle interposition [3]. However, it leads to high-level morbidity at the donor site, including a long scar, wide resection area, and muscle loss.

We present a case of rectourethral fistula reconstructed with a gluteal-fold perforator flap, resulting in a successful outcome.

Patient and Methods

A 64-year-old man was diagnosed with prostate cancer on biopsy and underwent radical prostatectomy. On the 5th day after surgery, he developed fecaluria and liquid stool. Retrograde cystourethrography showed the filling of the bladder and the contrast in the rectum, which suggested the development of a rectourethral fistula.
fistula (Figure 1). Although we created a colon stoma, the fistula had remained for 7 months. As liquid stool continued and did not decrease, surgical closure using a gluteal-fold adipofascial perforator flap was planned.

The patient was placed in a supine position with the legs abducted. A horizontal incision was made between the anus and scrotum. The dissection was undertaken to divide the fistula tract, and all inflamed tissue was removed. The rectal and urethral defect were closed (Figure 2). The location of the cutaneous perforator vessels from the internal pudendal artery were identified on the medial side of the ischial tuberosity preoperatively using a Doppler flowmeter. The adipofascial flap was designed to include these points according to the size of the space between the rectum and bladder.

Dissection of the flap was carried out lateral to medial in the fascial plane until the perforator vessel could be seen. A 12.0x3.0-cm adipofascial flap including a 7.0x3.0-cm hatchet-shaped skin flap was harvested (Figure 3). The adipofascial flap was rotated and placed in the space between the rectum and urethra (Figures 4,
The viability of all flap was favorable, without infection or necrosis. Computed tomography after 3 weeks showed that the adipofascial flap filled the soft tissue defect between the rectum and bladder, and resolved the rectourinary fistula (Figure 7). The patient could walk the next day, and was discharged two weeks later without fecaluria or liquid stool. The urinary bladder catheter was removed 4 weeks after surgery. Two months later, the patient did not complain of rectourethral fistula symptoms.

DISCUSSION

Although rectourinary fistula after radical prostatectomy is rare, if it does not spontaneously close after colostomy, surgical closure should be considered.

Various surgical procedures have been suggested for the repair of these fistulas [2]. The rectal flap method with the York-Mason approach and gracilis muscle flap interposition are the most common procedures. For radiated cases, gracilis muscle interposition may be preferred, because bringing viable tissue to interpose between
the rectum and urethra results in complete dissection between these two organs, and both the rectal and urethral defects are repaired [1]. However, the gracilis muscle is usually thin and the blood supply to the distal part of the muscle flap becomes tenuous, which may lead to an insufficient flap volume to fill the cavity. Furthermore, a gracilis muscle flap requires an extended incision for flap harvest and mobilization [4].

The most significant advantage of the perforator flap is that there is no need to sacrifice any main arteries; thus, there is minimal morbidity at the donor site [5]. Also, elevating the gracilis muscle flap sometimes causes prolonged sensory disturbance of the medial thigh and gluteal regions, and the large muscle flap involves a risk of developing hematoma [6]. On the other hand, the dissection of adipofascial perforator flaps was carried out at a supra-fascial or fascial plane level, bring free from nervous disturbance. Furthermore, the small incision reduced intra-operative bleeding [6].

An ideal flap has a favorably vascularized skin paddle with the suitable thickness
and width as the wound, which minimizes negative impacts on walking, creates a
natural esthetic appearance, and only requires a single-stage operation [7]. A
gluteal-fold adipofascial perforator flap fully satisfies these requirements.

Furthermore, surgeon can harvest the flap in the same operative field without
position changing, which is another advantage.

We conclude that the gluteal-fold adipofascial perforator flap offers excellent
functional advantages in rectourethral fistula reconstruction, with minimal morbidity
at the donor site.

Acknowledgments; none.
References


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**Figure Legends**

Figure 1: Retrograde cystourethrography shows contrast fluid passing through the rectum. (arrow ①: bladder, ②: rectum)

Figure 2: Intraoperative view showing dissection to divide the fistula tract and the removal of all inflamed tissue.

Figure 3: Intraoperative view of the design of the gluteal-fold adipofascial perforator flap (①: cutaneous perforator vessels from the internal pudendal artery, ②: a 7.0x3.0-cm hatchet-shaped skin flap, ③: a 12.0x3.0-cm adipofascial flap)

Figure 4: Intraoperative view of the elevated adipofascial perforator flap.
Figure 5: View of the reconstructed rectourinary fistula using the gluteal-fold perforator flap just after surgery.

Figure 6: Diagram of gluteal-fold adipofascial perforator flap transposition for the rectourethral fistula technique.

Figure 7: Computed tomography after 3 weeks showing adipofascial flap (arrow) transposition to separate the rectum and bladder, and resolution of the rectourinary fistula.
Retrograde cystourethrography shows contrast fluid passing through the rectum. (arrow ①: bladder, ②: rectum)
60x55mm (300 x 300 DPI)
Intraoperative view showing dissection to divide the fistula tract and the removal of all inflamed tissue.

78x44mm (300 x 300 DPI)
Intraoperative view of the design of the gluteal-fold adipofascial perforator flap (1: cutaneous perforator vessels from the internal pudendal artery, 2: a 7.0x3.0-cm hatchet-shaped skin flap, 3: a 12.0x3.0-cm adipofascial flap)

44x25mm (300 x 300 DPI)
Figure 4

Intraoperative view of the elevated adipofascial perforator flap.
78x44mm (300 x 300 DPI)
Figure 5

View of the reconstructed rectourinary fistula using the gluteal-fold perforator flap just after surgery.
78x44mm (300 x 300 DPI)
Diagram of gluteal-fold adipofascial perforator flap transposition for the rectourethral fistula technique.

217x201mm (72 x 72 DPI)
Computed tomography after 3 weeks showing adipofascial flap (arrow) transposition to separate the rectum and urethra, and resolution of the rectourinary fistula.

36x32mm (300 x 300 DPI)