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CASE REPORT
Reconstructive

Effective Secondary Reconstruction of Refractory Urethrocutaneous Fistula after Metoidioplasty Using Folded Superficial Circumflex Iliac Artery Perforator Flap

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Summary: One of the primary goals of penile reconstruction for female-to-male transsexuals is to enable voiding while standing. Metoidioplasty represents a viable option, but it is associated with a high rate of postoperative fistula formation and recurrence, which affects the aesthetic and functional outcomes. Subsequent surgical repair using scarred and inadequate local tissue may contribute to fistula recurrence. The folded superficial circumflex iliac artery perforator (SCIP) island flap offers sufficient well-vascularized tissue and skin envelope for the reconstruction of the urethra and outer skin after failed metoidioplasty. The SCIP flap can be elevated as a hairless thin flap, making it useful in urethral reconstruction even when it is folded. We describe a case of a 44-year-old female-to-male transsexual patient who developed a refractory urethrocutaneous fistula after metoidioplasty. Surgical repairs were attempted using local tissue 4 times without success. The patient presented to our hospital, and we performed urethral reconstruction using a folded, pedicled SCIP flap for both urethra and skin augmentation. The postoperative course was uneventful, with satisfactory functional results and low donor-site morbidity. No fistula recurrence was observed during the 2 years of follow-up. This novel procedure offers a viable alternative technique for refractory urethrocutaneous fistula repair. *(Plast Reconstr Surg Glob Open 2020;8:e2716; doi: 10.1097/GOX.0000000000002716; Published online 24 March 2020.)*

INTRODUCTION

Metoidioplasty is a genital reconstruction technique employed for the creation of a microphallus. It can be used in gender-reassignment surgery for female-to-male transsexual patients who wish to avoid extensive scarring that is associated with the more comprehensive procedure of phalloplasty.[1–3] Complications of metoidioplasty are common and mainly involve the urethra. The overall complication rates vary widely depending on the surgeons and follow-up periods; in one long-term follow-up study, up to 90% of the patients experienced post-surgery complications, as complications often occur eventually despite an initially uneventful postoperative course.[3,4] The most common urologic complication after metoidioplasty is urethrocutaneous fistula formation, which drastically reduces the patient's quality of life due to functional and aesthetic problems.[3]

Although conservative management of the fistula may result in spontaneous resolution in 35.7% of the patients, many patients require surgical revision. As the surrounding local tissue is scarred and inadequate after metoidioplasty, reconstruction with this tissue is often associated with fistula recurrence, and Hage and van Turnhout[4] described that recurrent fistulas were encountered in 36% of the patients. Therefore, using the alternative approach of flap reconstruction can reduce the risk of recurrence.[2,3,5]

The present report describes a case of refractory urethrocutaneous fistula following metoidioplasty that was successfully treated using a folded, pedicled superficial circumflex iliac artery perforator (SCIP) flap.

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CASE REPORT

A 44-year-old female-to-male transsexual patient presented to our hospital with a refractory urethrocutaneous fistula. He had undergone metoidioplasty 6 years ago and had subsequent fistula development. The patient underwent surgical repair using local tissue 4 times for repeated fistula recurrence, including Z-plasties and hinge flaps, all of which were unsuccessful.

On initial examination in our hospital, the patient presented with a reconstructed neophallus with a ventrally located large fistula (Fig. 1). The chief complaint was inability to void in standing position. We planned to perform fistula repair using a SCIP flap.

The SCIP flap was elevated from the left hairless groin area. A tunnel was created between the left groin and the base of the neophallus, and the flap was turned over and threaded through the tunnel to the penopubic incision (**see figure, Supplemental Digital Content 1**, which demonstrates the elevation and transfer of the SCIP flap, http://links.lww.com/PRSGO/B340). After the fistula tract was incised and the scarred tissue was excised (Fig. 2), the proximal portion of the skin paddle was sutured to reconstruct the urethral lumen (Fig. 3). Thereafter, the distal portion was folded back externally and sutured to the outer skin. The rest of the skin paddle was de-epithelialized, facilitating in-setting of the flap, and thus, ensuring watertight closure (Fig. 4). The donor site was closed primarily.

The postoperative course was uneventful, and the outer skin paddle survived entirely, with no signs of congestion or ischemia. A urethral catheter was placed for 2 weeks after the surgery. Postoperatively, the patient could

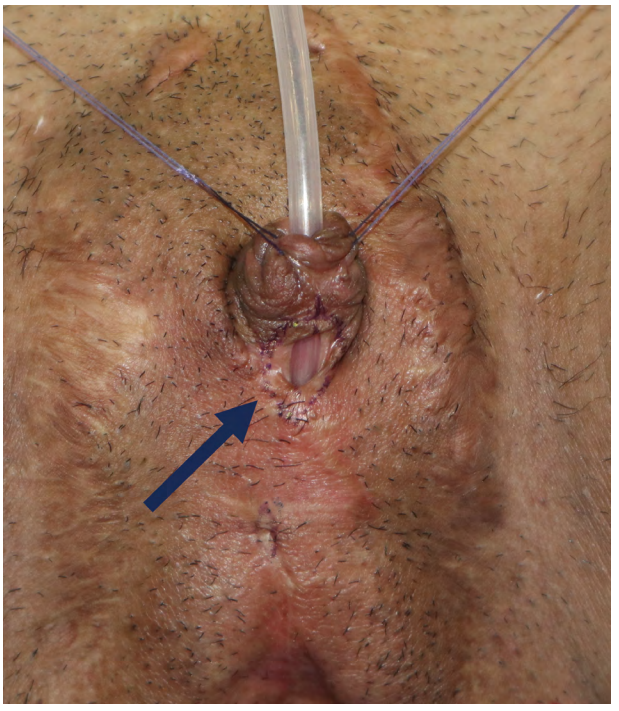

Fig. 1. Metoidioplasty neophallus with ventrally located fistula (arrow). The surrounding local tissue is scarred and sparse.

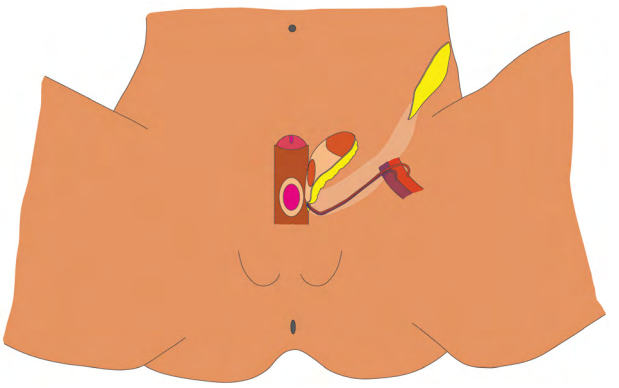

Fig. 2. The patient was positioned in the lithotomy position. The SCIP flap was elevated, turned over, and threaded through the subcutaneous tunnel to the penopubic region. Then, the fistula tract was incised, and the scarred tissue was excised.

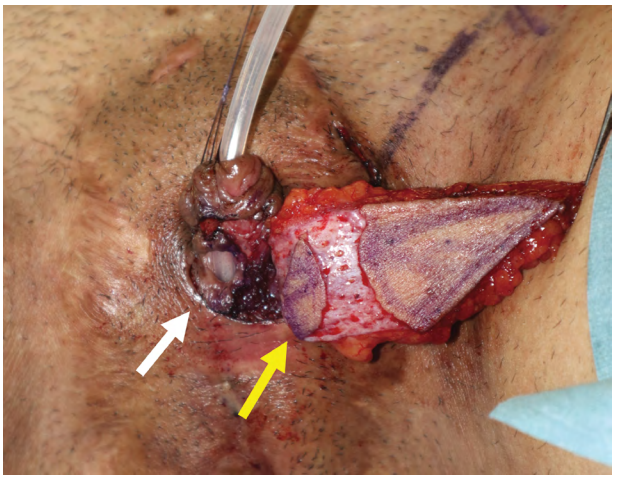

Fig. 3. The proximal portion of the skin paddle (yellow arrow) was sutured to reconstruct the urethral lumen (white arrow).

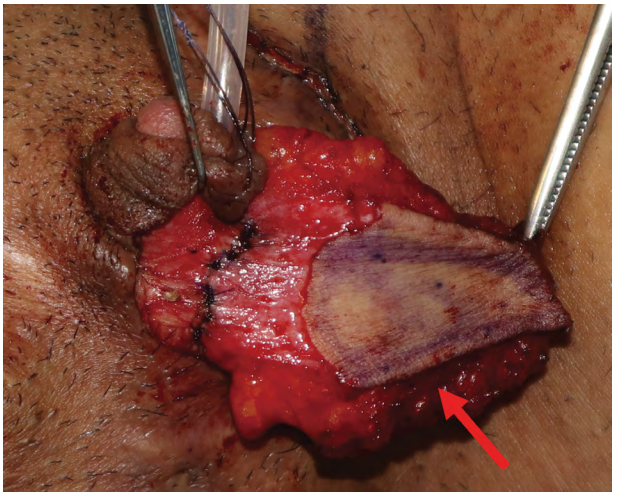

Fig. 4. The distal portion of the skin paddle (arrow) was folded back externally and sutured to the outer skin. The rest of the skin paddle was de-epithelized, facilitating in-setting of the flap and thus ensuring watertight closure.

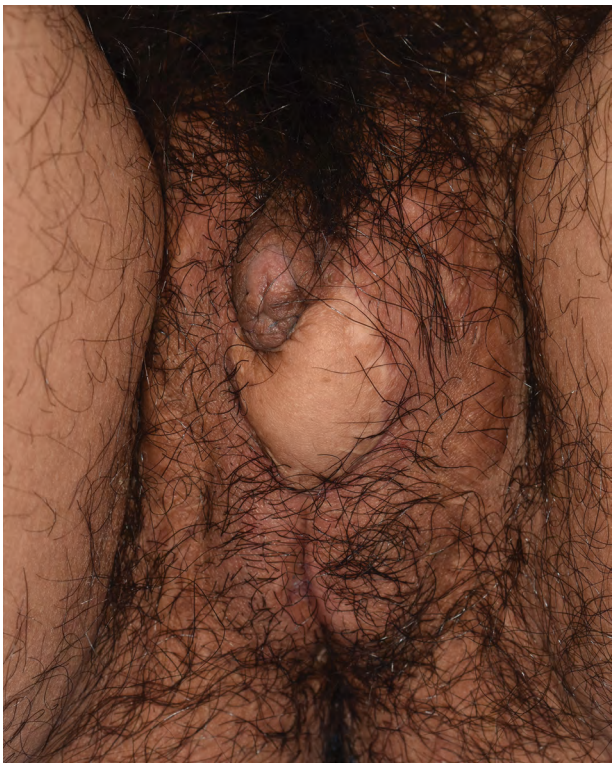

Fig. 5. External appearance of the operative site 2 years after SCIP flap reconstruction. No fistula recurrence is observed.

void in a single stream in standing position (**see figure, Supplemental Digital Content 2**, which demonstrates the patient's ability to void in standing position, http://links.lww.com/PRSGO/B341). No fistula recurrence was observed during the 2 years of follow-up (Fig. 5).

DISCUSSION

Urethroplasty procedures are associated with high rates of fistula formation and recurrence.[1–3] The incidence of fistula following metoidioplasty varies widely, with studies reporting rates of 14%–37%.[1,4] Scar tissue, compromised blood supply, and the lack of a soft-tissue envelope are risk factors for fistula formation and highly prevalent in transgender patients after metoidioplasty with multiple subsequent revision surgeries.[2,3] In these cases, surgical repair using local tissue may predispose the operated site to fistula recurrence. Pedicled flaps can offer a preferable option, as they provide well-vascularized tissue and a sufficient envelope for reconstruction of the urethra.[2,3,5]

To our knowledge, there are no prior reports on the use of folded SCIP flap for the treatment of urethrocutaneous fistula. This method facilitates enough excision of severely scarred tissue around the fistula, by providing sufficient tissue to reconstruct both the urethra and the outer skin.

In the present case, previous multiple revision surgeries had left scarring and sparse tissue remnants around the fistula; therefore, we utilized a pedicled and folded SCIP flap for augmentation of the urethra and surrounding skin. The flap enabled adequate resection of the extensively scarred tissue and fistula repair using well-vascularized tissue that was sufficient to reconstruct both the urethra and the outer skin.

Our method may also enable the evaluation of the vascular supply to the flap, by utilizing the distal outer portion of the flap as an indicator. Even pedicled flaps may demonstrate blood-flow instability, which can lead to flap failure and fistula recurrence.[6] Although it is generally difficult to assess the viability of buried flaps, our method enables the evaluation of the vascular supply of the proximal buried urethral portion,[7] as it allows the monitoring of the distal outer portion of the flap.

The drawbacks of this method include a less satisfactory aesthetic outcome than that of fistula repair using local tissue and the possibility of false-negative blood-flow monitoring. Congestion or pallor of the outer skin paddle does not necessarily indicate insufficient blood flow to the reconstructed proximal urethra, especially when the flap is folded.[7]

With the drawbacks of pedicled flaps, such as donor-site scarring and color mismatch, local flaps are considered as the primary reconstructive method for fistula repair.[4] However, in the case of fistula recurrence, repetitive local tissue repair may often result in spreading tissue cicatrization and lack of soft-tissue envelope around the fistula, exacerbating the situation each time. Therefore, in refractory cases, pedicled flap repair is optimal as a secondary reconstructive method.[2,3]

The versatility of a SCIP flap in the context of penile reconstruction has been described previously.[1,5,8] The flap is harvested from the hairless groin area and can be utilized as a pedicled flap. Furthermore, as this site is located in a concealed area and primary closure can be easily achieved, donor-site morbidity is low. The thickness of the flap is adjustable as needed; it can be elevated either as a thin flap or a bulky flap.[9,10]

Although other pedicled flaps can also be used for urethral reconstruction, including the anterolateral thigh flap, gluteal fold flap, gracilis flap, and superficial inferior epigastric artery perforator flap, these are usually associated with more obvious donor-site scarring or difficulty in creating a thinner flap.[1–3,5] Free-flap transfer can represent an alternative, but it involves longer operative duration and hospitalization.

As the patient in the present case had previously undergone metoidioplasty, additional phalloplasty could have been a good alternative for fistula closure.[4] However, the patient did not wish to undergo phalloplasty; therefore, we only performed fistula repair.

SUMMARY

One of the primary goals of penile reconstruction for female-to-male transsexuals is to enable voiding while standing. Metoidioplasty represents a viable option, but it is associated with a high rate of postoperative fistula formation and recurrence, which affects the aesthetic and functional outcomes. Subsequent surgical repair using

scarred and inadequate local tissue may contribute to fistula recurrence.

The folded SCIP island flap offers sufficient well-vascularized tissue and skin envelope for the reconstruction of the urethra and outer skin after failed metoidioplasty. The SCIP flap can be elevated as a hairless thin flap, making it useful in urethral reconstruction even when it is folded. We describe a case of a 44-year-old female-to-male transsexual patient who developed refractory urethrocutaneous fistula after metoidioplasty. Surgical repairs were attempted using local tissue 4 times without success. The patient presented to our hospital, and we performed urethral reconstruction using a folded, pedicled SCIP flap for both urethra and skin augmentation. The postoperative course was uneventful, with satisfactory functional results and low donor-site morbidity. No fistula recurrence was observed during the 2 years of follow-up. This novel procedure offers a viable alternative technique for refractory urethrocutaneous fistula repair.

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