Pedicled superficial inferior epigastric artery perforator flap for salvage of failed metoidioplasty in female-to-male transsexuals

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PEDICLED SUPERFICIAL INFERIOR EPIGASTRIC ARTERY PERFORATOR FLAP FOR SALVAGE OF FAILED METOIDIOPLASTY IN FEMALE-TO-MALE TRANSSEXUALS

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Metoidioplasty represents a viable option for female-to-male transsexual patients seeking gender reassignment surgery. The aim of this procedure is to create a microphallus with lengthening of the urethra to the tip of the hypertrophied and released clitoris. However, fistula formation and urethral obstruction might occur in the long term and reconstruction represents a challenging problem in this setting. In this report, we present the tubed superficial inferior epigastric artery perforator island flap as an option for urethral reconstruction after failed metoidioplasty in a female-to-male transsexual patient. In a 26-year-old transsexual patient a combination of urethral fistula, urethral stenosis, and disintegrated distal neourethra had developed as a consequence of postoperative hematoma formation. Metoidioplasty was reconstructed by means of a tubed, pedicled superficial inferior epigastric artery perforator flap from the left lower abdomen. The long-term result was stable with pleasing genital appearance, adequate functional outcome, and satisfactory donor site morbidity. In our opinion, this procedure may represent a viable alternative for urethral reconstruction in thin patients. © 2014 Wiley Periodicals, Inc. Microsurgery 00:000–000, 2014.

Sex reassignment surgery (SRS) represents the last step in gender reassignment of transsexual patients. For female-to-male (FtM) transsexuals, metoidioplasty is a potential surgical procedure for sex reassignment without taking the risk of total phalloplasty.[1,2] Metoidioplasty is derived from the Greek words "meta"-"toward" and "oidion"- "male genitalia". The procedure aims to create a microphallus with lengthening of the urethra to the tip of the hypertrophied and released clitoris.[3,4] Benefits of metoidioplasty include male genital appearance, short operative time with quick recovery time and limited donor-site morbidity.[1,2] However, disadvantages of this particular technique may comprise a short phallus with limited sexual penetration capability or inability to void in a standing position. Surgical complication rates have been described as low in literature (<20%),[1] but may consist of hematoma and local infection or fistula formation and urethral obstruction in the long term.[1,2,5–7] Despite spontaneous closure of minor fistulas in the majority of patients, reconstruction of major urethral fistulas represents a challenging problem in revision metoidioplasty. Due to the fact that local tissue typically has been used in the primary procedure, local tissue options are sparse.

In this article, we present the salvage of failed metoidioplasty with a tubed, pedicled superficial inferior epigastric artery perforator island flap as an option for revision metoidioplasty in a thin FtM transsexual patient.

CASE REPORT

A 26-year-old FtM transsexual patient presented to our department requesting metoidioplasty. Urethral lengthening was performed using two ventrally based local flaps from the inner labia minora with tubulization and release of the clitoral bands together with vaginectomy. Pronounced hematoma formation with prolonged swelling was observed postoperatively, which eventually led to wound dehiscence and fistula formation. Coagulopathy was ruled out by laboratory investigation. However, 6 weeks postoperatively the patient was presented with acute symptoms of urethral obstruction which were managed by perineal urethrostomy. After uneventful recovery, the patient was scheduled for elective reconstruction of the failed metoidioplasty at an interval of 3 months (Fig. 1).

Ventrally to the perineal urethrostomy, the proximal neourethra was densely scarred and the distal neourethra was completely disintegrated. After rigorous scar release, a pedicled groin flap was planned initially for urethral reconstruction due to the consistent anatomy of this flap. However, after opening the skin over the groin triangle, a very strong and pulsating superficial inferior artery was found. Thus, a pedicled island flap from the left lower abdomen was raised on the superficial inferior epigastric vessels (Fig. 2). The flap was tunneled into the defect and tubulized for urethral reconstruction (Fig. 3). The proximal end of the tubulized flap was anastomosed to the urethrostomy, whereas the distal end was merged into the distal opening of the lengthened pars fixa of the urethra. Primary wound closure was achieved after advancement of the labia majora over the reconstructed urethra after placement

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Figure 1. Appearance of the failed metoidioplasty at the time of surgical revision. Note the perineal urethrostomy, the densely scarred proximal neourethra and the completely disintegrated distal neourethra. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 2. After rigorous scar release, a pedicled island flap from the left lower abdomen was raised on the superficial inferior epigastric artery perforators. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

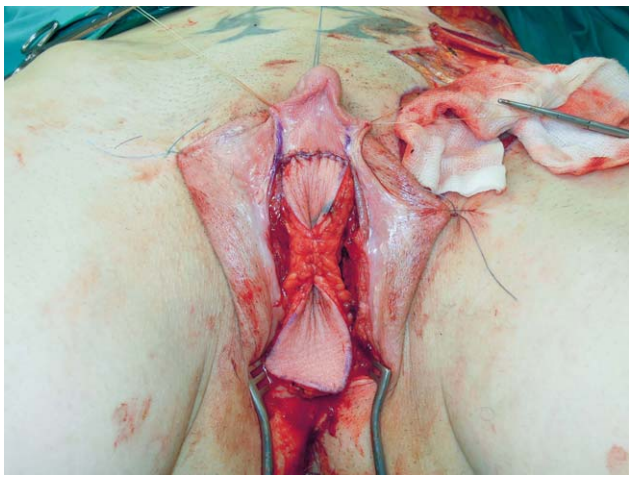

Figure 3. The flap was tunneled into the defect and tubulized for urethral reconstruction. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

of a 14-gauge silicone catheter (Fig. 4). The subsequent postoperative period was uneventful and the catheter was removed by postoperative day 14. The patient was presented for follow up 3 months postoperatively with a pleasant aesthetic result and an acceptable donor site scar (Fig. 5). Functional result was excellent with the patient being able to urinate in standing position (Fig. 6).

DISCUSSION

Metoidioplasty represents a valid option for changing the genital appearance in FtM transsexuals. Different techniques have been described for successful metoidioplasty by several authors,[3–10] all of which attempting to create a microphallus with lengthening of the urethra to the tip of the hypertrophied and released clitoris (also called "clitoris penoid" or "clitpen"[2,11]).

However, none of the published techniques has overcome the considerable amount of complications which have been associated with this method of surgical gender reassignment. Due to the highly vascularized vaginogenital tissues and its anatomic location, hematoma and infection might occur in the immediate postoperative course.[5] Furthermore, a high incidence of long term complications including fistula formation and urethral strictures has been described.[5] Despite potential conservative management of these above-mentioned complications in selected cases, most patients suffering from long-term sequelae will require secondary surgery for correction. A mean number of 2.6 procedures for completion of metoidioplasty including scrotoplasty have been published by Hage and Turnhout.[5]

A variety of different operative techniques might be applied for correction of urethral stenosis or fistulas including urethroplasty with full thickness skin grafts, buccal mucosal grafts[8] or local pedicled flaps from remnant labium skin.[6] However, in cases of subtotal disintegration of the newly constructed neourethra, these above-mentioned techniques will fail due to the paucity of locally available tissue. Furthermore, the remaining local tissue is

Figure 4. Primary wound closure was achieved by advancement of the labia majora after placement of a 14-gauge silicone catheter. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 6. Lateral view with patient demonstrating posture for voiding in a standing position. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

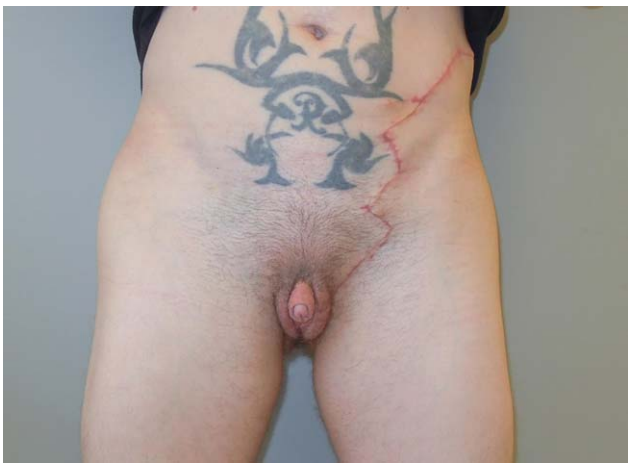

Figure 5. Clinical appearance of frontal view at three-months follow-up with pleasant functional and aesthetic result and acceptable donor site scar. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

severely scarred and sufficient tissue perfusion and healing capacity might be questionable.

To the best of our knowledge, this is the first report of utilizing a pedicled and tubulized SIEA-flap for reconstruction of a failed metoidioplasty.

In our case, a combination of urethral fistula/perineostoma, urethral stenosis and disintegrated distal neourethra had developed as a consequence of immediate postoperative swelling and hematoma formation. For single stage correction of metoidioplasty, replacement of the scarred and immobile local tissue was achieved with a well perfused tubed adipocutaneous flap. It has to be noted though, that this reconstructive option is only viable if the patient is rather thin. In patients with a thicker pannus, tubulization might not be technically possible or at least compromise perfusion of the flap. Furthermore, a thick flap will be difficult to bury in the perineogenital region and direct closure over the flap possibly not achievable. An alternative under such circumstances would be the free radial forearm flap, since this flap is usually sufficiently thin, even in more obese patients.[12] The prerequisites for a free flap for urethral reconstruction would be its thinness in first place. Bulky flaps would be precluded since the paucity of space in this region. All flaps that allow for supra-thin harvest would be eligible for this endeavor.[13] In our opinion, the dorsalis pedis free flap would be another interesting option, since it could be harvested as a very thin flap and this flap is usually hairless, another feature that makes it very suitable for urethral reconstruction.[14] On the other hand, in a suitable patient, the tubed and pedicled SIEA-island flap is a choice for reconstruction of a neo-urethra not only in the failed metodioplasty as in our case but also in different clinical situations in the female-to-male transsexual. Preoperative angiographic studies or high-resolution ultrasonography will aid in planning this flap since there is a great variety in the anatomy of vasculature in this area.[15] If no sufficient vessels can be found during these investigations, alternatives as the above-mentioned flaps should be taken into consideration. If, however, the SIEA-vessels are chosen, it is necessary to trace the vascular bundle with its corresponding skin island as far distally as possible to achieve maximal pedicle length and a sufficient arch of rotation to reach to the external meatus. This will lead to a donor site scar that lies centrally on the abdomen, which is a disadvantage of this flap. We chose a zig-zag skin incision to raise the flap's pedicle to avoid linear scar contracture. The position of the skin island was oriented in a way in which the patient's tattoo was not harmed. More tunneling could have been performed in the inguinal region to reduce the

extent of the donor scar since the pivot point of the flap was more laterally. However, since this was already a revision operation and the patient suffered from a complication earlier, maximum safety was chosen over a shorter scar. On the other hand, this should be discussed with the patient preoperatively since this patient population is very alert to scars creating the stigmata of gender reassignment procedures.

The tubulized SIEA-island flap may be a good solution for reconstruction in patients with a failed metoidioplasty. We therefore propose the SIEA-flap as a further armamentarium in the difficult sex reassignment surgery in suitable, i.e. thin, female-to-male transgender patients. The reliability of this application will need more cases to prove.

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