

Second-stage Scrotoplasty with Autologous Tissue Augmentation after Metoidioplasty

Ross G. Everett, MD, MPH*

Christi Butler, MD†

Geolani W. Dy, MD‡

Daniel D. Dugi, MD, FACS‡

Summary: We present our technique for second-stage scrotoplasty with autologous tissue augmentation following gender-affirming metoidioplasty. This technique augments the scrotum while removing the upper labia majora and making the penis more visible and accessible. This procedure avoids the need for testicular prostheses and their potential for discomfort, displacement, extrusion, or infection. Our preliminary results show that the complication rate is low. (*Plast Reconstr Surg Glob Open* 2024; 12:e5545; doi: [10.1097/GOX.0000000000005545](https://doi.org/10.1097/GOX.0000000000005545); Published online 22 January 2024.)

INTRODUCTION

Metoidioplasty is a gender-affirming genital surgery that forms a neophallus from the hormonally enlarged clitoris in individuals assigned female sex at birth.¹ A neoscrotum is often constructed by rotating inferior labia majora flaps superomedially.² However, the superior labia majora are still present and may, depending on individual anatomy, surround and cover the phallus. Many patients seek removal of this tissue to further treat genital dysphoria and/or make the phallus more visible, and some patients desire a larger scrotum. We present our technique for a second-stage scrotoplasty to remove the superior labial tissue and use that tissue as an autologous augmentation to the scrotum constructed at the initial metoidioplasty.

METHODS

In our center, a Ghent-style scrotoplasty is performed at the time of metoidioplasty,² elevating and rotating the inferior labia majora superomedially, joining them in the midline at the base of the penis. We offer

a second-stage surgery at least 4 months later (Fig. 1). [See figure, Supplemental Digital Content 1, which displays the patient after first-stage metoidioplasty (left) and 3 months after second-stage scrotoplasty with autologous tissue augmentation (right), <http://links.lww.com/PRSGO/D34>.]

A second-stage procedure is tailored to meet the individual's goals. For those who do not wish to augment the scrotum but desire to remove remnant labia majora, we simply excise this tissue. For those who desire testicular implants, we have adapted our technique from the reported VY-plasty technique.³ We now describe our technique of using rotational flaps of the superior labia majora as autologous tissue scrotal augmentation in lieu of prostheses.

An inverted V-shaped incision is made over the superior margins of each labia majora. [See Video (online), which displays the surgical technique and shows several examples of postoperative results.] We leave intact as wide a bridge of tissue as possible between the flaps to maintain lymphatic drainage from the skin of the phallus, the lymphatics draining through the mons pubis and to the inguinal lymph nodes.^{4,5} Inferiorly, the incisions continue to just below the base of the phallus.

We develop the flaps to the level of dartos fascia in each of our second-stage procedures, as removing fat from the region immediately lateral to the phallus increases its visibility. Based on patients' choice, we may simply excise this tissue and not alter the scrotum. In those who desire testicular implants, tissue from the flaps in excess of what is needed to close over the implants is excised.

In the autologous tissue augmentation technique, the majority of the subcutaneous fat is carried with the

From the *Department of Urology, University of South Florida, Morsani College of Medicine, Tampa, Fla; †Department of Urology, University of California San Francisco, San Francisco, Calif.; and ‡Department of Urology, Plastic & Reconstructive Surgery, Oregon Health & Science University, Portland, Ore.

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superior labial flaps to provide sufficient bulk to the scrotum as an alternative to testicular implants. The incisions are extended inferiorly to the midline of the scrotum and the previous scrotal scars are reincised as needed to inset the new flaps. We are meticulous in hemostasis as this tissue is highly vascular. Each flap is rotated inferomedially and inset with the previous scrotal tissue with 2-0 and 3-0 Polysorb/Vicryl and 3-0 Maxon/PDS. We use fibrin glue to help close the potential dead space. Excess skin and fat are trimmed to achieve an aesthetic result, creating a midline scrotal raphe. It is important to discuss the desired aesthetics with the patient beforehand; some patients prefer a larger scrotum than what the surgeon may think looks “proportional.” We aim for a full-appearing scrotum intraoperatively as there may be fat atrophy over time.

We close the flap harvest defects with a deep dermal layer of interrupted 3-0 Maxon/PDS because of the relatively high tension in the wound, followed by a running subcutaneous 3-0 V-Loc suture.

RESULTS

Fifteen patients underwent the procedure during the study period, July 2020 to December 2022. Results of this initial cohort are shown in Table 1. Six (40%) patients experienced some degree of mostly minor wound separation, five of which healed by secondary intention. Five (33.3%) reported self-limited bleeding postoperatively. One patient underwent testicular implant placement after autologous scrotal augmentation.

DISCUSSION

Although individual anatomy is variable, in our practice, a majority of people who undergo metoidioplasty seek removal of the superior labia majora. We stage these procedures to ensure adequate vascularity and avoid

Takeaways

Question: After gender-affirming metoidioplasty, many patients seek removal of superior labia majora and additional scrotal augmentation. Testicular implants are an option but have risks of migration, infection, or discomfort.

Findings: We present our technique for a second-stage scrotoplasty with early results that show a low rate of complications.

Meaning: We present a surgical technique to remove the superior labia majora after initial metoidioplasty and use that tissue to augment the neoscrotum as an alternative to testicular prostheses.

further disruption of lymphatic drainage of the penile skin by complete resection of the labia majora at time of metoidioplasty.^{4,5}

For those who desire further augmentation of the scrotum, this autologous tissue transfer technique offers potential advantages over testicular prostheses. Prosthesis explantation rates secondary to infection, urinary complications, or dehiscence are significant.^{6,7} Prostheses may also be displaced to an undesirable location and require revision. Anecdotally, we have found many patients report discomfort from testicular prostheses. The technique we report avoids many of these risks. Admittedly, the look and feel of the neoscrotum is different than one with testicular implants; specifically, the firmness and defined oval shape provided by implants is missing. However, we have found that the option of scrotal augmentation without implants is appealing to many patients. Additionally, for patients with a small scrotum after initial scrotoplasty, the autologous augmentation can facilitate placement of larger testicular implants should a patient so desire, although with yet another surgical stage. This technique is an intuitive evolution from

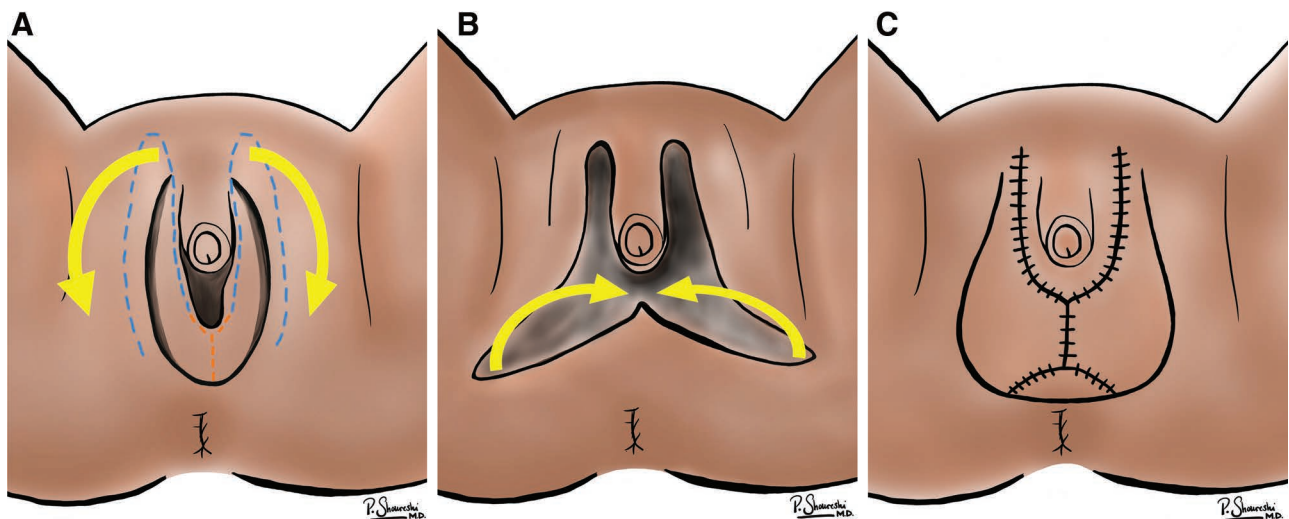


Fig. 1. Steps for autologous augmentation second-stage scrotoplasty. A, Markings for the incisions of the superior labial flaps. B, Flaps are raised and mobilized inferiorly. C, Resulting suture lines after inset and closure, incorporating the superior labial flaps into the previously constructed scrotum. Original illustrations by Poone Shoureshi.

Table 1. Operative Details of Patients Undergoing Second-stage Scrotoplasty to Date

| Case Number | Age at Surgery (y) | BMI at Surgery (kg/m ²) | Interval between Stages (mo) | Length of Follow-up Available (mo) | Urethral Lengthening (Yes/No) | Pertinent Surgical Notes | Wound Separation | Surgical Site Bleeding | Other Complications |
|----------------------------|--------------------|-------------------------------------|------------------------------|------------------------------------|-------------------------------|---|------------------|------------------------|----------------------------------|
| 1 | 25 | 32.11 | 4 | 19 | Yes | Concomitant urethral meatus repair | — | — | — |
| 2 | 27 | 20.36 | 9.5 | 2 | Yes | | — | Yes | — |
| 3 | 39 | 29.23 | 14 | 6 | Yes | Concomitant monsplasty | Yes | Yes | Prolonged edema of phallus |
| 4 | 30 | 23.49 | 12 | 25 | Yes | | Yes | — | — |
| 5 | 33 | 34.46 | 4.5 | 15 | Yes | | Yes | — | — |
| 6 | 31 | 37.34 | 9.25 | 3.5 | Yes | | Yes | — | Prolonged edema of phallus |
| 7 | 40 | 37.49 | 6 | 0.5 | Yes | | — | — | — |
| 8 | 43 | 22.96 | 8 | 8 | Yes | | — | Yes | Cellulitis requiring antibiotics |
| 9 | 51 | 28.80 | 7 | 5 | Yes | | — | — | — |
| 10 | 34 | 31.96 | 32.5 | 6.5 | Yes | | — | — | — |
| 11 | 37 | 21.13 | 4.75 | 1 | Yes | | Yes | Yes | — |
| 12 | 41 | 27.67 | 8 | 5 | Yes | | — | Yes | — |
| 13 | 36 | 47.61 | 4 | 3 | No | Initial surgery was simple metoidioplasty without vaginectomy | — | — | Cellulitis requiring antibiotics |
| 14 | 37 | 23.69 | 11.5 | 2 | Yes | | Yes | — | — |
| 15 | 52 | 27.44 | 24 | 1.5 | Yes | | — | — | — |
| Medians (where applicable) | 37 | 28.80 | 8 | 5 | | | — | — | — |

the well-established VY-advancement scrotoplasty³ and the Ghent-style scrotoplasty.²

The appearance of the scrotum constructed with this two-step technique will evolve significantly postoperatively with the effects of tissue relaxation and gravity. Because the labial tissue used is usually significantly thicker than native scrotal skin, we aim to create smooth contours, especially at lateral edges. We aim for a plump-appearing scrotum with a midline raphe intraoperatively.

Despite appearing significantly less invasive than initial metoidioplasty, patients often report significant tightness along the superior labial suture line. Additionally, we have occasionally observed prolonged swelling of the penile skin after the second-stage scrotoplasty secondary to lymphatic disruption. This may be exacerbated in those undergoing concomitant monsplasty; we prefer to perform monsplasty, when requested, at the time of metoidioplasty. A limitation of our study is the relatively short follow-up, with further study needed to know long-term aesthetic and functional outcomes.

CONCLUSIONS

Not all patient goals may be met with a single-stage metoidioplasty. Our described technique combines resection of the superior labia majora with scrotal augmentation with that same tissue as a second-stage operation. This is an intuitive technique that avoids the risks and complications of testicular prostheses.

Daniel D. Dugi, MD, FACS

Department of Urology, Plastic & Reconstructive Surgery
Oregon Health & Science University
Portland, OR
E-mail: dugi@ohsu.edu

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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