A Labia Majora Sharing Perforator Flap for Labial Defect Reconstruction

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Summary: Reconstruction of a defect in the labial area has to be performed by taking account of the shape of the labial area and urogenital function. The gracilis myocutaneous flap and the gluteal fold flap are commonly used reconstructive procedures, but sometimes these flaps are too bulky and cause a deviation of the urination stream and/or deformity of the reconstructed site. In this report, we present our unique method of reconstruction using a contralateral labia majora sharing perforator flap. The patient was a 76-year-old woman who presented with squamous cell carcinoma on the left labia majora. Following radical vulvectomy with 2 cm radial margins and left inguinofemoral lymphadenectomy, an 8 x 6 cm² defect was created. Primary closure was possible, but there was a risk that it might cause an unfavorable deformity and exposure of the urethral and vaginal vestibule. Part of the contralateral side of the labia was used for a dorsal clitoral artery perforator–based transposition sharing flap. The defect was covered without tension, and the donor site was closed primarily. The postoperative course was good. One year after the operation, deviation of the urination stream and severe asymmetry was not observed. This study shows feasibility of perforator-based labia majora sharing flap for contralateral labia majora defect. Our “like with like” reconstruction provides a good functional outcome and less donor-site morbidity to the patient. (Plast Reconstr Surg Glob Open 2020;8:e2931; doi: 10.1097/GOX.0000000000002931; Published online 25 June 2020.)

The labia majora are a complex urogenital region of the perineum. Reconstruction of this 3-dimensional region is challenging because the external structure is intimately related to key features of urinary and sexual function. The ability to restore a defect in the labia majora with an aesthetically acceptable appearance has a pronounced impact on the patient’s quality of life.

Primary closure of defects in the perineal region is challenging because of poor wound healing, with dehiscence rates up to 66%.1–10 When a patient has perioperative chemotherapy and radiation, wound problems and subsequent infection cause frequent failures of primary perineal wound closure and emphasize the importance of durable and reliable soft-tissue reconstruction. Also, even when primary closure is possible and causes no wound problems, there is still a risk of severe asymmetry or deformity after the closure (Fig. 1). This can cause deviation of the urination stream and exposure of the vaginal/urethral vestibule, which may cause drying of the mucosa and infection in these areas.

A split-thickness or full-thickness skin graft is another simple option if there is no prior irradiation or planned postoperative radiation therapy. There is a possible risk that such grafts may contract and distort the urethra, with unsatisfactory functional and aesthetic results.

To achieve primary wound healing, the gracilis flap and the gluteal fold flap are frequently used for reconstruction of the labia majora. These procedures have a long history and reliability, but they cannot reproduce labia with comparable symmetry, shape, and consistency to the contralateral side. Also when the defect is not large, these flaps are too bulky, cause asymmetry, and interrupt the urinary stream (Fig. 1). These cases sometimes need secondary revision surgery.

Also, the labia majora are special in that they make a pair, as with the eyelids, lips, and nipples. A sharing flap is consistent with the principle of reconstruction of like with like, and in the reconstruction of these body parts, it is known to produce satisfactory results. Thus, we used a sharing flap for the labia majora reconstruction (Fig. 1). We chose a perforator flap to achieve more mobility of the flap and a less pronounced dog ear. As far as we know, there has been only 1 report on the labial transposition
flap,11,12 and our technique is the first one involving a labial sharing flap based on the perforator.

CASE REPORT

A 76-year-old woman first presented to a nearby doctor with a 2-cm mass on her left vulva, and a biopsy examination determined this mass to be a squamous cell carcinoma. She was referred to the gynecology department of our hospital, and a radical vulvectomy and left inguinofemoral lymphadenectomy were planned. The patient had a medical history of uterine cancer, and she had previously undergone hysterectomy and adnexectomy. The patient had no history of chemotherapy and radiation.

The patient was placed in the lithotomy position. Following a radical vulvectomy with 2 cm radial margins and left inguinofemoral lymphadenectomy, a 8 × 6 cm² defect was created including a part of the clitoris and the labia minora. The orifices of the urethra and vagina were spared. The right labium was planned for a sharing flap. The flap was designed to be 12 × 3 cm², half the width of the defect. The clitoral artery supplying the right labia was marked out using a handheld Doppler.

![Fig. 1. Wound closure and possible deviation. A, Primary closure with strong tension causes severe asymmetry. B, Myocutaneous flap tends to be too bulky. Both may cause aesthetic and functional problems. C, The labial sharing flap was designed as half the width of the defect, to make the tension of defect site and donor site equal after wound closure.](image)

![Fig. 2. A 8 × 6 cm² defect was created including a part of the clitoris and labia minora. The orifices of the urethra and vagina were spared. The right labium was planned for a sharing flap. The flap was designed to be 12 × 3 cm², half the width of the defect. The clitoral artery supplying the right labia was marked out using a handheld Doppler.](image)
On postoperative day 6, the urine catheter was removed. At this time, the urinary stream was deviated. The wound healed without complications. Until 3–4 months after the surgery, the patient was not satisfied with the result, and she complained about urinary deviation and discomfort during urination. At six months postoperative, urinary deviation showed a gradual improvement, and this deviation had entirely disappeared 1 year after the surgery. Subsequently, the patient did not complain about any uncomfortableness during urination, and she was satisfied with the appearance of the reconstructed site (Fig. 4).

**DISCUSSION**

The goal of vaginal reconstruction is to create as symmetrical a shape as possible, with a moderate volume, which does not interrupt the urinary stream but is enough to cover the vestibules, and sensate if possible, to protect the sexual functions and self-image. The labia majora are the folds of haired skin and fat that protect the vestibule of the urethra and vagina, which is a unique structure on the body; therefore, a sharing flap is the only way to achieve symmetric reconstruction consistent with the like with like principle. Besides, some reports are describing the usability of local flaps, named “Singapore flap,” for the vaginal stenosis reconstruction. They addressed that the advantage of this flap is its stable viability and the possibility of maintaining cutaneous innervation.

We design the flap to be half the width of the defect so as to create the same bilateral wound tension after transposition of the flap. It is essential to prevent deformity of the perineum, which could cause a deviation of the micturition stream. Primary closure of the donor site minimizes donor-site morbidity.

The arterial supply to the area is from both the external and internal pudendal arteries. From the internal pudendal artery, the posterior labial artery supplies the posterior portion of the labia and the dorsal artery of the clitoris, while the deep branch of the internal pudendal artery supplies the anterior portion. Our flap is based on the perforating branch of the clitoral artery, which was located using a handheld Doppler. The venous drainage is from the concomitant vein of the artery. The vascular anatomy is reliable, and that makes this flap reproducible.

**CONCLUSIONS**

The perforator-based labia majora sharing flap is thought to be a good option for vulva reconstruction, based on the principle of like with like, with the best
symmetry and urogenital function and with minimal donor-site sacrifice. It is simple and reliable and does not require a second reduction surgery.

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