Total Phalloplasty With Latissimus Dorsi Musculocutaneous Flap in Female-to-male Transgender Surgery

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OBJECTIVE To present our technique of musculocutaneous latissimus dorsi (MLD) free-flap total phalloplasty. This technically demanding female-to-male gender reassignment surgery consists of creating a neophallus from extragenital tissue.

METHODS The presented technique included: removal of internal and/or external female genitalia, creation of neophallus using latissimus dorsi free flap, clitoral incorporation into the neophallus, urethral lengthening, and insertion of testicular implants into the newly created scrotum. The MLD flap with proper dimension is harvested from nondominant side and tubularized. Microvascular anastomosis is done between thoracodorsal vessels and femoral artery and saphenous vein. Neophallus is positioned in adequate place. Urethroplasty is performed by combining different genital flaps that are harvested from anterior vaginal wall, urethral plate, and both labia minora and clitoral skin. Scrotoplasty is done by joining both labia majora with implantation of testicular implants.

RESULTS Operative time was 427 minutes with minimal blood loss. Both donor site and graft healed well, and the patient reports voiding well while standing. Penile prosthesis implantation as well as neophallic urethroplasty are planned for the second stage.

CONCLUSION Total MLD flap phalloplasty with urethral lengthening is a challenging and complex surgical procedure. This technique presents good variant for female transgenders with acceptable cosmetic outcome and enables good volume of neophallus, sexual arousal, and voiding while standing.
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Video Clips cited in this article can be found on http://www.goldjournal.net under "Collections".

0:00 Phalloplasty is indicated in men lacking a penis due to congenital or acquired causes or in transgender men. The goals of surgery include a cosmetically acceptable result, the ability to void while standing, penetrative sexual intercourse with adequate sensation, and minimal scarring of the donor site. In this video, we present our technique of total phalloplasty with latissimus dorsi musculocutaneous flap in a female-to-male transgender patient.

0:28 The patient is placed in dorsal lithotomy position. A Foley catheter is placed. Traction sutures are placed through each labia and the glans clitoris. The first step is to deglove the clitoris. A circular incision is made at the border between the inner and outer layers of the clitoral prepuce. The dorsal fundiform and suspensory ligaments are detached as required to lengthen the clitoris, enabling it to be fixed in its new position at the base of the neophallus. In this particular case, both labia minora are dissected with long pedicles for later urethral tubularization.

1:09 Here, the area directly adjacent to the urethral meatus is injected with dilute epinephrine for hemostasis and hydrodissection. A periurethral flap is then harvested from the anterior vaginal wall. This provides a well-vascularized flap that will form the basis of the reconstructed bulbar urethra and marks the first phase of urethral reconstruction.

1:32 The flap is joined with the urethral plate with absorbable sutures in an interrupted fashion. Care must be taken to not leave a diverticulum here, as the associated urostasis will put the patient at risk for urinary tract infections.

1:48 Vaginectomy is accomplished through colpoclesis, consisting of ablation of the vaginal epithelium with electrocautery followed by closure of the vaginal lumen with 1-vicryl and drain placement. Of note, laparoscopic hysterectomy had been performed in this patient previously in anticipation of phalloplasty.

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2:06 A space is developed within the labia majora with blunt dissection and testicular implants are placed to form the scrotum.

2:17 An opening is made in the pedicle of the harvested labia, and the clitoris and reconstructed bulbar segment are pulled through.

2:31 Additional attachments are taken down here to allow for full rotation of the flaps.

2:40 Labia are trimmed in anticipation of tubularization and neourethra creation.

2:46 Care is taken to remove only epidermis, while leaving the well-vascularized subcutaneous tissue intact.

3:06 A portion of the flap is interposed on the reconstructed bulbar segment to reduce the likelihood of fistulization.

3:16 The proximal end is joined to the bulbar urethra in an interrupted fashion.

3:24 The urethral plate is incised, allowing for complete tubularization of the neourethra.

3:37 Several interrupted sutures are placed along the neourethra to aid in alignment during closure.

3:52 Here, the dorsal neourethra is attached to the incised urethral plate.

4:12 The tubularization is completed with a running-locking stitch. In the end, the midline incision is closed.

4:25 The recipient site at the mons pubis is then prepared. The femoral artery and vein are exposed. A tunnel between the groin incision and recipient site is created.

4:42 Lateral decubitus position is used for flap harvesting. The course of the thoracodorsal artery is defined preoperatively. The neophallus dimensions are predetermined with the patient. The dimensions are usually 11-15 cm wide and 13-18 cm long. The flap consists of 2 parts: a rectangular part for the neophallic shaft and a circular component for glans reconstruction. One must take extra caution during the pedicle dissection. It is important to achieve maximum pedicle length.

5:15 The flap is tubularized while still perfusing on its vascular pedicle. The entire edge of the latissimus dorsi muscle is over sewn with 2-0 Vicryl for hemostasis. If significant tension is present, split thickness skin graft can be used to cover the defect.

5:34 The main advantage of the latissimus dorsi free flap over the radial forearm free flap is its larger volume. It can more adequately incorporate the neourethra as well as both penile prosthesis cylinders. The donor site scar is also less visible and more easily concealed.

5:49 The neophallus is transferred through the previously created tunnel. The neophallic base is fixed to the skin using 3-0 Vicryl in an interrupted fashion. Microsurgical anastomoses are created between the thoracodorsal and femoral arteries in an end-to-side fashion, and the thoracodorsal and saphenous veins in an end-to-end fashion using 7-0 Prolene in an interrupted fashion.

6:15 The neourethra is pulled through the neophallus, and the neourethral meatus is matured on the ventral side using 3-0 Vicryl. The clitoris is fixed to the ventral base of the neophallus with 3-0 Vicryl.

6:29 The neophallus is wrapped in saline dressing and postoperative antibiotics are started. The patient will be on bed rest for 48 hours. Neophallic skin color, temperature, and capillary refill will be closely monitored. The urethral and suprapubic catheters will be removed in 2 and 3 weeks, respectively.

6:47 Additional stages may be undertaken at a later time for penile prosthesis placement, glansplasty, and further neophallic urethral reconstruction.