

Big Ben Method Phalloplasty: Step by Step

Blair R. Peters, MD*†‡; Kamran P. Sajadi, MD†‡; Jens U. Berli, MD*†‡

Gender-affirming phalloplasty is an amalgam of procedures that can be combined and staged differently to achieve individual patient goals. The most described version of gender-affirming phalloplasty is a single “tube-within-tube” (TWT) flap to allow for standing urination. At our institution, we perform the TWT in a staged approach, referred to as the “Big Ben method,” coined after the city of its inventors.¹ The creation of the phallic shaft and urethra occurs first, followed 5 months later by creation of the perineal urethra, transposition of erogenous clitoral tissue, colpectomy/colpocleisis, glansplasty, and scrotoplasty. In this video, we demonstrate the key principles of the Big Ben phalloplasty as performed at Oregon Health & Science University. (See Video [online], which shows key steps of Big Ben phalloplasty.) Specific nuances of phalloplasty are the focus here, as the principles of microsurgery and flap harvest are robustly discussed in the plastic surgery literature.

STAGE 1: CREATION OF PHALLUS AND PHALLIC URETHRA

The TWT flap is harvested from either forearm or anterolateral thigh (ALT). Meticulous flap templating is critical to factor in patient goals for length and girth, while balancing flap perfusion and donor-site morbidity.^{2,3} The ALT flap is pedicled whenever possible; the radial forearm is taken free with the radial pedicle in addition to the cephalic vein.⁴ The deep inferior epigastric vessels and saphenous vein are used as recipient vessels. The flap is harvested with two sources of innervation whenever possible. The posterior and lateral antebraichial cutaneous nerves in the radial forearm and the lateral femoral cutaneous nerve ± a femoral perforating nerve in the ALT.^{5,6} The donor nerves used are the dorsal nerve of the clitoris and the ilioinguinal

nerve. A 4–4.5 cm proximal urethral extension of flap is incorporated to bring the phallic urethra into a prepubic position and shorten distance needed for urethral lengthening at stage 2. An opening is made to marsupialize the urethral extension just lateral to clitoral shaft in nonhair-bearing skin of the vulva. The ipsilateral labia minora are excised to create a flat surface between the native urethra and marsupialized proximal neo-urethra.

STAGE 2: VAGINECTOMY, URETHRAL LENGTHENING, CLITOROPLASTY, SCROTOPLASTY, PERINEOPLASTY, GLANSPLASTY

A formal vaginectomy with mucosal excision is performed.⁷ A 16 Fr catheter is inserted through the penis and into the bladder. A u-shaped urethroplasty is designed with a width of 23–25 mm. Labia majora flaps are raised, urethroplasty incisions are made, and the remaining mucosal tissue is de-epithelialized from the clitoris and remaining labia minora. The urethroplasty is performed; the denuded clitoris is then transposed superiorly against the pubic bone at the base of the penis. Robust, multi-layer closure is performed using the labia minora and perineal tissues to eliminate dead space and reinforce the urethroplasty. The labia majora flaps are rotated and advanced to create an anteriorly positioned scrotum. The perineum is closed in the midline, and if needed minor tissue rearrangement is performed at the most inferior aspect to avoid a perineal pit. The phallus glansplasty is performed raising a coronal flap and using two full-thickness skin grafts and quilting sutures to maintain coronal ridge projection long term.⁸ The patient will have a penile catheter for 5 days and a suprapubic catheter for 4 weeks.

Blair R. Peters, MD

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

From the *Division of Plastic & Reconstructive Surgery, Oregon Health Sciences University, Portland, Ore.; †Transgender Health Program, Oregon Health Sciences University, Portland, Ore.; and ‡Department of Urology, Oregon Health Sciences University, Portland, Ore.

Received for publication March 6, 2023; accepted June 6, 2023.

Copyright © 2023 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the [Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 \(CCBY-NC-ND\)](https://creativecommons.org/licenses/by-nc-nd/4.0/), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Plast Reconstr Surg Glob Open 2023; 11:e5126; doi: [10.1097/GOX.0000000000005126](https://doi.org/10.1097/GOX.0000000000005126); Published online 17 July 2023.

DISCLOSURE

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

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

ACKNOWLEDGMENTS

This work conforms to the Declaration of Helsinki put forth by the World Medical Association. The authors would like to acknowledge the significant contributions and expert care provided to our phalloplasty patients by Carley Putnam, PA and Lizzandra Trueba-Mejia, MA.

REFERENCES

1. Garaffa G, Spilotros M, Christopher NA, et al. Total phallic reconstruction using radial artery based forearm free flap phalloplasty in patients with epispadias-exstrophy complex. *J Urol*. 2014;192:814–820.
2. Peters BR, McCreary E, Putnam C, et al. Shaft-only phalloplasty: technical modifications to optimize aesthetics. *Plast Reconstr Surg Glob Open*. 2021;9:e3645.
3. Cylinder I, Heston A, Carboy J, et al. Partial flap loss in gender-affirming phalloplasty. *J Reconstr Microsurg*. 2022;38:276–283.
4. Danker S, Annen AW, Cylinder I, et al. Technical description and microsurgical outcomes in phalloplasty using the deep inferior epigastric artery and locoregional veins. *Plast Reconstr Surg*. 2020;146:196–204.
5. Peters BR, Richards HW, Berli JU. Optimizing innervation in radial forearm phalloplasty: consider the posterior antebrachial cutaneous nerve. *Plast Reconstr Surg*. 2023;151:202–206.
6. Aryanpour Z, Skelton H, Shepard E, et al. Dual innervation in anterolateral thigh (alt) phalloplasty: consider the femoral perforating nerves. *Plast Reconstr Surg Glob Open*. 2022;10:e4545.
7. Hougen HY, Shoureshi P, Sajadi JP. Gender-affirming vaginectomy-transperineal approach. *Urology*. 2020;144:263–265.
8. Sommeling CE, De Wolf EJ, Salim A, et al. A new technique for coronaplasty in penile reconstruction. *J Sex Med*. 2018;15:920–923.