



FOCUS ISSUE – Celebrate Diversity with the AUA

A Critical Overview of Urethral Complications in Transmasculine Surgery



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Transmasculine genital reconstructive surgeries (TMGRS) are often performed with urethral lengthening (UL) to allow for micturition through a glanular meatus.¹ Unfortunately, urethral complications are common. Despite increasing numbers of TMGRS with UL being performed across multiple centers, the true rate of urethral complications remains unknown due to a lack of standard

nomenclature, heterogeneous reporting, varying surgical techniques and a paucity of prospective, multi-institutional outcomes data.

TMGRS include metoidioplasty and phalloplasty, which is further categorized as free flap and pedicled flap phalloplasty. UL techniques frequently differ within metoidioplasty and phalloplasty cohorts. For metoidioplasty UL, some surgeons utilize labia minora flaps (fig. 1) with or without vaginal mucosa flaps, while others use adjunct tissue like buccal mucosa grafts. In phalloplasty, 2 segments of urethral reconstruction are required to bring the urethral meatus to the glans: the pars fixa (PF) urethra and pars pendulans (PP) urethra. The PF urethra is made from endodermal or ectodermal labia minora, and the PP urethra

is made from skin flap tubularization within the neophallus. PF and PP urethras may be reconstructed simultaneously—commonly called single stage phalloplasty—or separately. Some surgeons will further stage phalloplasty UL by pre-laminating the urethral portion of the neophallus flap.² Single stage phalloplasty with UL has estimated urethral revision rates of 23% to 73%.³ Staged phalloplasty with initial PP urethroplasty (and neophallus reconstruction) requires secondary PF urethroplasty, with 35% of patients needing urethral revisions thereafter.⁴ Staged phalloplasty with initial PF urethroplasty (or metoidioplasty) requires secondary PP urethroplasty, with resultant fistula and stricture rates of 30% and 35%, respectively.⁵ Counseling patients on the number of expected TMGRS stages and the likelihood of complications is important for shared decision making and surgical planning.

Fistulas are the most common early urethral complication after TMGRS with UL. Fistula rates vary depending on flap choice, UL

technique and whether a vaginectomy is performed simultaneously.⁵ Severity and duration of postoperative edema also play a role in fistula development, and resolution of the edema often parallels fistula closure. Small, low output fistulas generally heal without surgical intervention. Larger fistulas, or those that persist beyond 3 months, will frequently need revision surgery and may be associated with urethral strictures. Many studies are retrospective and report on overall fistula rates either in combination with strictures and/or with mixed cohorts, yielding wide-ranging fistula rates (22% to 75%).⁶

Strictures in metoidioplasty occur in about 25% of patients.³ Staged or single stage phalloplasty strictures occur 25% to 58% of the time.⁷ Strictures almost always require surgical intervention. Those managed with indefinite self-dilation may not be reported, yielding stricture results that are likely underestimations.⁸ Metoidioplasty related strictures usually require buccal graft urethroplasty proximally and staged repairs distally.

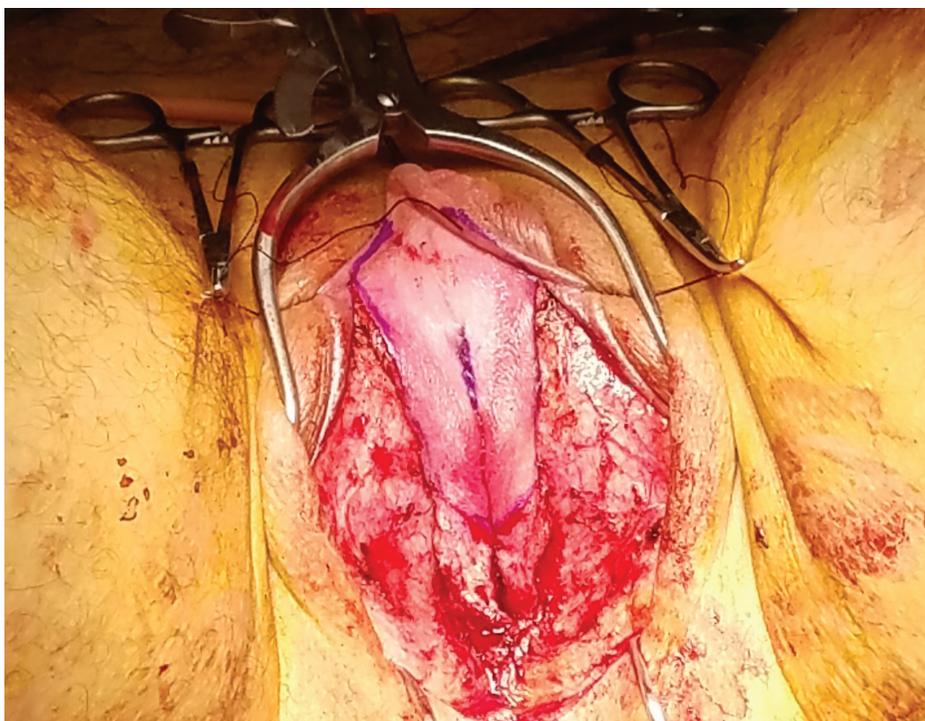


Figure 1. PF urethroplasty using labia minora endothelial tissue. Dorsal anastomosis is completed with proximal de-epithelialized flaps for coverage over native urethra-to-PF urethral anastomosis after ventral suturing is completed.

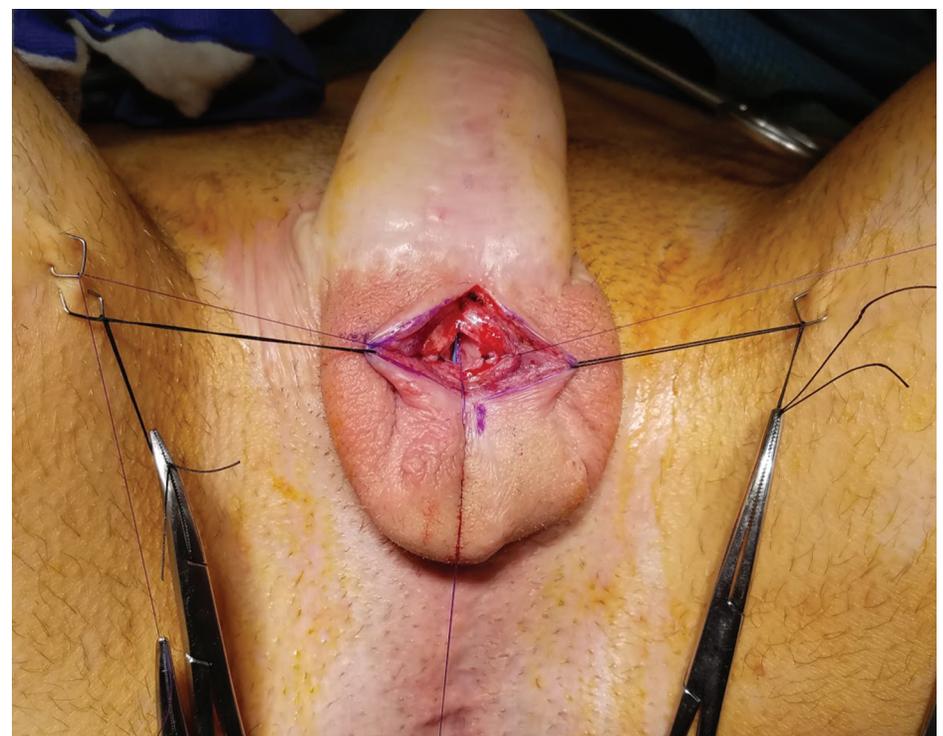


Figure 2. Short PF-PP urethral anastomotic stricture opened vertically. Transverse closure is possible given laxity of PF urethral tissue.

Phalloplasty related short strictures that develop slowly may lead to proximal dilatation of the urethra, facilitating tension-free anastomotic or Heineke-Mikulicz type urethroplasties (fig. 2). Strictures longer than 2 cm and located in the PF urethra often require substitution urethroplasty (fig. 3). Long PP urethral strictures, especially those associated with pre-laminated urethral flaps, need staged reconstruction with large skin and/or mucosal grafts. Severe PF strictures in patients with minimal perineal tissue may require staged reconstruction with or without gracilis muscle flap coverage. Perineal urethrostomy and free flap urethral reconstruction are utilized as last resort options. Endoscopy-mediated dilations and/or urethrotomy, with or without scar modulator injection, may also be offered.

Other UL complications are rarely described or reported. Urethral granulation tissue and pseudodiverticuli are common examples.⁷ Granulation tissue may cause hematuria and obstructive urinary symptoms. Pseudodiverticuli (fig. 4) are often related to strictures due to proximal hydrodistention of the vaginectomy site. Diverticula symptoms include large volume post-void dribbling, recurrent urinary tract infections (UTIs) and perineal pain. Also, periurethral fornices that are purposely incorporated into the UL procedure usually require cystoscopically guided catheter placement.

The variability in TMGRS-UL techniques, the heterogeneity in reported urethral complications and the practice of only reporting complications that require surgical

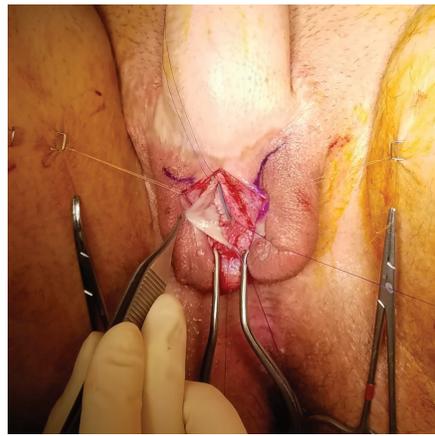


Figure 3. Long PF-PP stricture requiring ventral onlay substitution urethroplasty with buccal mucosa graft.

intervention cloud the interpretation of existing data. Furthermore, outcomes data are impacted by lack of routine, longitudinal followup—especially for patients traveling across the country or internationally to undergo specialized care. Complication rates published are thus low approximations. As centers perform more TMGRS with UL, there is the potential to develop prospective, multi-institutional longitudinal databases. Until then, to define more clearly TMGRS-associated urethral complications and accurately report their rates, and to better counsel and empower individuals to choose the surgery best aligning with their goals, a critical overview must be done of the existing data and future publications. Standardizing terminology and reporting—much like the International Consultation on Urological Diseases did for urethral strictures, stenoses and distraction injuries—would be beneficial.⁹ In addition, separating cohorts by specific flaps and UL techniques with or without vaginectomy, categorizing severity of urethral

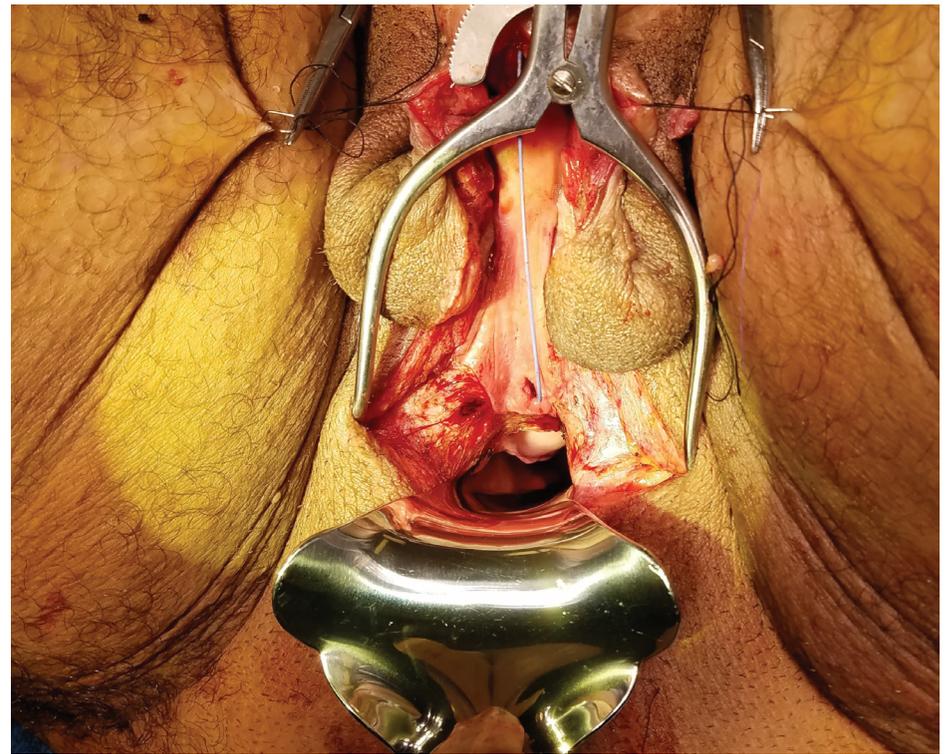


Figure 4. Urethral pseudodiverticulum posterior to native urethral meatus. Distal PF-PP urethral stricture was treated concomitantly.

complications, and reviewing types of urethral repairs required would all help surgeons and patients have a better understanding of specific TMGRS and their outcomes. ♦

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