Caring for Transgender Patients: Complications of Gender-Affirming Genital Surgeries

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Patients who undergo gender-affirming genital surgeries may present to the emergency department for their postsurgical complications. In this paper, we briefly describe the transfeminine and transmasculine genital procedures, review the diagnosis and management of both common and potentially life-threatening complications, and discuss the criteria for hospitalization and time frame for surgical consultation and referral. [Ann Emerg Med. 2021;78:409-415.]

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INTRODUCTION

Gender-affirming surgeries have increased significantly since a decision by Medicare and Medicaid allowed coverage of transition-related surgery in 2014.[1,2] Many transgender and gender-diverse (TGD) individuals who undergo gender-affirming procedures have genital surgery.[1,2] Although all patients are cared for after surgery by their surgeons, some may present or be sent by their surgeon to the local emergency department (ED) for their care. However, formal education in emergency medicine residency often does not include TGD health, and clinicians may not have sufficient knowledge to provide optimal care for these patients.[3] Furthermore, because these procedures are one of the many potential options in a TGD person's journey toward self-actualization, they may experience tremendous anxiety about their postsurgical complications. Some issues related to the acute care of hospitalized TGD patients have been previously published, but there are very few articles on managing postsurgical complications for nonsurgeons.[4-6] In this article, we will review the common types of gender-affirming genital surgeries, describe the diagnosis and management of common and potentially life-threatening complications, and discuss the criteria and time frame for surgical referral.

CLINICAL APPROACH TO TGD PATIENTS

Some best practices for clinicians to provide culturally appropriate care for TGD patients include eliciting and using patient-identified names and pronouns, using patient-preferred terminology in verbal and written communication, and, if relevant to the patient's chief complaint, obtaining a medical and surgical history that includes hormone therapy and anatomical inventory.[4] Terms such as "preop" and "postop" to describe TGD patients are not recommended because not all transgender people choose to, or can afford to, undergo surgery, and these terms inaccurately suggest that they must have surgery in order to transition.[7] Gender-affirming procedures include nonbreast, nongenital surgeries (eg, facial feminization procedures), "top" (breast) surgeries, and "bottom" (genital) surgeries.[4,8] We will discuss only the binary transfeminine and transmasculine "bottom" procedures and recognize that some patients may undergo nonbinary self-actualizing procedures. It is also important for providers to be aware that TGD patients may have experienced prior sexual assault or other traumatic injuries, so the physical examination may cause significant anxiety and discomfort. When obtaining patient consent for examination, we encourage allowing a support person to be present in the room and offering an analgesic and/or anxiolytic to mitigate discomfort. This is especially important when performing a speculum examination on a transwoman who is likely to have little experience with the pelvic examination.

TRANSFEMININE GENITAL SURGERIES

Transgender women undergo vaginoplasty to create a neovagina. Procedures involved in vaginoplasty include penectomy, orchiectomy, vaginoplasty, clitoroplasty, and vulvoplasty. The neovaginal vault may be lined with residual tissue from the penoscrotal flap or reconstructed from a segment of the rectosigmoid colon or peritoneal lining.[9] After surgery, patients are treated with antibiotics while they have a urinary catheter and vaginal packing in place, both of which are removed at their 1-week clinic follow-up. After vaginal packing removal, patients are asked

Table 1. Management of transfeminine genital surgery complications.

Symptom	Early Complication (≤1 Month Postop)	Late Complication (>1 Month Postop)	Management*
Change in voiding function	Postoperative swelling with urinary retention, urinary tract infection, or sexually transmitted infection	Urinary tract infection, sexually transmitted infection, urethral meatal stenosis	UA, sexually transmitted infection screening (if sexually active), PVR. May need catheter placement and follow-up with operating surgeon in 1 week. Antibiotics for urinary tract infection or if the urinary catheter is replaced.
Vaginal bleeding	Pelvic hematoma or trauma from intercourse/dilation	Trauma from intercourse/ dilation or granulation tissue	Direct pressure, vaginal packing, tranexamic acid and transfusion, and surgical consult, as needed.
Vaginal discharge	Sexually transmitted infection, wound infection, tissue necrosis, fistula, bacterial overgrowth	Sexually transmitted infection, wound infection, bacterial overgrowth, granulation tissue	Antibiotics if concern for infection. Nonurgent referral to operating surgeon if necrosis is present or fistula is suspected.
Pink discoloration of the neolabia	Normal postoperative healing, wound dehiscence	Granulation tissue or wound dehiscence	Allow normal healing for wound dehiscence or granulation tissue. Follow-up with operating surgeon.
Black discoloration of the neolabia	Tissue necrosis, necrotizing fasciitis (rare)	Tissue necrosis, necrotizing fasciitis (rare)	Diagnostic workup, antibiotics, and surgical consultation if high suspicion for necrotizing fasciitis; however, this is extremely rare. Nonurgent referral to operating surgeon for tissue necrosis.
Erythema of neolabia with pain, induration, and/or fever	Cellulitis, abscess	Cellulitis, abscess	Treat with oral antibiotics and/or bedside incision and drainage as needed.
Abdominal pain after intestinal vaginoplasty	Dehiscence of anastomosis, perforation of neovagina, infection	Small bowel obstruction, infection	Diagnostic imaging, surgical consultation, and hospital admission.

Postop, Postoperation; *PVR*, postvoid residual; *UA*, urinalysis.
*Early and late management are the same unless otherwise specified.

to douche at least 1 to 2 times per week (to compensate for not having an acidic natal pH to prevent bacterial overgrowth and excessive discharge) and instructed to follow a daily dilator regimen with progressively larger dilators. Standard dilators are color-coded with the following sizes (diameter): purple (29 mm), blue (32 mm), green (35 mm), and orange (38 mm); however, patients may also use a personalized set of dilators that include (diameter): purple (22 mm) and orange (25 mm). After the first year, they will continue with weekly dilation to prevent stenosis unless they are regularly experiencing penetrative vaginal intercourse.[10,11] Patients are typically followed closely by their surgeons, particularly in the first postoperative month, so try to contact them during your evaluation to discuss the management plan. If you are unable to contact the patient's primary surgeon and would like additional input on your clinical management, we would recommend consulting a gynecologist or plastic surgeon.

The management of complications related to transfeminine genital surgery is summarized in Table 1. Critical historical information to ascertain include the type of procedure (or anatomical inventory) and timing of the procedure. In general, outside of the first 6-week postoperative period, patients may be evaluated and treated like cisgender patients.

In the first postoperative week, complications to consider are similar to those after other major surgeries (ie, venous thromboembolism, urinary tract infection, pulmonary atelectasis, and pneumonia), and the patient's symptoms should guide diagnostic testing. If the patient still has a urinary catheter, check that the tube is in the correct position and has not clogged or kinked.

Specific to the procedure itself are urologic and surgical wound complications, so the pelvic examination is an important (and often the most difficult) part of the physical examination. The only time a pelvic examination should not be performed is if the bulky dressing is still in place. Do

not remove the dressing unless specifically recommended by the patient's surgeon. Anatomically, transfemale patients are the same as cisfemale patients, but the vaginal vault may be difficult to distinguish from the urethral opening because of its small size, exacerbated by postoperative soft tissue swelling in the first 1 to 4 weeks. A speculum examination should be performed, if possible, using a pediatric speculum or an adult Pederson speculum with a narrower blade (22 mm). If the patient is already using the orange dilator (the largest size), then a regular adult speculum may be used. If there is any difficulty inserting the speculum, the blade can be turned upside down to enter at a more acute angle. If the speculum is unable to be inserted, try performing a gentle manual examination instead.

Urologic Complications

Symptoms related to a change in voiding function (eg, difficulty urinating, dysuria, retention, or hematuria) are common.[12-14] Acute management should focus on excluding a urinary tract infection with a urinalysis, sexually transmitted infection if the patient is sexually active, and urinary retention with a postvoid residual test.

Symptoms of urinary tract infections in transgender women are the same as in cisgender women and may occur following catheter removal or any time within the first year after surgery.[15,16] The pathogens causing urinary tract infections are also similar, so they may be treated with oral antibiotics for 3 to 7 days based on the local antibiogram without additional surgical consultation. If the urinary catheter is still in place, patients should be on antibiotics until removal. Because patients may still have a prostate, although small and atrophied from estrogen use, they should also be evaluated for prostatitis with a rectal examination.

Acute urinary retention that occurs within hours after foley removal is usually caused by periurethral inflammation or mechanical obstruction from tissue swelling, whereas retention that occurs several months after surgery is commonly caused by urethral meatal stenosis from scarring.[10,15] Patients with urinary retention following catheter removal should have the catheter reinserted, be started on another 1 to 2 weeks of prophylactic antibiotics (such as amoxicillin-clavunalate or cephalexin), and be instructed to follow up with their surgeon within 1 to 2 weeks for catheter removal and a voiding trial. If catheterization is necessary to treat urinary retention, the provider should carefully identify the anatomical structures in the perineum prior to the procedure.

Specific considerations for urinary catheterization include:

- Gently open the labia to expose the perineal structures. Some patients may not have an obvious vaginal opening or the coloration of the vaginal opening may be different from cisgender vaginal mucosa.
- If the urethral opening is not easily identifiable on examination, insert a finger into the vaginal opening and look superiorly for another opening just below the pubic symphysis.
- The size of the urethral opening in transgender female patients is similar to that in cisfemale patients, so a standard adult urinary catheter may be used.

Vaginal bleeding may be caused by pelvic hematomas (especially within the first 2 weeks after surgery), granulation tissue growth (2 months after surgery), or mucosal trauma from mechanical dilatation or sexual activity (any time after surgery).[16-18] Clinically significant vaginal bleeding is extremely uncommon and may be treated initially with direct pressure, vaginal packing, and transfusion as appropriate, followed by a surgical consultation. Even though vaginal bleeding in transgender women is not menstrual bleeding, we would still recommend giving intravenous tranexamic acid. It may also be helpful to add the intravenous form of tranexamic acid to a gauze bandage roll and, with a large amount of lubrication, pack the vaginal mucosa to stop the bleeding.

Vaginal discharge, sometimes malodorous or excessive, can be caused by a sexually transmitted infection, wound infection, or bacterial overgrowth (if the patient is not douching at least 1 to 2 times a week).[12] Providers should examine the perineum for the presence of genital warts, wound infection, tissue necrosis, or wound dehiscence.[6,10] Treatment for sexually transmitted infections follow the same guidelines as for cisgender patients.[19] If the patient reports position-dependent discharge (ie, discharge that only occurs when standing or lying on one's side), they may have a urethrocutaneous fistula. A rectovaginal fistula may be present if the patient reports foul-smelling, brown vaginal discharge. Both conditions may be referred for outpatient surgery evaluation within a few weeks.

Surgical Wound Complications

Wound healing complications are common after surgery. Neolabia majora or other local soft tissue infections may be seen, with only about 5% of patients developing a focal abscess.[14] Differentiating normal wound healing from a wound infection is difficult, particularly within the first month after surgery. The surgical site will look edematous and ecchymotic, with exudative drainage, and

patients will be tender to palpation. Examination findings more likely to indicate infection include presence of malodorous discharge, induration, erythema, and fever. Timing may be most helpful, as most soft tissue infections will develop in the period from when prophylactic antibiotics are stopped until 1 month after surgery. We recommend trying to contact the surgeon to help with differentiating normal postoperative healing from infection and, if unable to reach the surgeon, having a low threshold to treat for cellulitis with oral antibiotics. Similarly, simple, superficial abscesses may be drained by the emergency physician at the bedside and treated with antibiotics. Just as with the speculum examination, be cautious with any invasive bedside procedure, as patients may not be able to tolerate them without additional support, including procedural sedation, and some procedures may need to be done in the operating room. Abscesses that are deep, located around or near a blood vessel, or too large and painful to be performed at the bedside warrant surgical consultation. Finally, although this patient population is at risk of developing a necrotizing soft tissue infection due to undergoing multiple procedures, it is exceedingly rare.[9]

Soft tissue findings that may cause distress to the patient are actually part of the normal healing process and do not require intervention. Granulation tissue (ie, pink tissue growing along the seams of the vaginal opening) may be seen 2 months after surgery and usually self-resolves in the first year. Wound dehiscence can occur in up to a third of patients, and patients should be encouraged to continue regular cleaning with soap and water or very dilute hydrogen peroxide to prevent infection, especially after each void, and continue dilating.[14,15] Over time, the dehisced wound will heal without intervention. Do not recommend dressings, antibiotics, cream, or ointments for dehiscence, as these will trap bacteria and promote infection. A black discoloration to the tissue may indicate tissue necrosis (seen in 10% of cases in 1 study),[16] which may be referred to the surgeon within 2 to 3 days for debridement.[14] While distinguishing tissue necrosis from necrotizing fasciitis is difficult based on appearance alone, we recommend a diagnostic workup and surgical consultation if you have a high clinical suspicion for necrotizing fasciitis.

Complications Specific to Intestinal Vaginoplasty

Patients who undergo intestinal vaginoplasty may have complications from the use of intestinal tissue to construct the neovagina. As with any bowel surgery, there is an increased risk of small bowel obstruction or iatrogenic rectal injury.[20,21] Acute peritonitis from dehiscence of the intestinal anastomosis or perforation of the neovagina is an uncommon condition that should not be missed.[17] Vaginal bleeding may be caused by variceal bleeding, intestinal polyps, inflammatory bowel disease, colitis, or carcinoma.[18,22,23] In general, these patients are more likely to need advanced radiographic imaging and emergency surgical consultation.

Indications for Admission

Although most posttransfeminine surgery patients may be managed as outpatients, some may require surgical consultation and hospital admission. These include:

- Patients with vaginal or wound-related bleeding that cannot be controlled with simple bedside interventions such as direct pressure, compression dressings, vaginal packing, or tranexamic acid. This is more common in the early postoperative period but may also present weeks later in certain cases (eg, a patient taking too many nonsteroidal anti-inflammatory drugs for pain control)
- Septic patients from wound infection or pyelonephritis requiring intravenous antibiotics
- Patients with intestinal complications after abdominal surgery, such as small bowel obstruction, bowel perforation, peritonitis, or variceal bleeding

TRANSMASCULINE GENITAL SURGERIES

Transgender men may choose either metoidioplasty or phalloplasty. Patients who undergo metoidioplasty have a small phallus that facilitates urination while standing but not penetrative intercourse; up to 24% of patients subsequently undergo phalloplasty, with a staged erection or testicular prostheses implantation.[8,24,25] Common donor sites used to create the neophallus include skin flaps from the radial forearm and anterolateral thigh.[25] After surgery, patients are discharged with a suprapubic catheter for up to 4 weeks while the neophallus heals. Patients are encouraged to avoid penetrative intercourse for 3 months. Because these are staged procedures that may span months or years, it is important to understand where the patient is in this process. Within the first 6 months after surgery, patients are in close communication with their surgeons. If they present to the ED during this period, they have most likely been sent by their surgeon for evaluation.

The management of complications related to transmasculine genital surgery is summarized in Table 2.

Similar to transfeminine and other major surgeries, complications to consider in the first postoperative week include venous thromboembolism, urinary tract infection, pulmonary atelectasis, and pneumonia, and the patient's symptoms should guide diagnostic testing. In addition, check that the suprapubic catheter is in the correct position and has not clogged or kinked, and assess the flap donor site for infection or ischemia from arterial or venous occlusion. The presentation and management of catheter malfunction and donor site infection and ischemia are the same as for postoperative cisgender patients.

After the first week, complications primarily involve the urinary tract or surgical wound. When evaluating a transmasculine patient for abdominal pain, it is important to remember that they may still have their internal pelvic reproductive organs.

Urologic Complications

The clinical evaluation of patients with voiding complaints should include a careful examination of the neophallus and perineum for fistulous openings and fluid collections and the urethral meatus for patency.[26] Dribbling or incomplete emptying causes constant collection of urine in the urethra, which may lead to urethral bulging. Manually compressing the perineum during urination may express urine or pus, depending on the underlying etiology. Although there are nonemergency causes of these symptoms (eg, meatal stenosis, urethral stricture, or urethrocutaneous fistula), they may cause acute urinary retention that requires placement of a urinary catheter.[5,26,27] Catheter placement will be more difficult than in a cisgender patient because of the acute angle of the urethral extension, so we would recommend using a 12F or 14F catheter with a coude tip. Multiple attempts may cause urethral trauma, so if 1 attempt at urethral insertion is unsuccessful, patients may need to have their procedure done in the operative room by a urologist. Suprapubic catheter placement may also be difficult to perform at the bedside due to scarring from prior placement after surgery. Finally, a urine sample should be sent for urinalysis and culture because incomplete bladder emptying may increase the risk for urinary tract infections, and urethral discharge should be sent to exclude sexually transmitted infection if the patient is sexually active.[5,26] Once these conditions have been excluded, patients may be referred to their surgeon within a few weeks for further evaluation of their urethral anatomy.

Surgical Wound Complications

Wound healing complications (ie, flap necrosis and wound infection) involving the tissue flap used to reconstruct the neophallus or at the donor sites can be difficult to distinguish from normal postoperative healing based on appearance alone. During the examination of the neophallus, the provider may observe a hyperpigmentation or pink discoloration of the skin along the wound edges, which, in the absence of fever or pus drainage, may be normal postoperative healing.[25,28] However, black discoloration or necrotic change of the skin is concerning for tissue ischemia and flap necrosis. Flap necrosis most often occurs within the first 48 hours after phalloplasty. If a patient presents after the first week with concerning skin changes, try to consult with the operating surgeon to assist with the diagnosis. If you would like additional input on your clinical management and the operating surgeon is unavailable, we recommend consulting with a urologist or plastic surgeon. Although full phallic loss is less common than partial phallic loss, both conditions require emergency surgical consultation, unlike necrosis noted after transfeminine genital procedures, which requires nonemergency debridement within 2 to 3 days.[25]

Swelling, redness, and pain involving the neophallus may indicate a flap infection as its location in the perineum puts it at a particularly high risk for infection. Acutely ill or septic patients should follow the usual workup and testing, including radiographic imaging and hospital admission for broad-spectrum intravenous antibiotics. Necrotizing fasciitis and Fournier's gangrene are rare, as this patient population typically has few comorbidities. If the patient is clinically well-appearing and reliable, providers may discharge the patient with oral antibiotics and clinic follow-up within 1 to 2 days, preferably after consultation with the operating surgeon.

Prosthesis Complications

Insertion of penile and/or testicular prostheses occurs after the penile flap has healed and attained its final size and protective sensation has been restored, typically months to years after the initial surgery.[29] Similarly to flap infections, prosthesis infections may be difficult to diagnose. Patients may report pain and discoloration of the skin along the shaft and have tenderness along the entire course of the implant. Septic patients with prosthesis infections require intravenous antibiotics, hospital admission, and prosthesis removal.[30] However, patients who are well-appearing and reliable may be treated with oral antibiotics and instructed to follow up

Table 2. Management of transmasculine genital surgery complications.

Symptom	Early Complication (≤1 Month Postop)	Late Complication (>1 Month Postop)	Management*
Change in voiding function	Urinary tract infection, urinary catheter malfunction, urethral stenosis, stricture, or fistula	Urinary tract infection, sexually transmitted infection, urethral stenosis, stricture, or fistula	UA, sexually transmitted infection screening (if sexually active), PVR. May need placement of catheter with coude tip or suprapubic catheter. Antibiotics for infection and arrange follow-up with operating surgeon.
Pink discoloration of the phallus	Normal postoperative healing	Granulation tissue	Refer to operating surgeon for nonurgent follow-up.
Black discoloration of the phallus	Tissue ischemia and necrosis (especially ≤48 hours postop), necrotizing fasciitis (rare)	Necrotizing fasciitis (rare)	Emergency surgical consult for tissue necrosis. Outside of the first 48 hours, consider diagnostic evaluation, antibiotics, and surgical consultation for necrotizing fasciitis.
Erythema of the phallus with pain, induration, and/or fever	Cellulitis, abscess	Cellulitis, abscess	Intravenous antibiotics, surgical consult, and hospital admission if ill-appearing. Oral antibiotics, bedside incision and drainage, and follow-up with operating surgeon in 1-2 days.
White or black discoloration of the donor site	Arterial or venous ischemia (especially 1-3 days postop)		Vascular ultrasound and emergency surgical evaluation.
Prosthesis complications	Prosthetic infection or erosion	Prosthetic infection or erosion	Intravenous antibiotics, surgical consultation, and admission for septic patients. Oral antibiotics and outpatient surgical follow-up within 1 week in well-appearing patients with infections. Prosthesis erosion causing urinary retention often requires surgical consultation for urinary catheter placement.

*Early and late management are the same unless otherwise specified.

with their surgeon within a week. Erosion of the prosthesis out of the neophallus or mechanical failure of the prosthesis may also occur, but unless there is associated urinary obstruction, these do not require acute interventions, and patients may call their surgeons for follow-up.

Donor Site Complications

Providers should remember to examine the donor site to exclude infection and limb ischemia. Acute hand swelling, severe hand pain, and white or black discoloration of skin that occurs in the first 1 to 3 postoperative days may be caused by arterial or venous ischemia and require emergency surgical evaluation and management. Donor site skin infections in TGD patients may be treated like those in cisgender patients.

Indications for Admission

Although most posttransmasculine surgery patients may be managed as outpatients, some may require urgent surgical consultation and hospital admission. These include:

- Patients with flap necrosis suggesting imminent flap loss for emergency surgical intervention to preserve the flap
- Septic patients from infection of the flap, prosthesis, donor site, or urine for intravenous antibiotics
- Patients with acute urinary retention requiring surgical placement of the urinary catheter
- Patients with abrupt hand pain, swelling, or skin discoloration (these patients may have impending ischemia requiring vascular intervention)

In conclusion, TGD patients who undergo gender-affirming genital surgery may present to the ED for postsurgical complications. Most often, the complications are either urologic or wound-related, particularly within the first 6 weeks after surgery. Having a basic understanding of these procedures and their complications may improve the care of these patients, and we encourage

all providers to continue to expand their knowledge of TGD health.

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