

Gender-Affirming Penile Inversion Vaginoplasty



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KEYWORDS

- Vaginoplasty • Neovagina • Penile inversion • Plastic surgery • Transgender • Gender dysphoria
- Gender affirmation • Trans woman

KEY POINTS

- Gender-affirming vaginoplasty stems from use of skin grafts in the early 1900s. The most common form of reconstruction today is based on pedicled penile inversion flaps.
- A multidisciplinary approach to evaluation and preoperative work-up following World Professional Association for Transgender Health standards of care and thorough informed consent are necessary to reduce risks and optimize outcomes.
- The penile inversion approach consists of development and lining of a neovaginal space, shortening of the urethra, construction of a neoclitoris, and local skin rearrangement to define the vulva and introitus.
- Postoperative care protocols, including strict adherence to a dilation schedule, are critical to a successful reconstruction and maintenance of adequate neovaginal depth.
- Despite complications, high patient satisfaction and reduction in dysphoria have been documented after vaginoplasty.

INTRODUCTION

In recent years, greater acceptance of transgender individuals in society and the inclusion of medical coverage for gender-affirmation surgeries (GASs) has led to an increasing number of patients seeking male-to-female vaginoplasty. Since the first descriptions of neovaginal reconstruction for gender affirmation were described in the early to mid-1900s, various techniques and revisions have been introduced. This article provides a brief historical perspective, defines the goals of surgical treatment within a multidisciplinary approach adhering to World Professional Association for Transgender Health (WPATH) standards, and focuses on issues related to the most common method for primary neovaginal reconstruction: the penile inversion vaginoplasty (PIV).

HISTORY

Surgical techniques for vaginoplasty are often divided into categories based on the type of donor tissue used to create the neovaginal canal. The donor sites include (1) genital (scrotal) and nongenital skin grafts, (2) pedicled penoscrotal and nongenital local skin flaps, and (3) pedicled bowel segments.¹

The first case of a vaginoplasty in a trans woman was reported by Abraham in 1931² and involved the use of a skin graft placed inside-out over a form to line the neovaginal canal in a patient who had prior orchiectomy and penectomy. For several decades, surgeons continued to perform vaginoplasties using split-thickness skin grafts to line the neovagina, likely due to donor site availability, simplicity of grafts, and potential for non-hair-bearing reconstruction.³ To

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reduce the contracture related to split-thickness grafts, full-thickness skin grafts were also used. In 1956, Paul Fogh-Andersen, a Danish plastic surgeon, was first to report harvest and inset of penile skin as a full-thickness graft to line the neovagina.⁴ Graft contracture, notable scars outside of the perineum, and early stenosis of the neovaginal introitus, however, led to the use of other tissue options. One year later, Gillies and colleagues⁵ published their technique of pedicled penile skin to reconstruct the neovaginal canal in trans women. Independently, Burou in Casablanca developed a similar technique and performed his first pedicled penile skin inversion for gender-affirming vaginoplasty in 1956, and he continued this practice into the 1980s.⁶

The implementation of the pedicled penile flap meant improved vascularity and thickness of tissue placed over the rectum, less contracture, and typically hairless skin. Several modifications have been made over the years, which include the addition of a small posteriorly based perineal skin or scrotal flap to lessen introital stenosis, or use of both pedicled penile flap and posteriorly or laterally based scrotal flaps. Other local pedicled skin flaps from the medial thigh and inguinal and pudendal regions have also been described but have not been adopted as first-line surgical options due to notable scars and often thicker tissue which can narrow the neovaginal canal.⁷

Reconstruction of a neovagina using a bowel segment has been well described in the oncology literature. More recently, this technique has been applied in the setting of primary or secondary vaginoplasty for trans women.⁸ The advantages of bowel vaginoplasty are reliable length, texture, and natural lubrication. The disadvantages are the addition of abdominal surgery and the potential for odor, excessive mucus discharge, and introital stenosis.⁹ Because the number of young transgender women seeking vaginoplasty who lack sufficient penile and scrotal tissue due to early hormone treatment is growing, bowel vaginoplasty as a primary method may become more popular.¹⁰

Other options for reconstructing a neovagina are emerging and include the use of peritoneum, buccal mucosa, amnion grafts, or decellularized tissue. To date, most surgeons prefer the use of inverted pedicled penile skin flaps with the addition of either scrotal flaps, scrotal skin grafts, or nongenital skin grafts to accomplish a fully lined neovaginal canal.

GOALS OF RECONSTRUCTION

The goals of a vaginoplasty follow one of the general tenets of plastic surgery—reconstructing like with like. As described by Karim and colleagues,¹

the gender surgeon should strive to create a functional and aesthetically acceptable perineum that appears as feminine as possible with minimization of scars and desensitization. In terms of function, the patient should be able to urinate in the sitting position without obstruction and achieve sexual satisfaction. Sexual stimulation may arise from either the neoclitoris (prior penile glans) or from penetrative intercourse secondary to prostate stimulation. Given the cis female vagina is hairless and elastic, the tissue used to line the neovaginal canal should have similar characteristics. Accordingly, preoperative hair removal of the donor site skin is important. Furthermore, the neovagina should be similar in length to the average cis female vagina, at 9.6 cm (range 6.5–12.5 cm).¹¹ The reconstructed length is limited by a patient's anatomy. The neovaginal space is developed along Denonvilliers fascia and should not extend past the peritoneal reflection and enter into the abdominal cavity. To yield a natural appearance, the labia majora are created from their embryologic equivalent, the scrotum. Lastly, given that the PIV is completed through the use of skin flaps, the neovagina is not self-lubricating. The only established means of achieving a self-lubricating vagina is bowel-based reconstruction.

PREOPERATIVE PLANNING

The key to success for performing GAS is to develop a multidisciplinary team that consists of a combination of reconstructive surgeons (eg, plastic surgeons, urologic surgeons, urogynecologists, and colorectal surgeons), endocrinologists, internists, case managers, physical therapists, social workers, and mental health specialists so that all aspects of a patient can be adequately addressed according to WPATH standards of care. In addition to use of the WPATH guidelines and a multidisciplinary team during both the diagnostic and treatment phases of care, it is critical for the responsible surgeon(s) to provide informed consent for the proposed procedure. This includes a thorough review of options, risks, and possible complications.

Body mass index and medical comorbidities are addressed preoperatively to reduce anesthesia and surgical complications. Even in surgical candidates with no physical comorbidities, the presence of severe mental health issues outside the diagnosis of gender dysphoria will likely complicate compliance with the recovery plan, both in the short term and long term. In the authors' practices, patients have multiple discussions with the surgical team to provide ample opportunity for informed consent prior to surgery, and they are also provided with didactic teaching and exposure to patient panels.

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