

# Metoidioplasty

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## KEYWORDS

• Transgender • Genitalia • Metoidioplasty • Neophallus

## KEY POINTS

- Metoidioplasty with simultaneous removal of the internal genitalia may be performed in a single procedure.
- The preconditions include a clitoris that is sufficiently large for creation of a neophallus, normally developed labia minora, and labia majora of sufficient size to construct a scrotum capable of placing testicular implants.
- The technique is demanding, and meticulous attention to detail is required.

## INTRODUCTION

Transmasculine gender confirmation surgery remains challenging and demanding. As there is no perfect or standard procedure for creating male genitalia, practitioners continue to strive for better solutions.

There are 2 goals in the surgical treatment of transgender persons: removal of the native genitalia and secondary sexual characteristics and creation of the desired genitalia and secondary sexual characteristics. In transmen, this often means removal of the uterus, fallopian tubes, ovaries, and vagina and creation of the external genitalia.

Metoidioplasty creates a small neophallus in transmen that is typically not capable of penetrative sexual intercourse. The term metoidioplasty is derived from Greek words meta (toward) and oidion (male genitalia). Surgical techniques resemble procedures for the correction of the most severe forms of perineal hypospadias and were refined and named metoidioplasty by Lebovic and Laub<sup>1</sup> or clitoris-penoid by Eicher.<sup>2</sup> These techniques were later modified by Hage<sup>3</sup> and Perovic<sup>4</sup> to include urethral lengthening. The goal of metoidioplasty is the creation of male-like genitalia for the purpose of voiding in a standing position. The procedure consists of elongation and exposure of the hormonally hypertrophied clitoris in order to construct a microphallus.

Metoidioplasty is the only procedure that enables creation of male genitalia with completely preserved protective and erogenous sensitivity; this is possible due to the homologous anatomy and common embryologic development of male and female external genitalia. The scrotum is created from labia majora flaps and allows implantation of testicular prostheses either simultaneously or as a staged procedure. Although the constructed penoid is not sufficiently large to enable penetrative sexual intercourse, a small number of transgender patients are satisfied with this solution (less than 5% in the author's recent experience). Some reasons individuals forego phalloplasty include not wanting to undergo a more complex procedure with visible scarring and donor sites or dissatisfaction with current phalloplasty outcomes. Regardless, some patients subsequently choose to convert their metoidioplasty to a phalloplasty, often after finding a partner.

Metoidioplasty, compared with phalloplasty, has a shorter hospital stay, minimal donor site morbidity, and preserves erogenous sensitivity; however, it creates a short phallus that is typically not capable of sexual penetration. The author and colleagues developed their modified metoidioplasty technique based on extensive experience in the repair of severe proximal hypospadias in children.<sup>5</sup>

The author has nothing to disclose.

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## INDICATIONS AND LIMITATIONS

Metoidioplasty is performed in transmen who request single-stage gender confirmation surgery, for those individuals who wish to avoid a complicated, multistage total phalloplasty, or for those individuals considering phalloplasty at a later date. A precondition for a successful outcome is a sufficiently large clitoris; the clitoris should have a length of at least 3 cm in a stretched position. Additionally, the absence of pubic obesity is helpful in the ability to void in a standing position (**Fig. 1**). If the clitoris size is small, topical hormonal treatment (di-hydrotestosterone) and simultaneous vacuum stretching can be performed for a few months prior to surgery so as to enable maximum clitoral length gain (**Fig. 2**). The labia minora should be sufficiently developed in order to construct both the urethra and the ventral penile skin. If the mons pubis is prominent, liposuction or lipectomy should be performed to allow better neophallic exposure.

## OPERATIVE TECHNIQUE

Surgery is performed under general or regional anesthesia, according to the patient's wish. The patient is positioned in standard lithotomy (extended lithotomy position if a simultaneous transvaginal hysterectomy is performed). The procedure starts with the removal of the internal genitalia via a transvaginal approach. Alternatively, the internal genitalia can be removed laparoscopically prior to the metoidioplasty. Beginning at the vestibulum, the vaginal mucosa is removed by electrocautery. Care is taken to remain at the submucosal layer so as not to injure the muscular layer, which can cause significant bleeding. Injury to the urethral sphincter is minimized as the vaginal muscular layer is preserved. Using a continuous spiral suture, the vaginal vault is then obliterated.

The metoidioplasty commences with 2 parallel incisions at least 2 cm apart along the urethral plate.



**Fig. 1.** Preoperative measurement of clitoral length.



**Fig. 2.** Vacuum device for pre-and postoperative penoid stretching.

These longitudinal incisions begin at the native urethral meatus and terminate at the subcoronal level of clitoris (**Fig. 3**). The urethral plate, which is short and tethers the clitoris, requires division so as to lengthen the ventral clitoris. The urethral plate is divided at the subcoronal level and carefully dissected off the ventral side of clitoral albuginea, incorporating the thick spongiosal tissue. The dissection proceeds to the urethral meatus. This maneuver significantly lengthens the ventral side of the clitoris and creates a gap, usually 4 to 7 cm long, between the divided edges of the urethral plate (**Fig. 4**).

The lateral and dorsal clitoral (penile) skin is mobilized from the underlying Buck fascia without detaching the prepuce (**Fig. 5**). This provides exposure of the suspensory ligament of the clitoris. This ligament is stronger than the suspensory ligament of the penis in cis-males and pulls the clitoris toward the pubic symphysis. The ligament runs the entire length of the clitoris, beginning at the suprapubic area proximally and terminating at the subcoronal level of the clitoris distally. The ligament is released from the clitoral body, preserving only its most proximal part. This helps to avoid destabilizing the clitoris and enables additional clitoral lengthening. The lower parts of the labia minora are detached from their base and mobilized cranially. The perineal artery is divided, and the flap vascularity is based solely on the deep and superficial external pudendal vessels.

The base of the penile skin is sutured to the remaining clitoral ligament to create the peno-pubic angle (**Fig. 6**). Urethral reconstruction is performed by tubularization of the mucosa between the clitoris and the urethra around a 12 French siliconized Foley catheter, with fixation of the urethra to the base of the cavernosal bodies (**Fig. 7**). The distal part of the neourethra (the raw surface between the transected urethral plate) is created

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