Metoidioplasty: a variant of phalloplasty in female transsexuals

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OBJECTIVE
To describe metoidioplasty, a technique for creating a neophallus from an enlarged clitoris in female transsexuals, without needing the complex, multi-staged surgical construction of a large phallus, as this reconstruction is one of the most difficult in female transsexuals.

PATIENTS AND METHODS
From September 1995 to April 2002, metoidioplasty was used in 22 patients (aged 18–33 years). The technique is based on the repair of the most severe form of hypospadias and intersex. The ‘urethral plate’ and urethra are completely dissected from the clitoral corporal bodies, then divided at the level of the glanular corona, and the clitoris straightened and lengthened. A longitudinal vascularized island flap is designed and harvested from the dorsal skin of the clitoris, transposed to the ventral side, tubularized and Anastomosed with the native urethra. The new urethral meatus is brought to the top of the neophallus, and the skin of the neophallus and scrotum reconstructed using labia minora and majora flaps.

RESULTS
The mean (range) follow-up was 3.9 (0.5–6) years; the neophallus was 5.7 (4–10) cm, considered satisfactory in 17 patients but the remaining five required additional phalloplasty. The complications were urethral stenosis in two and fistula in three patients.

CONCLUSIONS
Metoidioplasty is an alternative to phalloplasty, allowing voiding while standing. In patients who desire a larger phallus, various techniques of phalloplasty can also be used.

KEYWORDS
clitoris, phalloplasty, transsexualism, metoidioplasty

INTRODUCTION
Penile reconstruction is one of the most difficult problems in the surgical treatment of female transsexuals. There are various techniques available but the results are not equally acceptable. Metoidioplasty is a technically difficult method used in female-to-male transsexuals who desire sexual reassignment surgery without the complex, multi-staged surgical construction of a large phallus. Lebovic and Laub [1] first introduced the main principles of the technique and named it metoidioplasty, derived from the Greek words ‘meta’, ‘toward’ and ‘oidion’, ‘male genitalia’. Later, authors published modifications of metoidioplasty [2–4]. We developed our variant of metoidioplasty from our experience in repairing the most severe forms of hypospadias associated with penoscrotal transposition.

PATIENTS AND METHOD
From September 1995 to April 2002, 22 female transsexuals with an enlarged clitoris (mean age 26.2 years, range 18–33) were treated using metoidioplasty. The patients were treated hormonally for a mean (range) of 17 (14–31) months before surgery, and had undergone hysterectomy and adnexectomy through a vaginal approach either before (nine) or simultaneously (13) with metoidioplasty. The vagina was also removed but the anterior vaginal wall preserved, to be used for urethral reconstruction.

OPERATIVE TECHNIQUE
A clear understanding of the anatomy of the clitoris is important for this surgical reconstruction. The clitoris consists of two corporal bodies and glans clitoris, with a neurovascular bundle dorsally and wide urethral plate ventrally. The distribution and course of the neurovascular bundle of the clitoris is similar to that of the penis. The wide urethral plate with well-developed spongiosal tissue is adherent to the corporal bodies, causing ventral chordee. The clitoris has fundiform and suspensory ligaments, as in penile anatomy [5].

The current technique includes the release of the ventral chordee and clitoral ligaments, to straighten and lengthen the clitoris, and urethroplasty. The skin is incised around the glans clitoris at the border between the inner and outer layer of the clitoral prepuce (Fig. 1), continued around the urethral plate and native urethra that includes the distal part of anterior vaginal wall. After complete degloving the fundiform and suspensory ligaments are divided to advance the clitoris. The urethral plate is dissected from the clitoral bodies and divided at the level of the glanular corona. This completely straightens and lengthens the clitoris.

Urethroplasty consists of two parts: (i) the flap formed from the anterior vaginal wall is anastomosed with the urethral plate and the remaining part of the plate tubularized, thus lengthening the native urethra. The urethra is fixed to the corporal bodies to prevent retraction. (ii) the distal urethroplasty uses an island skin flap, harvested from the dorsal clitoral skin. A hole is made at the base of the flap, the flap transposed to the ventral side using a ‘button-hole’ manoeuvre, anastomosed to the native urethra and tubularized (Fig. 2). The suture lines of the tubularized urethra lie on the corporal bodies.

CONCLUSIONS
Metoidioplasty is an alternative to phalloplasty, allowing voiding while standing. In patients who desire a larger phallus, various techniques of phalloplasty can also be used.
The new urethra is brought to the top of the glans using the glans-groove technique and the penile body reconstructed using the remaining clitoral skin and labia minora flaps (Fig. 3–9). The labia majora are reconstructed as a scrotum. The immediate results of surgery are shown in Fig. 7. A self-adherent dressing is used for the neophallus, with suprapubic urine drainage and a urethral stent placed for 2 weeks. Prophylactic antibiotics were given to all patients for 7 days after surgery.

RESULTS

The mean (range) follow up was 3.9 (0.5–6) years and the neophallus was 5.7 (4–10) cm; 17 patients were satisfied with their penile size and aesthetic appearance (Fig. 8), while five patients required additional phalloplasty (Fig. 9). The complications were related to the urethroplasty, with two urethral stenoses and three fistulae.

DISCUSSION

Metoidioplasty is a technically difficult and challenging procedure for creating a neophallus from an enlarged clitoris in female transsexuals who do not wish to have sexual intercourse. The technique is possible in cases where the clitoris seems large enough to provide a phallus that will satisfy the patient. Lebovic and Laub [1] reported good results for voiding while standing, and a good appearance of the external genitalia, with a more male-like configuration. As the urethral plate remains intact the neophallus is usually small and curved. Hage [4] reported a modification of metoidioplasty characterized by urethral lengthening. The neourethra is created from labia minora flaps and the urethral plate, which is divided at the level of the urethral opening and dissected toward the glans. As the course of dissection is from proximal to distal, it could compromise the vascularization of the mobilized urethral plate. This type of urethral plate preparation is more difficult and associated with significant bleeding, and does not allow fusion of the remaining labia majora; the scrotum has a bifid appearance.

To overcome the disadvantages of reported techniques of metoidioplasty we developed a variant based on our experience of repairing the most severe forms of hypospadias associated with penoscrotal transposition [6]. The goals were to straighten and lengthen the neophallus, a complete urethroplasty and normal relationships of the neophallus and scrotum. The penis is straightened and lengthened by clitoral degloving, releasing...
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Both ventral chordee and dorsal ligaments. The urethral plate is dissected and divided at the coronal level so that its proximal vascularization remains intact. Urethroplasty includes urethral lengthening with joining of the anterior vaginal wall flap and urethral plate, and tubularization of the well-vascularized island clitoral skin flap. To obtain a normal appearance of the external genitalia, the labia minora are used to reconstruct the neophallic shaft, while the scrotum is created using labia majora, in which testicular implants can be placed. The complications of the technique were related only to urethral reconstruction, mostly from the tubularized urethroplasty. Most patients were satisfied with the final outcome of metoidioplasty for size and voiding position. In the five patients requiring augmentation phalloplasty, free microsurgical tissue transfer (forearm flap, latissimus dorsi, etc.) was used. All structures (urethra, corpora cavernosa, glans with neurovascular bundle) of the neophallus are used to provide a successful cosmetic and functional result.

Metoidioplasty is a single-stage and time-saving procedure; we recommend it as the method of choice when the clitoris is large enough to create a neophallus that will satisfy the patient. Metoidioplasty also represents a first step in cases where additional augmentation phalloplasty is required.

FIG. 2. After urethral plate tubularization, the native urethra is lengthened. (a) A longitudinal vascularized flap is created from dorsal clitoral skin and a hole made at the base of the. (b) The flap is transposed ventrally by a button-hole manoeuvre. (c) The flap is anastomosed with the native urethra (inset) and tubularization urethroplasty performed (d).
FIG. 3. The new urethra is brought to the top of the glans using the glans-groove technique. The penile body is reconstructed using the remaining clitoral skin and labia minora flaps (a) and the scrotum constructed using labia majora flaps (b).

FIG. 4. The flaps created from anterior vaginal wall and urethral plate are joined to lengthen the native urethra.

FIG. 5. A longitudinal vascularized island flap is designed at the dorsal skin of the clitoris and harvested with abundant vascular pedicle.
REFERENCES


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