CHAPTER 23
GENDER AFFIRMATION SURGERY

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I. GENDER IDENTITY DISORDER

A. Gender dysphoria describes a group of individuals who are dissatisfied with their anatomic gender and want to acquire the secondary sexual characteristics of the opposite gender
   1. Prevalence
      a. 1 in 11,900 males
      b. 1 in 30,400 females
      c. Worldwide population estimated at 15 million
B. Distinct entity from those individuals with congenital disorders of sexual development/ambiguous genitalia
C. Surgery plays a role in relieving their psychological discomfort
D. Gender reassignment surgery is the best option for normalizing their lives
   1. Genetic males are 3X more likely to seek surgical correction
E. Criteria for diagnosis
   1. Desire to dress and live as opposite gender (and make his/her body a closer resemblance to the opposite gender)
   2. Gender identity present for > 6 months
   3. Not a symptom of another genetic or psychiatric disorder
F. Treatment of these individuals requires a multidisciplinary team
   1. Mental health professionals for psychotherapy
   2. Patients need to have life-experiences in their desired gender role
   3. Hormone therapy (monitored by medical physicians)
      a. Feminization via suppression of androgens and induction of female characteristics
         i. GnRH antagonists
         ii. Estrogens
      b. Masculinization
         i. Testosterone: induces clitoral hypertrophy
      c. Special consideration needs to be taken for adolescents, and puberty suppression may be indicated
   4. Surgeon
G. Etiology unknown
   1. Current debate about whether or not this is a biological or psychosocial disorder
H. Likely a spectrum with male and female on either side and various gender identities in between (the gingerbread person)

II. HISTORY
A. Transsexualism is recorded throughout history, particularly in Greek and Roman literature
B. 1923 Transsexualism term coined by Magnus Hirschfeld, a German physician
C. 1931 Dr. Felix Abraham, a German surgeon, first to report staged vaginoplasty
D. Modern use of the word transsexual evolved in the 1940s
E. 1973 “gender dysphoria syndrome” coined describing individuals who had a conflict between their natal and desired gender
F. Current term is “gender identity disorder”
   1. Need to be contrasted from transvestites, who like to dress as the opposite gender but have no desire to change their gender
   2. Does not relate to sexuality or homosexualism
G. 1978 the Harry Benjamin International Gender Dysphoria Association was founded
   1. Plays a major role in research and treatment of these patients
   2. Publishes “Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People” which is now in its 7th edition
   3. Now known as the World Professional Association for Transgender Health (WPATH)

III. MALE TO FEMALE

A. Facial Surgery
   1. Frontonasal-orbital complex is greatest defining feature of male vs female face
   2. Male face:
      a. Increased supraorbital bossing, prominent forehead and glabella, forehead more angled
      b. Hairline with frontotemporal and overall recession (M-shaped)
      c. Squarer chin and jaw, mandible is larger and thicker with greater body height
      d. Malar area flatter but larger
      e. Larger in all dimensions than female face
      f. More muscle bulk
      g. Prominent thyroid cartilage
   3. Female face:
      a. Curved forehead
      b. Pointed chin
      c. Smaller nose
      d. More prominent malar region
      e. Less acute glabellar angle
      f. Rounded hairline
      g. Orbits are higher, more rounded, and larger
      h. Smaller overall than male, about 4/5ths the size
Figure 1. A more acute glabellar angle, a more acute nasal tip angle, a less open nasolabial angle, and a more pronounced chin are preferred in males. 


4. Typical procedures
   a. Brow lift
   b. Forehead/supraorbital bar reduction
   c. Frontal hairline advancement/hair transplant
   d. Feminizing rhinoplasty
   e. Genioplasty
   f. Masseter resection/mandibular contouring
   g. Malar implants
   h. Thyroid cartilage reduction
   i. Vocal cord shortening

B. Top Surgery (chest surgery)
   1. Often performed before “bottom surgery”
   2. Breast augmentation
      a. Some breast growth from hormones
      b. Different that natal female: chest is wider, nipple to IMF distance is less, areolae are smaller, pectoralis major more developed
      c. Implant can be placed pre- or sub-pectoral
      d. Any incision is ok: transaxillary, peri-areolar, IMF (most common)

C. Bottom Surgery (Genital reconstruction)
   1. Goals
      a. Need to create normal appearing vagina and mons pubis
      b. Need to create a sensate neoclitoris
      c. Need to create a large and deep enough canal for penetration
   2. Operations
      a. Skin graft creation of a vaginal canal, similar to McIndoe operation or with use of grafts from penile skin
         i. Pros: single stage, can hide scars, skin can be hairless
ii. Cons: Requires use of obturation and dilation

b. Penile inversion technique
   i. First line operation at most centers
   ii. Typically, the last stage of the gender confirming process
   iii. Pedicled penile and scrotal flaps for creation of neovagina and labia
        (from deep external pudendal, superficial perineal, and funicular
        arteries)
   iv. Anterior penile flap and posterior scrotal flap to create vaginal canal
        a) Can add skin graft for more length
   v. Labia majora from scrotum
   vi. Clitoris from dorsal glans penis
   vii. Labia minora and urethral flap made together from urethra
   viii. Pros: Lined cavity, minimal shrinking, sensate
   ix. Cons: Need for dilation, need for pre-op hair removal, may need
       revisions/labiaplasty for further feminization

Figure 2. Penile inversion vaginoplasty performed in a 51-year-old transgender woman. (Above, left) Preoperative genital area. (Above, right) An incision is made along the preoperatively marked pattern. (Second row, left) Blunt dissection of the neovaginal cavity is performed. Caution is taken not to sever the rectum. This is checked by bimanual palpation. (Second row, right) Bilateral orchiectomy is performed. (Third row, left) Penile skin is separated from the penile haft and closed at the distal end. (Third row, right) The dorsal neurovascular bundle is separated from the roof of the corpora cavernosa, and from a part of the glans penis and preputium the neoclitoris and the labia minora are sculptured. (Below, left) A linear incision is made into the raphe of the penile skin, and the penoscrotal flap is imbedded. (Below, right) Postoperative genital area. From Buncamper M, et al. Surgical Outcome after Penile Inversion Vaginoplasty: A Retrospective Study of 475 Transgender Women. Plast Reconstr Surg 2016;138(5):999-1007.
c. Intestinal transplantation
   i. Often used as backup procedure in severe stenosis requiring revision, or as first line procedure in adolescents who do not have adequate penile length
   ii. Pros: vascularized vagina with moist lining, decreasing the need for dilation and lubrication
   iii. Cons: intraabdominal operation, constant lubrication (sometimes excessive) that can be malodorous, diversion colitis, stricture and cancer of the reconstruction

Figure 3. Steps in the procedure of rectosigmoid vaginoplasty. (Above, left) The dissection plane is shown with a marked line that is anterior to the rectum and posterior to the bladder. (Above, right) The area of rectosigmoid colon to be used is shown within the dotted line and based on the superior hemorrhoidal artery. (Below, left) The rectosigmoid portion is harvested with continuity of the bowel established in an end-to-end fashion. (Below, right) Final anatomy of the male-to-female patient after the procedure. *From Morrison S, et al. Long-Term Outcomes of Rectosigmoid Neocolporrhaphy in Male-to-Female Gender Reassignment Surgery. Plast Reconstr Surg 2015;136(2): 386-394.*
IV. FEMALE TO MALE

A. Top Surgery
   1. Chest wall contouring/mastectomy
      a. Typically, the first surgical procedure in these patients
      b. Need to decrease breast/skin, obliterate IMF, reduction of nipple/areola
      c. Incision choices depend on amount of ptosis
         i. Subcutaneous keyhole or periareolar mastectomy for small breasts with minimal skin excess
         ii. Double incision mastectomy with free nipple grafts for medium and large/ptotic breasts


B. Bottom Surgery

1. Goals
   a. Neourethra capable of voiding
   b. Phallus for sexual penetration
   c. Aesthetically pleasing

2. Operations for phalloplasty
   a. Metoidioplasty/metaoidioplasty
      i. Stretching the hormonally hypertrophied clitoris, lengthening urethra with local flaps
      ii. Complications are usually urethral fistulas/strictures
      iii. Scrotoplasty from labia majora (can be concomitant or staged)
      iv. Pros: tactile and erogenous sensate clitoral tissue, sustained erectile rigidity without prostheses, minor donor site scarring, shorter hospitalization
      v. Cons: very small phallus so unlikely to be able to provide penetration, impaired standing urination
Figure 8. Result of metaoidioplasty and scrotum construction in a slim, 30-year-old female transsexual who has been on hormonal treatment for 6 years. (Left) Preoperatively, (Right) Postoperatively.

b. Pedicled flaps
   i. Urethroplasties are via tube within a tube design
   ii. More common in the pre-microsurgery era
   iii. ALT
      a) Pros: Reliable vascular supply, reduced total flap failure risk, hidden donor site, able to be innervated
      b) Cons: donor site may be too thick
   iv. Inferiorly based abdominal flaps
      a) Less aesthetic and higher complication rate
      b) Easier to hide donor site scars
      c) Diminished sensation
      d) Variability in vascular pattern
      e) Limited ability to void standing and unable to provide sexual penetration
   v. Pedicled groin flaps
      a) Similar to abdominally based flaps
      b) Insensate
      c) Functional problems the same as abdominal flaps
   vi. Gracilis flap
      a) Bipedicled design with two flaps
      b) Urethra made from skin graft
Figure 9. Illustration of the pedicled anterolateral thigh flap. A tube-within-a-tube design is used. The inner conduit becomes the neourethra, and the outer tubularized tissue represents the neophallus. The semicircular extension at the distal portion of the flap more accurately approximates the circumcised male phallus. From Morrison S, et al. Phalloplasty: A Review of Techniques and Outcomes. Plast Reconstr Surg 2016;138(3):594-615.

c. Free flaps
   i. Radial forearm  
      a) Most commonly used  
      b) Tube within a tube neourethra  
      c) Can be sensate  
      d) Pros: aesthetic reconstruction, standing urination, tactile and erogenous sensation  
      e) Cons: donor site morbidity, urinary fistulas/strictures, requires prosthesis  
   ii. Osteocutaneous fibula  
      a) Can be made sensate  
      b) Does not require a prosthesis  
   iii. Others  
      a) ALT  
      b) Latissimus flap
1. Can be made functional with inclusion of muscle/nerve and may be able to have erectile function

Figure 10. Illustration of the radial forearm free flap and the fibula osteocutaneous free flap. In the osteocutaneous free fibula flap, the fibula is harvested with a cuff of muscle, the peroneal artery, and either the lateral or posterior sural nerve to create the sensate phallus. The neourethra is created from a groin skin flap. In the radial forearm free flap, the tube-in-tube design is used to create a neophallus and neourethra in a single flap. The radial artery and the antebrachial nerves are harvested to create the sensate phallus. The Norfolk technique is used for the radial forearm free flap to create a glans.

Figure 11. Illustration of the Norfolk technique. A distal circumferential portion of the neophallus shaft is elevated and rolled to create the corona. A split- or full-thickness skin graft is then placed over the defect on the shaft. From Morrison S, et al. Phalloplasty: A Review of Techniques and Outcomes. Plast Reconstr Surg. 2016; 138(3):594-615.

Figure 12. Illustration of the gracilis flap. A bipedicled gracilis muscle flap is harvested and pedicled into the groin. Once joined together around a skin graft used for the neourethra, another skin graft is placed around the muscle. From Morrison S, et al. Phalloplasty: A Review of Techniques and Outcomes. Plast Reconstr Surg 2016; 138(3):594-615.
d. Other
i. Penile epithesis
ii. Penile transplantation
3. Requires vaginectomy, salpingo-oophorectomy, and hysterectomy
4. Scrotoplasty with testicular prosthesis
   a. Labia major flaps +/- implants or tissue expanders
      i. Good color and texture match
      ii. Embryologically from the same area
      iii. Have erogenous sensation
      iv. Can use pump for prosthesis to make one testicle

Figure 13. Illustration of groin flap. The groin flap with or without the iliac bone can be performed in either one or two stages. The two-stage procedure is based on the superficial circumflex iliac artery and the deep circumflex iliac artery. The lateral and medial skin edges of the flap are sutured together, constructing a tube still attached to the body. After some time, the flap is raised on its pedicle. The neourethra is reconstructed using a full thickness skin graft from the contralateral groin. From Morrison S, et al. Phalloplasty: A Review of Techniques and Outcomes. Plast Reconstr Surg 2016; 138(3):594-615.

REFERENCES


