

The role of colpocleisis with urethral lengthening in transsexual phalloplasty

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OBJECTIVE: Transsexual surgery is an unique area of rarely performed surgery. This study examines factors that have significance in the prevention of major morbidity in this unusual surgery. The role of the gynecologist in the psychologic, endocrine, and operative management is presented.

STUDY DESIGN: Initial operations were complicated by fistulas at the urethra-to-phallus anastomosis site. After reviewing these complications, we modified our approach to include a two-stage procedure allowing for healing before microsurgery and sparing of the anterior vaginal wall during vaginal hysterectomy and colpocleisis. By sparing the anterior vaginal wall, we were able to better extend the urethra for later phallus attachment.

RESULTS: Using the two-stage procedure at colpocleisis allowed a significant reduction in the fistula rate. ($p = 0.0087$) with the effective elimination-fistulas, the use of stiffeners during phalloplasty for better functional results is possible.

CONCLUSION: Extending the urethra during colpocleisis allows for better healing and significantly decreased fistula formation. Proper blood supply for microvascular surgery and adequate tissue for the anastomosis site contribute to better results. (Am J Obstet Gynecol 1996;175:1443-50.)

Key words: Transsexual surgery, colpocleisis, anterior vaginal wall extension, phalloplasty

Gender dysphoria is a psychologic condition characterized by genetic sex dissatisfaction. Patients feel "trapped" in the body of the wrong sex and desire hormonal and surgical reassignment to function socially in their desired gender. Harry Benjamin's book *The Transsexual Phenomenon*, published in the 1960s, attracted widespread media attention. The sexual reassignment of Christine Jorgensen and Dr. René Richards stimulated many dysphoric persons to seek therapy. The surgical complexities involved in reassignment surgery have resulted in most programs performing only male-to-female surgery. Our program is supported by strong plastic surgery and reconstructive urology programs, and we perform female-to-male surgery in addition to male-to-female surgery.

Material and methods

Our group consists of a nurse coordinator, a plastic surgeon, two urologists, two clinical psychologists, and a gynecologist. As previously reported,¹ patients are seen by all members of the committee and evaluated before

acceptance. The Harry Benjamin standards of care are used during patient evaluation to protect both the patient and the group from inappropriate care.² Our multispecialty approach strengthens proper patient selection in gender reassignment.

Transsexualism is commonly confused with other entities. Transvestite men derive their pleasure from wearing female clothing. Transvestitism in women is rarely recognized because the wearing of male clothing has no stigmas in our society. Some of these persons desire hormone therapy to assist in their cross-dressing; however, they do not desire actual sexual reassignment. Homosexual men are not confused as to their identity. They desire their genitals left intact to seek sexual gratification. Patients who are psychotic or have major personality disorders are difficult to evaluate. The Harry Benjamin standards are helpful in these situations. Psychologic evaluation must be performed by professionals who are familiar with and trained in the evaluation of transsexualism.

Candidates for consideration for hormonal and surgical reassignment must meet the following criteria, as modified from the Harry Benjamin standards: (1) The patient must demonstrate a desire for sexual reassignment for at least 2 years; (2) the diagnosis of gender dysphoria must be confirmed by our psychologists; (3) the patient must be in a psychotherapeutic relationship with a behavioral therapist for at least 2 years before

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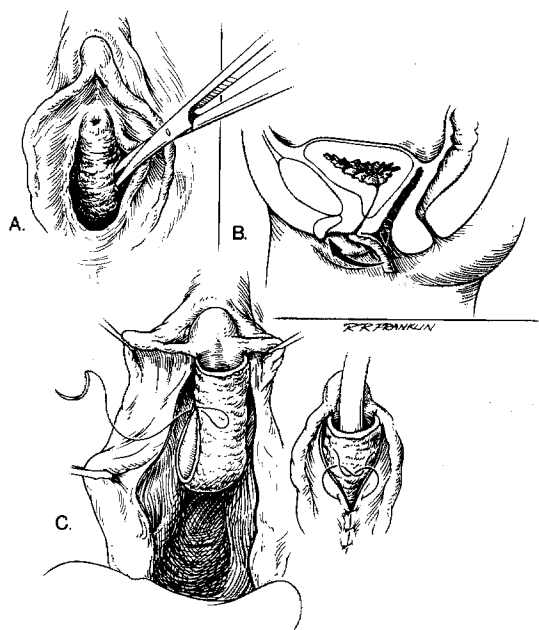


Fig. 1. A and B, Anterior wall of vagina is preserved while rest of vaginal mucosa is removed. C, This mucosa is rolled up to provide extension of urethra to base of clitoris. Labia minora are then sutured in the midline and urethra is closed over for healing phalloplasty.

reassignment; (4) before surgery, the patient must have been employed with a name change in the chosen gender; (5) after acceptance into the program the patient must complete at least 6 months of hormonal treatment.

All patients have basic laboratory studies, including a complete blood cell count, electrolyte and blood chemistry evaluations, human immunocompromised (human immunodeficiency virus) status, and a Papanicolaou test. Adequate social and financial support is essential to the successful completion of the program, especially surgical reassignment. A willingness to continue in a psychotherapeutic relationship signifies the patient's desire to work through inherent difficulties unique to the program.

Before any surgical reassignment, hormonal reassignment is initiated by the gynecologist after committee approval. Initially, female-to-male reassignment patients receive testosterone 200 mg intramuscularly every 2 to 4 weeks to suppress menstrual cycles. The responses to testosterone therapy are significant and include hirsutism, mild clitoral enlargement, and voice deepening. Many patients opt for better development of a male habitus through weight training. The success of initial stages of hormonal reassignment may be so successful that, depending on finances, some patients elect not to undergo surgical reassignment or only undergo mastectomy and chest contouring. Hepatic dysfunction with high-dose testosterone therapy used by athletes has not been reported in lower doses used by transsexuals.

Long-term effects of testosterone on lipid alterations have not been addressed, nor have the effects of early castration and hormonal changes on cardiovascular morbidity. In female-to-male reassignment, smoking and other addictions carry an unacceptable complication rate and are relative contraindications to hormonal and surgical reassignment. Microsurgical vascular techniques necessary for this procedure are not successful in heavy smokers, and therefore smoking is an absolute contraindication to phalloplasty.

Surgical aspects. The creation of a phallus has been associated with multiple surgical problems, and efforts are ongoing to improve function and appearance. The older, insensate phallus shriveled, and efforts to provide stiffness were associated with fistula formation and cutaneous erosions. The initial desire of our female-to-male transsexuals is not to have a functional phallus but to void while standing in the men's bathroom to elude disclosure. Others have expressed only a desire for a good appearance in swimsuits.³ Ultimately, most of our patients would like to be able to use the phallus sexually.

Hysterectomy and mastectomy have been performed on many patients before they enter our program and affect further surgical procedures. Mastectomy is accompanied by chest contouring and proper nipple placement. In many cases our plastic surgeon revises previous surgical attempts. Body contouring is performed on thighs and buttocks, and facial aesthetic surgery is also carried out.

Vaginal hysterectomy with bilateral salpingo-oophorectomy is currently performed together with colpocleisis. The vaginal introitus presents an access problem (lack of operating space) and is overcome by initially dissecting mucosa from the posterior aspects of the vagina, similar to Schuchardt's incision. The vaginal mucosa is initially separated posteriorly with the aid of submucosal injection of dilute vasopressin, creating a less vascular plane. If a hysterectomy has been previously performed, then removal of scarred vaginal mucosa from the apex is difficult. The cervix aids in dissection by allowing more access and traction to perform the colpocleisis. Although laparoscopy may be used to assist in hysterectomy and salpingo-oophorectomy, it has not been found necessary in our hands.⁴

Extension of the urethra to the base of the clitoris with the anterior vaginal wall mucosa has greatly reduced fistula formation. Colpocleisis also better supports the vascularity of this area, providing a well-vascularized anastomosis site for the next stage of creating a neourethra (Figs. 1 to 5). Previous surgical attempts that did not separate this phallic anastomosis from the immediate vaginal opening or left the vagina in situ created difficult urinary fistulas. Once the first stage of colpocleisis with urethral lengthening is allowed to heal, the final phallo-

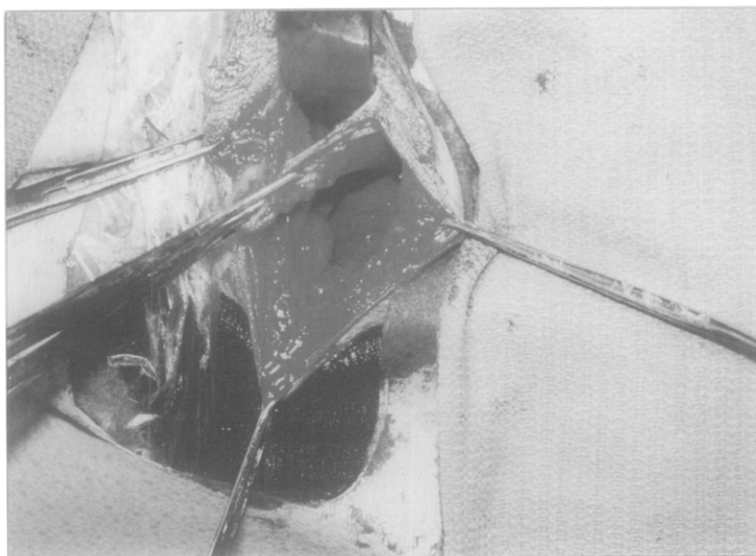


Fig. 2. Vaginal mucosa is dissected intact, with care taken to leave no islands of mucosa and to achieve homeostasis.

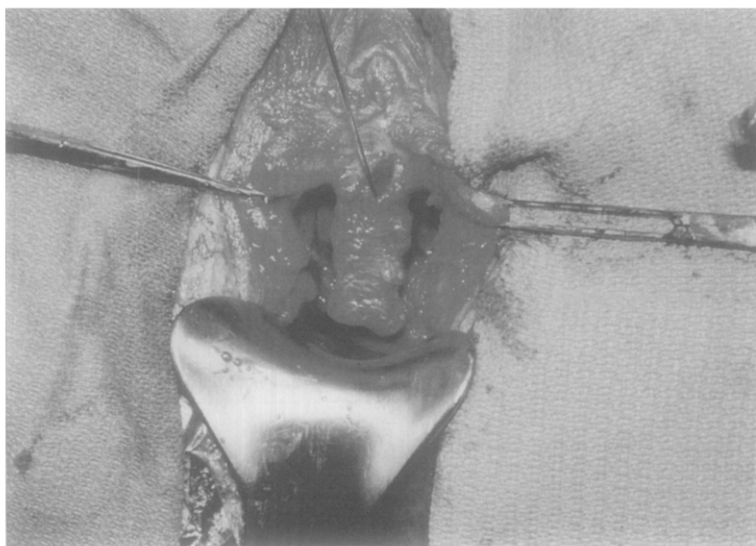


Fig. 3. Three to four centimeters of anterior vaginal wall is mobilized from distal urethra.

plasty can be performed. By eliminating occasional excessive blood loss, obvious vaginal bacterial contamination, and excessive anesthesia time, the two-stage procedure has decreased our rate of complications.

Final phallic construction involves the use of a radial or ulnar forearm flap for the neourethra and phallus⁵ (Figs. 6 to 9). The ulnar side is often devoid of hair and makes a satisfactory flap site for the urethra. Additionally, this anatomic site has reliable nerves, arteries, and veins that are identifiable for microsurgical anastomosis. Cutaneous nerves in the proximal shaft aspect of the flap are coapted to the internal pudendal nerves or clitoral nerves. In scrotal reconstruction the labia majora are

used as a bilabial bipedicle flap to cover the perineum and accept testicular implants. Occasionally, a gracilis myocutaneous flap is used for better support and to protect the urethral anastomosis site. A bulbocavernosus fat pad may also be used for protection of the anastomosis site. Currently, two different “stiffeners”—an inflatable type and a malleable rod—have been implanted and allow sexual function.

Results

Before we changed to a two-stage format, many of our procedures were complicated by urethrocutaneous fistulas and strictures that were quite difficult to repair. After

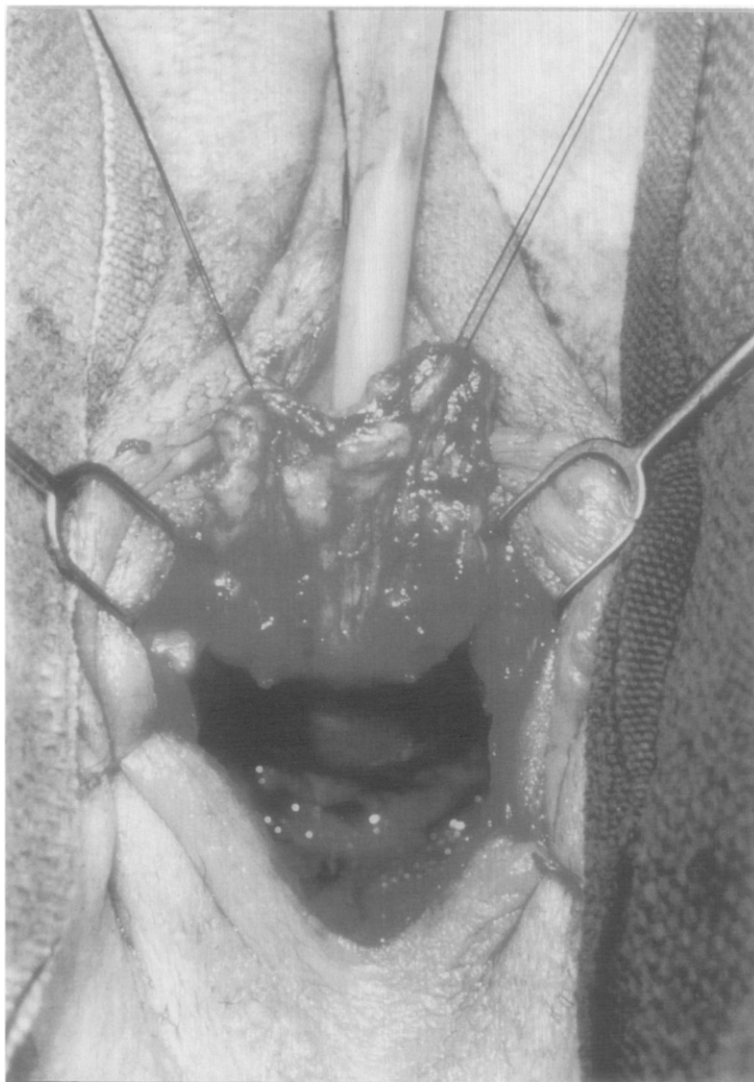


Fig. 4. Vault has been closed to just inside hymeneal ring, and vaginal wall extension is approximated to level of clitoris.

a gynecologist (R.R.C.) joined the group, five cases without urethral lengthening were all complicated by difficult fistulas. Subsequently, a two-stage procedure was instituted and 20 phalloplasty procedures have been performed. Fourteen were uncomplicated by any fistula formation (two-sided Fisher exact test, $p = 0.0087$). Three of the patients without complications had stricture problems requiring additional urethral dilation. All phalloplasties are associated with minor stricture problems. Of the six complications, five were associated with severe vascular problems (age >50 years, smoking, and obesity).

Vaginal hysterectomy with bilateral salpingo-oophorectomy was completed in five patients who had not previously undergone hysterectomy, and none had complications. The only gynecologic complication encountered

was kinking of a ureter in an obese patient who also had loss of the urethral flap. This patient had previously undergone a hysterectomy that created a difficult dissection of the mucosa from the vaginal apex. The ureter was stented without further complication. Three patients elected not to have a phalloplasty after the first stage. "Stiffeners" have been placed in five patients (one complication required replacement of the prosthesis), and several more are scheduled to be placed.

Comment

The goal of hormonal and surgical reassignment has been to provide the transsexual patient with a physical appearance that allows the person to function in society without ridicule. The initial efforts of our group were compromised by attempts to perform surgery in a single

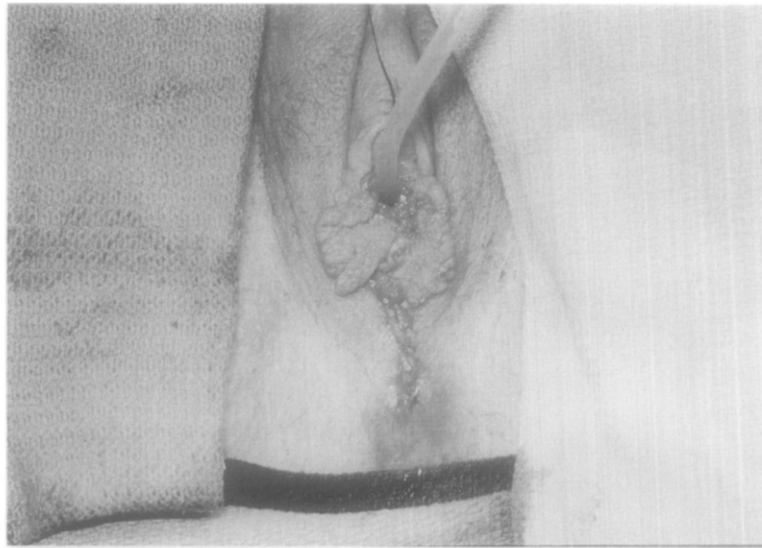


Fig. 5. Urethra has been lengthened to clitoris, and perineum is closed. This site will be allowed to heal several months before final phalloplasty, with removal of vaginal flora from final critical anastomosis.



Fig. 6. Sites are marked on nondominant forearm. (From Gilbert DA, Winslow BH, Gilbert DM, Jordan GH, Horton CE. Transsexual surgery in the genetic female. *Clin Plast Surg* 1988;15:471-87.)

setting. These operations involved 18 to 24 hours of operating time with complications of prolonged anesthesia, as well as breaks in sterile technique. Blood loss was excessive, and the hypothermia involved in extended surgery compromised microvascular anastomosis. There was much pressure from patients, especially those from as far away as Hong Kong, to come to Norfolk for only one visit. Patient expense and the need to return to our hospital for a second operation (and a third for a stiffener) were significant considerations. However, with the morbidity of fistula formation that healed poorly despite additional corrective surgical procedures, a modification was necessary. For other groups who may at-

tempt to perform this surgery, we believe a two-step approach is necessary to prevent the major morbidity that initially limited our group. In spite of initial significant morbidity we have now accomplished the goal of ensuring acceptance in society through a reasonable physical appearance (Fig. 10). We have also started to provide sexual function for some of our patients but acknowledge that this program is not without morbidity and requires motivated patients with proper social and financial resources.

The encouragement of Thomas E. Nolan, MD, was instrumental in the preparation of this article.



Fig. 7. Phallus is ready for transfer and closure of arm defect. Urethra has been tubed on itself, and then shaft is sutured over neourethra as a tube-in-a-tube.

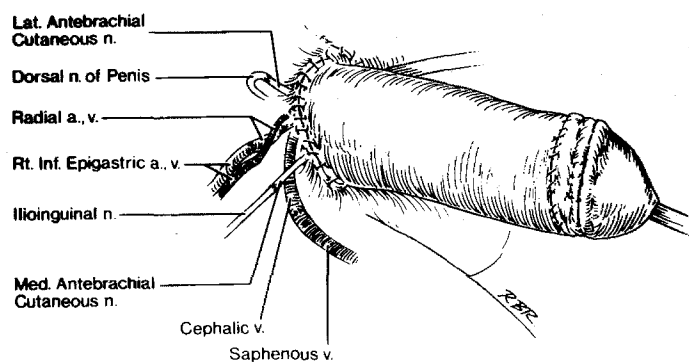


Fig. 8. Phallus sutured to perineum with neourethra anastomosed to urethral extension.

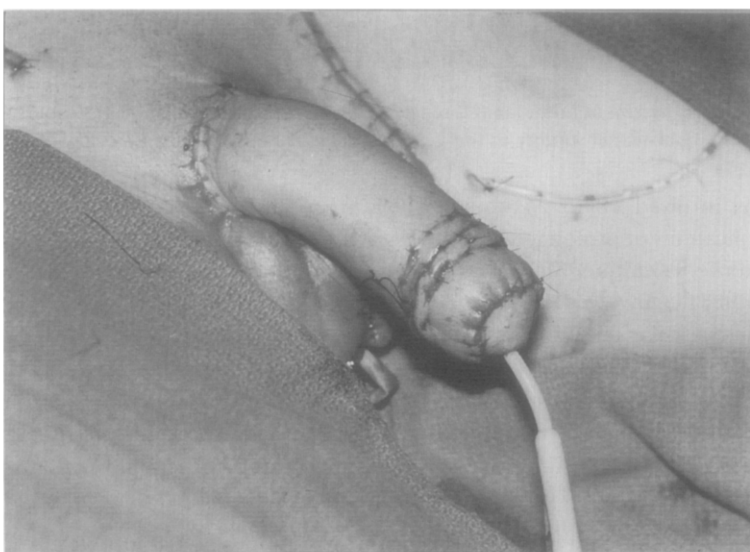


Fig. 9. Phallus is attached so that it will hang in a proper position.

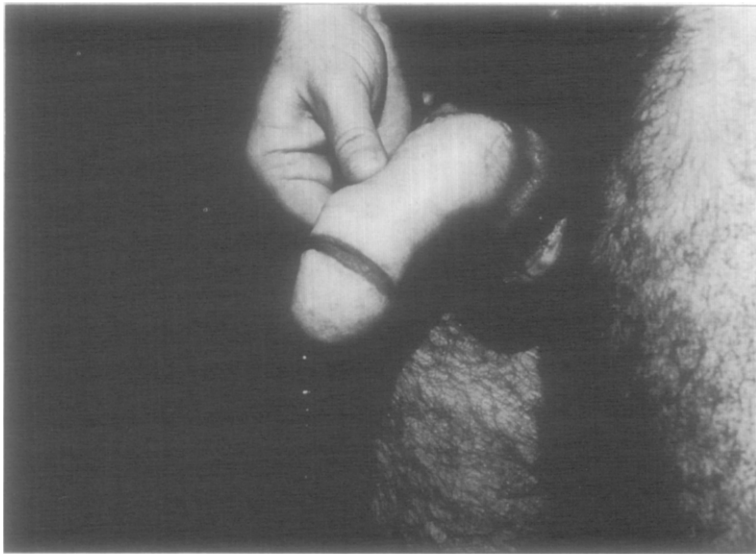


Fig. 10. Although somewhat large and bulky, it is functional and will pass in most male restrooms.

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Discussion

DR. JOHN A. ROCK, Atlanta, Georgia. I appreciate the opportunity to comment on this article. The authors correctly point out that the gynecologist plays an important role in the endocrine and operative management in cases of gender dysphoria. The gynecologist is more often involved in the care of male-to-female transsexuals; however, the uterus and ovaries must be removed and colpocleisis performed in the female-to-male transsexual patient. The gynecologist often supervises the administration of hormone therapy.

It is important to assemble a team of health care providers to care for these patients. Psychologists and plastic, urologic, and gynecologic surgeons provide a multispecialty approach that strengthens proper patient selection and gender reassignment.

The authors present their experience with reassignment surgery for female-to-male transsexuals. As has been noted, hysterectomy with bilateral salpingo-oophorectomy and colpocleisis is usually performed. There is debate on the usefulness of phalloplasty in these patients. The authors have met this challenge of creating a satisfactory phallus. The first stage consists of colpocleisis

with urethral lengthening. Extension of the urethra to the base of the clitoris with the anterior vaginal wall mucosa has greatly reduced the incidence of fistula formation. The final phallic construction involves the use of a radial or ulnar forearm flap for the neourethra and phallus. Occasionally, a gracilis myocutaneous flap is used for better support and to protect the urethral anastomosis site. A bulbocavernosus fat pad may also be used for protection of the anastomosis site. An implanted, inflatable and malleable rod allows sexual function. It is important that once Dr. Chesson became involved in the surgery team there was a marked reduction in fistula formation because of the above-mentioned modifications he suggested.

I have several questions for the authors: (1) Dr. Chesson, female-to-male transsexuals are usually psychologically well adjusted and often a pleasure to care for. They are in most instances married and often have adopted children to complete a family. Often these men take high-dose testosterone therapy. What is the current testosterone dosage and follow-up recommended by your team? (2) Although the complication rate was reduced with the modifications of the technique of phalloplasty, there was no mention of functional success. What percentage of the patients were able to have satisfactory intercourse?

This report demonstrates the importance of a multidisciplinary approach to patients with this type of gender dysphoria. Proper patient selection for gender reassignment maximizes the successful integration of these men and women into their appropriate role in society. The surgical modifications that have allowed successful phalloplasty are a significant advance, allowing these men to maintain appropriate self-esteem and sexual function.

DR. CHESSON (Closing). I thank Dr. John Rock for his insightful comments and his observation of how much fun it is to deal with these patients and their sincerity.

First, I'll answer the questions about sexual functioning. We had trouble using phallic stiffeners until the fistula problems were solved. Before we solved the fistula problems, some of our patients used several condoms with a "swizzle stick" type of arrangement for penetration. Once we began using stiffeners, our patients were more satisfied, but we do not have adequate long-term follow-up. Concerning testosterone therapy, we give patients an adequate dose for cessation of menses and for adequate virilization. Because we do not know the long-term effects

of testosterone therapy, I routinely review health factors such as the effects of testosterone on lipid profiles and the possible impact on cardiovascular disease. Because of the significant negative impact on lipids, we counsel them on other issues, such as cigarette cessation and the health benefits of exercise. We explain that the long-term effects of crossed hormone therapy are unknown.

Female-to-male transsexuals are very psychologically stable, whereas male-to-female transsexuals are unstable and are more difficult for us to evaluate and treat.

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