Reconstructive Surgery for Severe Penile Inadequacy

INTRODUCTION

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The biological male without a penis or with very insufficient penis remains a major challenge to the reconstructive urological surgeon. Severe penile insufficiency or absence of a penis are devastating conditions at any age with significant psychological and physical impact. We would like to discuss the treatment of these conditions in infants, children and adolescents, presenting our current experience in penile substitution surgery. Although uncommon, it is a difficult abnormality to treat. Possible treatment options are gender reassignment, tailoring of the penile stump, penile replantation, penile transplantation, and phallic reconstruction (phalloplasty).

In the past, sex reassignment to the female gender has been offered, based on the principles applied to newborns with Disorders of Sexual Development (DSD) and ambiguous genitalia. There is no evidence to show that the outcome of this policy is satisfactory. Indeed long-term evaluation of a few patients shows contradictory results, which have triggered great controversy of this therapy.1 The topic of gender reassignment is beyond the scope of this issue of the Dialogues in Pediatric Urology. However, some recent reports have alerted a high incidence of gender identity disorder in gender reassigned children. Especially in cloacal exstrophy the results have been especially disappointing.2, 3 Today sex reassignment is no longer considered treatment of choice.

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FROM THE EDITOR

Anthony A. Caldamone, M.D.

If you have read John Colapinto’s “As Nature Made Him,” you might wonder what the recommendation would have been for the boy with a traumatic loss of his penis had an acceptable technique for phalloplasty been available at that time. As a resident and fellow, I was engrained with the dictum that it is far easier to create a functional female than a functional male. This dictum was a significant driving force in sex assignment for the DSD population for many years. As we have more recently come to understand, sexual identity is more complex than the malleable nurture concept of the 1970’s and 1980’s. Roberto DeCastro and Piet Hoebeke are to be congratulated for pushing the envelope of reconstructive genitoplasty as they are providing us with viable alternatives to managing the patient with male sexual identity and penile agenesis or penile inadequacy.

As a resident and fellow, I was engrained with the dictum that it is far easier to create a functional female than a functional male.

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Introduction (continued from page one)

Tailoring of the penile stump by means of penile degloving, division of the suspensory ligament and rotational skin flaps has been reported. However, this can only by applied to moderate penile injuries which retain a reasonable penile stump.

Penile replantation can be attempted in the acute phase of traumatic amputation of the penis. The survival of the replanted penis depends on the viability of the amputated segment and the condition of the graft bed or penile stump. Replantation must take place within 24 hours. Current replantation techniques rely on microsurgical approximation of the dorsal structures and cavernosal arteries with uniformly good results. In traumatic amputation, salvage of the amputated segment with replantation is the primary treatment option. The outcome of erectile function after replantation is not very clear.

Recently, one case report has been published on penile transplantation. Transplantation is technically possible due to microsurgical approximation of the dorsal structures and cavernosal arteries with uniformly good results. In traumatic amputation, salvage of the amputated segment with replantation is the primary treatment option. The outcome of erectile function after replantation is not very clear.

Next to congenital conditions in which the penile development failed, traumatic events, medically necessary penile amputations and failed reconstructions of congenital anomalies are the main reason for penile insufficiency (Table 1).

There are 2 serious congenital conditions that perfectly and primarily match the definition of severe penile inadequacy: penile agenesis (aphallia, complete absence of the penis) and male cloacal exstrophy. In penile agenesis, the penis is totally absent, the scrotum is present and normal, and the testes are present and normal (occasionally undescended): replacement phalloplasty is required. In male cloacal exstrophy 2 short and deformed hemiphalluses are present attached on each side at the widely separated pubic braches, 2 hemiscrotums are present, and testes are present and normal: penile reconstruction may be impossible and phalloplasty required.

Selected cases of disorders of sexual development (DSD), as patients affected by 46,XY, PAIS (Partial Androgen Insensitivity Syndrome) DSD with female phenotype but male karyotype and identity, may require a genitoplasty with male genital reconstruction. Phalloplasty may be a crucial part of the necessary procedure. In patients affected by bladder exstrophy, penile reconstruction is part of the complex procedures needed, and acceptable penile function and appearance is usually achieved. The need for a replacement phalloplasty is rare, however, it may be necessary in case of severe corpora cavernosa and glans penis injury and deficit after neonatal epispadias repair or as result of multiple penile procedures.

Iatrogenic acquired aphallia for sub-complete penile loss during circumcision is fortunately extremely rare, especially compared with the enormous number of circumcisions done on daily basis. Nevertheless, it has happened and phalloplasty be required.

Finally, patients affected by complete traumatic penile amputation may be good candidates for replacement phalloplasty.

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<tr>
<th>Table 1: Conditions leading to severe penile insufficiency</th>
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<tr>
<td><strong>Congenital conditions</strong> (disorders of sexual development)</td>
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<tr>
<td>♦ Aphallia or penile agenesis</td>
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<tr>
<td>♦ Idiopathic micropenis</td>
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<td>♦ 46 XY DSD</td>
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<td>♦ Bladder exstrophy-epispadias complex</td>
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<tr>
<td>♦ Cloacal exstrophy</td>
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<td><strong>Genital trauma</strong></td>
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<td>♦ Injuries</td>
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<tr>
<td>♦ Surgery</td>
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<tr>
<td><strong>Penile amputation</strong></td>
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Severe Penile Inadequacy: Description of the Condition

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References
Psychological Impact of Living with Inadequate Male Genitalia During Adolescence

Coping with a chronic condition can add another dimension to the adolescence, which in itself is a time of tremendous biological and psychological change. For patients with a chronic illness, early adolescence is a time of risk for affecting body image, self-esteem and emotional development, due to the perception of being different from peers in a period when conformity is important.

Adolescents with inadequate male genitalia due to genitourinary anomalies have to deal with a so-called ‘invisible condition’. This condition is invisible being covered in their clothing, however, due to prolonged incontinence, residual genital defects and anaesthetic postoperative genital appearance, it can affect their psychosocial and psychosexual development.

Few data are available concerning psychosocial and psychosexual aspects in male adolescents with inadequate genitalia. Some research has been done on adults treated for hypospadias during childhood. These studies show socially and psychosexually well-adjusted adults, who have already gone through puberty. Due to methodological difficulties, such as lack of disease specific measures, lack of control groups and limited comparable data about ‘normal’ sexual development, extrapolation of results is rather difficult.

However, taken into account some of these limitations, Ebert et al. published an interesting study of 76 male patients with extrophy-epispadias complex (EEC) who were admitted to hospital, with a mean age of 14.5 years. The present health status was generally reported as positive, school education level and social integration was high, but the impairment of daily life due to their medical condition was remarkably high in about 25% of the patients. The main causes of impairment included incontinence, voiding problems, inability to participate in group sports and reluctance to shower in a group. In a study of Reiner et al., 12 (86%) of the 14 patients had never undressed in front of anyone outside of a clinical situation.

Contact with same and opposite sex peers was frequent in males. However, 58.7% of patients stated that contacting peers was influenced by the medical condition. Consequently, few close friendships existed, and sharing about extrophy-epispadias related problems such as incontinence and anxiety was rare. In more than 25% of the patients the medical condition was hidden from peers and in 16% no one outside the family knew about the presence of EEC. In the same study of Ebert et al., a subgroup of 32 male patients, 15 years or older, filled out an additional questionnaire to assess psychosexual development. More than 90% of the males never showered or undressed in a gym class. Sixty-two percent of the male patients never or rarely practiced masturbation, which was also found in a study by Reiner et al. In multiple cross-cultural studies, the prevalence of masturbation in this age group varies between 58.5% and greater than 90%. Sexual intercourse was present in 40% of the male patients but 60% of the patients had anxiety about sexual intercourse. All patients expressed heterosexuality. Male patients were dissatisfied with penile appearance (78%) and penile size (93.8%). Diseth et al. also found dissatisfaction with penile appearance and function in 59% of the adolescents with bladder extrophy and epispadias.

How to care?
Evaluation and long-term management must be performed at a centre with an experienced multi-disciplinary team. A key point to emphasize is that the child with an inadequate male genitalia has the potential to become a well-adjusted, functional member of society.

It is important to have open communication with patient and family, so the parents will do this also with their child. Parents need to be informed about sexual development and to be taught to talk about sexuality.

The adolescent with inadequate male genitalia listed as the most important coping strategies in parents: openness, normal upbringing, sufficient information. Also a supportive parental attitude regarding self-esteem and autonomy and providing adequate information about normal sexual development is recommended. Correct medical information and realistic information on possible outcomes can avoid future frustration. Transitional care should be organized with the multidisciplinary team operating in an environment comprising specialists with experience in both paediatric and adult practice. Finally, support groups can stop isolation and stigma, and can give a feeling of normalcy early on.

Conclusion
Inadequate male genitalia in adolescence have a negative impact on psychosexual development. These adolescents have more anxiety concerning genital appearance and sexual activity. Most patients have a good health status and a normal development. Long-term follow-up by different disciplines (urologist, psychologist) from childhood is important to avoid resistance in adolescence for additional psychological assistance.

References
Reconstructive Surgery for Severe Penile Inadequacy: Therapy in Infants

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From a surgical perspective, it is certainly easier to create a vagina than a penis, and this regrettably remains a criterion for gender assignment even today in some societies. In the sphere of the disorders of sexual development (DSD) and congenital and acquired severe genital disorders, this huge gap in surgical armamentarium between male and female genitoplasty definitely generates a disproportion of female gender reassignment, which sometimes leads to disaster.2,14,15,18 We have been interested in overcoming this limitation, reproducing male looking external genitalia very early in life and retaining male gender assignment in 46,XY individuals affected by congenital or acquired, total or sub-total aphallia. The most commonly used procedure for phalloplasty in post-pubertal patients is the micro-vascular radial forearm flap transfer, particularly utilized in transsexual genetic female, but it’s use is not recommended in growing individuals.11,13 Although alternative techniques have been introduced,6,8,12 microvascular radial forearm flap transfer phalloplasty is at the moment the only established procedure with controlled long-term results, and, therefore, is the gold standard procedure.

We have experience with a technique for phalloplasty that is appropriate for infants, the phalloplasty with abdominal flap (PAF).5 Obvious social and psychological reasons and possible complications related to the rectal ending urethra, when present, would justify early PAF in infancy. We first designed our method as a temporary surgical treatment, anticipating definitive forearm flap phalloplasty after puberty as the final procedure. Actually, we still must investigate the potentiality of PAF in the long term, evaluating the possible growth of the new phallus. Later we utilized our phalloplasty in older children when an alternative procedure was not available.

Indications
Penile agenesis (aphallia, complete absence of the penis)3,9,10,16 was the first indication for early phalloplasty in our series and it is still the most frequent, comprising 40% of the cases (Fig. 1). We have utilized the phalloplasty also in selected cases of DSD, patients affected by partial androgen insensitivity syndrome (46,XY, PAIS, DSD), with a clear and strong male identity. The same technique was used for infants with cloacal exstrophy with extremely poorly developed external genitalia,12,15,20 bladder exstrophy with severe penile deficiency after neonatal epispadias repair, iatrogenic acquired aphallia for sub-complete penile loss during circumcision, and for children affected by traumatic complete penile amputation. Any penile/glans-penis remnants were incorporated in the new phallus. Skin expanders were used in preparation of phalloplasty in cases of previous abdominal surgery and subsequent lower abdominal wall scars.

Technique
Our technique utilizes a quadrangular lower abdominal skin flap as previously described by Pryor1,13 for penile construction. An original aspect of PAF is the use of a free graft of mucosa for the urethroplasty to be incorporated in the skin flap, simultaneously as a free graft tube, or conducting a staged urethroplasty following the Bracka technique.4 Multiple staged urethral reconstruction is our preference most recently. This allows the use of the entire skin flap for the penis and glans penis replacement, avoiding the complications related to the long neo-urethras made of skin (as in Pryor’s original report), as well as the common free graft tube problems arising with the use of a free graft tube, which we experienced early in our series. Willing to persist on simultaneous total urethroplasty, the better outcome is certainly achieved when the new urethra is constructed with the combination of bladder (proximally) and buccal (distally) mucosa grafts. Construction of an adequate urethral meatus at the tip of the new glans penis is another challenging part of the operation. Moreover, in patients affected by exstrophy-epispadias complex, penoscrotal urethrostomy might be considered definitely adequate (at least during childhood), as well in other complex cases regardless of the original anomaly, or for patient’s preference.

Fig. 1 a, b: Classical penile agenesis.

Fig. 2 a - d: Rectal urethral ending, when present, is usually dissected via ASTRA with the patient placed in the prone knee-chest position.
Urethral dissection

In patients with aphallia, the urethra ends in the rectum in the majority of cases, or in the perineum or it is part of an associated ano-rectal malformation (ARM). The urethral dissection can be best appreciated in knee-chest position, through a posterior sagittal transrectal as described by Pena, an anterior sagittal transrectal approach (ASTRA), or a pararectal sagittal (Rink) approach. In the case of associated ARM, the Peña approach is the preferred option. When an isolated rectal urethra is present, we use ASTRA with no protective colostomy (Fig. 2). In PANS patients, the urethra is a straight, female shaped, ending inside of the vulva, sometime associated with a urogenital sinus (UGS). UGS, when present, needs to be opened. The pseudovagina, when present, should be removed, preventing formation and possible complications of a urethral diverticulum, nevertheless, following the principle of no ablative surgery in DSD patients during childhood, when possible, the pseudovagina might be left in place. Longitudinal vulvar mucosa flaps are available for urethral lengthening as far as the penoscrotal level.

In patients affected by cloacal or bladder extrophy, the previously reconstructed urethra has to be separated from the residual or deformed corpora cavernosa and from the glans penis when present. The urethra is normally long enough to reach the penoscrotal area as a penoscrotal urethrostomy. Actually, since extrophy-epispadias complex (EEC) patients may not be continent at this early stage, they may need further transurethral treatment or clean intermittent catheterization (CIC). Consequently, penoscrotal urethrostomy is the correct solution in the majority of infants and children with EEC, on a temporary basis or even definitively. Moreover, cloacal extrophy patients frequently have already had a continent urinary diversion, and, therefore, they need partial urethral reconstruction for proper ejaculation.

In patients affected by iatrogenic penile injury or traumatic penile amputation, the residual urethra has to be separated from the remaining corpora cavernosa. According to the urethral length, a urethrostomy is created at the penoscrotal junction or along the ventral aspect of the new phallus. A multiple staged distal penile urethroplasty may be subsequently performed.

Phalloplasty

PAF is created with a quadrangular skin flap, typically with the patient in lithotomy position (Fig. 3). The size of the flap is based on patient age and weight and scrotum width at its inguinal attachments. We utilized 4-5 x 5-6 cm flaps in patients less then 2 years of age, 6-7 x 7-8 cm flaps in 2-3 to 7-8 year-old ones, 9 x 9 cm flaps in 10 to 12 year-old ones, and 11 x 11 flaps in a 14 year old. The flap is partially defatted and rolled up, fashioning a cylinder that will reproduce the penis and the glans penis (Fig. 4, 5). Skin expanders may be used in preparation of the phalloplasty in case of previous abdominal surgery and subsequent lower abdominal wall scars or for older children to facilitate covering the large donor site. Residual corpora cavernosa, when present, are dissected and incorporated in the new phallus. In some patients, a glans penis or 2 hemi-glans penises (EEC), a microphallus, or a clitoris (DSD) are present. These precious tissues must be preserved for ergonomic purpose, dissected together with their corpora cavernosa (clitoris) or alone with their neurovascular bundles and incorporated in the scrotal raphe. In aphallia, when isolated cavernous tissue is identified, it has to be saved for possible future tissue engineering and re-utilization. If the ilioinguinal nerve is identified, it should be marked by metallic clip to possibly be utilized for neo-phallus re-innervation and sensation.

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The defatted abdominal skin flap is finally rolled and sutured dor-sally in a multiple layers (Fig. 5). A skin cylinder is fashioned (Fig. 6). The urethral meatus is sited at the upper crest, connected or not with the urethra. In the past we fashioned the coronal sulcus suturing a free graft of abdominal skin. A nice glans penis appearance is now obtained by inverting the skin edges (glanduloplasty).

**Donor site covering**

It is necessary to properly undermine the abdominal wall skin, together with its subcutaneous layers, to achieve a tension free suture at the inguinal fold. In the younger patients to cover the relatively small abdominal wall defect, the umbilical scar is detached from the rectal fascia attachment, the subcutaneous undermining extended cranially, the umbilicus re-fixed about 2 cm distally on the fascia, and a tension free inguinal closure of the donor site finally obtained (Fig. 6). In older patients in order to cover the very large abdominal wall defect, we make a circular incision around the umbilical scar and dissect the surrounding skin and subcutaneous tissue, leaving the umbilical scar in place. We extend the mobilization of the subcutaneous tissues far cranially and we pull the mobilized skin of the abdominal wall distally, creating a new passage for the umbilicus that is sutured at the adjacent skin. The skin hole of the previous umbilicus is closed and a tension free inguinal closure of the donor site lastly obtained. In these older patients, to facilitate the covering of the donor site and a tension free suture, we found it particularly helpful to place the patient nearly in a sitting-up position on the operating table during the final part of the procedure. This approximately 100-degree position is maintained for the 7 days postoperatively.

**Patients and results**

Eighteen PAF have been performed. PAF was used in the following pathological conditions:

- Penile agenesis, 7 cases (Fig. 7);
- Extreme micropenis with rectal urethral ending, 2 cases;
- Partial Androgen Insensitivity Syndrome (PAIS), 3 cases (Fig. 8);
- Acquired aphallia for complete penile loss during circumcision, 1 case;
- Traumatic penile amputation, 2 cases (Fig. 9);
- Cloacal exstrophy, 2 cases;
- Bladder exstrophy, 1 case.

Patients are divided according to age: we treated 10 patients less than 3 years of age (at the moment, only 1 of them, affected by iatrogenic aphallia for circumcision complication, already had a successful first stage of Bracka penile urethra reconstruction) and 8 patients over 3 years of age.

**Infants:**

- Age at the time of PAF: 5, 7, 9, 13, 17, 18, 24, 24, 29, and 36 months;
- Original disease: 4 penile agenesis with rectal urethra, 1 penile agenesis with perineal ending urethra, 2 extreme micropenis with a single corpora cavernosa and a rectal urethra, 1 PAIS, 1 bladder exstrophy, 1 circumcision complication;
- Type of PAF: 4 simultaneous phalloplasty and total urethroplasty and 6 phalloplasty and partial urethral reconstruction with scrotal/penoscrotal urethrostomy;
- Penile cosmetic outcome was considered as: excellent in 4, good in 4, poor in 2;

**Fig. 6 a, b:** The flap donor site is covered with a sliding flap of proximal abdominal skin.

**Fig. 7 a - f:** A 17 month-old patient with penile agenesis: a) before surgery; b) short-term outcome after PAF; c) 18 months later; d –f) 3.7 years later outcome. The new urethra accepts a 10 Fr. cystoscope.

**Fig. 8 a - f:** 18-month-old patient with PAIS: a) before surgery; b) clitoris is dissected and preserved; c) glans clitoris is inserted in the scrotal raphe, below the penoscrotal urethral meatus; d) immediate outcome after PAF; e and f) appearance one year postoperatively.
Urethroplasty complications when total urethral reconstruction was done simultaneously:
- 1 total penile urethra failure (perineal urethrostomy),
- 1 recurrent urethro-rectal fistula (redo rectal urethra separation and Mitrofanoff continent vesicostomy),
- 1 partial dorsal dehiscence with epispadic appearance (revision),
- 1 meatal/distal urethra stricture (multiple dilations);

Urethroplasty complications when partial urethral reconstruction was done simultaneously, maturing a scrotal or penoscrotal urethrostomy: none.

Children:
- Age at the time of PAF: 5, 5.5, 8, 11, 11, 11, 12, and 14 years;
- Original disease: 2 penile agenesis with rectal urethra, 2 PAIS, 2 traumatic penile amputations, 2 cloacal exstrophy;
- Type of PAF: 3 simultaneous phalloplasty and total urethral reconstruction and 5 phalloplasty and partial urethral reconstruction with scrotal/penoscrotal urethrostomy;
- Penile cosmetic outcome: excellent in 5, good in 2, poor in 1;
- Urethroplasty complications when total urethral reconstruction was done simultaneously:
  - 2 total penile urethra failure (penoscrotal urethrostomy),
  - 1 partial dorsal dehiscence with epispadic appearance (revision);
- Urethroplasty complications when partial urethral reconstruction was done simultaneously, maturing a scrotal or penoscrotal urethrostomy: none.

Conclusions

PAF has shown satisfactory outcome in our hands and it can be the appropriate preliminary treatment for infants and selected children affected by congenital, acquired, iatrogenic or presenting with a microphallus. Actually, we believe PAF is certainly indicated in the young children, at least from 5 years of age. We need a longer follow-up to evaluate the potentialities of this procedure. In particular we would consider the possibility for the new phallus to grow, reaching an acceptable size and being able to accept the insertion of a penile prosthesis, allowing erection and sexual intercourse. If this desired outcome occurs in some of the PAF patients, our procedure will be upgraded from temporary to definitive for those patients. If this proves not to be the case for some PAF, the “gold standard” phalloplasty, with microvascular transfer radial forearm flap\(^{11,13}\) or other new techniques\(^{6,12}\), might be applied to create a larger phallus.

The remaining open questions are related to PAF in children over 5 years of age: is PAF justified? Do social and psychological reasons validate PAF despite the potential of only temporary benefit? We do not have solid answers to those questions. At the moment, we have used PAF in older children only in cases of cloacal exstrophy or in when a specialized team in adult phalloplasty was not available or affordable.

Finally, we would like to emphasize the rationale that drove us in applying early phalloplasty in infants. We were interested to avoid that the so called “outside-sex” criteria (size of the phallus), its potential response to androgen stimulation, potential adult size, and presence of müllerian cavity might influence the gender assignment in case of 46,XY infant with absent, lost or very poor penis. We are deeply convinced that this unlucky individual must be raised as boy. The concern of physical and psychological problems related to penile deficiency is authentic, serious and critical, however, they do not justify female gender realignment, adding tragedy to tragedy. The right strategy is to retain the male gender and properly face the difficult circumstance from all points of view. PAF may help in this complex itinerary, and, indeed, it happened in our patients.

References


Fig. 9 a – c: A 11 year-old patient affected with total penile amputation and castration: a) before surgery; b) immediate outcome after PAF; c) penile appearance 6 months after phalloplasty.

Drawings by Dr. Francesco Paolo Di Lorenzo
Reconstructive Surgery for Severe Penile Inadequacy: Therapy in Adolescents

Surgical reconstruction of the penis or phalloplasty is difficult because of the different cosmetic and functional requirements:

- The aesthetic appearance of the neo-phallus must be as normal as possible (minimal scar, reconstruction of the glans).
- The penile shaft must contain a urethra in order to void in a standing position and with a normal stream.
- The penile shaft must allow the implantation of a penile stiffener in order to obtain the possibility of sexual intercourse. For this implantation protective and erogenous sensitivity is required.
- Morbidity of the donor area must be minimal and the scar should be easy to conceal.

The first phalloplasty was described by Bogoras in 1936, but it was a very complex, time-consuming, multistage procedure with suboptimal results. Phalloplasty has followed the advances made in plastic surgery and also used the development of microsurgical free flap techniques. Chang completed the first successful microsurgical phalloplasty with a radial forearm free flap in 1984. Most of our knowledge and skills regarding phalloplasty are from surgery for female-to-male transsexuals. Nowadays, the radial forearm free flap is considered the golden standard, although different types of free and pediculated flaps are described and used.

Surgical technique

In biological males the urological team prepares the recipient area. Depending on the underlying condition we try to preserve any useful penile and cavernosal tissue. The urethral stump if available is prepared for connection with the phallic urethra and if available a dorsal penile nerve is identified. At the same time, the plastic surgeon is dissecting the free vascularised flap of the forearm, the creation of a phallos with a tube-in-a-tube technique is performed with the flap still attached to the forearm by its vascular pedicle. A small skin flap and skin graft are used to create a corona and imitate the glans of the penis. The free flap is then transferred to the pubic area and after the urethral anastomosis, the radial artery is microsurgically connected to the common femoral artery in an end-to-side fashion usually with an interpositional vein graft taken from the ankle. The venous anastomosis is performed between the cephalic vein and the greater saphenous vein. One forearm nerve is connected to the ilio-inguinal nerve for protective sensation and the other nerve is anastomosed to the dorsal penile nerve for erogenous sensation. The defect on the forearm is covered with split-thickness skin grafts harvested from the medial and anterior thigh. All patients receive a suprapubic urinary diversion post-operatively. The patients remain in bed for a one-week period after which the transurethral catheter is removed. One week later the suprapubic catheter is clamped and voiding is started. It may take time before effective voiding is achieved. The average admission period for the phalloplasty procedure is about 2.5 weeks. Tattooing of the glans can be performed after a 2 to 3 month period, before sensation is returned to the penis (Figure 1).

The results of phalloplasty using radial forearm free flap in penile insufficiency are encouraging, as the aesthetic appearance is good and donor morbidity is low (Figures 2, 3, 4). As mentioned earlier, other types of free flaps have been described. Djordjevic et al. reported the musculocutaneous latissimus dorsi free flap, Sengezer et al. suggested the osteocutaneous free fibula flap, and Felici et al. described the anterolateral thigh flap (ALT-flap). They all report satisfactory results. The type of free flap that is used mostly depends on personal preference and the experience of the plastic surgeon that is involved in phalloplasty. In case of uncertain pelvic anatomy, such as after multiple operations for cloacal exstrophy, the use of a pediculated flap is preferred because it brings its own blood supply to the phallus. Possible flaps are the pedicle island groin flap or the pediculated anterolateral thigh flap. Although aesthetic appearance is good, erogenous sensitivity remains a concern in these pediculated flaps. For this reason, it is very important to incorporate any residual sensitive penile tissue in the neo-phallus. We recently operated on 2 boys after cloacal exstrophy and used the ALT flap with excellent cosmetic result.

Only two series focused on the psychological impact of phalloplasty on these patients. Both series reported a significant improvement in the sexual and psychological status with a boost in self-esteem.

The major drawbacks of phalloplasty are the urinary complications and the problems with the penile stiffeners. Urethral strictures and/or fistulas are frequent (about 40%) and well known from the experience with transsexual phalloplasty. Secondary procedures are needed to treat these complications, especially the treatment of urethral strictures is challenging and difficult.

Obtaining sufficient rigidity to allow penetration is extremely difficult because there is no good substitute for the unique erectile tissue of the penis. The flaps that are used are too soft and the use of bone or cartilage implants has often resulted in complications and failure because of resorption, curvature or fracture. Thus, implantation of a penile stiffener is needed for sexual intercourse. The implantation must be withheld until the urethra is free of strictures or fistulas and until the phallus is endowed with sufficient protective sensation. This usually takes 12 months. Sufficient protective sensation is needed to prevent breakdown and erosion of the stiffener. Despite all, complication rates are high (20-50%). One of the possible explanations for this are the less vascularised skin and subcutaneous tissue in the neo-phallus, which can lead to chronic ischemia after implantation and subsequently diminished resistance against infection and perforation. Another reason may be the more frequent use of the penile stiffener in comparison with mostly older and less active impotent men, with a higher chance of malfunction on the long term.

Patients must be warned about these possible complications but despite this, phalloplasty is a valuable treatment option for severe penile insufficiency.
References

Conclusion

The penis is an exceptionally composite organ with several complex roles: urinary, fertility and psychosexual. When the penis is absent or absolutely inadequate, surgery is certainly still unable to totally replace it by recreating an anatomically and functionally normal organ with adequate sensation, erection and capability to convey sperm and urine. On the other hand, there are patients, affected by severe congenital or acquired penile insufficiency, who would greatly benefit from penile reconstructive surgery. Some of them may require a phalloplasty during their infancy, childhood or adolescence. We believe we should proceed in helping them, despite difficulties and complications.

A unique experience on phalloplasty in young patients has been presented in this issue of Dialogues in Pediatric Urology. Some of these technical proposals are new and only preliminary results can be offered at the moment. However, these procedures may open new prospectives in male reconstructive surgery, reproducing a partially efficient and cosmetically acceptable penis in infants, children and adolescents, with an immediate improvement in self-esteem and psychological behavior.

Pediatric Urology lost a friend and colleague, Hjalmar Johnson of Vancouver, Canada, on May 13, 2009. A Manitoban, from the Icelandic community of Gimli on Lake Winnipeg, Hjalmar ultimately founded and led pediatric urology at BC Children’s Hospital in Vancouver until his retirement in 1995. He was respected as a kind, honest, clever physician and mentor, who like most Canadians, loved hockey (and golf). He was a founding member of PUC (Pediatric Urologists of Canada) and PRIAPUS (Pacific Rim Association of Pediatric Urologists).

Although seemingly quiet, Hjalmar will be remembered by many for his wit and practical jokes. On one occasion, it was recalled that he filled a colleague’s umbrella with multi-colored condoms. When it rained, one can only imagine the response when the umbrella was opened. Apparently he offered 25 cents to each of various complex patients, hoping that they would see his junior associates in lieu of the “old man”. He will be deeply missed by patients and colleagues and our sympathy is extended to his family.

Martin A. Koyle, M.D.

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AAP
American Academy of Pediatrics, Section on Urology

APAPU
Asian Pacific Association of Paediatric Urologists

AUA
American Urological Association

ESPU
European Society for Paediatric Urology

EUA/
Egyptian Urological Association/

PAUSA
Pan African Urological Surgeons’ Association

ICCS
International Children’s Continence Society

SFU
Society for Fetal Urology

SIUP
Ibero-American Society of Pediatric Urology

SPU
Society for Pediatric Urology

PUNS
Pediatric Urology Nurse Specialists

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INSIDE THIS ISSUE......

Reconstructive Surgery for Severe Penile Inadequacy

♦ Severe Penile Inadequacy: Description of the Condition
♦ Psychological Impact of Living with Inadequate Male Genitalia During Adolescence
♦ Reconstructive Surgery: Therapy In Infants
♦ Reconstructive Surgery: Therapy In Adolescents