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'Bird-Wing' Abdominal Phalloplasty: A Novel Surgical Technique for Penile Reconstruction

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Phallic reconstruction is indicated when penile development is either deficient due to congenital anomalies or loss of penis due to any cause or gender dysphoria. Increasing recognition of the role played by androgens in the perinatal period & gender dysphoria occurring later in life has led to a paradigm shift in approach to gender assignment. As a result masculinizing genitoplasty is increasingly offered to children with aphallia and complete androgen insensitivity syndrome. Increasing acceptance of the transsexual individual by society will result in an increase in the number of patients presenting for sex reassignment of the various procedures in vogue the most popular has been forearm flap others being-anterolateral thigh flap suprapubic flaps, lateral arm free flaps & extended pedicle island groin flap Current procedures involve aggressive interventions with undesirable sequelae. The high level of expertise required for performing the currently available techniques also limit their use. Perfect technique does not exist and no flap can be considered the gold standard.

There has been considerable reduction in the use of microsurgical techniques for penile reconstruction over the years. Long-term results reflect the constraints in achieving desired results. Aggressive procedures leave behind unacceptable deformities at donor sites & less than expected outcomes. Single stage reconstructions have given way to staged reconstruction mainly due to complications associated with urethral repair. It is hoped, that, a simpler technique such as the abdominal 'bird wing' phalloplasty would be useful.

Factors deciding the approach to phalloplasty are: an aesthetically appearing neo-phallus which can permit penetrative sex like a natural male with minimal donor site scarring and a reproducible, practical application. The operative stages include: Stage 1–formation of the phallus, Stage 2–formation of the urethra, Stage 3–sculpting of glans & placement of testicular prostheses (where necessary) & Stage 4–insertion of penile prosthesis.

Various procedures can be used in the formation of neo-urethra, such as, labial urethroplasty, buccal mucosal grafting, use of posterior auricular skin & use of anterior vaginal wall.

We describe a novel technique which can be easily performed with a staged approach.

Technique

The vascular supply of the flaps is dependent upon superficial and deep circumflex iliac artery and superficial inferior epigastric artery (Fig. 1). Under general anaesthesia, patient is placed in lithotomy position. Urethral lumen is catheterized easily by inserting an age appropriated Foley's catheter. A 'bird wing' incision was marked with its base in suprapubic/mons pubic location and lateral extensions upto lower abdominal skin crease extending to both flanks (Fig. 2a). The base to limb ratio of the flaps is kept at 4 or 5:1, so that adequate blood supply is ensured to the most distal end. It may be noted, that, a unique feature of this flap design is the common base which sustains blood supply to both the flaps (Fig. 2a). The depth of the incision reaches upto the anterior rectus sheath and the external oblique aponeurosis, from medial to lateral. Thus, the blood supply of this region is retained, namely, superficial epigastric and circumflex iliac vessels.

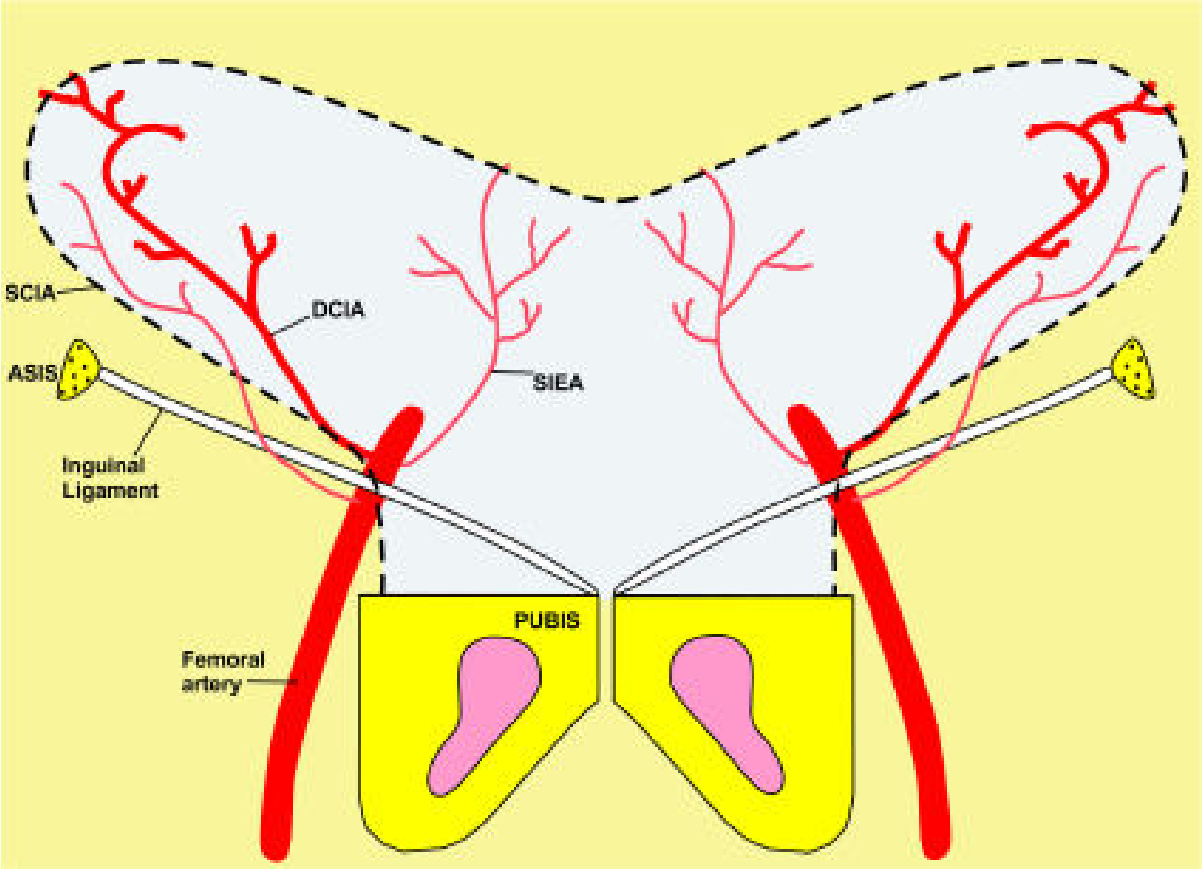

Fig. 1. Vascular supply to the 'Bird Wing Abdominal Flaps'

Abdominal 'flap-apposition' & phalloplasty

Both lateral 'wings' are approximated in the midline using subcuticular sutures (Fig. 2b). The phalloplasty remains viable even during the follow-up (Fig. 2c). Note the closure of donor area in a linear, skin crease suture line (Fig. 3a). The wound healing is excellent, both, at donor area as well as in the neo-phallus. (Fig. 3 and Fig. 4) and is ready for subsequent stages for urethroplasty & penile implantation.

The most common indications for phalloplasty in children include aphallia, micropenis, ambiguous genitalia, phallic inadequacy associated with epispadias/bladder exstrophy and female to male gender reassignment in adolescents. While scrotal phalloplasty serves as an excellent & reproducible technique its use is restricted as a temporizing procedure suited for neonates born with aphallia (penile agenesis). In older children, the goal of phalloplasty is to ultimately make an aesthetically appearing neophallus followed by creation of a competent neourethra, to allow for voiding while standing, and sufficient rigidity. It is desirable, that, the donor site should be left with minimal scarring and deformity.

Fig. 2a. A 'bird wing' incision is marked with its base in mons pubic location and lateral extensions upto lower abdominal skin crease extending laterally. The base to limb ratio of the flaps is kept at 4 or 5:1 so that adequate blood supply is ensured to the most distal ends. It may be noted, that, a unique feature of this flap design is the common base which sustains blood supply to both the flaps

Fig. 2b. (immediate postoperative): Both lateral 'wings' are approximated in the midline using subcuticular sutures

Fig. 2c. At 9 months

Fig. 3a, 3b and 3c. Note donor area suture line in lower abdominal skin crease & the immediate post-operative appearance of different cases

Fig. 4a, 4b and 4c. Preoperative (Fig. 4a) & early post-operative (Fig. 4b, Fig. 4c) appearances

The psychological effects from penile dysmorphic disorders may have serious consequences. Use of genitoplasty will become increasingly commonplace as patient satisfaction is reported. It would also be imperative to use a technique which would meet the goals of phalloplasty and at the same time simple to construct with least complications.

Urethral reconstruction in neophalloplasty presents a great challenge for surgeons who manage genital reconstruction. Different flaps (penile skin, scrotal skin, abdominal skin, labial skin, vaginal flaps, etc.) or grafts (skin, bladder, buccal mucosa) have been suggested for urethral lengthening. Although, possible in a single stage urethral reconstruction is generally delayed as Single stage procedure using free grafts is associated with high complication rates in order to allow adequate healing for the phallic procedure as has also been preferred in the present series.

The final stage in phalloplasty involves making a provision for rigidity required for penetration. Penile prostheses are subject to continuous development & divided into two general types: semirigid (malleable and mechanical) and inflatables. Fasciocutaneous phalloplasties require the insertion of a penile prosthesis for penetration. Complications include erosion, exposure, infection, mechanical failure, and penile fibrosis. Autologous tissues including bone and cartilage have been used; however, these materials can resorb over time or fracture. It is generally felt that insertion of a penile prosthesis should be done at a stage when the neo-phallus is completely healed and protective sensation has returned at around a year after the initial surgery.

For neonates and infants who require phallic reconstruction, we routinely offer scrotal phalloplasty as a temporizing procedure.[1] Abdominal phalloplasty should be undertaken prior to (as in our case 2) or just around the time of puberty (10–14 years) in an effort to minimize the psychological trauma associated with genital inadequacy. We offer abdominal phalloplasty as the definite procedure.

References:

1. Minu Bajpai, Scrotal phalloplasty: A novel surgical technique for aphallia during infancy and childhood by pre-anal anterior coronal approach. *Journal of Indian Association of Pediatric Surgeons*, Vol 17, Issue 4, October-December, 2012.