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Original Research Article

A Hospital Based Prospective Assessment of Correct Axis and Good Depth in Gender Affirming Vaginoplasties by Penile-Perineoscrotal Flap Vaginoplasty

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Abstract

Aim: The aim of the present study was to evaluate correct Axis and good Depth in Gender Affirming Vaginoplasties by Penile-Perineoscrotal Flap Vaginoplasty.

Methods: The present study was conducted at Department of Burn & Plastic Surgery, ESIC Medical college, Bihta, Patna, Bihar, India for one year and 100 patients were included in the present study. Mean follow-up was 11 months and maximum follow-up 2 years. The case records of these patients were analyzed for intra and postoperative complications. The study was approved by Institutional Review Board.

Results: There was one case of vaginal depth ranging from 7.5 to 9cm. Six (12%) patients had vaginal depth of 10 to 12 cm and remaining 43 (86%) being in the range of 13 to 14 cm (our largest dilator) or more at last follow-up. 38 (76%) patients had satisfactory penetrative sexual intercourse, 10 (20%) had not attempted intercourse, due to lack of a partner or being uninclined for various reasons. Two patients (4%) complained of poor sexual experience on account of inadequate vaginal depth.

Conclusion: PPSFV addresses the limitations in PSFV and results in good vaginal depth and posterosuperior axis, which facilitates penetrative sexual intercourse, at the same time, avoiding potential complications of procedures such as intestinal vaginoplasties.

Keywords: Vaginoplasty, Penile Inversion Vaginoplasty, Feminizing Genitoplasty, Gender Affirmation Surgery, Gender Incongruence, Gender Dysphoria.

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Introduction

FG is a complex, usually single staged procedure inclusive of vaginoplasty, clitoroplasty, labiaplasty, vestibuloplasty, shortening of urethra, and siting of urinary meatus to feminine location, orchidectomy, and corporectomy (except corpora cavernosa, all other penile components are utilized for construction of female pudenda). The procedure is known to alleviate gender dysphoria (GD) and associated mental health issues with significant increase in quality of life of these individuals. Vaginoplasties are also performed for indications like partial or complete agenesis, post malignant extirpation, post traumatic and other conditions, though the commonest indication remains, as part of FG. The first FG procedures in transwomen (TW) were performed on Dorchen Richter [1] and more famous Lile Elbe [2] (The Danish Girl) in 1931, likely with the use of skin grafts.

Hair removal is critical for gender affirmation surgery. In phalloplasty, any hair-bearing skin used for the neourethra can lead to chronic infection and obstruction. In vaginoplasty, failure to perform preoperative or intraoperative hair removal can lead to inaccessible hair deep within the vagina. This can result in a hairball, which can be a nidus for debris and infection. Therefore, we generally recommend pre-vaginoplasty removal of all penile shaft hair and scrotal hair when scrotal skin use is planned. Options for hair removal include electrolysis or laser hair removal. Electrolysis is an older technique involving epilation of individual hair follicles and often requires hours of treatment over months. A newer technique of laser hair removal more rapidly treats a patch of follicles by selectively targeting melanin in the hair shaft. [3] There are some benefits to each approach. Hair removal tends to be more efficacious for dark hair and light skin. Patients with light hair may have inadequate clearance from laser techniques, and electrolysis would be necessary. However, a systematic review by Haedersdal and Wulf favoured the efficacy of laser hair removal compared to electrolysis when feasible. [4]

Venous thromboembolism (VTE) is a risk during the perioperative period of vaginoplasty. The case can be associated with a prolonged operative time in lithotomy position, especially early in the learning curve. Patients are usually on chronic estrogen supplementation. Estrogen has been associated with VTE through numerous mechanisms. [5] Normal vagina is a fibromuscular tube lined with nonkeratinized stratified squamous epithelium with dimensions of 7.5 cm along anterior and 9 cm along posterior wall. It is inclined in a posterosuperior direction. The lining is lubricated by mucus from cervical glands, as there are no glands in the vaginal lining. The procedure of FG intends to create a pudendovaginal complex which is aesthetic and resembles the normal. It should be free of scars and neuromas, sensate at least at introitus, of adequate depth and with neither absent, nor excessive lubrication. The neovaginal axis should be directed poster superiorly to enable normal intercourse. [6-8]

The aim of the present study was to evaluate correct Axis and good Depth in Gender Affirming Vaginoplasties by Penile-Perineoscrotal Flap Vaginoplasty.

Materials and Methods

The present study was conducted at Department of Burn & Plastic Surgery, ESIC Medical college, Bihta, Patna, Bihar, India for one year and 100 patients were included in the present study. Mean follow-up was 11 months and maximum follow-up 2 years. The case records of these patients were analyzed for intra and postoperative complications. The study was approved by Institutional Review Board.

Inclusion criteria (including recommendations from WPATH SOCs 7 [7] and ISOC 1 [8]):

1. Has undertaken feminizing hormone therapy for minimum 12 months.
2. Has lived in desired gender role (feminine) full time for minimum12 months.
3. Is above 18 years of age.
4. Has stopped hormone therapy at least 4 weeks before surgery.
5. Has referral letters from two different mental health professionals confirming the diagnosis GD/incongruence and recommending genital gender affirmation surgery.
6. If the patient is a smoker, then she has stopped smoking at least 1 month before surgery.
7. Surgical steps included all the modifications in authors technique as described below.
8. Minimum postoperative follow-up of 6 months.

Procedure of Penile-Perineoscrotal Flap Vaginoplasty

1. Raising a perineoscrotal flap to augment the penile skin flap. The perineoscrotal flap is marked with its base 2.5 cm anterior to the anterior margin of anal sphincter. The flap is 5 cm wide-2.5 cm on either side of midline raphe. It is marked with a gentle anterior traction on scrotum by assistant, to a length of 15 cm, gently tapering at the end. The flap incorporates central perineal and posterior scrotal skin and soft tissue, and is raised in the plane of bulbospongiosus, to the region of perineal body posteriorly.
2. Bilateral testicles are removed, and full length of cords is retained for incorporation in ipsilateral labia majora instead of high ligation of spermatic cords at external inguinal ring. The retained cords are sited in ipsilateral labium majus, giving bulk to these structures.
3. Penile disassembly and resection of corpora cavernosa is performed conventionally.
4. Neoclitoris is formed by dorsal part of trimmed glans penis on dorsal neurovascular pedicle. The pedicle includes Buck's fascia and dorsal tunica albuginea. The neoclitoris is sited at the level of combined corporal stumps and sutured to these with folding of dorsal part of prepuce in a manner resembling clitoral hood. The neoclitoral pedicle is brought upward in a gentle curve and held in midline at the level of mons with a couple of edge sutures. The pedicle is then rolled into a tube and fixed at midline with a few sutures thus simulating clitoral body.
5. Labia minora construction: the remaining ventral glans wings together with ventral part of prepuce is sutured to the lateral margins of dorsal urethral flap medially, and later, with margins of slit in penile skin flap laterally, to form labia minora.
6. Vestibuloplasty and urethral meatus: urethra is transected at a level 4 cm distal to optimum feminine location at bulb. Bulbospongiosus fibers are removed from the exposed part of bulb and a vertical incision is given in it to expose the catheter. This is carried upward to the end of divided urethra. The resultant dorsal-based urethral flap around 4 cm long and 3.5 cm wide is sutured superiorly to the inferior aspect of neoclitoris and laterally to glans wings and ventral prepuce. This flap lines the vulvar vestibule. The other margins of incision in bulb are everted and sutured to the bulb and sutured later to the remaining margins of slit in penile skin flap to form labia minora.
7. Cavity dissection: This is done conventionally through the perineal body, in the plane between prostate and rectum, superiorly till pelvic peritoneum is reached. The rectovesical pouch peritoneal reflection lies around 7.5 cm from anorectal junction, at the level of mid third of rectum. This is loosely attached to rectum and can easily be stripped away, to attain a depth of 14 to 15 cm.
8. Sacrospinous ligament fixation of neovagina: A PDS suture is taken through one of the sacrospinal ligaments (usually right), at least 2.5 cm medial to ischial spine, to avoid injuring pudendal NV bundle, which always lies within 0.5 cm of ischial spine. A Deschamps ligature carrier is very helpful for this manoeuvre.
9. Construction of vaginal lining: the penile skin flap is now sutured to perineoscrotal skin flap with 3/0 Vicryl suture, to form neovaginal lining. The NV lining is fixed in position with the help of previously placed sacrospinal ligament suture. This helps prevent early postoperative prolapse of NV lining with any straining and

considerably eases the early postoperative care including dilatation.

10. Exteriorization of clitoris and neourinary meatus: an incision/slit is made in midline in PSF, avoiding the branches of external pudendal vessels, for exteriorization of neoclitoris and urinary meatus.
11. Construction of labia majora: done conventionally by pulling the lateral remnants of scrotal skin dartos flaps posteriorly to be sutured on either side of base of perineoscrotal skin flap.

Mold and Dressing

The NV cavity is checked for depth with the help of measured dilators and packed with a sterile glove containing U foam. The area is then covered with conventional perineal dressing. Epidural analgesia and thromboembolic deterrent stockings are continued for 3 days. Patient is discharged between day 3 to 5 postoperative.

Postoperative Regimen

On day 7 postoperatively, the vaginal mold is removed, cavity is irrigated with betadine saline and dilatation is performed. The patient is taught to self-dilate with graduated dilators. Urinary catheter is removed at same sitting. Patient continues self-dilatation for 15 minutes, three times a day. Dilatation is followed by irrigation of NV cavity. This is carried on till 3 months postoperative, at which time, sexual intercourse is allowed. In patients, who do not have a partner, dilatation continues with reduced frequency.

Results

In this cohort of 100 patients, whose surgery was performed, the average age was 29 (18–52) years. Mean follow-up was 11 months and maximum follow-up 2 years. The average surgical time was 4 hours. There was postoperative bleeding in one patient, which required return to OR on postoperative day 1. The bleeder was from tunica albuginea part of neoclitoral pedicle. There was no case with loss of neoclitoris.

Table 1: Vaginal depth

Vaginal depth	N%
7.5 to 9cm	1 (2%)
10 to 12 cm	6 (12%)
13 to 14 cm	43 (86%)

There was one case of vaginal depth ranging from 7.5 to 9cm. Six (12%) patients had vaginal depth of 10 to 12 cm and remaining 43 (86%) being in the range of 13 to 14 cm (our largest dilator) or more at last follow-up.

Table 2: Sexual intercourse experience after surgery

Sexual intercourse experience	N%
Satisfactory penetrative sexual intercourse	38 (76)
Not attempted	10 (20)
Poor experience	2 (4)

38 (76%) patients had satisfactory penetrative sexual intercourse, 10 (20%) had not attempted intercourse, due to lack of a partner or being uninclined for various reasons. Two patients (4%) complained of poor sexual experience on account of inadequate vaginal depth.

Discussion

Neovaginoplasty, as part of FG has been performed with the help of split and full thickness skin grafts, penile inversion techniques with various modifications, pedicled intestinal flaps and peritoneal

methods. Skin grafting techniques are prone to poor graft take with resultant granulations and prolonged discharge, loss of vaginal depth and shrinkage due to cavity and graft contracture, need for life-long dilatation, no lubrication, poor sensation, increased incidence of condylomatosis, human papillomavirus infections and carcinoma. [9,10]

In contrast, penile inversion vaginoplasties have less morbidity, as no abdominal procedure is required. Peritoneal vaginoplasty, though not a new procedure, has been performed in only a small number of patients, and the long-term results of neovagina are unknown. Penile inversion is the commonest procedure used for FG. Use of penile skin flaps is a significant advance over skin grafts. There are fewer tendencies for contracture. Sensate and usually hairless skin lines vagina. It is done in many ways: (1) abdominally based penile skin tube, (2) penile skin flap combined with perineal/scrotal skin flap, (3) penile skin flap augmented with urethral flap, (4) penile/ urethral flap extended with scrotal or other skin graft.

Also, due to relentless anterior pull, with healing, neoclitoris and urethral meatus too may get pulled to ectopic anterosuperior location. Also, the surface area of penile skin lining is limited. In a penile skin flap dissected from a penile length of average 5 to 6 inches, 2 inches gets consumed in negotiating and going around pubic symphysis, thus leaving only 3 to 4 inches available to line the neovaginal cavity. [11] In circumcised patients, in those on hormone therapy and in those, who had been on puberty blockers, even lesser length is available. Hence, use of only penile skin flap to line neovaginal cavity will result in a shallow vagina in most cases irrespective of the size of dissected cavity. Harvesting of perineoscrotal skin flap, adds a 15 x 5cm lining to neovagina, which depending on penile size, forms 50 to 60% of neovaginal lining, and the ability to line even the deepest dissected cavity. Since the flap is posteriorly based, it also balances the anterior pull on the penile skin flap, thus maintaining the neovaginal axis. Employment of perineoscrotal skin flap also ensures a posterior placement of vaginal introitus, which is necessary, to allow penetration in the narrow bony pelvis in TW. [15]

Our series results as detailed above compare favourably with previously published reports of complications during neovaginoplasty such as rectal injury (0.4–4.5% cases), [11-14] urethral injury (1.1–3.6% cases),27,30 postoperative bleeding requiring transfusion (4.8%),30 minor necrosis (24.6% cases)30 and major necrosis (0.6% cases),30 reoperation (1.5%),30 introital/vaginal stenosis (1.2–12%), [17,18] and urethral meatus stenosis (1–39%). [13,19] This may be due to the use of a refined procedure with many modifications in place in this cohort, surgeries by a single surgical team consisting of a senior and junior plastic surgeon and a GI surgeon with assigned tasks and set protocols. Many authors who use penile skin flap only, have employed additional skin grafts to extend the neovaginal lining. [11,16]

Over a period of time, under the stimulus of increasing surgical confidence and familiarity with tissue vascularity as well as increasing demands with reference to aesthesis by patients, authors technique has undergone significant changes. [20] The addition of perineoscrotal flap in dimension of 15 x 5 cm, together with other modifications as detailed above applied sequentially, reduces some disadvantages, which are inherent to the technique of penile skin flap inversion vaginoplasty, as well as result in better sculpting of pudendal organs such as neoclitoris, clitoral hood, and labia minora. Modifications of penile skin flap vaginoplasties remain the dominant

procedures today in the field of gender affirming FG.

Conclusion

FG is an integral part of gender affirmation surgery in TW. It helps alleviate dysphoria, improves body image and quality of life in their journey toward gender congruence. Penile inversion vaginoplasty remains the dominant procedure in this field, with minimal morbidity, but has many inherent disadvantages. In this paper, the authors present their version of the technique with many modifications to improve the aesthesis, sexual and urinary functions in the set patient population.

References

1. Dora Richter from Wikipedia. Accessed March 15, 2021 at: https://en.wikipedia.org/wiki/Dora_Richter
2. Lile Elbe from Wikipedia. Accessed March 15, 2021 at: https://en.wikipedia.org/wiki/Lili_Elbe
3. Zhang WR, Garrett GL, Arron ST, Garcia MM. Laser hair removal for genital gender affirming surgery. Translational andrology and urology. 2016 Jun;5(3):381.
4. Haedersdal M, Wulf HC. Evidence-based review of hair removal using lasers and light sources. Journal of the European Academy of Dermatology and Venereology. 2006 Jan;20(1):9-20.
5. Tchaikovski SN, Rosing J. Mechanisms of estrogen-induced venous thromboembolism. Thrombosis research. 2010 Jul 1;126(1):5-11.
6. Gupta R, Gupta R, Mehta R, Aggarwal A, Mathur A. Gender Dysphoria. In: Agrawal K, Mahajan RK, eds. Textbook of Plastic, Reconstructive and Aesthetic Surgery Volume IV. Noida, Uttar Pradesh: Thieme Publishers; 2019:259–293.
7. Coleman E, Bockting W, Botzer M, Cohen-Kettenis P, DeCuypere G, Feldman J, Fraser L, Green J, Knudson G, Meyer WJ, Monstrey S. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, version 7. International journal of transgenderism. 2012 Aug 1;13(4):165-232.
8. Gupta R, Kaushik N, Asokan A, et al. Surgical Care: Surgical Management of Gender Incongruence. In: Indian Standards of Care for Persons with Gender Incongruence and People with Differences in Sexual Development/Orientation Version 1. Delhi: Wisdom Publishers; 2020:66–165.
9. Bizic M, Kojovic V, Duisin D, Stanojevic D, Vujovic S, Milosevic A, Korac G, Djordjevic ML. An overview of neovaginal reconstruction options in male to female transsexuals. The Scientific World Journal. 2014 Jan 1;2014.
10. Selvaggi G, Ceulemans P, De Cuypere G, VanLanduyt K, Blondeel P, Hamdi M, Bowman C, Monstrey S. Gender identity disorder: general overview and surgical treatment for vaginoplasty in male-to-female transsexuals. Plastic and Reconstructive Surgery. 2005 Nov 1;116(6):135e-45e.
11. Reed HM. Aesthetic and functional male to female genital and perineal surgery: feminizing vaginoplasty. Semin Plast Surg 2011;25(02):163–174.
12. Perovic SV, Stanojevic DS, Djordjevic ML. Vaginoplasty in male transsexuals using penile skin and a urethral flap. BJU Int 2000;86 (07):843–850.
13. Goddard JC, Vickery RM, Qureshi A, Summerton DJ, Khoosal D, Terry TR. Feminizing genitoplasty in adult transsexuals: early and long-term surgical results. BJU Int 2007;100 (03):607–613
14. Krege S, Bex A, Lümmen G, Rübben H. Male-to-female transsexualism: a technique, results and long-term

follow-up in 66 patients. BJU Int 2001;88(04):396–402.
15. Buncamper ME, van der Sluis WB, van der Pas RSD, et al. Surgical outcome after penile inversion vaginoplasty: a retrospective study of 475 transgender women. Plast Reconstr Surg 2016;138 (05):999–10 07
16. Pariser JJ, Kim N. Transgender vaginoplasty: techniques and outcomes. Transl Androl Urol 2019; 8 (03):241–247
17. Salibian AA, Schechter LS, Kuzon WM, et al. Vaginal canal reconstruction in penile inversion vaginoplasty with flaps, peritoneum or skin grafts: where is the evidence? Plast Reconstr Surg 2021;147 (04): 63 4e–643e
18. Massie JP, Morrison SD, Van Maasdam J, Satterwhite T. Predictors of patient satisfaction and postoperative complications in penile inversion vaginoplasty. Plast Reconstr Surg 2018;141(06):911e–921e.
19. Rossi Neto R, Hintz F, Krege S, Rubben H, Vom Dorp F. Gender reassignment surgery—a 13-year review of surgical outcomes. Int Braz J Urol 2012;38(01):97–107.
20. I F., TM B., S D., OA T., AM K., B S., F C., L T., & J, T. Eye health status and cause of visual impairment in survivors of Ebola virus disease in the Republic of Guinea: Etat de santé oculaire et cause de déficiences visuelles chez les survivants de la maladie à virus Ebola en République de Guinée. Journal of Medical Research and Health Sciences, 2022; 5(10): 2317–2323.