

Review Article

Management of gender incongruence and gender affirmation surgeries – The Indian perspective, from a large volume gender identity clinic

Richie Gupta¹, Rajat Gupta¹

¹Department of Plastic Surgery, Fortis Hospital, New Delhi, India.

ABSTRACT

A mismatch between the birth sex of a person and psychological recognition of self (gender) leads to a gender expression, which is at variance with the societal norms, and thus gives rise to a persistent distress, which is known as gender incongruence (GI) (previously gender dysphoria). These persons are known as trans genders. A subset of these individuals feels that they are trapped in the wrong sexed body and need to bring their physical sex into alignment with their gender. The “gender” is already imprinted into the brain at birth, and hence cannot be changed, but the physical sex of a person can be, through gender affirmation surgeries (GAS). There has been relative paucity of data from India regarding medical and surgical affirmative management of trans persons, and hence, the authors present their experience in GAS together with current demography, hypothesis regarding etiology and management, as carried out in India. Authors have been providing comprehensive affirmative management to trans persons, through their multi-specialty gender identity clinic (GIC) sited in a tertiary care hospital. Over past 27 years, the senior author has performed over 3,000 GAS. The authors have noticed a 20- fold rise in presentation of these cases (from six cases per year in 1993 to now around 150 cases in the year 2019), an observation, which is similar to the experience of large volume GICs worldwide, as well as many recent publications. There has been a steep rise in the number of persons with GI worldwide, and those reporting at GICs. In the face of this rising number, authors present their experience, together with current demographics and management. Authors have also contributed to the first version of Indian Standards of Care for persons with GI and people with differences in sexual development/orientation Indian standards of care I in November 2020.

Keywords: Gender incongruence, Gender affirmation surgery, Gender dysphoria, Phalloplasty, Vaginoplasty

INTRODUCTION

Physical “sex” of a person is determined by the phenotype and is assigned at birth usually by parents and the physician. On the other hand, the word “Gender” refers to our psychological identification of self and its expression. Normally, one’s physical sex and “gender” are in alignment. In a few individuals, there is a noticeable and persistent incongruence between “sex” and “gender” to an extent, that the individuals wish to get rid of their primary and/or secondary sexual characteristics and acquire the physical/phenotypic characteristics of a gender, which is different from that of assigned (birth) sex/gender diagnostic and statistical manual of mental disorders, 5th edition (DSM-5).^[1] The inherent need by these persons to express their perceived gender, their longing for the society to accept them in this role, and their negative treatment by the society gives rise to a deep-seated pain/conflict referred to as “gender incongruence (GI)” (ICD11),^[2] (previously dysphoria DSM-5). Till as recently as 2007, the oft quoted prevalence rates^[3,4] for the GI were 1:11900 to 1:45000 for trans women

and 1:30400 to 1:200000 for trans men. However, the later literature suggests rates as high as 1:167 for trans women and 1:500 for transmen.^[5] Recent studies^[6-9] indicate that 0.4–1.3% of world’s population experiences GI. A California Health Interview Survey estimated 3.5% of all adults in U.S. to be lesbian, gay, bisexual, and transgender and around 0.3% transgender.^[10] A gender identity clinic (GIC),^[11] which treats 95% of all patients in Netherlands, estimated a 20-fold increase in the number of patients from 1980 (34) to 2015 (686). The authors experience has been similar, with increase in number of patients presenting with GI in their GIC over a period of 26 years from 6 in 1993 to around 150 new patients in 2019.

DIAGNOSIS OF GENDER DYSPHORIA (NOW CALLED GI) AS PER DSM-51

- A noticeable incongruence between the patient’s sex (assigned gender) and gender (expressed/perceived gender), persistent for minimum 6 months with at least 2 of the following criteria present

*Corresponding author: Richie Gupta, Department of Plastic Surgery, Fortis Hospital, New Delhi, India. guptarichie@yahoo.com

Received: 10 December 2020 Accepted: 02 May 2021 EPub Ahead of Print: 10 July 2021 Published: 23 December 2021 DOI 10.25259/IJMS_494_2020

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms. ©2021 Published by Scientific Scholar on behalf of Indian Journal of Medical Sciences

1. Noticeable incongruence between the patient's gender and primary and/or secondary sexual characteristics
 2. An intense need to do away with his or her primary or secondary sexual characteristics (or, in the case of young adolescents, to prevent the development of the secondary characteristics)
 3. An intense desire to have the primary or secondary sex features of the expressed gender
 4. A deep desire to transform into a gender, different from assigned gender
 5. A profound need for society to treat them in their expressed gender, which is different from assigned gender
 6. A strong conviction of having the characteristic feelings and responses of the alternative gender.
- The second necessity is that the condition should be associated with clinically important distress, or affects the individual significantly socially, at work, and in other important areas of function.

ETIOLOGY

Earlier postmortem studies of brains of transsexual individuals identified an area of hypothalamus, the bed nucleus of stria terminalis (BSTc), in which, the volume of nucleus and number of somatostatin neurons which normally differ in biologic males and females (biologic male brains have larger BSTc and higher number of somatostatin neurons), had a volume and number concordant with the perceived gender identity, that is, BSTc in trans women (who are biologic males) resembled that in the biologic women and vice versa.^[12,13] Recent studies indicate a strong genetic and neurologic basis for GI. GI has been associated with polymorphism in genes involved in steroid genesis^[14-17] especially repeat length variants of androgen receptor (AR), Estrogen receptor (ER), aromatase (CYP19), and CYP17. There is a higher incidence of GI in siblings, 4.48 times higher for trans women than trans men, and 3.88 times higher in brothers compared to sisters of proband.^[18] There is also, 33.3% concordance in monozygotic male twins and 22.8% in monozygotic female twins,^[19] even in the twins, who were reared apart.^[20] Trans women and trans men as well as men and women have distinct phenotypes in grey and white matter of brain. Human cerebral cortex is sexually dimorphic and has both AR and ER. Brain bundles connecting cortical regions and related to cognitive and emotional function show demasculinization in trans women and opposite in transmen.^[21,22] There is a complex interaction of hormones, genes, and cephalic structure in the formation of gender identity. Sexually dimorphic gene expression has been identified in mammalian brain. The expression of these genes occurs even before gonadal formation.^[23] These genes may lead to differentiation of gender (masculinization/feminization) of brain earlier than the SRY gene (gene

coding for testosterone synthesis, located on y chromosome) sponsored testosterone surge, which leads to physical differentiation of sex. This may be responsible for transsexual phenomenon – these persons feel that they are born in the wrong sexed body. As “Gender”, is firmly imprinted into the brain and thus corresponds to psychological identification of self, it cannot be changed. Gender can only be affirmed by bringing patient's physical sex into alignment with it. Hence, the surgical interventions which aim to relieve GI are best called gender affirmation surgeries (GAS) or sex reassignment surgeries (SRS).

COMPREHENSIVE MANAGEMENT AND GICS

Persons with GI are best managed by a multidisciplinary team consisting of Plastic Surgeons, Mental Health Professionals (MHPs), Endocrinologists, Gynaecologists, Urologists, related specialties, social worker, and advocate for facilitating legal work and affidavits. Persons who are transitioning from male to female sex are called “trans women”. Female to male transitioning persons are “transmen”. Ideally, the GIC should be in a discrete area of the hospital and have dedicated entry and exit. The registration area for these patients should be separate from general patients and there should be a provision in hospital information system to include patient's desired name and gender in all patient documents. The hospital documents may include the above as well as name and gender as per legal identity proofs, for medicolegal purposes. The washrooms should be gender neutral and clinic staff should be gender sensitized. One should ask the patient regarding the preferred pronoun, as well as which sexed chaperone should be present with the examining surgeon. After the interview, patient should be given a customized algorithm to follow for achieving a smooth transition.

Our current treatment plan is broadly based on our own experience as published in Indian standards of care 1 (ISOC1)^[24] (ISOC for persons with GI and people with differences in sexual development/orientation), as well as 7th version of Standards of Care for the health of transsexual, transgender and gender nonconforming people (7th SOC's)^[25] published by the World Professional Association for Transgender Health. These recommend one referral from a board- certified MHP working in this field before initiation of hormone therapy or breast surgery and two such referrals before genital surgery. However, the authors prefer to obtain both reference letters at the outset, as they feel that it makes the path to patient's transition smoother with a higher certainty in diagnosis. The letters of recommendation should include the following:

- a. The patient's demographic data, results of psychological assessment including a firm diagnosis of GI
- b. The duration of patient's evaluation and therapy
- c. A statement that any underlying mental health issues have been addressed

- d. That the patient is well informed about the irreversible nature of surgery
- e. An informed consent has been taken
- f. That the criteria for recommending surgery have been met
- g. That the MHP is available for any coordination of care and will welcome any call from the treating physician/surgeon for verifying the contents of the referring letter.

Before starting any reversible and non-reversible intervention for alleviating GI, it is important to discuss fertility preservation options with the patient, as between 37% and 76% patients opt for it, though the actual number undergoing the procedure is smaller, around 3.1% for trans men and 9.6% for trans women.^[26] Hormone therapy and surgery are likely to impact adversely, the patient's ability to reproduce, and hence, procedures such as sperm, testicular, oocyte, embryo, and ovarian tissue cryopreservation should be carried out as per requirement. Hormone therapy plays an important role in the management of GI.^[4] Puberty suppressing hormones such as GnRH analogs (Triptorelin 3.75 mgs once a month or 11.25 mgs once in 3 months) may be started at around Tanner Stage II of puberty (age 10–12 years). By delaying the development of secondary sexual characteristics, this reversible intervention gives the young patient, around 4 more years of time to explore one's gender identity and expression, spending the time productively in the company of peers, and without the obvious disadvantage of GI and associated social distress and depression. At around 16 years of age, cross sex hormone therapy (CSHT) may be initiated. CSHT eases the patient's transition into the desired gender role. Deepening of voice, growth of beard and moustache hair shifts in body fat distribution to masculine and better definition and development of musculature and cessation of menses with clitoromegaly goes a long way in adapting a trans man, who was otherwise a biologic woman, in the desired male gender role. Likewise, development of breasts, shifts in body fat resulting in feminine curves, smoother skin, reversal of male pattern baldness with better scalp hair growth and thinning with slower growth of facial and body hair help the transition of a trans woman, who was otherwise a biologic man, in a female gender role. Post-orchidectomy in trans women, the hormone therapy also plays an important role in bone health. In effect, hormone therapy provides a real-life experience for GI persons, as a partially reversible intervention, prior to surgery. Hence, ISOC¹^[24] and 7th SOC's^[25] recommend CSHT for 12 months prior to genital surgery for both trans men and trans women, unless patient is unwilling to take it, or it is medically contraindicated. CSHT is also recommended for 12 months as an optional criterion, for enhancing breast development before breast augmentation in trans women. After 12 months on hormone therapy, there is little if any further increase in breast size and the patient can realistically assess the need

for further surgical breast augmentation. It is important for the patient to undergo periodic consults and lab tests as advised by endocrinologist or hormone prescribing physician, to minimize the risk of side effects from CSHT. It is also important to stop oral oestradiol therapy 2–4 weeks prior to any surgery, to obviate the increased risk of venous thromboembolism.

GENITAL AND NON-GENITAL GAS

GAS/SRS helps in alleviation of GI and the associated conditions such as anxiety and depression. As per law, any irreversible intervention such as surgery can be only be carried out after the age of legal majority, which is 18 years in India.^[4] Although the procedure of informed consents is well established, and there is legal precedence in the form of Bidhan Baruah Judgment,^[4] when a division bench of Mumbai High Court observed that-there is no law which prohibits sex change operation and an adult (>18 years) can undergo sex change operation without the need of parental consent, the GAS still involves removal of normal organs. There have been instances in the past, where the surgeons were sued by the patients, pleading that the, patient had not understood the consent or, the surgery was forced upon them. Hence in India, we prefer to involve the court in the form of a notarized affidavit on a Rs. 100/- stamp paper, called "Waiver of Liability Affidavit,"^[27] in which the patient promises not to sue the treating GIC for undertaking the patient's surgeries. The affidavit explains the patient's need for transition and releases the operating team for removing the patient's normal sexual organs, causing irreversible loss of current sexual functioning and fertility. In case the patient is married, a spousal release affidavit may also need to be notarized for extra caution, though it is not legally necessary. Although these affidavits cause some extra expense to the patient, and the added discomfort of having to visit courts, these also go a long way in smoothening the doctor-patient relationship. These affidavits also imply that the state has been informed and the patient has had adequate opportunity and time to think about the implications of GAS.

It is important for the surgeon to motivate the patients to follow a proper pathway in their quest of surgical transition to the desired gender role. Living in a gender congruent role for at least 12 months, as mentioned in 7th SOC's is especially important for the patient, before undergoing genital surgery such as Phalloplasty/Metaidoioplasty or Vaginoplasty. This provides a real-life experience of living in desired gender role in all seasons, gaining a first-hand experience, and resolving any conflicts regarding gender expression and sexuality before undergoing the irreversible genital transformation, thus decreasing the chances of regret.

In general, core procedures are those, which are carried out in all gender incongruent persons, while ancillary procedures are the ones that are carried out on demand. Ancillary

procedures do not require any letters of recommendation from MHPs, and some of these may be carried out before the core procedures. The procedures are detailed in Table 1.

SURGICAL PROCEDURES IN GENDER INCONGRUENT PEOPLE

GAS in trans women

Breast augmentation

Breast development occurs once the patient initiates feminizing hormone therapy. However, after the initial 12 months period of hypertrophy, there is little if any further increase as the therapy continues. In contrast to the breast development in biologic women, who have extra fat around muscle origins and insertions, as well as axillary tail, which together with natural ptosis, produces a tear drop shape, the breast hypertrophy in trans women is hemispherical and conical, and without distinctive feminine curves or natural ptosis. Therefore, many trans women opt for surgical breast augmentation, often without waiting for this 12-months period. There are two common methods for breast augmentation:

- Autologous fat grafting – In this procedure, fat is harvested from an area in which there is excess – such as abdomen, love handles, and thighs under low suction pressure. This fat is then filtered, centrifuged, gravity sedimented and decanted or otherwise processed in operation theater itself to obtain the infiltrate, which has been shown to consist of purified fat cells, stromal vascular fraction, and adipose derived stem cells. This infiltrate is then injected into the appropriate area on chest wall for breast development. 1–4 sittings may be required, at intervals of 4–6 weeks each for optimum breast development to take place
- Breast augmentation with implant – Cohesive silicone gel implants are used for augmentation, commonly through inframammary or axillary approach. In contrast to trans women, biologic women have extra mammary fat overlying the origins and insertions on muscles in chest wall and axilla, thus softening the contours. Furthermore, their thorax is shorter and more conical. As a result, to compensate for this, trans women generally opt for larger size implants [Figure 1].

Feminizing genitoplasty (vaginoplasty, clitoroplasty, labiaplasty, vestibuloplasty, orchidectomy, penile corporotomy, and feminizing urethroplasty)

The goals of this procedure are – to create a perineo-genital complex, which is aesthetic and as feminine as possible, free of scars and painful neuromas, a vagina of adequate depth and dimensions, and lined by self-lubricating, and hairless epithelium, sensate and with correct axis. The urinary stream should be downwards in a sitting position. Unlike neovaginoplasty (NVP) in biologic women, this procedure is

more difficult in trans women, on account of a narrow pelvis and only a thin dense septum separating urinary bladder and rectum, which needs to be dissected carefully. The procedure of feminizing genitoplasty includes penile disassembly with excision of corpora cavernosa and testicles, neo-clitoroplasty, labiaplasty, and vaginoplasty [Figure 2]. Authors do not carry out high ligation of spermatic cords at external rings, and instead preserve the cord tissue for incorporation in ipsilateral labia majora. Orchidectomy is carried out. A small portion of dorsal glans penis based on dorsal neurovascular bundle forms the neoclitoris [Figure 2]. The urethra is shortened to female length and sutured in a manner that urinary stream is directed downwards. Vaginal cavity is dissected in the plane between urinary bladder and rectum, right up to peritoneum [Figure 2d] and lined by a tube consisting of inverted penile flap and a 5 cm ×15 cm perineo-scrotal flap (Author's own technique) [Figure 2]. The lining of the dissected cavity can also be carried out with other techniques such as

- Inverted Penile skin dartos flap tube with or without urethral, perineal, scrotal flap, or scrotal skin graft extension [Figure 2]. In authors practice around 80% of the patients undergoing feminizing genitoplasty opt for this technique
- Intestinal flaps such as sigmoid colon, ileum. In authors practice, around 20% of the patients undergoing feminizing genitoplasty opt for this technique
- Peritoneal flap
- Dilatation and traction techniques such as Frank's and Vecchiotti are more useful in cases of vaginal agenesis with biologic women, with laxer tissue planes
- Split and full thickness skin grafts are sometimes employed in cases, who have undergone castration end similar procedures elsewhere resulting in non-availability of penile tissue
- Non-genital skin flaps are used more often in cases of extirpation following resection in cases of vaginal malignancy. These are too bulky to be used in cases of NVP in trans women

Table 1: Gender affirmative surgeries carried out in trans persons.

Core surgical procedures for trans women	Orchidectomy, penectomy, vaginoplasty, clitoroplasty, labiaplasty, vestibuloplasty, urethral recession, breast augmentation
Core surgical procedures for trans men	Reduction mammoplasty (the top surgery), HSOV, urethroplasty, scrotoplasty, phalloplasty or metaidioplasty, placement of penile, and testicular implants
Ancillary surgical procedures for trans men and trans women	Hairline and scalp hair restoration surgery, facial harmonization surgery (feminizing/masculinizing), rhinoplasty, thyroid chondroplasty, affirmative voice surgery, body contouring surgery, lipoplasty, and implant surgery (pectoral/calf, etc.)

g. Jejunal graft, amnion, artificial dermis, and buccal mucosa grafts are also, not widely used in transsexual vaginoplasty. Vaginal dilatation is started at 1 week. The patients are taught to self-dilate the neovaginal cavity with the help of a set of dilators for a period of 3 months or till the time of initiating regular vaginal intercourse.

Ancillary procedures

These are carried out as per the need, and many trans women do not require these procedures. If the person suffers from male pattern baldness or receding hairline, this can be readily corrected to approximate a feminine hairline by hairline advancement procedures or hair transplants. Thyroid chondroplasty can be done to reduce Adam's apple. Voice can be feminized by a procedure on larynx, such as the tightening of guitar/violin strings, in a few minutes, and under local anesthesia. A male forehead, which is more

prominent with bulging supraorbital ridges, a wide chin, excessively prominent wide cheek bones, square jaws and nasal hump or convex nose, all of these can be feminized by facial feminization surgery and rhinoplasty. Removal of lower floating ribs can be done to mimic the shorter and conical feminine thorax and a narrow waist. Body contouring procedures such as liposuction and abdominoplasty can also be done as per the requirement.

GAS in trans men

Breast reduction ("the top surgery")

This is usually the first surgery carried out in trans men. Reduction of the breast mounds enables trans men to easily pass off as men, while wearing shirts or T shirts, and thus helps alleviate GI. It also frees them from the difficult and painful practice of breast binding and wearing loose fitting shirts. The common methods for breast reduction surgery are (a) inferior periareolar, if the breasts are relatively small sized [Figure 3], (b) concentric circular, if these are moderately large, and (c) double incision and free nipple grafting, if the breasts are really – large and ptotic.

Hysterectomy, bilateral salpingo-oophorectomy, and vaginectomy (HSOV) with pars fixa urethra reconstruction, scrotoplasty, and vaginectomy

In addition to the procedure of hysterectomy and salpingo-oophorectomy, the authors construct pars fixa urethra,

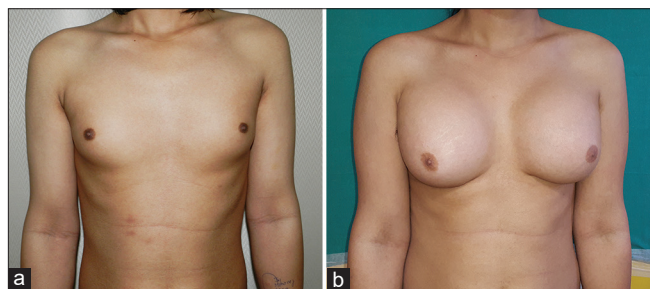


Figure 1: (Breast augmentation in a transwoman.

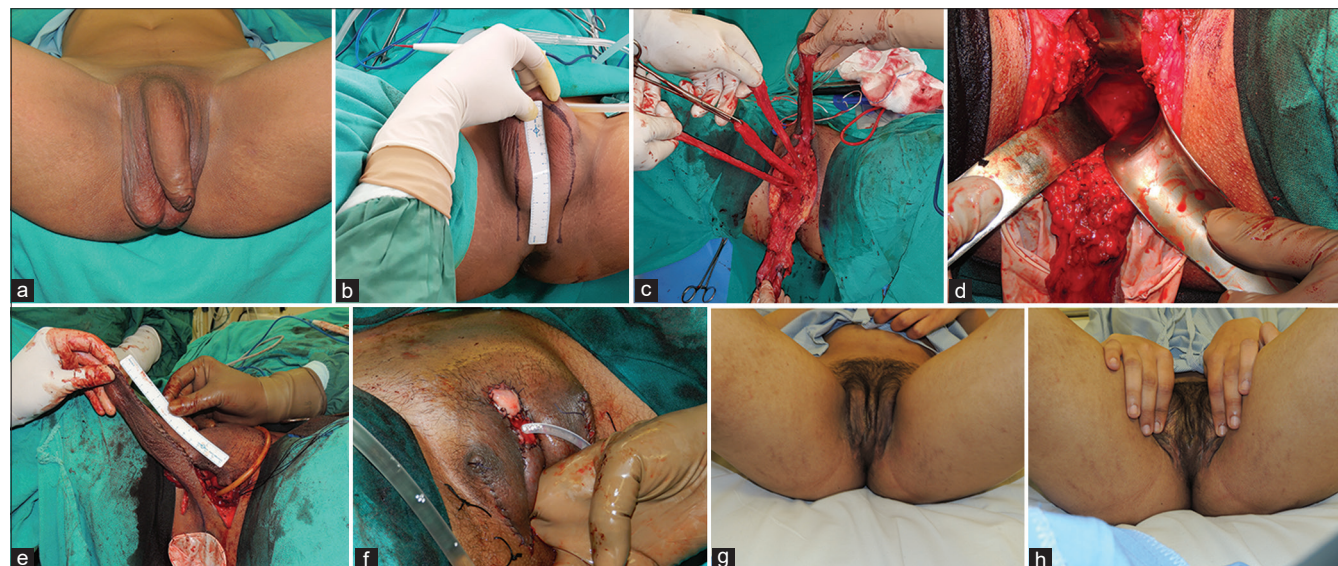


Figure 2: (a) Preoperative male phenotype. (b) Long 15 × 5 cm perineo-scrotal flap measured, (to be raised and added to penile flap, to form a deep vaginal lining, author's technique). (c) Penis disassembled into skin dartos flap (12 o'clock), glans with neurovascular bundle (11 o'clock), bilateral corpora (10 o'clock), corpus spongiosum with urethra (9 o'clock), and the raised perineo-scrotal flap (6 o'clock). (d) Vaginal cavity dissected. (e) Long vaginal lining constructed from penile flap and perineo-scrotal flap. (f) Completed feminizing genitoplasty. (g) Long-term result. (h) Long-term result with labia majora retracted.

thus extending the female urethra by 6–8 cm, so that the neo urinary meatus lies anteriorly, almost near pubic bone [Figure 4]. This facilitates the urethral anastomosis in subsequent surgeries. Sometimes, the authors also graft the excised vaginal mucosal lining to form urethra in the future flap, which will be used to form penis at a later stage, a process called prelamination. This is especially required in phalloplasty using thigh flaps, which are bulkier and hence difficult to fold in a tube in tube manner. In addition, authors also mobilize bilateral labia majora at this sitting, to form neo-scrotum [Figure 4]. This not only provides an additional waterproofing tissue covering over the newly constructed urethra but also enables them to close the perineum completely, as even a small residual pit at the location of obliterated vaginal opening propagates GI in these patients.

Masculinizing genitoplasty (phalloplasty/metoidioplasty, and urethroplasty)

The goal of masculinizing genitoplasty is – to construct genital organs, which aesthetically simulate the biologic male

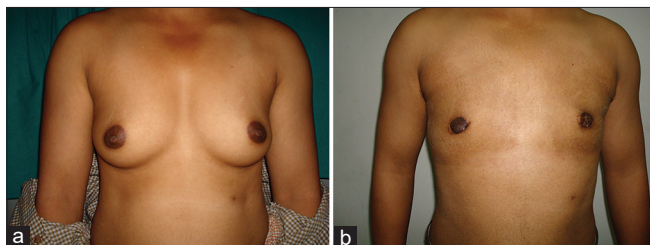


Figure 3: The top surgery- Breast reduction in a transman.

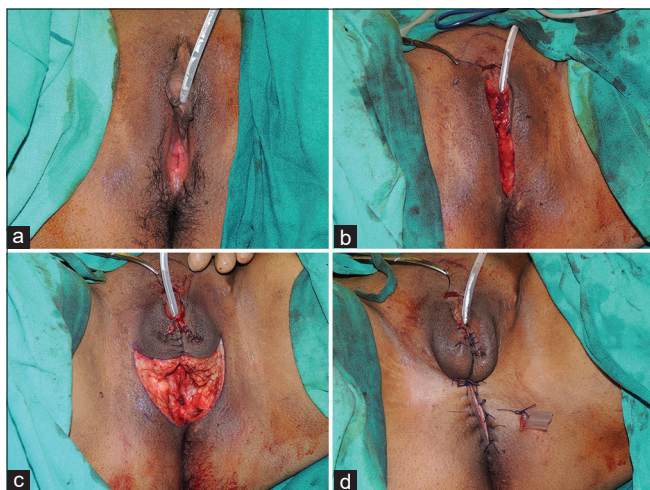


Figure 4: Pars fixa urethra construction and scrotoplasty, done in a trans man during the second stage surgery of hysterectomy, salpingo-oophorectomy, and vaginectomy. (a) Pre-operative status. (b) Pars fixa urethra constructed with urinary meatus advancement to pubic area. (c) Labia majora flaps transposed for scrotoplasty and perineal closure started. (d) Scrotoplasty and perineal closure completed.

genitalia, allow the trans man to easily micturate in erect position in a male washroom without soiling himself, and to enable him to function as a male partner in penetrative sexual intercourse. In this operative procedure, usually, the most complex of the core surgeries, penis is constructed from (a) the tissues of forearm (free-radial artery forearm flap phalloplasty [fRAFFp]), (b) thigh (pedicled anterolateral thigh flap phalloplasty [pALTp]), or (c) back (free musculocutaneous latissimus dorsi flap or [fMLDp]). Other flaps and sites are used uncommonly. The thigh flap can be transferred directly, but other two procedures require microsurgical free tissue transfer. RAFFp is still considered the gold standard for phalloplasty and provides excellent aesthetic result with natural size and shape and good sensation, as two nerves are anastomosed, one for general touch and the other for erogenous sensation [Figure 5]. However, many trans men do not opt for this procedure, as the skin grafted forearm donor site may be readily visible in short sleeved clothing and could be a giveaway for those conversant with the procedure. Furthermore, the size of phallus is limited by forearm length. In patients, who desire larger/longer phallus, or those, who wish to avoid forearm donor site, pALTp or fMLDp are recommended [Figure 6]. The authors carry out glansplasty at the same sitting in fRAFFp and at a later stage in pALTp. The resultant neopenis looks like a circumcised erect penis. Urethra is also constructed at the same time in fRAFFp, by using a part of flap skin rolled inside the outer part (tube in tube method) or rarely, previous prelamination. This penile urethra is anastomosed to the previously advanced urinary meatus to restore the urethral continuity. Previously constructed

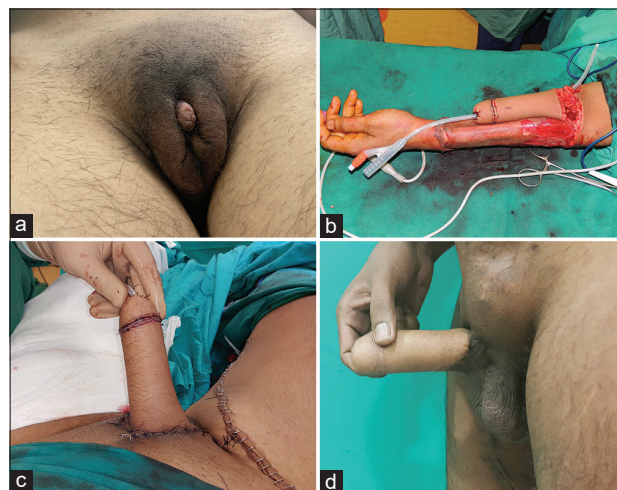


Figure 5: Free Radial artery forearm flap phalloplasty in trans man: (a) Pre-operative status with advanced urinary meatus and scrotum in place. (b) Neophallus constructed and still attached to donor forearm. (c) Immediate post-operative status after microvascular and microneural anastomosis. (d) Long-term result of free radial artery forearm flap phalloplasty.

scrotum is now sutured to the ventral aspect of neopenis, thus providing a waterproofing layer over urethral anastomosis. The complication rate of urethral fistula and stricture is close to 40% after phalloplasty. As a result, few patients do not opt for phalloplasty, and instead opt for enlargement of clitoris (Metaidoioplasty). In this procedure, the natural clitoral chordee is released and urethra is advanced to the tip of clitoris. Although this procedure does not enable the patient to engage in penetrative sexual intercourse in most cases, it allows for excellent erogenous sensation and orgasm, and in some cases, allows the patients to micturate in erect position.

Ancillary procedures

As there is no other erectile tissue in the body like penile corpora, a reconstructed penis is made in erect size. However, it still lacks the necessary rigidity, to allow vaginal penetration necessary for a sexual intercourse. On recovery of penile sensation at around 6 months, the erectile device is implanted, thus enabling the patient to engage in penetrative sexual intercourse. The device can be a malleable rod with hinge, or inflatable prosthesis. Testicular implants may also be implanted at this stage, if not done earlier. Mandibular implants, genioplasty, rhinoplasty, etc., can help masculinize a face. Laryngeal surgery can masculinize the voice. Pectoral implants in addition to top surgery can help masculinize the chest. Hi definition body contouring procedures and “six pack plasty” can help produce an aesthetic masculine abdominal appearance.

THE AUTHORS GIC

The senior author has been carrying out GAS since past 27 years, with more than 3,000 such procedures done till date. The number of new patients reporting at the outpatient department has increased from six cases in the year 1993 to nearly 150 cases (with 242 GAS procedures done) in 2019 [Table 2]. The author's GIC currently has specialists from around seven different specialties and is sited in a tertiary care hospital, providing comprehensive affirmative care.

CONCLUSION

GI and variance are a universal and culturally diverse phenomenon. These persons should be managed by multidisciplinary teams GIC's comprising various specialists, who are gender sensitive and well versed in managing such patients. Surgical management is a part of the comprehensive management of such persons and helps in alleviating GI. Not all patients require every surgical procedure. The surgical care of these patients needs to be customized to the patient's requirements. The goal of GAS is to allow these patients to live their life and freely express their gender in daily life without drawing undue attention to themselves.

Table 2: Gender affirmative surgeries carried out in the author's Gender Identity Clinic in the year 2019.

Type of surgery (Data from 1 st January 2019 to 31 st December 2019)	Numbers
Breast reduction in trans men (the top surgery)	35
Hysterosalpingo-oophorectomy with pars fixa	39
urethra construction with scrotoplasty and with or without urethral prelamination in flap	
Phalloplasty with or without primary urethral anastomosis	41
Urethral anastomosis, penile and scrotal implants and secondary surgeries for phallus	53
Breast augmentation in trans women	14
Feminizing genitoplasty (modified penile inversion/sigmoid)	45
Ancillary and other procedures	15
Total GAS	242

GIC: Gender identity clinic, GAS: Gender affirmative surgeries

Declaration of patient consent

Individual consents were taken from patients regarding publication of their photographs in medical journals and social media. Still, care was taken, not to disclose patient's identity in photographs.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- DSM5 American Psychiatry Association. Washington DC, London: Americal Psychiatry Publishing; 2013. Available from: <https://www.cdn.website-editor.net/30f11123991548a0af708722d458e476/files/uploaded/DSM%2520V.pdf>. [Last accessed on 2020 Sep 06]
- ICD 11. 17- Conditions Related to Sexual Health. Available from: <https://www.icd.who.int/browse11/1-m/en#/http%3a%2f%2fid.who.int%2fid%2fentity%2f411470068>. [Last accessed on 2020 Sep 17].
- De Cuyper G, Van Hemelrijck M, Michel A, Carael B, Heylens G, Rubens R, *et al.* Prevalence and demography of transsexualism in Belgium. *Eur Psychiatry* 2007;22:137-41.
- Gupta R, Gupta R, Mehta R, Aggarwal A, Mathur A. Gender dysphoria. In: Agrawal K, Mahajan RK, editors. *Textbook of Plastic, Reconstructive and Aesthetic Surgery*. Vol. 4., Ch. 11. Noida, Uttar Pradesh: Thieme Publishers; 2019. p. 259-93.
- Kuyper L, Wisjen C. Gender identities and gender dysphoria in the Netherlands. *Arch Sex Behav* 2014;43:377-85.
- Berli JU, Knudson G, Fraser L, Tangpricha V, Ettner R, Safer JD, *et al.* What surgeons need to know about gender confirmation surgery when providing care for transgender individuals:

- A review. *JAMA Surg* 2017;152:394-400.
7. Arcelus J, Bouman WP, van Den Noortgate W, Claes L, Witcomb G, Fernandez-Aranda F. Systematic review and meta-analysis of prevalence studies in transsexualism. *Eur Psychiatry* 2015;30:807-15.
 8. Conron KJ, Scott G, Stowell GS, Landers SJ. Transgender health in Massachusetts: Results from a household probability sample of adults. *Am J Public Health* 2012;102:118-22.
 9. Winter S, Diamond M, Green J, Karasic D, Reed T, Whittle S, *et al.* Transgender people: Health at the margins of society. *Lancet* 2016;388:390-400.
 10. Gates GJ. How many People are Lesbian, Gay, Bisexual and Transgender? Los Angeles, CA: Williams Institute, University of California, Los Angeles School of Law: Available from: <http://www.williamsinstitute.law.ucla.edu/wp-content/uploads/Gates-How-Many-People-LGBT-Apr-2011.pdf>. [Last accessed on 2020 Sep 17]
 11. Wiepjes CM, Nota NM, de Blok CJ, Klaver M, de Vries AL, Wensing-Kruger SA, *et al.* The Amsterdam cohort of gender dysphoria study (1972-2015): Trends in prevalence, treatment and regrets. *J Sex Med* 2018;15:582-90.
 12. Zhou JN, Hofman MA, Gooren IJ, Swaab DF. A sex difference in the human brain and its relation to transsexuality. *Nature* 1995;378:68-70.
 13. Kruijver FP, Zhou J, Pool CW, Hofman MA, Gooren LJ, Swaab DF. Male to female transsexuals have female neuron numbers in a limbic nucleus. *J Clin Endocr Met* 2000;85:2034-41.
 14. Henningsson S, Westberg L, Nilsson S, Lundström B, Ekselius L, Bodlund O, *et al.* Sex steroid related genes and male to female transsexualism. *Psychoneuroendocrinol* 2005;30:657-64.
 15. Bentz EK, Hefler LA, Kaufman U, Huber JC, Kolbus A, Tempfer CB. A polymorphism of the CYP17 gene related to sex steroid metabolism is associated with female-to-male but not male-to female transsexualism. *Fertil Steril* 2008;90:56-9.
 16. Hare L, Bernard P, Sanchez FJ, Baird PN, Vilain E, Kennedy T, *et al.* Androgen receptor length polymorphism associated with male to female transsexualism. *Biol Psychiatry* 2009;65:93-6.
 17. Fernandez R, Esteva I, Gomez-Gil E, Rumbo T, Almaraz MC, Roda E, *et al.* The (CA) in polymorphism of ERb gene is associated with FtM transsexualism. *J Sex Med* 2014;11:720-8.
 18. Gomez-Gil E, Esteva I, Almaraz MC, Pasaro E, Segovia S. Familiarity of gender identity disorder in non-twin siblings. *Arch Sex Beh* 2010;39:265-9.
 19. Diamond M. Transsexuality among twins: Identity concordance, transition, rearing, and orientation. *Int J Trans* 2013;14:24-8.
 20. Heylens G, De Cuypere G, Zucker KJ, Schelfaut C, Elaut E, Bossche HV, *et al.* Gender identity disorder in twins: A review of the case report literature. *J Sex Med* 2012;9:751-7.
 21. Rametti G, Carrilo B, Gomez-Gil E, Junque C, Segovia S, Gomez A, *et al.* White matter microstructure in female to male transsexuals before cross sex hormonal treatment: A diffusion tensor imaging study. *J Psychiatric Res* 2011;45:199-204.
 22. Rametti G, Carrillo B, Gomez-Gil E, Junque C, Zubiarre-Elorza L, Segovia S, *et al.* The microstructure of the white matter in male to female transsexuals before cross sex treatment: A DTI study. *J Psychiatric Res* 2011;45:949-54.
 23. Dewing P, Shi T, Horvath S, Vilain E. Sexually dimorphic gene expression in mouse brain precedes gonadal differentiation. *Brain Res Mol Brain Res* 2003;118:82-90.
 24. Gupta R, Kaushik N, Asokan A, Gupta R, Nair M, Kanjoor R, *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. New Delhi: Wisdom Publishers; 2020. p. 66-165.
 25. Coleman E, Bockting W, Botzer M, Cohen-Kettenis P, DeCuypere G, Feldman J, *et al.* Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, 7th Version. World Professional Association for Transgender Health; 2012.
 26. Neblett MF 2nd, Hipp HS. Fertility considerations in transgender persons. *Endocrinol Metab Clin North Am* 2019;48:391-402.
 27. Gupta R, Murarka A. Treating transsexuals in India: History, prerequisites for surgery and legal issues. *Indian J Plast Surg* 2009;42:233-40.

How to cite this article: Gupta R, Gupta R. Management of gender incongruence and gender affirmation surgeries – The Indian perspective, from a large volume gender identity clinic. *Indian J Med Sci* 2021;73:289-96.