

Gender-affirmation surgery and bariatric surgery in transgender individuals in The Netherlands: Considerations, surgical techniques and outcomes

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ABSTRACT

Introduction: The number of transgender individuals seeking medical and surgical care has increased over the last years. Within the transgender population overweight and obesity is more frequently observed when compared to the general population. Little is known on the prevalence of bariatric surgery in the transgender population and the effects on the surgical gender transition path of the individual transgender with overweight or obesity.

Material and methods: All transgender individuals who underwent gender-affirming surgery (GAS) between 1980 and 2020 were retrospectively identified from our hospital registry. Those with a history of bariatric surgery were selected. A retrospective chart study was conducted, recording gender identity, bariatric surgery specifications, gender surgery specifications, complications, reoperations and clinical follow-up time.

Results: A total of 15 transgender individuals (11 transgender men, 4 transgender women) who underwent bariatric surgery were identified. All individuals underwent bariatric surgery before any GAS procedure, except for one transgender man. At the first GAS procedure, all individuals experienced significant weight loss when compared to their weight at bariatric surgery (mean 13.1 ± 3.8 BMI points lost for transgender men, mean BMI points lost 14.3 ± 2.8 for transgender women, $p < 0.01$). Obesity was still frequently prevalent in transgender men after bariatric surgery. All included transgender men underwent mastectomy via the double incision with free nipple grafting technique. Only one transgender man underwent genital GAS. All transgender women underwent penile-inversion vaginoplasty, one in combination with prosthesis-based augmentation mammoplasty.

Conclusion: Surgical gender transition is possible after massive weight loss after bariatric surgery. Specific surgical subtechniques will be more prevalent in this population.

KEYWORDS



Transgender; gender dysphoria; gender affirming surgery; mastectomy; obesity; bariatric surgery

Introduction

The number of transgender individuals seeking medical and surgical care has increased over the last years (Arcelus et al., 2015, Wiepjes et al., 2018, Al-Tamimi et al., 2020). Gender-Affirming Surgery (GAS) is being performed more frequently worldwide, both in transgender men and women. GAS in transgender men may comprise mastectomy, facial masculinization surgery, and genital GAS (gGAS), which is either metoidioplasty or phalloplasty. GAS in transgender women may comprise breast augmentation, facial

feminization surgery, chondrolaryngoplasty or gGAS, which is either vaginoplasty, gender-affirming vulvoplasty or bilateral orchiectomy. Generally speaking, postoperative quality of life is good (Defreyne et al., 2017, Eftekhari Ardebili et al., 2020).

Compared to the general population, transgender individuals are more frequently overweight or obese (Bishop et al., 2020, Martinson et al., 2020). Literature indicates that >25% of transgender individuals are obese (BMI ≥ 30 kg/m²) in an initial GAS consultation in the United States.

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After initiation of hormonal therapy, an increase in BMI is frequently observed (Klaver et al., 2018). Also, the prevalence of eating disorders, such as anorexia nervosa and bulimia nervosa, is higher in transgender individuals when compared to the cisgender population, which has been linked to body dissatisfaction (Ålgars et al., 2010, Avila et al., 2019, Diemer et al., 2015, Nagata et al., 2020). There is a higher prevalence of co-existing psychological problems among transgender individuals than the general population. These may impede an individual to seek or adhere to, weight-loss interventions.

The negative effects of overweight and obesity on postoperative surgical outcomes related to wound healing are well known (Pierpont et al., 2014, Waisbren et al., 2010). Bariatric surgery improves quality of life and morbidity of comorbid diseases (Szmulewicz et al., 2019). Little is known on the prevalence of bariatric surgery in the transgender population and the effects of massive weight loss (MWL) on the surgical gender transition path of the individual. To this date, knowledge on this is anecdotal (Wynn & Clapp, 2018). In this article, a clinical sample of transgender individuals undergoing GAS with a history of bariatric surgery was studied.

Material and methods

Setting and subject identification

The Center of Expertise on Gender Dysphoria in Amsterdam is currently the only institution in the Netherlands providing all facets of transgender (surgical) healthcare, thus making our data suitable for (high-volume) trend analysis. All transgender, transfeminine and transmasculine individuals who underwent a form of GAS between 1980 and 2020 at our center were retrospectively identified from a departmental database. Individuals who underwent bariatric surgery were identified and included in this study.

Retrospective chart study

A retrospective chart study was conducted on these individuals, recording self-reported gender identity, individual characteristics (somatic comorbidities and co-existing psychological problems,

history of smoking and/or substance abuse), bariatric surgery specifications (type of surgery, BMI before surgery, postoperative characteristics after bariatric surgery), GAS specifications (type of surgery, surgical technique, BMI before surgery, intra- and postoperative complications) and clinical follow-up time (time between first GAS procedure and last outpatient visit at our gender clinic.

Definitions

Definitions regarding gender dysphoria were used as formulated in the Standards of Care for the health of transsexual, transgender, and gender nonconforming people (Coleman et al., 2012). Gender dysphoria was defined as discomfort or distress caused by a discrepancy between one's gender identity and sex assigned at birth. A BMI of <18.5 was classified as underweight, 18.5-24.9 as normal, 25-29.9 as overweight, 30-34.9 as obesity, 35-39.9 as severe obesity and >40 as morbid obesity.

Statistical analyses

Continuous Gaussian variables were presented as means with standard deviations, continuous non-Gaussian variables as medians and ranges. Categorical data were presented as frequencies with percentages. A paired t-test was used to compare BMI at bariatric surgery with BMI at the first GAS procedure.

Ethical statement

Our Medical Ethical Committee (METC-AUMC-2014322) approved the research protocol. Included individuals provided written informed consent for participation in this study. All transgender individuals are treated according to the Standards of Care for the health of transsexual, transgender, and gender nonconforming people (Coleman et al., 2012).

Results

In the time period 1980-2020, a total of 1459 transgender men and transmasculine individuals underwent primary gGAS and/or mastectomy in our institution. A total of 11 (0.8%) were

Table 1. Demographics of included individuals.

	Transgender men (n=11)	Transgender women (n=4)
Median age at first GAS procedure (range)	27 (20–60)	36 (22–56)
History of smoking (%)	5 (45%)	1 (25%)
History of substance abuse		
Alcohol	2 (18%)	–
Cannabis	1 (9%)	–
Co-existing psychological problems		
Depression	2 (18%)	2 (50%)
Conversion disorder	–	1 (25%)
Autism spectrum disorder	2 (18%)	–
ADHD	1 (9%)	–
Somatic comorbidities		
Myocardial infarction	–	1 (25%)
Hypertension	–	2 (50%)
Diabetes	–	1 (25%)
Polyostotic fibrous dysplasia	1 (9%)	–
Polycystic ovary syndrome	3 (27%)	N/A
Hypothyroidism	1 (9%)	–
Bariatric surgery type		
Gastric bypass	6 (55%)	2 (50%)
Gastric sleeve	4 ^a (36%)	2 (50%)
Gastric banding	1 (9%)	–
Gender-affirming surgery		
Mastectomy	11 (100%)	N/A
Hysterectomy + BSO	5 (45%)	N/A
Metoidioplasty	1 (9%) ^b	N/A
Phalloplasty	1 (9%) ^b	N/A
Breast augmentation	N/A	1 (25%)
Vaginoplasty	N/A	4(100%)

GAS, Gender-Affirming Surgery; ADHD, Attention-Deficit Hyperactivity Disorder; BSO, bilateral salpingectomy.

^aOne individual underwent a redo gastric bypass.

^bGenital GAS was performed in only one individual, who primarily underwent metoidioplasty with urethral lengthening and later FRFF phalloplasty.

identified who also underwent a form of bariatric surgery. In the same time period, a total of 1546 transgender women and transfeminine individuals underwent primary gGAS and/or breast augmentation in our institution, of whom 4 (0.3%) were included in this study. An overview of demographics is presented in [Table 1](#).

Surgical path and outcomes

An overview of included individuals is presented in [Table 2](#). All individuals underwent bariatric surgery before any GAS procedure, except for one transgender man ([Table 2](#), ID 3).

Transgender men

At the time of mastectomy (10 individuals with a mean of 3.4 years after bariatric surgery), all individuals weighed less than at time of their bariatric procedure. The mean BMI at mastectomy was 32.1 ± 4.1 , which is a mean loss of 13.1 ± 3.8 BMI points, $p < 0.01$, paired t-test). However, obesity was still frequent; seven individuals were classified as ‘obese’, one as ‘severely

obese’, one as ‘overweight’ and only one had a normal weight at time of mastectomy.

All included transgender men underwent mastectomy via the double incision with free nipple grafting technique. For comparison, in the study time period, the most frequently performed mastectomy techniques were: double incision mastectomy (61%), donut mastectomy (33%) or peri-areolar approach mastectomy (4%) (unpublished data). Postoperative hemorrhage, for which reoperation was performed, occurred in two (18%) individuals and seroma in five (45%). In one individual, mastectomy was combined with fleur-de-lis abdominoplasty, which was performed as post-MWL procedure. Postoperative requests for secondary corrections were frequent ([Table 2](#)).

Laparoscopic hysterectomy and bilateral salpingo oophorectomy was performed in five (in three combined with the mastectomy procedure) (Elfering et al., 2020). There were no intra- and postoperative complications. In one individual without a history of other abdominal surgery, intra-abdominal adhesions caused the TLH-BSO to take longer, however was still uneventful.

Genital GAS was performed in only one transgender man, who primarily underwent metoidioplasty with urethral lengthening and later free radial forearm flap phalloplasty.

Transgender women

An individualized overview of surgical path and outcomes of included transgender women is presented in Table 2. The mean time between bariatric surgery and the first GAS procedure was 3.0 years. All lost weight occurred between their bariatric procedure and vaginoplasty (mean BMI points lost 14.3 ± 2.8 , $p < 0.01$). Three were classified as overweight at time of vaginoplasty, one had a normal weight. All transgender women underwent penile inversion vaginoplasty, one in combination with prosthesis-based augmentation mammoplasty. Postoperative hemorrhage, for which reoperation was performed, occurred in one patient. No severe long-term complications occurred.

Discussion

In this study, the surgical path and outcomes of 11 transgender men and 4 transgender women were described who underwent GAS and bariatric surgery. Considering the burden of obesity and the size of our gender surgery program, the total number of transgender individuals who undergo bariatric surgery seems small. All lost a significant amount of weight after their bariatric procedure. All transgender men underwent top surgery, five underwent TLH/BSO surgery and one underwent gGAS. All transgender women underwent penile-inversion vaginoplasty and one combined with augmentation mammoplasty.

Complications were frequent, however mostly minor and in concordance with reported complication rates in the literature. After mastectomy, postoperative hemorrhage, for which reoperation was performed, occurred in two (18%) individuals and seroma in five (45%). This is higher when compared to the general population at our center (11% hemorrhage and 19% seroma (Elfering et al., 2020)). However, the number of included individuals is too small to draw generalizable conclusions on this matter.

All included individuals lost a significant amount of weight after the bariatric procedure. However, some degree of obesity was still noted in the group of transgender men. The difference observed between transgender men and women in terms of obesity at GAS is, at least partly, explained by different BMI restrictions set per specific GAS procedure at our institution. For example, mastectomy and TLH/BSO is performed (since 2004) only on individuals with a BMI < 35 . The upper BMI limit for vaginoplasty is set at 30. A high BMI is a common used exclusion criterion for certain (g)GAS procedures (Goddard et al., 2007; Buncamper et al., 2016). However, some debate exists if, and if so which BMI criteria should be used and for which procedure (Ives et al., 2019). Bariatric surgery in combination with a healthy dietary pattern and physically active lifestyle, may facilitate MWL in obese transgender individuals and make them healthier and eligible for surgical gender transition. How to interpret BMI restrictions for (g)GAS procedures after MWL and bariatric surgery is unclear.

MWL after bariatric surgery may have some impact on the chosen GAS subtechnique. For example, all included transgender men underwent mastectomy by the double incision with free nipple grafting technique. MWL will cause skin laxity and breast ptosis, which makes peri-areolar surgical techniques, such as non-skin excisional techniques or donut mastectomy less feasible in this population (Monstrey et al., 2008). When considering different phalloplasty techniques, it is highly likely that the use of a pedicled abdominal flap or SCIA flap will provide a less predictable result when compared to other options, for the same reason. On the other hand donor-sites for phalloplasty may be easier to close primarily without skin grafts. Using other flaps, such as the FRFF seems more appropriate as the lower arm is less effected by massive weight loss as other parts of the body.

For transgender women, the surgical subtechniques of GAS procedures seem less significantly influenced by a history of MWL and bariatric surgery. Penile inversion vaginoplasty and augmentation mammoplasty can be performed in a regular manner. When intra-abdominal surgery is indicated (intestinal or peritoneal vaginoplasty), intra-abdominal adhesions and incisional hernias

Table 2. Overview of included individuals.

Pt_ID	Gender	Age at bariatric procedure	BMI at bariatric procedure	Type bariatric procedure	Type of GAS procedure	Surgical technique	Age at GAS procedure	BMI at GAS procedure	Complications/reoperations	Clinical follow-up time after first GAS procedure
1	Trans male	36	NR	Gastric bypass	Mastectomy Metodioplasty Phalloplasty Erection prosthesis Mastectomy	Double incision + free nipple graft With urethral lengthening FRFF Dynaflax Double incision + free nipple graft + Abdominoplasty	47 48 49 50 48	37.9 39.0 34.0 NR 34.9	Surgical scar correction Urethral stenosis, for which reoperation Extrusion, for which explantation Correction dogears	6.7y
2	Trans male	43	41.0	Gastric sleeve	Mastectomy	Double incision + free nipple graft	22	32.3	Seroma	4.4y
3	Trans male	25	38.6 37.7	Gastric bypass Gastric sleeve	Mastectomy + TLH-BSO	Double incision + free nipple graft In combination with TLH-BSO	26 29	34.4 36.0	Hemorrhage for which return to theater	3.0y
4	Trans male	22	47.1	Gastric bypass	Mastectomy TLH-BSO	Double incision + free nipple graft	32	33.5	Seroma Correction dogears (local anaesthesia)	3.8y
5	Trans male	32	49.0	Gastric bypass	Mastectomy	Double incision + free nipple graft	32	30.9	–	–
6	Trans male	22	49.1	Gastric bypass	Mastectomy	Double incision + free nipple graft	26	31.6	–	–
7	Trans male	18	39.1	Gastric bypass	Mastectomy TLH-BSO	Double incision + free nipple graft	20	21.7	Hemorrhage for which return to theater	6.3y
8	Trans male	47	41.5	Gastric sleeve	Mastectomy + TLH-BSO	Double incision + free nipple graft In combination with TLH-BSO	21 50	21.6 32.2	Seroma Correction dogears (local anaesthesia)	0.9y
9	Trans male	26	45.8	Gastric sleeve	Mastectomy + TLH-BSO	Double incision + free nipple graft In combination with TLH-BSO	27	29.0	Correction dogears	2.7y
10	Trans male	19	42.6	Gastric sleeve	Mastectomy	Double incision + free nipple graft	20	32.9	Seroma	1.7y
11	Trans male	58	46.3	Gastric banding	Mastectomy	Double incision + free nipple graft	60	33.2	Seroma Secondary scar + contour correction	2.4y
12	Trans female	50	47.3	Gastric sleeve	Vaginoplasty	Penile inversion	56	29.9	Hypergranulation neovaginal top	2.9y
13	Trans female	22	39.0	Gastric bypass	Vaginoplasty	Penile inversion	22	29.1	–	5.7y
14	Trans female	48	39.2	Gastric sleeve	Vaginoplasty	Penile inversion	49	23.2	Hemorrhage for which return to theater	2.3y
15	Trans female	20	41.0	Gastric bypass	Vaginoplasty + breast augmentation	Penile inversion Breast augmentation via axillary approach	24	27.2	–	7.7y

NR, not reported; FRFF, free radial forearm flap; TLH-BSO, total laparoscopic hysterectomy with bilateral salpingectomy.

may be encountered. Sometimes, having a history of MWL and bariatric surgery may be used as an advantage. When vaginoplasty is combined with an abdominoplasty procedure, redundant abdominal skin can be used as skin graft to line the neovaginal canal (Hage & Karim, 1998).

Strengths of this study are the completeness of data and the subject of the study, on which a paucity of data exists. Another strength is the long clinical follow-up time. A weakness of this study is the retrospective nature. The number of individuals that could be included was low, however that is largely due to the niche subject of interest.

The prevalence of overweight and obesity is high in the transgender population. Counseling overweight transgender individuals in an early stage, for example even before the start of hormonal therapy, and offering lifestyle modification interventions, may be beneficial for their health. In the morbidly obese transgender individual, bariatric surgery may be beneficial. Surgical gender transition is possible after massive weight loss after bariatric surgery. Specific GAS subtechniques will be more prevalent in this population.

Disclosure statement

There are no commercial or financial conflicts of interest to report. No funding was received for the work.

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