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Narrative Review Article "Aesthetic Gynecology"

Fariha Altaf*[1], Dr Rabia Tabassum [2], Dr Sayeda Rahila Atiq [3]

1. MBBS, MCPS, FCPS, MRCOG, MRCPI, PG Cert. Med Ed (Uk). Senior specialist Ob Gyn, Arrayan Hospital, Dr Sulaiman Al Habib Medical Group, Riyadh, Saudi Arabia.

2. MBBS, FCPS, Consultant Ob Gyn, Arrayan Hospital, Dr Sulaiman Al Habib Medical Group, Riyadh, Saudi Arabia.

3. Ob Gyn, Arrayan Hospital, Dr Sulaiman Al Habib Medical Group, Riyadh, Saudi Arabia.

Corresponding Author: Fariha Altaf, MBBS, MCPS, FCPS, MRCOG, MRCPI, PG Cert. Med Ed (Uk). Senior specialist Ob Gyn, Arrayan Hospital, Dr Sulaiman Al Habib Medical Group, Riyadh, Saudi Arabia.

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Abstract

Aesthetic gynecology is a broad term that comprises of numerous surgical and non-surgical procedures, including labiaplasty, clitoral hood reduction, hymenoplasty, labia majora augmentation, vaginoplasty, G-spot amplification, platelet rich plasma, CO2 laser, nanofat and radiofrequency vaginal rejuvenation. Both patient interest and performance of cosmetic genital procedures have increased during the past decade. Women should be informed about the lack of high-quality data that support the effectiveness of genital cosmetic surgical procedures and counseled about their potential complications, including pain, bleeding, infection, scarring, adhesions, altered sensation, dyspareunia, and need for reoperation. The option of nonsurgical techniques should be discussed. In women who have suspected psychological concerns, a referral for evaluation should occur before considering surgery. Postmenopausal women and events like childbirth, and aging may cause structural and functional changes in women genitalia. The arising indications do not only cause psychological distress to women but negatively affect the sexual well-being and deteriorate the quality of their lives. Regenerative/ cosmetic gynecology procedures enable women to treat the functionality issues and modify the physical structure of vagina. Despite the advancements made in this field, it lacks regulatory guidelines and standardized procedures which imposes one of the biggest challenges of the field.

Keywords: *Sexual Enhancement, Cosmetic Improvement, Genital Cosmetic Surgery, Non-surgical cosmetic procedures*

Introduction

Aesthetic gynaecology is currently one of the most dynamically developing areas of gynaecology and has seen increasing patient and physician demand. Its defined as a set of procedures that aims at eliminating the mental and health consequences resulting from defects of the genital organs, improving the appearance and attractiveness of the external genital organs, and improving their sexual functions. All these activities lead to the improvement of the quality of life, increased self-esteem, and woman's sexual satisfaction**(**1**)**. Women now are empowered with the choice to change the external appearance of their vulvovaginal region in case they are unhappy with its cosmetic appearance. Studies have shown that this is a trend driven by women themselves and not their sexual partners**(**2**)**. Sexual satisfaction is an essential component of human sexuality, which is considered to be the main component of quality of life, sense of physical and mental health, as well as the quality of relationships. A satisfying sexual life has a positive effect on the relationship which strengthens it in many dimensions**(**3**)**.

Developments in technology and fashion, social and cultural difference among countries induce changes in the notion of beauty. Thus, one cannot give an exact description of the normal view of external genitalia. Female cosmetic genital surgeries address the aesthetic, functional, and sexual concerns of women. The most common problems in plastic gynaecology include enlarged labia, loose vagina syndrome, wide vaginal opening syndrome, and vaginal and labial atrophy. Defects in the intimate area caused by labour, menopause, congenital malformations, or other external factors may have a negative impact on a woman's life**(**4**)**.

Aesthetic gynaecology cosmetic treatments using minimally invasive energy-based devices, like CO2 lasers, radiofrequency, chemical treatment, labial fillers and stem cell therapy, are practised to enhance patients' satisfaction with both sexual function and appearance**(**5**)**. It is imperative to have an insight into the burden of female sexual dysfunction and related disorders globally and treatment available for these problems, as in the experienced hands these procedures are quite safe and can be life-changing. Vulvar and vaginal rejuvenation have become popular aesthetic procedures. Advances in non-surgical techniques has helped increase the demand and so is the rise in the number of surgical procedures. Most childbirth or menopause related conditions in women are amenable to treatment especially with non-surgical options. To ensure safe practice, aesthetic practitioners need to have a good understanding of the anatomy and physiology of the female genitalia.

Several questions have been raised regarding the safety and effectiveness of female aesthetic genital surgery by several professional bodies, including the American College of Obstetricians and

Gynaecologists (ACOG)((6-8). Due to the lack of published clinical data, the ACOG has recommended that all women seeking aesthetic genital surgery should be aware of the potential complications, such as altered sensation, dyspareunia, scarring, and adhesions(6). Recently, the Society of Obstetricians and Gynaecologists of Canada (SOGC) released clinical practice guidelines to attempt to provide evidenced-based direction for cosmetic vaginal and vulvar surgeries(8). The concerns of these organizations continue to revolve around the belief that studies showing the safety and efficacy of female aesthetic genital surgery are lacking. Several studies have reported minor complications associated with labia minora reduction, such as wound dehiscence, skin necrosis, infection, and hematoma (9-16). More recently, studies examining the changes in psychosexual function relating to body image and sexual satisfaction have been published(3).

Female Genital Plastic Surgery, a relatively new entry in the field of Cosmetic and Plastic Surgery, has promised sexual enhancement and functional and cosmetic improvement for women(6). The efficacy, complications, effects on sexual function, ethical considerations for the vulvovaginal aesthetic procedures of Labiaplasty, vaginoplasty/perineoplasty ("Vaginal Rejuvenation") and clitoral hood reduction are yet to be studied. Its therefore important to study the prevalence and incidence of the problems for which aesthetic and regenerative gynaecology plays a big role.

Indications

The cultural and social differences amongst countries plays an important role in the notion of beauty. Thus, exact description of the normal view of external genitalia cannot be given. However, upon consideration of anatomic variations, Hodgkinson and Hait (17) defined the ideal aesthetic picture of female external genitalia as the one in which the labia minora are small and not larger than the labia majora. The Motakef classification is based on the protrusion of the labia minora that exceeds the size of the labia majora(18). The Banwell classification categorizes labia according to their shape and morphologic variations(19). None of the classification systems have been accepted by gynaecologic or plastic surgical societies and are rarely used. Medical indications are labial hypertrophy and congenital adrenal hyperplasia. Women seek surgery for aesthetic, functional, sexual and cultural reasons. A number of physical complaints are described by these women, such as pain, discomfort or irritation associated with clothing, exercise, sexual intercourse as well as a sensation of vaginal relaxation and lack of coital friction. Most operations are performed upon the patient's request due to a feeling of enlargement and looseness in the vagina, a desire to improve sexual function, discomfort when wearing clothes or doing fitness activities, or with an aim to increase sexual satisfaction for both

herself and her partner. Motives for the surgery include perceived larger size or asymmetry of the labia minora and a dark-coloured appearance of the labia majora **(**20,21**)**

Surgical procedures	Labia majoraplasty Labia minoraplasty Clitoral hood reduction **(**Hoodoplasty**)** Vaginal rejuvenation Hymenoplasty Vaginoplasty Perineoplasty
Minimally invasive procedures	Platelet Rich Plasma therapy G-spot amplification Nanofat
Non-surgical procedures	Laser **(**CO2**)** treatment Radiofrequency vaginal rejuvenation Vulvar lightening HIFU

Procedures in aesthetic Gynecology **(**22**)**:

1. Surgical procedures:

Female Genital cosmetic surgery:

Female genital cosmetic surgery **(**GCS**)** is undoubtedly a fast-growing sub-speciality with increasing demand for a variety of procedures to beautify the female genitals. GCS would typically include procedure**(**s**)** to enhance, reduce or refashion various anatomical components of the female genitals so as to cumulatively improve the aesthetic appearance of the female genitals. This beautification can be achieved by selective and judicious use of a combination of surgical as well as non-surgical procedures. Vaginal tightening should ideally not fall under GCS as it is done for improvement of sexual function rather than improving aesthetic appearance but here its included under GCS as it is a part of genital beautification procedures in various international studies **(**22, 23**)**

Types of GCS

Labia majoraplasty **(**LMP**)** by Ostrzenski's method is employed with the incision placed in the vulvar folds. The medial incision is placed just lateral to the medial hairline, and the lateral incision should leave at least 2 cm of the pigmented labia majora laterally **(**24**)**

Labia minoraplasty **(**LmP**)** LmP done by Alinsod's labiaplasty technique **(**25**)** in which incision starts right below the clitoris, leaving 1 cm of the frenulum on either side. A 'canal' incision is made, leaving nothing at the introitus. The edges are sutured in layers with 5-0 monocryl, without tension.

Clitoral hood Reduction is done in patients with LmP, to avoid an overtly prominent clitoris. "D & Inverted D"-shaped incisions are taken on the either side. The cut edges are sutured in a two layers with 5-0 Monocryl, interrupted sutures **(**26**)**. Clitoral hood reduction **(**hoodoplasty**)** is performed with labia minoraplasty, but not always. One of the techniques is to reduce the clitoral hood skin over the clitoris using the skinning de-epithelialization technique, lateral in location. The clitoris is not unhooded in the large majority of cases and the procedure is performed to achieve better symmetry and reduce the "top-heavy" look post labia minoraplasty. The goal is to improve sexual arousal by revealing more of the clitoris.

Vaginal rejuvenation A full-length tightening of the vaginal tract performed and closure is done in three layers with absorbable sutures. Perineoplasty is done in all cases.

Hymenoplasty is performed by freshening the edges and approximation of the hymenal membrane tags with an absorbable suture. If hymenal remnants are found insufficient, then a vaginal flap is taken from post-vaginal wall and sutured to raw area made on the anterior wall **(**like an inverted "V"**) (**27**)**.

Perineoplasty is a specific repair of the vaginal entrance and the space between the vaginal and the anal openings. It is a complementary procedure to prolapse surgery. The surgical goals are cosmetic achievement through reformation of the perineal body, thereby lifting the perineum, and greater sexual satisfaction through increased friction with penile penetration. Also it can straighten out the path that stool passes through and improve defecation mechanics.

Vaginal tightening/vaginoplasty refers to surgery of the vaginal entrance, deeper canal, and epithelium. This procedure is not the same as pelvic floor repair and if there is pelvic floor defect it should be part of urogynecologic assessment. From the perspective of cosmetic gynaecology, the surgeon must determine the limits of the planned vaginal diameter reduction, in advance, in dialogue with the patient, and keep in mind that the patient's expectation might be unrealistic, thus risks of over tightening must be explained. The procedure may be done under local or regional anesthesia in an office-based surgical

facility and involves a full-length tightening of the vagina **(**i.e., not just of the introitus**)** whereby dissection occurs all the way up to the levators and laterally to the ischial spines. A depth of 7 to 8 cm is recommended for full-length tightening. The vagina can be resized to the exact dimension the patient desires.

Challenges: Cosmetic vulvovaginal surgery arouses considerable media interest. There are significant ethical and technical challenges posed by such procedures, which may not be justified on medical grounds. Many such operations are performed without adequate evidence of either safety or psychosocial benefit. The best established female genital cosmetic procedure is reduction labioplasty. Women request reduction surgery for their labia for two distinct indications: aesthetic dissatisfaction or discomfort. There are a variety of techniques, none of which has high-quality supporting evidence. Hymenoplasty is even more controversial than labioplasty, perhaps because it is seen to perpetuate misogynist myths about virginity. Despite its persistent popularity there is little evidence of successful outcomes. Vaginal laxity is a common complaint among parous women, and has a complex relationship with sexual dysfunction. When a multidisciplinary, conservative approach fails, surgical intervention, with either perineorrhaphy or posterior colporrhaphy may be justified.

Complications: A wide range of post-operative complications have been reported such as infection, haematoma, bleeding, wound dehiscence, dyspareunia, scarring, reduced sensations, bulky/prominent clitoris, scalloping of edges.

Patient counselling: Understanding a woman's motivation for cosmetic genital surgery requires careful and sensitive exploration to ensure her autonomy and rule out the possibility of coercion or exploitation by another person such as partner or family member. Labiaplasty in girls younger than 18 years should be considered only in those significant congenital malformations or persistent symptoms that the physician believes are caused directly by labial anatomy or both.

Training: Gynaecologists, urogynecologists, plastic surgeons and urologists perform these operations. In view of the increasing demand for these operations the relevant surgical professional bodies should provide some guidance on training and practice requirements. Ideally there should be a multidisciplinary team **(**MDT**)** of the healthcare professionals, including surgeons, psychologists, gynaecologists, urogynecologists, plastic surgeons and urologists.

2. Minimally invasive procedures:

Platelet-rich plasma (PRP):

It has been studied in wound care, orthopaedics, dental surgery, spine literature, and a variety of cosmetic surgery procedures(33). PRP contains high level of growth factors such as platelet-derived growth factor, transforming growth factor beta and epidermal growth factor. It is nonantigenic because it is autologous, and there have been no detected adverse effects(34). It has been found that PRP injections are nonsurgical options for female sexual dysfunction, lack of lubrication, and stress urinary incontinence(35). Some pilot studies have also shown that PRP has an effect in the treatment of lichen sclerosis(36, 37). The combination of PRP with RF for lichen sclerosis has shown tremendous promise for long term symptoms relief. Studies in the United States with Dr. Runels and Dr. Alinsod are ongoing.

G-spot amplification

In 1950, German gynaecologist Grafenberg(38) described an erotic zone on the anterior vaginal wall along the course of urethra. Since then, many articles have been published showing the existence of this zone and in 1981 this area was named as the G-spot by Addiego et al.(39) to honour Grafenberg(38). Many authors accept this area as the responsible zone for vaginally-activated orgasm. The precise anatomy is not fully understood but can be defined as a neurovascular complex(40, 41). G-spot augmentation with fillers such as collagen or autologous fat transplantation leads to bulking of this zone to the vaginal lumen and much more penetration during sexual intercourse(42).This procedure, which was empirically developed, makes the G spot more prominent and, hence, increases friction, which leads to better chances of vaginal orgasm. Bulking the sensitive area forward toward the vaginal lumen for greater frictional contact may lead to easier, longer, more frequent and intense orgasms. Methods of amplification include non-permanent fillers (e.g., hyaluronic acid) as PRP, and collagen injections. The results of the G-shot may last 3 to 5 months.

Nanofat

Nanofat, being a compact bundle of stem cells with regenerative and tissue remodelling potential, has greater application in the translational and regenerative medicine. Nanofat behaves on the line of adipose tissue-derived mesenchymal stromal cells. Considering the reconstructive and regenerative potential, the applications of nanofat can be extrapolated to various medical disciplines especially for

cosmetic purposes. Nanofat grafting enhances neoangiogenesis without producing any visible scars and provides a favourable outcome in aesthetic medicine for breast, buttock and genital augmentation.

3. Non-Surgical procedures

Laser treatment (CO2) for vaginal laxity

Several fractional lasers have been used for non-invasive treatment of vaginal laxity. Fractional carbon dioxide **(**CO2**)** lasers emit light at a wavelength of a 10.600 nm, which is strongly absorbed by tissue water. The penetration depth is dependent upon the water content, independent of melanin and haemoglobin. It stimulates and promotes the regeneration of collagen fibers and restores hydration and elasticity in the vaginal mucosa**(**28**)**. Fractional erbium laser is a minimally invasive thermo-ablative fractional laser technique, which is applied to the vaginal mucosa and is used in postmenopausal vulvar-vaginal atrophy, stress urinary incontinence, and vaginal tightening. With its wavelength of 2940 nm, it is close to the absorption peak of water. This laser has 10 to 15 times more affinity for water absorption compared with the fractional CO2 laser. The photothermal effect of the laser beam heats the collagen in selected mucosal tissue leading to the contraction of collagen fibers and at the end shrinkage of tissue. It has minimal thermal damage to surrounding tissue so has milder postoperative discomfort and edema**(**29**)**.

Radiofrequency (RF) vaginal rejuvenation

This energy-based skin rejuvenation technology has been harnessed for rejuvenation of vaginal tissue to treat vulvovaginal laxity resulting from age or childbirth-related causes. Studies have shown that the use of RF for vulvovaginal laxity results in increased collagen and elastin formation**(**30**)**. Unlike laser-based treatments, it is not dependent on skin type and is even more effective in naturally moist tissue. This technique has been demonstrated to be especially well tolerated when using temperature-controlled RF. The target tissue temperature is 40-45 degrees Celsius, and thermistors enable monitoring and thermosetting the temperature. This technique enables collagen denaturation and the healing process, supporting healthy tissue formation, which is the mechanism that provides tightening. Collagen fibers when heated contract and this causes the triple helix structure to fold, creating thicker and shorter collagen fibers, which are thought to be the mechanism of action of the immediate tissue tightening seen after these procedures. The creation of new elastin, which is relatively unique to RF, may play a role in its effectiveness in treating vaginal laxity**(**31**)**.

Vulvar lightening

This technique achieves whitening of a hyperpigmented vulvar appearance through chemical agents or the CO2 fractional laser method. Avoiding rebound hypo-hyperpigmentation should be the prime objective(32). Hyper and hypo-pigmentation can occur with the use of energy-based devices such as a CO2 laser to lighten the area. The use of RF in an ablative manner can also result in both hypo or hyperpigmentation. Non-ablative RF avoids these pigment issues.

HIFU

It stands for 'High Intensity Focused Ultrasound'. The principle behind HIFU is that it generates instant microthermal lesions by accumulating the high-frequency ultrasound beams at the target site without causing damage to the epidermis and surrounding tissue. This induces cellular damage and volume reduction of the target area which in turn aids in new collagen/ elastin formation and ECM. HIFU treatment has been evaluated for vaginoplasty and concluded that HIFU vaginoplasty can improve quality of life for women who suffer from pelvic floor disorder.

Discussion

The perception of ideal external female genitalia or ideal labium appearance differs between countries(43). The desired appearance according to countries affects the surgeons' techniques(32). According to the American Society for Aesthetic Plastic Surgery, labiaplasty numbers increased 23% from 2015 to 2016(44). Any desired reduction of labia can be provided with linear excisions but it cannot provide the retention of the natural look or coloration the patient currently has. The wedge resection and modifications of this technique may serve for patients who want more natural edges. When performed by the surgeons trained and experienced in this field, these operations are demonstrated to improve the reliability of the procedures and the functional and aesthetic appearance(32).

Nonsurgical techniques like transcutaneous temperature-controlled and laser devices are also options for aesthetic genital interventions, especially for vulvovaginal laxity. Studies also showed some changes in vulvovaginal atrophy and stress urinary incontinence(45). Patients with severe organ prolapse are not candidates for nonsurgical aesthetic techniques. Therefore, a careful examination should be performed to evaluate pelvic organ prolapse and several self-reported questionnaires can be used to assess the degree of symptoms(46). Unlike surgical techniques, non-surgical approaches need maintenance treatments, and the treatment protocol differ according to the device. We need to research on the standardization of treatment modalities and duration of efficacy.

When the American Colleges of Obstetricians and Gynaecologist **(**ACOG**)** first addressed this issue in 2007, it opined that procedures such as vaginal rejuvenation designer vaginoplasty, and revirgination were separate from procedures with non-aesthetic medical indications which had insufficient research so far**(**6**)**. However, after this committee's declaration, Ostrzenski.**(**47**)**, in 2011, published extensive evidence-based work on the effectiveness and reliability of these procedures and concluded that the ACOG's 2007 recommendations did not comply with scientific norms and were not sufficiently transparent. Iglesia**(**48**)** in 2012, emphasized that the term "perfect vagina" represented a significant domain in the concept of women's beauty and that doctors must inform their patients about the complications and all the relevant details concerning this matter. In 2013, Canada's Society of Obstetricians and Gynaecologists's policy statement recommended that the medical, sexual, and gynaecologic histories be reviewed with patients requesting genital cosmetic surgery. They also recommended that the patient be informed of the normal variations in genital appearance, the physiologic changes that developed with aging, and the unpredictability of changes that might occur during pregnancy and menopause**(**49**)**. In 2013, the Royal College of Obstetricians and Gynaecologists published ethical considerations in relation to the female genital cosmetic surgery and recommended that "female genital cosmetic surgeries shouldn't be carried out before 18 years of age, the patient must be fully concerned about the procedures, and any advertising of these procedures conforms to good medical practice"**(**50**)**. In 2015, the International Federation of Gynaecology and Obstetrics Committee for the Ethical Aspects of Human Reproduction published a report supporting that patients requesting cosmetic gynaecologic procedures and surgeons must be aware of the differences between therapeutic surgical procedures and surgical procedures without medical indications, that normal anatomy and variations must be explained so that patients have a good understanding of them, that patients should be evaluated, especially for body dysmorphic disorder and other mental problems, and that the operating surgeons must have competent skills in this field**(**51**)**.

In 2017 ACOG published a new committee statement recommending that in the case of requests for mammoplasty and labiaplasty, patients, especially adolescents, and their families be informed about normal variations and physical changes, that the patient's physical and emotional development had to be evaluated, and that consultation about non-surgical techniques should be provided**(**52**)**. According to the World Health Organization, the definition of female genital mutilation refers to all procedures involving partial or total removal of external genitalia**(**53**)**. It has no health benefit and it is a human rights violation. However, this description is totally different from female genital cosmetic surgery relating to genital destruction and the lack of patient consent in mutilation.

Conclusion

For those choosing to provide cosmetic services, patient counselling **(**including definitions of normal range of anatomy and sexual function**)**, shared decision making, and informed consent are paramount. Patients should be made aware that surgery or procedures to alter sexual appearance or function **(**excluding procedures performed for clinical indications, such as clinically diagnosed female sexual dysfunction, pain with intercourse, interference in athletic activities, previous obstetric or straddle injury, reversing female genital cutting, vaginal prolapse, incontinence, or gender affirmation surgery**)** are not medically indicated, pose substantial risk, and their safety and effectiveness have not been established. Long-term studies are required to understand the outcome of the procedures and to validate the treatment using the novel approaches in this field.

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