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Review – Sexual Medicine

A Critical Analysis of Penile Enhancement Procedures for Patients with Normal Penile Size: Surgical Techniques, Success, and Complications

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Abstract

Context: Most men who request surgical penile enhancement have a normal-sized and fully functional penis but visualize their penises as small (psychological dysmorphism).

Objectives: The aim of this review is to describe the various reported techniques and to provide the available scientific data on the success and complication rates of penile enhancement procedures.

Evidence acquisition: We performed an extensive systematic review based on a search of the MEDLINE database for articles published between 1965 and 2008. The following key words were used: penis, enhancement, enlargement, phalloplasty, reconstruction, girth, lengthening, and augmentation. Only English-language articles that were related to penile surgery and dysmorphism were sought. We excluded articles in which fewer than five cases were described and articles in which the type of surgical treatment and the outcome were not clear. Of the 176 papers found, 34 were selected and critically analyzed.

Evidence synthesis: We found only a small number of well-designed and comprehensive studies, and most of the published articles reported data that were obtained from small cohorts of patients. The more recently published studies presented better methodologies and descriptions of the surgical techniques than did the older publications.

In general, penile enhancement surgery can cause a 1–2-cm increase in penile length and a 2.5-cm augmentation of penile girth. Unwanted outcomes and complications, namely penile deformity, paradoxical penile shortening, disagreeable scarring, granuloma formation, migration of injected material, and sexual dysfunction were reported frequently in these studies. Disappointing short- and long-term patient satisfaction rates following these procedures were also reported in most studies.

Conclusions: To date, the use of cosmetic surgery to enlarge the penis remains highly controversial. There is a lack of any standardization of all described procedures. Indications and outcome measures are poorly defined, and the reported complications are unacceptably high. In our opinion, until new, reliable, and more objective and reproducible data are available, these procedures should be regarded as investigational and patients should be discouraged from undergoing these invasive treatments.

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1. Introduction

Penis size has been a source of anxiety for men throughout history, and still today men often feel a need to enlarge their penises in order either to improve their self-esteem or to satisfy and/or impress their partners [1]. A variety of cross-cultural references to penile enhancement exist. The Sadhus holy men of India and males of the Cholomec tribe in Peru used weights to increase their penile lengths. Males of the Dayak tribe in Borneo mutilated their penises by forming holes and then sticking decorative items through them for their partner's pleasure. In the 16th century, men of the Topinama tribe of Brazil allowed poisonous snakes to bite their penises in order to enlarge them [2]. The injection of exogenous substances into the genital skin to cause penile enlargement remains a common phenomenon in many cultures. Such practices exemplify the social, cultural, and psychological aspects among men regarding the size of their penises. The tendency of males to seek their identity in the penis with an emphasis on the belief that "bigger is better" and the idea that the penis is central to identity and is symbolically powered are truly significant myths that are firmly entrenched and are likely to persist in modern men [3,4]. These stigmas of apparently small penises, as well as the increasing influence of the media on sexual issues, have created a demand for penile enhancement. Unfortunately, the need to perform cosmetic surgery in order to enlarge the penis remains highly controversial, and the surgical outcomes are still uncertain [5].

The only consensus that exists today regarding the need for such procedures regards surgical correction of a micropenis. The etiology of this relatively rare condition is linked to a disturbance in endocrine function and genetic background of the individual. Reconstructive surgery for this condition is a very challenging procedure because of the anatomical complexity of the penis, which involves both the urinary and genital systems. The use of skin grafts, reconstruction of the urethra, and implantation of an inflatable penile prosthesis are generally required for achieving the desired cosmetic and functional results.

In contrast, the vast majority of men who request penile enhancement surgery usually have a normally sized and normally functioning penis [6]. Characteristically, these patients interpret normal appearances as abnormal, and as a result, they are noticeably distressed and depressed. Indications for penile enhancement surgery are poorly defined, and the outcome measures for success are still unclear. Nevertheless, due to huge demand, these proce-

dures are commonly performed, generally in private settings.

Measurement of penile dimensions is a basic requirement for evaluating the success rate of penile enhancement procedures. The size of the flaccid state is much more significant for males with psychological dysmorphism than the size of the erect state. Results of measured penile size vary across studies and depend on the method of measurement and on study populations. The reported normal length and girth of an adult flaccid penis ranges between 7.6 cm and 13.0 cm in length and 8.5 cm and 10.5 cm in circumference, and the reported normal length and girth of an erect penis ranges between 12.7 cm and 17.7 cm in length and 11.3 cm and 13.0 cm in circumference [1,7,8]. The increase in length following surgery that is required to satisfy the patient is not well established and is not adequately emphasized in the medical literature.

In this review, we will describe the various types of penile enhancement procedures that are currently used and try to provide any available significant scientific data on their success and complication rates (Table 1).

2. Methods

2.1. Penile lengthening

2.1.1. Abdomino/pubopelvic liposuction

Occasionally, a penis may appear small because it is partially covered by abundant pubic fat or by a protruding abdomen. In these circumstances, either abdominal/pubic liposuction or a suprapubic lipectomy is probably the most practical and safest approach to provide some visual extension of the penis. The procedure does not involve surgery of the penis and the genitalia. It entails the removal of excessive fat tissue that partially covers the proximal part of the penis in obese subjects. This cosmetic surgery is commonly performed by experienced plastic surgeons and results in an aesthetic visual "lengthening" effect. Since it is done normally as part of a penile enhancement procedure, data on its success and complication rate as a single procedure are scarce [9].

2.1.2. Suspensory ligament dissection

The suspensory ligament of the penis has a crucial role in supporting and stabilizing the penis at the specific angle that is required for vaginal penetration and sexual intercourse. Detachment of this ligament from the symphysis pubis allows forward movement of corpora, thereby enabling the penis to extend closer to its erect length while flaccid [10]. This effect can be achieved by an initial 3–4-cm transverse incision of the restricting bands of Scarpa's fascia proximal to the penopubic junction while stretching the penis and then dissecting the suspensory ligament from the periosteum of the pubic bone. Although the detached penis can be stretched, the length

Table 1 – Summary of clinically relevant studies on different surgical techniques^a

Study (EBM grade)	n	Mean age, years	Mean follow-up period, months	Penile length increase, cm ^b	Penile girth increase, cm ^b	Complications	Satisfaction
Dissection of suspensory ligament							
Li et al [12] (D)	27	39	16	1.3 ± 0.9	Not applicable	Penile shortening of 1 cm (% not reported) Five cases of postoperative wound infections	27% of the patients were satisfied.
Klein [8] (C)	58	39.3	12.2	Flaccid: 3 Erect: 0.75	Not applicable	45% of patients had postprocedural infection, 60.3% of patients had erectile changes (angle, pain, curvature, deviation)	69% of patients did not achieve the expected penile length. 62% of the patients were dissatisfied due to erectile changes.
Roos et al [10] (C)	260	38.5	4	4	Not applicable	Four cases of serious postoperative infection	Majority of patients were satisfied.
Panfilov et al [17] (D)	31	33.8	12	2.42	Not applicable	No serious postprocedural complications	88% of patients were very satisfied. 8% of patients moderately satisfied.
Spyropoulos et al [29] (C)	11	28	No data	1.6	Not applicable	No serious complications	91% of the patients were satisfied in terms of sexual self-esteem and improved function.
Austoni et al [32] (C)	18	24–47	9	1.5–2.5	Not applicable	No serious complications	High satisfaction and reported regular sexual activity 6 mo after procedure.
Autologous fat transplantation							
Klein [8] (C)	22	39.3	12.2	Not applicable	Flaccid: 2.5 Erect: 2.0	No data	The increase in penile girth was less than expected in 41% of patients; 78% of the patients were dissatisfied with the aesthetic result.
Panfilov et al [17] (D)	57	33	12	Not applicable	2.7	Two cases of extreme fat loss, one case of excessive implanted fat	94% of patients were satisfied. 6% of patients were dissatisfied.
Venous graft							
Austoni et al [32] (C)	39	24–47	9	Not applicable	Flaccid: 0.5 Erect: Mean 5	40% of the patients had transient mild curvature of the penis associated with penis retraction	High satisfaction. All reported regular sexual activity 6 mo after procedure.
Liquid silicone injection							
Yacobi et al [25] (E)	324 (data on 30)	35	20	Not applicable	2.6	No serious complications	High satisfaction. 21 patients reported improved erectile function. Some reported that the time to ejaculation was prolonged to about 15 min.

Table 1 (Continued)

Study (EBM grade)	n	Mean age, years	Mean follow-up period, months	Penile length increase, cm ^b	Penile girth increase, cm ^b	Complications	Satisfaction
Miscellaneous: hyaluronic acid injection Kim et al [26] (E)	100	42.2	12	Not applicable	1.5 (glanular circumference)	Initial transient discoloration and swelling	73% of the patients were very satisfied.
Scaffold Perovic et al [34] (C)	84	26.7	24	Not applicable	3.15	Three cases of postoperative infection, two cases of skin pressure necrosis, five cases of seroma formation	81% of the patients were highly satisfied. 19% of the patients were satisfied.

EBM = evidence-based medicine.
^a Data on liposuction, dermal fat graft, and Alloderm were not included in this table due to insufficient data and inadequacy of reports. Some of the studies include results of combined techniques, and in these instances, we reported on the relevant technique and population.
^b Calculated from the source data and metrically converted by the authors.

increase is only minimal. Therefore, reattachment of these ligaments and penile shortening need to be avoided by filling the new space created by the dissection with either fat tissue or some other type of biocompatible material. To this end, Alter et al [11] recommend suturing a vascularized flap from the lipomatous tissue of the spermatic cord to the pubic periosteum [9], and Li et al [12] suggest suturing a small testicular prosthesis to the base of the pubis.

Traction on the penis should always follow this procedure in order to keep the penis away from the pubis and to stretch the corporal bodies. Apparently, this process can prevent iatrogenic shortening of the penis and may add length. Special “tissue expanders” that promote the healing of the penis in the most outward position, such as vacuum devices, traction appliances, or specialized weights that are hung from the coronal margin of the glans penis, have been proposed [12].

Published data on the resultant change in penile length following this surgical procedure are scarce. Reported results are problematic because modes of penile length measurement differ and the surgical techniques are not identical. In a recent clinical study on 42 patients in which flaccid stretched penile length and patient satisfaction were measured, Li et al [12] reported that mean penile length increased significantly by 1.3 ± 0.9 cm ($p < 0.0005$) after dissection and insertion of a silicone buffer. Paradoxically, despite the moderate increase in penile length (10–17%), satisfaction rates were very low, suggesting that only a minority of patients benefited from this procedure.

Some investigators combined this type of enhancement surgery with another surgical procedure. Roos and Lissos analyzed the outcomes of 260 cases of penile ligament dissection and a skin flap (see section 2.1.3). They found that the average increase in length was 4 cm. No patient reported a decreased angle of erection or changes in erectile function. The majority of patients were satisfied, and the complication rate was minimal [10].

Klein analyzed results of penile enhancement surgery which was performed on 58 young men (mean age: 39.3 yr) by 12 surgeons from different clinics. The surgery was either dissection of the suspensory ligament only (17.2%) or dissection combined with girth enhancement by either fat injection (60.3%), dermal (10.3%), or pedicled fat grafts (6.9%) [8]. The resultant change in flaccid penile length was 2.6–9.1 cm, and there were no significant changes in the erect length [8].

If suspensory ligament release is properly controlled and followed by postoperative penile stretching, some length gain (1–2 cm) can be expected in most cases; complications such as decreased angle of elevation of the erect penis, paradoxical penile shortening, and penile instability are relatively rare [3,12]. Since satisfaction rates are low, other methods and directions for penile lengthening to achieve therapeutic success need to be explored.

2.1.3. Skin flaps

The penopubic skin may sometimes prevent further extension of the penis, and in these circumstances, skin flaps are done in an attempt to advance penopubic skin onto the penile shaft. These procedures are usually performed as part of an elongation procedure which necessitates full skin covering of the extended penis, and also in specific penile conditions

where skin shortage is apparent (ie, from an overly aggressive circumcision or penoscrotal webbing). Unfortunately, no standardized skin-flap technique exists, and a wide variety of surgical modifications are performed with differing results.

The most commonly performed procedure seems to be the inverted V-Y advancement flap, which was first described by Long in 1990 in China [13]. This technique was later modified by Roos and Lissos in 1994 in combination with a suspensory ligament dissection; lateral skin flaps were used to reattach the detached penis in order to recreate a new suspensory ligament in its forward position. The use of lateral skin flaps is advantageous because they add stability to the penis during erection and maintain the angle of erection [10]. Because V-Y advancement flaps are distally based, flap viability may be compromised when blood vessels to the flap are damaged. Therefore, distal flap loss, poor wound healing, and dehiscence can arise [14]. Other reported forms of skin flaps that are used in penile lengthening surgery are the lower abdominal Z-plasty which probably gives the best results due to a low risk of scrotal skin sliding onto the penile surface [15] and the W-flap reconstruction [9,16]. Unfortunately, most of these flaps cause unattractive hair-bearing tissue that covers the penis and causes pubic deformation. The use of skin flaps could result in a penis buried in the scrotum, thereby creating paradoxically a shorter penis [9]. Some of these undesirable outcomes are probably the result of poor surgical techniques of inexperienced surgeons. Other complications are due to the imperfect anatomical design of the procedure. For these reasons, the use of skin flaps is not yet an attractive surgical option for penile lengthening.

2.2. Penile girth enhancement

Penile girth enhancement is even more controversial than penile lengthening. There is no recommended indication for this procedure in the medical literature, and no guidelines for penile girth enhancement have been proposed due to lack of any aesthetic or other indication for this technique [7]. Although the optimal result of girth enhancement would be increased symmetry and uniform girth of the penis, achieving this aim is far from our reach and remains a significant challenge using the currently available techniques.

2.2.1. Injectable materials

2.2.1.1. Fat injection. The injection of autologous fat was thought initially to be a promising technique to enhance penile girth. This technique entails collecting abdominal fat by liposuction and subsequently injecting the fat into the dartos fascia. Panfilov [17] reported that the injection of 40–68 ml of autologous fat into the penis resulted in a 2.6-cm increase in penile circumference.

When small amounts of fat are injected into multiple locations of the penis, only a minimal increase in girth is gained, and the number of postoperative complications is small. When large amounts are injected at multiple sites, the risk of nodular formation increases [9]. Unfortunately, during the injection process, a significant number of adipocytes are ruptured or reabsorbed, and probably the final result leaves

only 10% of the fat cells intact [18]. Results for autologous fat injection are considered unpredictable due to the lack of an adequate blood supply to the injected fat and because no plane into which the adipocytes are injected has been determined. Fat-cell rejection and trauma result in fat necrosis and reabsorption [14,15,17]. Deformities such as curvature or asymmetry of the penis as well as the formation of nodules of liquefied, necrotic, or calcified fat may occur due to reabsorption or migration [9], and in extreme cases, sclerosing lipogranuloma can occur. Survival of a large volume of injected fat can lead to complaints of inadequate erectile rigidity because fat content of the enhanced penis overwhelms the firmness of the corporal bodies [9]. The rate of occurrence of these complications is not reported in the few published case reports.

2.2.1.2. Silicon injection. Since the 1940s, liquid injectable silicone (LIS) has been commonly used for cosmetic purposes with satisfactory results and relative safety, mainly in cases of soft tissue augmentation and restoration of damaged skin (facial and fibrotic scars). For these purposes, the microdroplet serial injection technique in which very small volumes of LIS (up to 0.75 ml) are required is used. In contrast, in order to achieve some change in penile girth, larger volumes of LIS (100–150 ml) are required. Although use of LIS for penile girth enhancement has been described [19–22], it has not been recommended due to the development of horrendous complications, some of which are related to the large volumes that were injected and others of which are due to drifting and distant migration, swelling, penile distortion, and idiosyncratic and late granulomatous reactions [20]. Additionally, injection of LIS into the penis increases the likelihood of damaging blood vessels and nerves, thereby causing loss of sensation and erectile dysfunction [23,24].

Nevertheless, a recent publication reported that these devastating complications seem neither to alert nor to alarm some urologists, who continue to do these procedures even now. In this study, the authors injected large volumes of silicone in order to increase the penile circumference by an average of 2.6 cm in 324 patients. Their results are unprecedented: All patients were fully satisfied without any reported short-term complications [25]. Twenty-one patients even reported improvement of erectile function, and strangely, patients who previously suffered from premature ejaculation reported that after the intervention, the time to ejaculation was prolonged to about 15 min. It is regrettable that such surgery is permissible and that the results are reported in peer-reviewed journals because the reporting of such results prevents further progress in this field.

2.2.1.3. Hyaluronic acid gel injection. Injectable hyaluronic acid gel is widely used for facial soft tissue augmentation. Recently, Kim et al [26] reported their findings on the use of this “tissue filler” for glans penis augmentation in 187 men. The study group was divided into two subgroups: a group of 87 men who had previously undergone a dermal fat graft for penile girth augmentation but felt that the glans penis was still small and a second group of 100 men who had not undergone any penile enhancement procedure.

Hyaluronic acid gel (2 cm³) was injected into the glans penis, and the resultant increase in glanular circumference was 1.5 cm at a 1-yr follow-up. The postoperative satisfaction rate was high, and there were no serious adverse reactions. There is already substantial controversy regarding indications for penile girth enhancement, and glanular enhancement as a separate procedure seems even more problematic.

2.2.2. Graft procedures

2.2.2.1. Dermal fat grafts. A dermal fat graft is a dermis-free graft that consists of all layers of skin and the underlying subcutaneous tissue after removal of the epidermis [27]. The first known human adipose tissue transplantation was attempted in 1893 by Neuber [28]. Since then, accumulated data have shown that the acceptance of and survival of the grafted adipocytes depends on a quick, atraumatic, sterile transfer of the graft and its early revascularization. Final results depend mainly on the amount of fat which is reabsorbed and replaced by fibrous tissue and on the remaining bulk of dermal tissue. Sawhney et al [27] documented the changes in size and consistency of a dermal fat graft for penile girth enhancement. At 1 wk after transplantation, the consistency of the dermal graft was still soft, with 70–90% of the fat preserved, but at 8 wk most of the fat had been replaced by fibrotic tissue [27]. Dermal fat grafts are harvested from the abdomen or the gluteal folds, and the strips or sheets of the dermal graft are then placed circumferentially between the dartos and Buck's fascia. This technique has significant disadvantages such as prolonged operative time (7 h) and a high incidence of postoperative complications: persistent postoperative penile edema and induration, venous congestion, and possible skin injury [9]. Donor-site scarring and deformity of the buttock crease or the suprapubic region are often cosmetically unpleasant, and curvature and shortening of the penis, as well as penile asymmetry due to fibrosis may occur [9]. Although the risk of partial graft loss or fibrosis is significant [29], girth enhancement is achieved at higher rates when compared with those following fat injections [29]; the final outcome (after 12 mo) is generally a 2.5–5.1-cm increase in girth. Nevertheless, after reviewing all published reports on this technique, we found that it gave inconsistent results and that the complication rates were high, and for these reasons we conclude that dermal fat grafting is not an acceptable procedure for penile girth enhancement.

2.2.2.2. Allografts. Alloderm is an acellular inert dermal matrix derived from donated human skin tissue, and its use has been sporadically reported for penile girth procedures [30]. The use of Alloderm for penile girth enhancement has the potential to provide a more consistent cosmetic result with respect to penile symmetry and durability associated with a lower relative incidence of adverse effects when compared with dermal fat grafting. Attempts to enhance penile girth by inserting Alloderm sheets above the superficial lamina of Buck's fascia at the interface with the dartos fascia in order to enhance penile and glanular girth have been done. The advantages of this technique are no donor-site scarring [9], good graft survival, and a low complication rate [30]. However, the viability of the overlying thin and delicate penile skin can be compromised in this procedure [31]. Other complications

associated with the use of Alloderm include erosion, fibrosis, infection, resorption, and skin loss, which can have a severe effect on penile length and function [9]. Due to limited data, Alloderm for penile girth enhancement must still be regarded as an investigational procedure.

2.2.2.3. Venous grafts. Corporeal augmentation surgery, in which the corpora cavernosa is enlarged by bilateral venous graft implantation, was first described by Austoni et al [32]. In this procedure, a longitudinal incision of the tunica albuginea from the pubis to the glans along the lateral aspect of each corpus cavernosum is made, and segments of saphenous vein are placed into the tunica albuginea. Corporeoplasty could be recommended for patients with dysmorphophobia related to the erect state [32], and corporeoplasty is the only reported girth-enhancement procedure which results in an increase in the volume of the corpora. Compared with other grafts, it may also have the advantage of having a lower incidence of postoperative fibrosis and occlusive vein pathology because the endothelial linings (of the vein and the corpora cavernosa) are highly compatible. In Austoni's report, none of the 39 men who underwent this procedure had any postoperative complications (infection and delayed wound healing), and all reported that they were satisfied with the cosmetic outcome. At the 9-mo follow-up, penile diameter had increased by 1.2–2.1 cm, and all the men reported that they had resumed their normal sexual activity 4 mo postoperatively [32].

This technique results in an increased penile girth during the erect state only. The reliability and efficacy of this procedure are strongly influenced by technical and other factors. This technique should still be considered to be experimental because it has not yet been reproduced, and no other reports from the original author or others have been published. For now, it still seems to be an extremely aggressive and invasive procedure for treating a psychological dysfunction [33].

3. Results and discussion

The debate as to whether surgery is an acceptable therapeutic option in these young, healthy, and sexually active men with a psychological dysfunction is ongoing. After years of surgical experience with these procedures, even basic issues such as patient profile and the identity of those subgroups of males who would benefit from penile augmentation surgery are unclear. Moreover, valid indications for performing such procedures, selection of the most suitable procedure, and designation of the outcome measures are all open issues. The absence of universally acceptable parameters for normal penile length and girth further complicate these issues. It is yet unclear how surgery affects the self-image or sexuality of these patients and whether it reduces their anxiety and depression levels. In addition to all of these concerns, all penile enhancement techni-

ques are unapproved by any of the professional societies, and the majority are performed in private settings, leading to medical-legal implications and paucity of scientific data.

The scarce published data have shown that these procedures result in a 1–2-cm elongation of the external part of the penile shaft and a 2.5-cm enhancement of penile circumference. The significance of these “successful” results is overshadowed by the fact that they do not directly correlate with patient satisfaction, as emphasized recently by Li et al [12]. Klein [8] was also able to demonstrate a poor satisfaction rate in a group of 58 males who had undergone penile enhancement surgery. For this purpose, he developed a unique satisfaction scoring method in which many parameters (eg, sexual satisfaction, erectile function, penile sensitivity, change in self-concept rating) were combined into one single score that defined the overall worthiness of the procedure. Interestingly, he also found a discrepancy of 5.6 cm between the actual erect penis size and the ideal erect penis size after surgery. This divergence from expectation may explain why satisfaction rates after the penile enhancement procedures are relatively low, although some enhancement was achieved.

Due to disappointing results, there is a need to determine which direction penile enhancement surgery should advance in order to improve existing outcomes. First, there is an urgent need for improved criteria for better patient selection in order to identify those patients who would benefit from penile enhancement surgery. Second, it is necessary to develop new and better surgical methods of penile enhancement. One such example is a novel approach that was described by Perovica et al [34] who applied an autologous ex vivo tissue engineering process to enhance penile girth. They harvested fibroblasts from the scrotal dermal tissue and then seeded them onto pre-treated tube-shaped biodegradable scaffolds. The fibroblast-seeded scaffolds were then incubated for 24 h before their transplant between dartos and Buck’s fascia. This innovative methodology was performed in 84 men with penile dysmorphic disorder in whom previous penile girth enhancement surgery had failed. The men who were evaluated 24 mo postoperatively reported a mean girth gain of 3.1 cm with an 8% complication rate (infection, skin necrosis, and seroma) and a high satisfaction rate. Although this experimental therapeutic modality is original, the results are far from optimal, and the 8% complication rate is a cause of concern. Third, nonsurgical approaches should be seriously considered as an alternate methodology

for penile enhancement, as well as comprehensive psychological treatments.

Regardless of all the above-mentioned problematic issues, urologists and plastic surgeons continue to perform these procedures on healthy men for aesthetic reasons. Regrettably, extensive misinformation and exceedingly optimistic promises for penile enlargement without complications or long-term embarrassment are given by a number of physicians to these insecure patients. It is the responsibility of every professional involved in sexual medicine to provide advice on these issues based on education and scientific evidence.

4. Conclusions

Current data regarding the results and complication rate of interventional augmentation procedures are reported mainly in patients without an objective penile-shaft problem, and they are extremely disappointing. There is a need for scientific and methodological research on the outcomes and complication rate of all these procedures. In addition, there is also a need to perform prospective randomized clinical trials on large cohorts and to develop validated methods for assessing subjective and objective perception of penile size. Research should be directed toward more logical and practical approaches to augment penile size and could include assessing the efficacy of nonsurgical modalities. There is also need for valid, reliable, and reproducible scientific data from other medical and paramedical disciplines (psychologists, sociologists, sexologists) in order to have the capability to respond to psychological issues concerning penile augmentation.

Penile enhancement procedures should become accepted only when they result in successful outcomes with minimal complications. However, serious life-changing complications such as penile disfigurement and dysfunction are not uncommon outcomes, especially following girth augmentation procedures. From the surgical point of view, the current techniques fail to show efficacy on a number of levels. Furthermore, no technique should be offered to patients as a valid treatment modality because none have yet been adequately evaluated. Until data on these issues are available, penile augmentation should be performed only when a penile prosthesis is implanted or when reconstruction of the penis is required for sexual function.

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Study concept and design: Vardi, Gruenwald.
Acquisition of data: Vardi, Harshai, Gil, Gruenwald.
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