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FEATURES:

SUPERFICIAL LIPOSUCTION FOR PERMANENT HAIR REMOVAL
UP-TO-DATE SURGICAL TECHNIQUES FOR PENILE AUGMENTATION WITH ALLODERM
THE INTRANASAL VALVULOPLASTY
NOVEL MANAGEMENT OF WOUND DEHISCENCE
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CLINICAL TECHNIQUE

Up-to-Date Surgical Techniques for Penile Augmentation With AlloDerm

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Introduction: Today, a man is capable not only of understanding his own nature and anatomy, but also of altering it. Specifically, surgical penile augmentation (phalloplasty) is available to enhance the length, girth, and glans of the penis. This article describes several modern phalloplasty surgical techniques.

Materials and Methods: A total of 374 phalloplasty surgeries using AlloDerm were reviewed for this article. These surgeries were performed by 2 surgeons over a 5-year period in multiple surgery centers. AlloDerm is a cadaveric, acellular, tissue-regeneration matrix that is processed from donated human skin. To create AlloDerm, a free human cadaver skin graft (allograft) is minimally processed to remove epidermal and dermal cells, while preserving the remaining bioactive components and structure of the dermis. The resulting graft serves as a framework to support cellular repopulation and vascularization. In phalloplasty surgery, this graft is used to enhance the length, girth, and/or glans of the penis in the male cosmetic surgical procedures described here.

Results: Seventy-four percent of the patients who underwent the phalloplasty procedures with AlloDerm and participated in the postoperative survey reported great satisfaction with their male cosmetic genital surgery.

Complications: Serious infections that required surgical treatment developed in 12 (3.2 %) of these patients. In 7 of these patients, the infection was cured after 2 weeks of continuous treatment with general and local antibiotics. The patients were successfully signed off from the treatment with subsequent instructions regarding continuity of care. In the remaining 5 patients, the AlloDerm required removal in order to successfully treat the infection. In addition, 18

patients (4.8%) experienced localized swelling 7 to 10 days after surgery. This swelling resolved spontaneously. Finally, 16 patients (4.3%) reported postsurgical retraction that was successfully treated medically and surgically.

Discussion: Today, a man can modify the size and shape of his penis using procedures introduced by cosmetic/plastic surgery. With the use of AlloDerm, these changes can last for years, and could be considered almost permanent. In the future, AlloDerm may be replaced by artificial tissue, by engineered material, or by human penis cells cultured and grown for use as a natural matrix. In 2000, Buvat and Lemaire wrote the following: "Penile lengthening and augmentation surgery is attracting more and more men. Nevertheless both its objective results and ethical implications are debated. Indications and operative strategies as well as the assessment of the results seem little standardized, while many candidates [for] this type of surgery have in fact a penis in the normal range of size."¹ In 2003, the American Academy of Phalloplasty Surgeons established international standards for male cosmetic genital surgery, including the identification of indications, operative strategies, surgical techniques, and the assessment of results.² These standards have been in effect for 5 years, and when qualified surgeons have followed them, these surgeries have been successful. Yet, despite successful physical results, the subjective evaluation of aesthetic results and the ethical implications of male cosmetic genital surgery continue to be debated.

Conclusion: This article represents the first published retrospective evaluation of patients who have undergone surgical penile enlargement with AlloDerm. The study reported a high satisfaction rate with a new surgical technique for penile augmentation (Penile Triple AugmentationTM) developed and used by the author of this article.

Introduction

Historically, men have considered a larger penis to be a symbol of greater masculinity. Worship of the phallus as a symbol of creative energy has been central to virtually every world culture, and strong

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This is a follow-up to an article previously published in *The American Journal of Cosmetic Surgery* (Am J Cosmet Surg. 2005;22:172-178). A third article is planned that will describe penile augmentation using a graft of the patient's own skin (dermal fat graft, or DFG).

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traditions of phallic art exist throughout India, Egypt, Greece, and Europe. "From the oldest human records to modern times, man's self-esteem and self-image have always been related to the size of the penis," writes Dr. Bayard Fisher Santos in his book, *The Measure of Man*.³

Technology has rendered nearly all previous definitions of masculinity obsolete. A man is no longer measured by his physical strength, because machines do much of his work for him. As a result, muscles have become more symbolic than useful. In our time, the erect penis has become the most powerful of a man's symbolic "muscles." However, modern cultural taboos remain. How often do you hear men speak about liposuction, plastic surgery, or a face lift, let alone about enhancement of their andrological part? If they discuss it at all, it is in private conversations and not in public places. Women feel free, however, to discuss diet, plastic surgery such as liposuction or breast enlargement and reduction, and peeling. Some psychologists and anthropologists argue that the establishment and maintenance of the masculine identity is more delicate and fraught with complications than the establishment and maintenance of the female identity. There is a great disproportion between acceptance of female body rejuvenation surgery in our society and acceptance of male rejuvenation surgery, especially with regard to the andrological parts of the body. Put another way, our society is not as acculturated to the idea of male rejuvenation surgery as it is to the idea of female rejuvenation surgery. Despite this lack of acceptance by society, many men undergo surgical penile augmentation (phalloplasty) to enhance the length, girth, and glans of their penises.

Today, man is capable not only of understanding his own nature and anatomy, but also of altering it. A man can modify the size and shape of his penis using procedures introduced by cosmetic/plastic surgery. Some of these procedures are permanent, and some are nonpermanent, or temporary.

Permanent penile enlargement surgery is surgery that does not require maintenance of the desired size or shape after surgery through additional grafting. In the United States, the dermal fat graft, or DFG (a graft made from the patient's own skin), and AlloDerm (a graft created from cadaver skin) are the two types of graft that offer permanent enlargement of the penis. Using the new techniques described in this article, complications from penile enlargement surgery using permanent grafts have been, for all practical purposes, eliminated in the majority of patients.

Nonpermanent penile enlargement surgery is an enlargement procedure that uses fat injections (free fat transfer [FFT]). This type of enlargement has many complications and requires periodic fat injections to maintain the penile girth gained from the first injection. It is important to note that no medical insurance company in the United States offers malpractice insurance for doctors using the FFT technique for penile augmentation. In addition, patients who seek penile reconstruction surgery after they have experienced fat injection are now the largest segment of reconstruction surgery patients in the United States.

The present study includes several permanent phalloplasty procedures currently in use. These procedures can be divided into two categories: single augmentation and combination augmentation.

Single augmentation refers to one of three procedures: penile lengthening, penile girth-enhancement, or penile glanular-enhancement surgery. In this study, single augmentation included girth enhancement only. *Combination augmentation* includes Penile Dual AugmentationTM (lengthening and girth-enhancement surgeries combined) and Penile Triple Augmentation (lengthening, girth-enhancement, and glanular enhancement surgeries combined). These modern phalloplasty techniques provide a cosmetic solution for patients who are dissatisfied with the natural size of their penises and related physical characteristics, even though, as previously mentioned, many of these patients have a penis within the normal range of size.

AlloDerm

Historically, penile augmentation surgery used free dermal grafts (DFGs) of the patient's own skin. These grafts were placed on the penis to increase penis girth. Today, a patient can choose to have his penis enlarged with AlloDerm. AlloDerm is the most up-to-date material for use in penile augmentation surgery. Penile cosmetic augmentation surgery with AlloDerm is supracavernous phalloplasty surgery, performed when the penis is in the flaccid state.

AlloDerm is a cadaveric, acellular, tissue-regeneration matrix that is processed from donated human skin. The free human cadaver skin graft is minimally processed to remove epidermal and dermal cells while preserving the remaining bioactive components and structure of the dermis. The resulting graft serves as a framework to support cellular repopulation and vascularization.

It should be noted that AlloDerm is regulated by the FDA as human tissue for transplantation. AlloDerm is processed in accordance with the FDA's requirements

for the procurement and processing of banked human tissue, as well as the standards and guidelines of the American Association of Tissue Banks (AATB). "AlloDerm is widely used in both medicine and dentistry for reconstructive surgery. Originally developed to treat burn patients, it is now used in general, orthopedic and urogenital surgery in addition to its applications in dental surgical procedures."⁴

The use of AlloDerm in phalloplasty augmentation surgery is an off-label use of the product, that is, there is not yet enough research evidence for this use to meet FDA requirements for listing of this use on the product label. The off-label use of products by physicians in the United States is, however, legal, even prevalent, with the exception of certain regulated substances, such as opiates. Physicians are expected to use their best professional judgment to ensure safe and effective off-label use of medical products.

Surgical Procedures Used in the Study

Two surgeons performed male cosmetic genital surgery with AlloDerm on 374 patients at multiple surgical centers over a period of 5 years. Phalloplasty procedures used, and the number and percentage of patients undergoing them, included: single (girth-enhancement) augmentation (41 patients [11%]), Penile Dual Augmentation (116 patients [31%]), and Penile Triple Augmentation (217 patients [58%]).

All patients were evaluated before surgery. Laboratory evaluation and anesthesiology clearance were obtained for all patients. Medical clearance was obtained in cases where the patient's age and general medical condition indicated a need to do so. Patients were photographed and marked in standard position before and after surgery. All procedures were discussed in detail with each patient. All patient questions were answered, and every patient signed a detailed consent form before his surgery.

Patient education prior to the phalloplasty procedures included a medical consultation, an introduction to a Surgery Preparation and Follow Up Checklist and a set of Phalloplasty Timelines and Guidelines, pre-operative and postoperative instructions, suggestions for maximizing the success of the surgery, lists of foods and medications to avoid, a list of tests required for the surgical procedure, physiotherapy stretching exercise information for use after surgery, a written detailed explanation of the upcoming surgery and potential surgical complications, and the answers to frequently asked questions.

General anesthesia was provided in accordance with the American Society of Anesthesiologists (ASA) guidelines, with subsequent additional local anesthesia. Standard postoperative monitoring was provided after surgery in the recovery room, and all patients were discharged in stable medical condition. All patients were instructed to contact the surgeon and/or the surgical center with any questions during the first 24 to 48 hours after surgery and returned for reevaluation and dressing change the day after surgery. All patients were then discharged. Follow-up to monitor the recovery of all patients continued on a weekly basis during the first 2 months after surgery through phone calls, e-mail, and photos. In some cases, patients were referred to local physicians for reevaluation, with follow-up phone consultation between the surgeon and the local doctor.

After surgery, all patients received prescriptions for antibiotics for 3 weeks, pain-control medication for 5 days, and erection-control medication for 6 to 8 weeks. All patients were instructed to resume sexual activities after 6 to 8 weeks, if cleared by the surgeon.

Background Information and Description of Techniques Used in the Study for Lengthening Surgery

The Function of the Suspensory and Fundiform Ligaments

In men and monkeys, erection is controlled by hydraulic pressure developed by arterial blood. In other animals, erection is mechanical; a muscular device projects the penis forward to achieve erection, and another muscular device retracts the penis after sexual intercourse. In men, the suspensory and fundiform ligaments that connect the penis to the pubic bone represent similar mechanical structures (Figure 1). However, as will be seen, these ligaments are evolutionary holdovers that play no part in a man's erection.

The suspensory ligament is attached to the pubic symphysis above the penis. It holds the penis close to the pubic bone and supports it when erect. The fundiform ligament runs from the pubic bone at the base of the penis laterally around the sides of the penis like a sling. The fundiform ligament derives its anatomical name from this looped or sling-like appearance. The suspensory and fundiform ligaments consist of fiber-elastic tissue. Under a microscope this tissue resembles muscle tissue. In many men, this tissue is very well developed and is constantly retracting the penis.

Most of the penis is visible externally, but part of the penis extends 3 to 5 cm inside the body. This part that

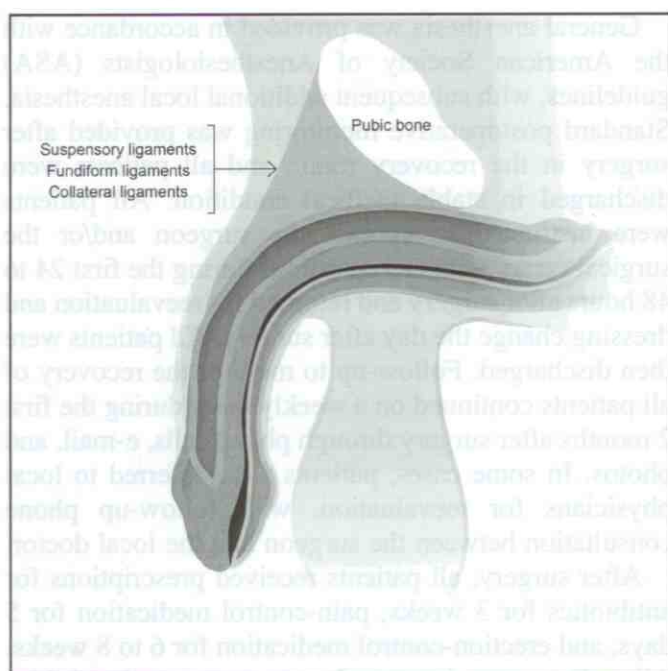


Figure 1. Attachment of the penis to the pubic bone by suspensory, fundiform, and collateral ligaments.

extends inside the body is called the crus of the penis (crus corporis cavernosi penis). It is connected to the pubic bone by the fundiform and suspensory ligaments. When these ligaments are fully detached from the pubic bone using a cutting technique, the crus of the penis, previously attached to the pubic bone, is revealed externally, increasing the apparent (visual) penile length (Figure 2). For some men, removal of extra pubic fat can add a few extra centimeters as well.

Surgical penile lengthening procedures have been performed for more than a quarter century, since the lengthening procedure was introduced and developed. Results of penile lengthening procedures have shown that releasing the ligaments does not result in penis instability in the erect position. These results have made it apparent that the suspensory and fundiform ligaments are not necessary for the support or orientation of the erect penis. Moreover, since the first lengthening surgery was performed over 25 years ago, penis instability following lengthening surgery has never been described in the medical literature.

Description of Modern Lengthening Surgery

Techniques Used in the Study

The patient was anesthetized before surgery and monitored according to the monitoring standards of

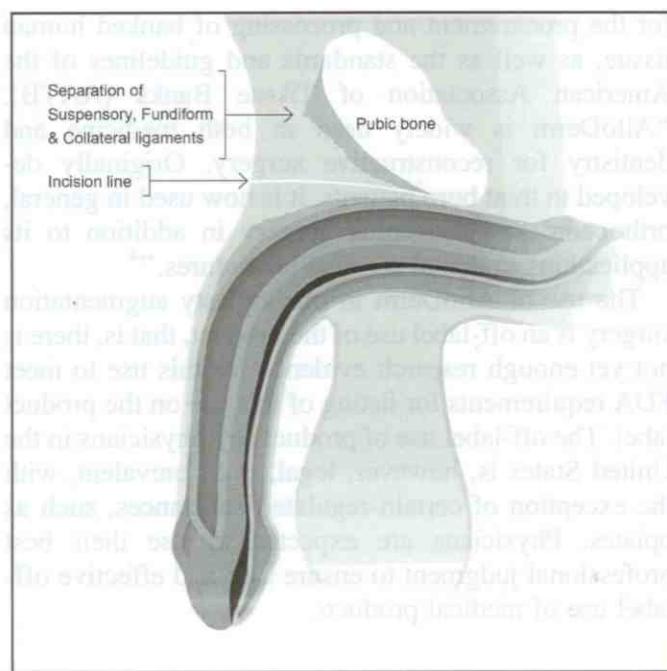


Figure 2. Complete separation of the penis from the pubic bone (modern lengthening procedures).

the ASA for electrical cardiac activity (EKG), blood pressure, heart rate, pulse, and oxygen-saturation levels in the blood (pulse oximeter).

Local anesthesia, including a penile block, usually complemented general anesthesia. The patient was placed in the supine position on the operating table, and the patient's genitalia were prepped and draped in a sterile fashion. A curvilinear (semicircular) incision, approximately 5 cm in length, was made in the infrapubic region at the base of the penis. Extreme care was taken to avoid contact with any significant blood vessels and nerves. Sometimes a very steep Trendelenburg surgical position was necessary to give better access to the ligaments.

As mentioned previously, the fundiform and suspensory ligaments in many patients are very well developed. Traction was applied to the penis to better identify the ligaments between the pubic bone and the shaft of the penis. In order to completely separate the penis from its attachment to the pubic bone, both ligaments were cut through.

The suspensory ligament is positioned very deep, and sometimes it is difficult to reach the ligament's tip. Some surgeons are satisfied with partial detachment of the ligaments from the pubic bone. However, with incomplete separation, the desired surgical result is not always achieved. In my experience, procedures

performed in the past have often resulted in incomplete separation of the ligaments from the pubic bone. Complete lengthening surgery includes incision of the fundiform ligament, the suspensory ligament, and several lateral extensions of the suspensory ligament that are found deep in the floor of the wound. In some patients, the depth of the incision can be 12 to 15 cm from the skin. In these cases, extreme care must be taken to avoid damage to major blood vessels and nerves.

Normally, with complete separation of the penis from the pubic bone, an additional 0.5 to 1.5 (1.22 to 3.76 cm) in of the penis in the flaccid state becomes available externally. In some cases the length of the penis can be increased up to 2.5 in (6.3 cm). The surgeon can only separate the portion of the penis that is attached to the pubic bone. The length of this portion of the penis varies from person to person. The surgeon should never promise the patient a set amount of postsurgical gain in penis length. The final result of the lengthening procedure depends equally on complete separation of the penis from the pubic bone and on adequate postsurgical stretching exercise therapy (physiotherapy) performed by the patient. In addition, rejuvenation of penile pubic junctions and scrotal pubic junctions should be discussed with the patient and taken into consideration, emphasizing the angle of the penis to the pubic area. Rejuvenation can be achieved by changing the sagging angle that appears when men age.

Description of Techniques Used in the Study for Girth-Enhancement Surgery with AlloDerm

Preparation of AlloDerm

Prior to initiation of the surgery, the AlloDerm was prepared. Depending on the purpose of the surgery and the patient's size, 2, 3, or 4 sheets of 4 × 7-in (4 cm wide × 7 cm long) extra-thick AlloDerm were prepared. If available, other AlloDerm sheet sizes (eg, 4 × 12-inch [4 cm wide by 12 cm long]) can be trimmed to fit the patient's anatomy.

The sheets of AlloDerm were placed in a normal saline solution to soften and prepare them for suturing. The AlloDerm sheets were carefully oriented so that all pieces were positioned uniformly. The AlloDerm sheets (2, 3, or 4) were stitched together to fit the patient's anatomy. These AlloDerm sheets were then altered and trimmed in a meticulous manner so that they could be easily incorporated under the skin along the shaft of the penis, as well as into the infrapubic region at the proximal portion of the penis.

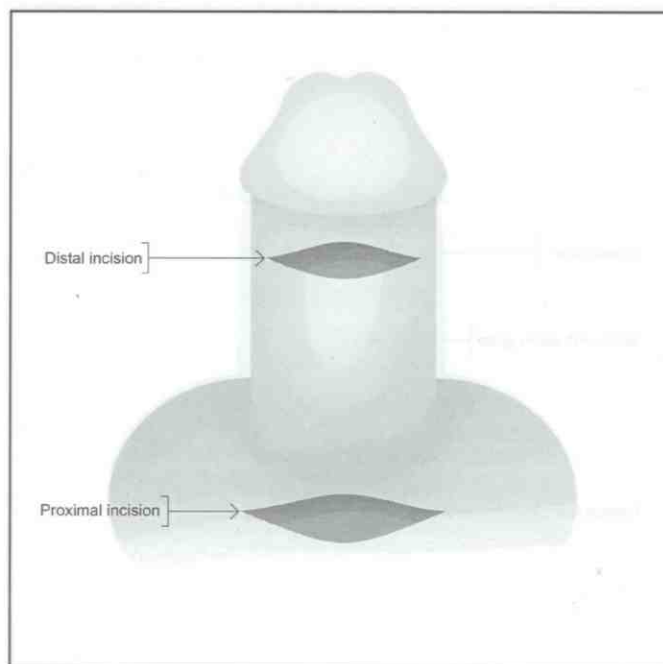


Figure 3. Proximal and distal incisions for penile augmentation.

Description of AlloDerm Girth-Enhancement

Surgery Techniques Used in the Study

The patient was anesthetized before surgery and monitored according to the monitoring standards of the ASA. Local anesthesia, including a penile block, usually complemented general anesthesia.

The patient was placed in the supine position on the operating table, and the patient's genitalia were prepped and draped in a sterile fashion. A curvilinear (semi-circular) incision, approximately 5 cm in length, was made in the infrapubic region at the base of the penis (Figure 3) in the same way as was described for lengthening augmentation surgery.

A second semicircular incision of the same length was made approximately 5 mm proximal to the glans of the penis (Figure 3). The incision was made on the dorsal aspect of the penis from the 9 o'clock position through the 12 o'clock position to approximately the 3 o'clock position. (This reference to clock positions refers to the circumference of the penis when the surgeon is facing the tip of the penis, where 12 o'clock is at the top side of the penis.). Needle tip cautery was used to incise and dissect down through the dartos fascia to the Buck's fascia. Nerves and large blood vessels were avoided.

At this point, attention was directed to the shaft of the penis. Using scissors, a large pocket was created along the Buck's fascia under the dartos fascia, along the dorsal

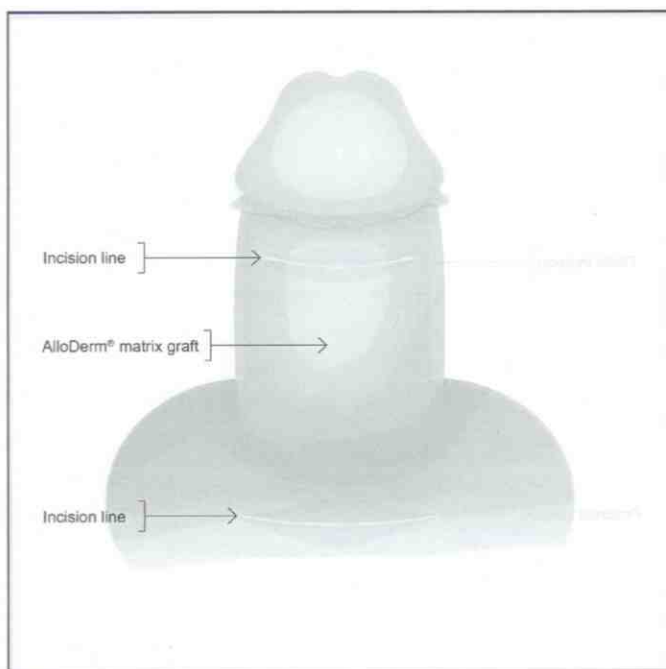


Figure 4. *AlloDerm placement for girth and glanular enhancement surgery.*

aspect of the corpora cavernosa all the way down to the base of the penis into the pubic region. This large pocket was also created starting at the 9 o'clock position, continuing through the 12 o'clock position to the 3 o'clock position along the dorsum of the penis into the pubic region. Dissection was always carefully performed.

Hemostasis was maintained using a Bowie. The corpora covered by the Buck's fascia was completely freed from the surrounding tissue in order to incorporate the AlloDerm. Once the pocket along the shaft of the penis was adequate, and the corpora cavernosa were completely free, the penis was inverted. The AlloDerm was positioned on the corpora, covering the anterior three-quarters of the penis (Figure 4). The AlloDerm in the corpora region of the penis was then tacked down on the stretched penis using absorbable interrupted sutures through the dorsal and lateral aspect of the Buck's fascia on both sides of the penis.

Once the AlloDerm was tacked down, it was inspected to ensure that it was in an appropriate position, that is, lying superficially flat and symmetrical on both sides of the penis in an absolutely uniform fashion with no twisting and no restriction of the corpora, allowing the penis to advance forward easily. The inverted position of the penis was then reversed, returning it to its original position.

Next, the coronal and infrapubic wounds were inspected for bleeding. If there was bleeding, hemosta-

sis was undertaken using cauterization. The coronal and infrapubic wounds were irrigated with antibiotic solution and then closed. The initial layer of the coronal wound, the deep dartos layer, was closed using absorbable running sutures.

The skin layer was then closed using absorbable vertical mattress running sutures. The proximal portion of the AlloDerm was secured to the proximal portion of the Buck's fascia that covers the corpora cavernosa. This was accomplished with interrupted absorbable sutures placed superficially in the pubic region and throughout the AlloDerm. Next, the initial layer of the infrapubic wound was closed using absorbable running sutures. The skin layer was then closed cosmetically using absorbable subcutaneous running sutures. In Penile Dual Augmentation surgery, the same technique was used as has been described for lengthening and girth-enhancement surgeries.

Description of Techniques Used in the Study for Glanular-Enhancement Surgery with AlloDerm

Penile glanular enhancement surgery is the most recent procedure developed for enhancement of the penis. This procedure can compliment lengthening and girth enhancement or it can be performed independently. In this study, glanular enhancement surgery was performed in conjunction with lengthening surgery and girth-enhancement surgery (Penile Triple Augmentation). In this description, glanular enhancement surgery will be described as it is performed during Penile Triple Augmentation surgery.

Prior to surgery, sheets of AlloDerm were prepared according to the needs of the patient. These sheets were placed in a normal saline solution and carefully oriented so that all pieces were positioned uniformly (the same technique used for girth and Penile Dual Augmentation surgeries).

The AlloDerm sheets (2, 3, or 4) were stitched together to fit the patient's anatomy.

These AlloDerm sheets were then altered and trimmed in a meticulous manner so that they could be easily incorporated into the area under the glans, on the top of the distal corpora cavernosa, and along the shaft of the penis into the infrapubic region in the proximal portion of the penis.

A curvilinear incision approximately 5 cm in length was made in the infrapubic region at the base of the penis. This is the same incision as that used for length-enhancement and girth-enhancement (as well as Penile Dual Augmentation) surgeries.



Figure 5. Lengthening procedure. Preoperative photograph. Postoperative photograph.

A second semicircular incision of the same length was made approximately 5 mm proximal to the glans of the penis. This is the same incision as that used for girth-enhancement (as well as for Penile Dual Augmentation) surgery.

Finally, using tenotomy scissors, pockets 1 to 2 cm in length were created underneath the glans on both sides (right and left) of the glans of the penis. The AlloDerm was then checked to ensure that it fit appropriately in the pockets on the top of the distal corpora cavernosa.

In the Penile Triple Augmentation procedure, assuming a uniform design for glanular enhancement and girth enhancement, the distal arms of the AlloDerm were sutured on the top of the distal corpora cavernosa. The pull-through technique, with a straight needle and dissolvable interrupted sutures, was used to accomplish this. Each arm of the AlloDerm was then placed into the appropriate pocket underneath the glans on both sides. Care was taken to ensure that the AlloDerm fit appropriately into these pockets. Two sutures were used to secure the AlloDerm to the glans.

Results

Satisfaction with the phalloplasty surgeries using AlloDerm in this study was analyzed before and after enhancement surgery using the Penis Image Assessment Scale.⁵ The scale is composed of questions related to penis size, satisfaction with sexual experiences, and the patient's perception of his penis. Seventy-four percent (230 patients) of the 311 patients we were able to contact after their phalloplasty procedure with AlloDerm reported the highest level of satisfaction with their male cosmetic genital surgery. Of the 374 phalloplasty surgeries in this study, 63 patients (17%) could not be reached for this assessment conducted 6 to 12 months after surgery.

The average length gain resulting from the lengthening phalloplasty surgeries in this study was about 1 in



Figure 6. Thickening procedure. Preoperative photograph. Postoperative photograph.

(2.54 cm) (Figure 5). (This includes Penile Dual Augmentation and Penile Triple Augmentation surgeries. In this study, as mentioned previously, only girth enhancement was performed as a single augmentation surgery.) Girth-enhancement gain (width gain) depends upon the quantity of AlloDerm used. It also depends somewhat on the patient because the patient decides how much gain he wants, and the surgeon confirms, by examining the surgical field, that the patient is a candidate for the gain enhancement requested. In this study, there was a 20 to 35% gain resulting from the girth-enhancement surgeries (Figures 6 and 7). (This includes single girth-enhancement, Penile Dual Augmentation, and Penile Triple Augmentation surgeries). Glanular enhancement surgeries in this study (as part of Penile Triple Augmentation surgeries) resulted in a 10 to 15% gain in penis head circumference.

Complications

In 12 patients (3.2%), serious infections developed that required surgical treatment. In these cases, in order to save the AlloDerm, a drain was positioned in the patient's pubic area, with extension into the penile shaft. Irrigation with triple antibiotic solution was applied. In 7 of these cases, after 2 weeks of continuous treatment with general and local antibiotics, the infection was cured. These patients were successfully signed off from the treatment with subsequent instructions regarding continuity of care. In 5 of these cases, the AlloDerm required removal in order to successfully treat the infections. Eighteen patients (4.8%) experienced localized swelling 7 to 10 days after surgery. This swelling resolved spontaneously. Sixteen patients (4.3%) reported postsurgical retraction that was successfully treated medically and surgically.

Description of Treatment of Infections

Infection complications can occur after any surgical procedure, including penile cosmetic surgery. These



Figure 7. Penile Dual Augmentation procedure. Preoperative photograph. Postoperative photograph.

complications occur in about 3 to 4% of our patient population. The patient must inform the office immediately, and see his surgeon for emergency consultation, if he notices any of the following changes that can signal infection: redness of the penis, pain, opening of the wound, fluid coming from the incision areas or from the skin, or pus (infected fluid that is a white/gray/green color) coming from the incision areas and/or from the skin. The surgeon outlines the necessary treatment at that time. Usually, the patient takes antibiotics prescribed by the surgeon and undergoes a surgical procedure to treat the existing infection. The surgical procedure consists of several steps. First, the wound is cleansed and a drain is inserted. The drain must be flushed regularly with an antibiotic solution for 5 to 7 days. After this time period, the drain must be removed. Next, the surgeon must follow up with the patient for 2 weeks. If the infection has not cleared up by that time, the graft must be removed. In this study, using the described technique, the success rate for saving the graft was about 60%.

Description of Treatment of Retraction

Penile retraction following lengthening surgery occurs in approximately 4 to 5% of all patients undergoing the lengthening procedure. This percentage applies to lengthening surgeries as well as combination surgeries, such as Penile Dual Augmentation and Penile Triple Augmentation. The reason that retraction occurs is that patients do not follow our rules and regulations related to follow-up care. In our protocol we clearly describe the necessity for postsurgical physiotherapy stretching exercises using the recommended stretching device for at least 6 months after surgery. The optimal time frame is 1 year after surgery. Completing this stretching exercise program makes the length gain the patient enjoyed immediately following surgery permanent. If the patient does not follow these stretching exercise program

instructions, he will either develop retraction, meaning that his penis will actually become shorter, or he will not gain any penile length as a result of the surgery.

We have developed a medical and surgical treatment for this type of patient. The patient must contact our office immediately if this condition develops. He must then undergo medical treatment that includes cortisone injections into the suprapubic area as well as very intensive physiotherapy stretching exercises. If this treatment does not bring enough satisfaction, we offer surgery that includes reconstruction of the suprapubic area and excision of scar tissue. A very small percentage of the patient population (about 1 to 2%) develops keloid scar tissue in this area. For these patients, there is no medical or surgical treatment for retraction available at this time.

Description of Erection-Control Program

Erection control is a mandatory post-penile surgery treatment, because an uncontrolled erection can ruin the results of the surgery, as well as compromise the reputation of the surgeon and his techniques. The force of an erection can open the surgical wounds very easily, regardless of the number and strength of the stitches that were used to close the wounds. An open wound can become infected from the skin and/or from the air. This, in turn, infects the graft. Wound infection is one of the most detrimental postsurgical complications, and it can necessitate removal of the graft.

In order to prevent an erection and the potential for opening the wound, an erection-control program has been developed and implemented as an absolutely necessary component for successful penile augmentation surgery results. The program has 2 parts: medical management and patient education.

Medical management consists of 2 medications that the patient is required to use and also includes the use of an ice pack. The first medication is a 5-mg Proscar pill. Five to ten of these pills must be taken every night for 6 to 8 weeks after surgery, until healing is complete. The second medication is a 200-mg Ketokonazole pill. Two of these pills must be taken each night for the same 6- to 8-week period. If these medications are not enough to help the patient to prevent an erection, he must use an ice pack as needed and, after consulting with his surgeon, increase his use of Proscar to up to 14 pills a day. This program has proven to be highly effective in decreasing the number of postoperative complications.

Patient education regarding postsurgical erection control is as important as medical management. The patient must understand that he is as responsible for

postsurgical management as his doctor. Follow-up with the surgeon regarding any questions about the erection-control program is mandatory to ensure a good result.

These 2 parts of the erection-control program usually work for all patients and decrease the rate of postsurgical complications to less than 5% for patients who have undergone penile enlargement surgery.

Discussion

Today's society requires a man to be a highly motivated and competitive individual, doing everything to stay ahead of others. He diets, exercises his body and mind, and seeks plastic/cosmetic surgery to look younger, masculine, and attractive. Across the country, middle-aged and elderly men alike are having their penises enlarged, pubic fat and breasts liposuctioned, and scrotal webs tucked. Most are seeking a more youthful and attractive appearance.

In general, tissue augmentation is a procedure that has been accepted and used for centuries all over the world by different cultures. However, for decades many medical professionals, including psychologists and urologists, have claimed that penis enlargement surgery is useless and even impossible. During the last two decades this perception has changed, largely due to cosmetic/plastic surgery achievements that have demonstrated that penis-enlargement procedures are safe and effective.

Early penis-enlargement surgery used FFT.³ Subsequent to the FFT technique, surgeons used the DFG, which is a graft prepared from the patient's own tissue. Both the FFT and the DFG techniques have been used for years for penile augmentation. Complications resulting from these techniques have been analyzed and described in the medical literature.⁵⁻⁹ More recently, AlloDerm, prepared from cadaver skin, was introduced and became the major player in phalloplasty surgery.^{3,5,10,11} In the future, AlloDerm may be replaced by artificial tissue, by engineered material, or by human penis cells cultured and grown for use as a natural matrix.

In 2003, the American Academy of Phalloplasty Surgeons, an association of highly qualified medical professionals, established international standards for male cosmetic genital surgery, including the identification of indications, operative strategies, surgical techniques, and the assessment of results.² The Academy does not consider male cosmetic genital surgery to be an experimental procedure.² In addition, many patients who undergo this type of surgery have a penis in the normal size range.

Yet, despite successful physical results, the subjective evaluation of aesthetic results and the ethical implications of male cosmetic genital surgery are debated.¹

Conclusion

This article represents the first published retrospective evaluation of patients who have undergone surgical penile enlargement with AlloDerm. The study reported a high satisfaction rate with a new surgical technique for penile augmentation (Penile Triple Augmentation) developed and used by the author of this article. Today, male cosmetic rejuvenation surgery has acquired wide acceptance and tremendous popularity. A growing number of men express interest in penile lengthening and augmentation surgery, in particular.¹ Many men want to learn about how phalloplasty can improve their self-confidence, sexual relationships, and ability to satisfy their female partners. The American Academy of Phalloplasty Surgeons is an association of highly qualified medical professionals that includes both urologists and plastic surgeons. The Academy has developed and established international standards for male cosmetic genital surgery and does not consider penile enlargement surgery to be an experimental procedure.²

The American Academy of Phalloplasty Surgeons was founded in the United States in 1994. The Academy has approximately 80 members from countries around the world. The members of the Academy are either urologists or plastic surgeons who perform penile plastic/cosmetic augmentation surgery. All members of the Academy have an opportunity to meet once a year at annual Academy meetings. The meeting agenda usually includes an invited speaker who presents new achievements in this field of medicine. Academy members and meeting attendees present their surgical experience in urology, plastic surgery, sexual medicine, cosmetic surgery, and related areas. The Board of Directors regulates all activities. The President of the Academy is a Board-certified urologist and former Associate Professor at Albert Einstein Hospital in New York. He is recognized for developing several procedures in the phalloplasty surgery field.

At the 2002 annual meeting, after many years of development of phalloplasty surgery as a surgical procedure, Academy members discussed the existing permanent graft technology available to the United States market (DFGs and AlloDerm). They concluded that phalloplasty surgery with permanent grafts should be considered a safe and medically accepted plastic/cosmetic surgical procedure and should no longer be considered experimental surgery (see Reference 2).

This year, 2008, the Academy is establishing an educational branch, the International Phalloplasty Institute, and working with insurance companies to create an insurable teaching program in the United States and abroad. This program will be for all surgeons who would like to learn how to perform these procedures correctly and safely. It is the Academy's goal to teach phalloplasty surgery to other medical specialists and to help them to become eligible for affordable malpractice insurance by completing this program.

For more information regarding The International Phalloplasty Institute program, including curriculum, schedule, location, fees, travel, and accommodations, please contact Dr Krakovsky at 858-551-9501 or visit the IPI website at <http://www.internationalphalloplastyinstitute.com>.

For more medical or scientific information about AlloDerm, please see the LifeCell Corporation website at <http://www.lifecell.com>.

Trademark references: AlloDerm is a registered trademark of LifeCell Corporation. Penile Dual Augmentation is a trademark of Alexander Krakovsky. Penile Triple Augmentation is a trademark of Alexander Krakovsky.

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