

Surgical Treatment of Penile Deformity Due to Curvature Using a Subcutaneous Soft Silicone Implant: Case Report

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Abstract

Introduction: Congenital and acquired penile curvature has a negative impact on penile aesthetics, sexual capabilities, and male psychology. Surgical procedures yield satisfactory correction of curvature, but are usually associated with penile shortening and palpable suture material and nodules under the skin, resulting in patient dissatisfaction. **Aims:** To present a novel technique using a subcutaneous soft silicone implant for surgical treatment of penile soft tissue deformities with curvature, with prevention of surgery-associated penile shortening and subcutaneous “bumps”, and with additional gains in overall penile length and girth. **Method:** 3 patients who complained about congenital, post-traumatic, and post-penile surgery associated penile curvature, with concerns about their penile aesthetics and associated negative psychosocial effects, were treated with the insertion of a subcutaneous soft silicone penile implant. **Results:** During a follow up period of 2 - 12 months (mean: 6.7 ± 3.6 months) all three patients expressed objective and subjective satisfaction regarding the corrective results of the surgery. Penile length and girth measurements during follow-up showed a mean increase in length of 4.3 cm (± 1.4 cm) and a mean increase in girth of 3.0 cm (± 1.0 cm). **Conclusion:** The insertion of the subcutaneous soft silicone implant in addition to corporeal fibrotic tissue removal in patients with congenital or acquired penile curvature is an effective option that provides the patient with aesthetic improvements by correcting penile deviation, preventing post-surgical subcutaneous nodule formation that results from the technique and suture material used, and adding penile length and girth. Further prospective studies are required to validate our initial experience.

Keywords

Penile Curvature, Peyronie’s Disease, Penile Prosthesis, Penile Shortening, Penile Length, Penile

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Girth, Penile Augmentation, Subcutaneous Soft Silicone Implant, Elist Silicone Implant

1. Introduction

The prevalence of congenital and acquired penile curvature among men has been reported to be as high as 1% - 10% [1] [2] and 0.4% - 9% [3]-[9], respectively. Congenital penile curvature is due to an asymmetry of corpora cavernosal length [10], whereas acquired penile curvature results from Peyronie's disease, iatrogenic manipulation, or trauma [11] [12]. Regardless of the nature of deformity, most affected men suffer from physical complaints including a negative impact on penile aesthetics and length, pain during erection, and sexual intercourse that is difficult or sometimes impossible [10] [13], as well as psychological distress, depression, and anxiety [14] [15].

Non-surgical treatment options such as oral, locally applied, or injectable medication are used for the early stages of Peyronie's disease with moderate success [16]-[19]. Advanced Peyronie's disease and other forms of congenital and acquired penile curvature warrant surgical repair, usually with satisfactory results, to resolve the curvature [20] [21].

At the present time, two types of procedures are used for surgical treatment of penile curvature: penile-shortening procedures (Nesbit and plication) and penile-lengthening procedures (tunica lengthening and grafting) [22]. Surgical procedures yield satisfactory correction of curvature, but are usually associated with penile shortening and palpable suture material and nodules (*i.e.* "dog ears") under the skin, resulting in patient dissatisfaction [10] [23]-[27].

We present a novel approach using a patented and U.S. Food and Drug Administration 510 (k) cleared subcutaneous soft silicone implant for surgical treatment of penile soft tissue deformities with curvature, with prevention of surgery-associated penile shortening and subcutaneous "bumps", and with additional gains in overall penile length and girth.

2. Materials and Methods

2.1. Implant

The subcutaneous soft silicone implant (PeNuva, International Medical Devices, Los Angeles, CA) consists of a soft silicone 3/4 tube that is inserted subdermally under the penile skin through a suprapubic incision. It is presented in three different sizes to accommodate various baseline penile measurements [28].

2.2. Patients

We report on three patients (28 - 40 years old) who complained about congenital ($n = 1$), post-traumatic ($n = 1$), and post-penile surgery associated ($n = 1$) penile curvature. All three patients expressed concerns about their penile aesthetics, with associated negative psychosocial effects and desired corrective surgery using the subcutaneous soft silicone implant. None of the patients suffered from erectile dysfunction or other comorbidities. Type of penile deviation and penile size before surgery were documented previous to procedure and are shown in **Table 2**.

2.2.1. Patient 1

Patient 1 was a 28-year-old black male, with congenital penile deviation and no preexisting trauma history. Physical examination showed the patient to be circumcised with a laterally left deviated flaccid penis with additional left axial rotation (**Figure 2(a)**).

Examination of the erect penis yielded a laterally left deviating penis with a mid-shaft curvature.

2.2.2. Patient 2

Patient 2 was a 36-year-old white male, with post-traumatic penile curvature due to repeated direct blunt-force trauma to the penis during childhood. Physical examination yielded a circumcised penis with an axially left rotating penis and subcutaneous scar tissue with nodule and band formation (**Figure 2(b)**).

2.2.3. Patient 3

Patient 3 was a 40-year-old white male, with penile curvature by status post prior penile enhancement surgery using autologous fat transfer and later removal. Physical examination yielded a circumcised penis with an axial right rotation, a lateral right deviation, and palpable subcutaneous scar tissue with nodule and band formation. The penile-shaft skin appeared to be thickened above the area of scar tissue formation (**Figure 2(c)**).

All possible risks, benefits, complications, and alternatives, including no surgery, were discussed with all patients in full detail. Written and verbal consents regarding the insertion of the subcutaneous soft silicone implant were obtained.

Satisfaction questionnaires were obtained from all patients before and after insertion of the subcutaneous soft silicone implant.

The preoperative questionnaire (**Table 1**) consisted of the following questions:

1. How satisfied are you with your current penis aesthetics?
2. How much do your current penile aesthetics affect your self-esteem?
3. How much do your current penile aesthetics affect your sexual relationships?
4. How much does your current penile curvature affect intercourse?

Patients rated their satisfaction on a scale from 0 to 5, with 0 being absolutely dissatisfied and 5 being absolutely satisfied.

2.3. Surgery

After appropriate preparation and draping of the skin with antimicrobial drape (Ioban 2; 3M Healthcare, St Paul, MN, USA), an 8-cm horizontal incision is made in the suprapubic area. A pocket is prepared bluntly between the Buck's and Dartos fascia. At this point, the penile skin is everted, and the pocket is carefully extended toward its distal end by undermining the glans as far as possible (approximately 5 mm). At this time, present fibrotic tissue and band formations are carefully released from the erectile and spongy bodies, allowing a repositioning of the bent penis in a straight direction (**Figure 1(a), (b)**). The distal end of the silicone implant is then covered with a 1-cm-wide polyester mesh (Parietex; Covidien, Dublin, Ireland) and fixed with six to eight non-absorbable braided sutures to the distal aspect of the corpora cavernosa beneath the glans (**Figure 1(c)**). The proximal end of the implant is placed adjacent to the pubic bone and symphysis, leaving the suspensory ligament partially intact as a resistor. The maximal possible length of the implant is now determined by pushing its end beneath the pubic bone (**Figure 1(d)**). If necessary, the implant's proximal end is trimmed and rounded to avoid friction and consequent serum formation. The proximal end of the implant is not fixed and stays free to move during erection and intercourse. Throughout the procedure, the complete surgical area is irrigated with triple antibiotic solution. Before skin closure, to prevent bacterial biofilm formation, a combination of antibiotic solution consisting of rifampicin and minocycline is instilled directly over the mesh and the implant. After the placement of a small Jackson-Pratt drain, the proximal implant pocket is tightly closed with non-absorbable sutures to prevent implant dislocation. Because of the high possibility of all surgical wounds becoming contaminated by skin bacteria, the drain remains closed for 3 - 6 hours, keeping the antibiotic solution in place. Daily drainage assessment and rifampicin instillation is followed by drain removal after 2 - 3 days [28].

3. Results

All three patients recovered very well from surgery, with no complications or lower urinary tract symptoms (**Table 2**). All patients reported in **Table 2** were followed for 2 - 12 months (mean: 6.7 ± 3.6 months). All three patients expressed objective and subjective satisfaction regarding the corrective results of the surgery (**Table 3**).

Penile length and girth measurements during follow-up showed a mean increase in length of 4.3 cm (± 1.4 cm)

Table 1. Patient satisfaction questionnaire before subcutaneous soft silicone implant insertion.

Patient	Aesthetic	Self-esteem	Sexuality	Intercourse
1	5	5	4	5
2	5	5	5	4
3	4	3	3	3

0 = absolutely dissatisfied; 1 = dissatisfied; 2 = somewhat satisfied; 3 = satisfied; 4 = very satisfied; 5 = absolutely satisfied.

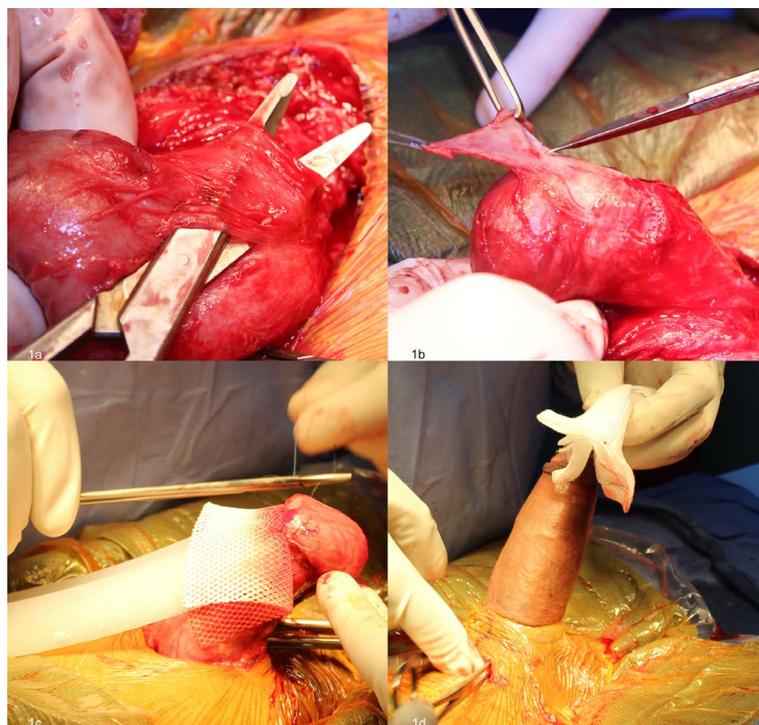


Figure 1. Removal of fibrotic tissue and bands (a), (b), distal fixation of the subcutaneous soft silicone implant (SSSI), and determination of implant's maximum length (d).

Table 2. Measurements before and after fibrotic tissue removal and subcutaneous soft silicone implant insertion.

Patient	Orientation of penile deviation and axial rotation	Length/girth before SSSI, cm	Follow-up period, mo	Length/girth after SSSI, cm	Increase in length/girth, cm
1	Left	9.5/11.5	2	16.0/14.0	6.5/2.5
2	Right	10.0/12.0	6	12.5/14.0	2.5/2.0
3	Left	12.0/11.0	12	16.0/15.5	4.0/4.5

SSSI = subcutaneous soft silicone implant.

Table 3. Patient satisfaction questionnaire after subcutaneous soft silicone implant insertion.

Patient	Aesthetic	Self-esteem	Sexuality	Intercourse
1	5	5	N/A	N/A
2	5	5	5	5
3	5	4	4	4

0 = absolutely dissatisfied; 1 = dissatisfied; 2 = somewhat satisfied; 3 = satisfied; 4 = very satisfied; 5 = absolutely satisfied; N/A = currently not sexually active.

and a mean increase in girth of 3.0 cm (± 1.0 cm).

Satisfaction questionnaires were obtained from all patients following insertion of the subcutaneous soft silicone implant (**Table 3**) and consisted of the following questions:

1. How satisfied are you with your post-surgery penile aesthetics?
2. How much do your post-surgery penile aesthetics affect your self-esteem?
3. How much do your post-surgery penile aesthetics affect your sexual relationships?
4. How much does your post-surgery result affect intercourse?

Patients rated their satisfaction on a scale from 0 to 5, with 0 being absolutely dissatisfied and 5 being absolutely satisfied.

The immediate post-surgical results for patient 1 are shown in **Figure 2(d)**. His current measurements after a follow-up period of 2 months are 16 cm in flaccid penile length and 14 cm in penile girth. During follow-up, patient 1 indicated not being currently sexually active, as per our advice, to allow for full recovery. The results for patient 2 are shown in **Figure 2(e)**. His current measurements after a follow-up period of 6 months are 12.5 cm and 14.0 cm in flaccid penile length and girth, respectively. The results for patient 3 are shown in **Figure 2(f)**. His current measurements after a follow-up period of 12 months are 16 cm in flaccid penile length and 15.5 cm in flaccid penile girth.

4. Discussion

Corrective surgery often remains the last solution for advanced congenital and acquired penile curvature that negatively affects the patient physically, sexually, and psychologically [10] [13]-[15] [20] [21]. Surgical procedures, although very effective, are usually associated with patient dissatisfaction because of post-procedure penile shortening and palpable suture material and nodules (*i.e.* “dog ears”) under the skin [10] [23]-[27]. The insertion of the subcutaneous soft silicone implant in addition to removal of corporeal fibrotic tissue is an effective treatment option for penile curvature. More advanced cases of Peyronie’s disease may also benefit from our presented technique when combined with other traditional methods for prevention of penile shortening and the aforementioned subcutaneous nodularity. Furthermore, the presented technique can be especially beneficial for patients suffering from penile curvature and penile dysmorphic or small penis syndrome by providing them with correction of penile deviation, elimination of surgery-associated subcutaneous “bumps” resulting from the technique and suture material used, and the benefit of additional penile length and girth. Advanced Peyronie’s disease with the need for penile prosthesis insertion is another indication for the use of the subcutaneous soft silicone implant, preventing surgery-associated penile shortening and narrowing [28]. Insertion of the subcutaneous soft silicone implant can be performed at any time when a patient presents with complaints of penile curvature. It is recommended that the insertion be performed simultaneously with fibrotic tissue removal or any of the traditional techniques to guarantee full healing and to prevent fibrosis after the initial surgery.

As with any smooth-surface implant, the subcutaneous soft silicone implant may be prone to bacterial biofilm infection. Consequently, the prevention of intraoperative entry of bacteria into the pocket of the implant and rigorous irrigation with minocycline and rifampicin, and keeping both around the implant during surgery and



Figure 2. Penile size and aesthetics before (a)-(c) and after the insertion of the subcutaneous soft silicone implant.

post-procedure follow-up, is advised to reduce risk. We recommend a minimum of 8 weeks for full recovery before reengaging in any kind of sexual activity.

5. Conclusion

The insertion of the subcutaneous soft silicone implant in addition to corporeal fibrotic tissue removal in patients with congenital or acquired penile curvature is an effective option that provides the patient with aesthetic improvements by correcting penile deviation, preventing post-surgical subcutaneous nodule formation that results from the technique and suture material used, and adding penile length and girth. Further prospective studies are required to validate our initial experience.

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