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Simplified Approach for Correction of Congenital Penile Curvature

Tarek A. Salem, Adel Elbakry, Gamal A. Al Attrash
Faculty of Medicine, Suez Canal University, Ismailia, Egypt
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ABSTRACT

INTRODUCTION: The purpose of the present study was to evaluate the long-term results of simplified tunica albuginea plication for correction of congenital penile curvature in adults.

METHODS: Twenty patients with congenital curvature of the penis had surgical correction. The mean age of the patients was 27 years (range, 16-48 years). Nineteen patients had a ventral penile curvature and 1 patient had a ventrolateral curvature. The mean angle of ventral bending was approximately 65° (range, 35°-90°). Detailed history was taken and physical examinations were conducted. Erection was induced by intracavernosal injection of 15 µg of prostaglandin E_1 to assess all directions of penile curvature and to determine the angle of deviation. The course of the neurovascular bundles was determined without dissection. Type 2/0 polypropylene plicating sutures were taken through the full thickness of the tunica albuginea. Two to 3 pairs of longitudinal plication sutures placed in both sides of the neurovascular bundles avoided injury of circumflex veins. Plication stitches were made parallel to assure symmetrical adjustment of the curvature. Patients were discharged after 16-24 hours. Follow-up evaluations were done weekly for 8 weeks and annually thereafter. Patients were followed for 2-5 years.

RESULTS: Operative time was 60 to 100 minutes. Successful outcome was achieved in 19 (95%) of the patients. The penis became straight during full and rigid erections and the patients were satisfied with the penile cosmetic feature and sexual intercourse. No patient complained of significant shortening of the erect penis. Recurrence of curvature occurred in 1 patient due to excessive and rigid erections early postoperatively. Three patients complained of uncomfortable sensation due to palpable knots from the polypropylene sutures. One patient had corrective surgery due to coital discomfort caused by the knots. The stitches were removed under local anesthesia with no recurrence of the curvature.

CONCLUSION: The present technique of tunica albuginea plication is simple and not time consuming. It prevents the complications of dissection and mobilization of the neurovascular bundles. Slight shortening of the penis is a disadvantage of the technique. However, it does not interfere with sexual satisfaction.

KEYWORDS: Penile curvature; Congenital; Chordee; Tunica albuginea

CORRESPONDENCE: Dr. Tarek Salem, Rehab City, Modern Cairo, Group 94, Building 4, Flat 11, Cairo, Egypt (tareksalem61@hotmail.com).

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INTRODUCTION

Congenital penile curvature (CPC) is a relatively rare condition that tends to manifest in postpubertal men. It occurs in 0.037% of the population, with the direction and distribution of the curvatures reported as ventral (50%), lateral (25%), combination of dorsal and lateral (20%), and dorsal (5%) [1]. Although penile curvature does not affect urination or ejaculation, it may cause difficulty in sexual intercourse or it may be severe enough to preclude vaginal intromission [2,3].

Several techniques have been described for correction of penile curvature. In 1966, Nesbitt, [4] described resection of elliptical segments of the tunica albuginea on the convex aspect and closure [4]. In 1973, Saalfeld et al [5] described longitudinal tunical incision and transverse closure. In 1965, Nesbitt [6] used plication of tunica albuginea for 1 patient, but this technique was abandoned due to recurrence. Tunica albuginea plication was revised by Ebbehoj and Metz in 1987 [7] and then popularized by Essed and Shroeder in 1990 [8]. Several methods of tunica albuginea plication have been used for correction of penile curvature [1,9]. In the present study, a simple plication procedure is described and long-terms results are evaluated.

METHODS

Participants

From 2002 through 2007, 20 patients with congenital curvature of the penis had surgical corrections done by 2 surgeons. The mean age of the patients was 27 years (range, 16-48 years). The direction of penile curvature was ventral in 19 patients and ventrolateral in 1 patient. The mean angle of ventral bending was approximately 65° (range, 35°-90°). Patients with associated hypospadias, acquired penile curvature due to trauma or surgery, and those < 15 years old were excluded from the study. All patients complained of abnormal deviation of the penis during erection and sought normal appearance of the erect penis. Thirteen patients were married; 11 of them complained of coital problems.

Detailed history was taken and physical examination was done. Erection was induced in an outpatient clinic by intracavernosal injection of 15 µg of prostaglandin E_1 to assess all directions of penile curvature and to determine the angle and site of the deformity.

Surgical Techniques

General or epidural anesthesia was induced. Circumferential subcoronal incision was done over the scar of circumcision. Penile skin was dissected off; the tunica albuginea and penis were degloved. Full artificial erection was induced by intracavernosal injection of normal saline while a tourniquet was tightened around the penile base. The segment of maximum curvature was determined. The neurovascular bundles and circumflex veins were visualized but not dissected. Points of suturing were marked on both sides of the neurovascular bundles at 10 o'clock and 2 o'clock. The stitches avoided circumflex veins (Figure 1; Figure 2). Artificial erection was released and 2/0 polypropylene plicating sutures were taken through the full thickness of the tunica albuginea. Two to 3 pairs of longitudinal plication sutures were placed at selected points on both sides of the neurovascular bundles. Plication stitches should be parallel to assure symmetrical adjustment of the curvature. Artificial erection was repeated for assessment of correction. If overcorrection or undercorrection was noted, sutures were repeated and readjusted until optimal correction was achieved and the penis became straight during full artificial erection. Available remnants of connective tissue attached to the tunica albuginea nearby were fixed using plication stitches approximated over the knots. Type 4/0 catgut sutures were used to minimize the discomfort of palpable stitches. The penis was gloved with its skin. The subcoronal incision was closed using subcuticular 5/0 catgut sutures.

Patients were instructed to avoid sexual activity during the first 6 weeks postoperatively. Diazepam (5 mg tablet) was taken every 12 hours and isosorbid dinitrate (sublingual tablet, 5 mg) was administered 3-4 times daily to prevent erection. Patients were discharged after 16-24 hours. They were evaluated in the outpatient clinic weekly for 8 weeks and annually thereafter.

RESULTS

The mean operative time of the procedure was 70 minutes (range, 60-100 minutes).

Patients were followed for a mean of 2.6 years (range, 2-5 years). Successful correction of penile curvature was achieved in 19 (95%) of the patients. The penis became straight during erection. Patients were satisfied with the penile cosmetic feature as well as sexual intercourse. The mean shortening of the penis was 0.75 cm (range, 0.5-1.5 cm). However, none of the patients had clinically significant shortening of the penis that may affect sexual function. Recurrence of curvature occurred in an adolescent patient due to excessive and rigid erections during the first 4 weeks postoperatively. The angle of deviation of recurrent penile curvature of this patient was much less than the original angle (35° versus 80°). This patient had a second surgery and the curvature was corrected.

Three patients complained of discomfort sensation due to palpable knots from the polypropylene sutures. However,

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Figure 1. Lateral View of the Plication Technique.
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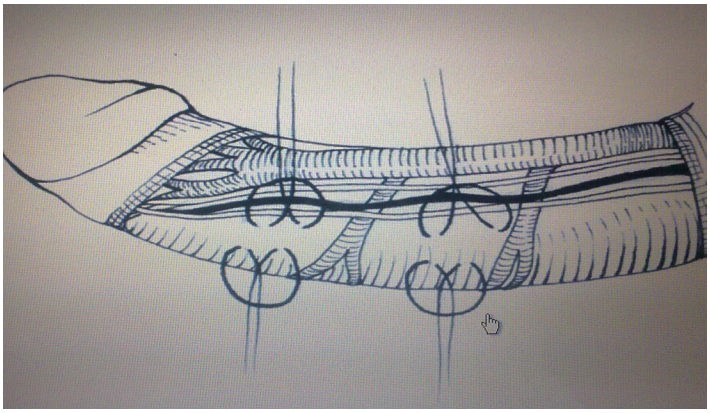

Figure 2. Top View of the Plication Technique.
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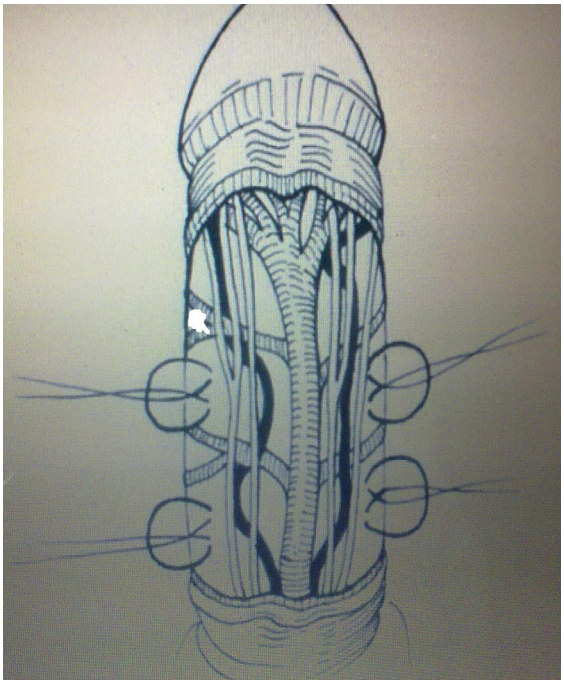

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the knots did not interfere with sexual intercourse except in 1 patient. This patient had the knots removed under local anesthesia 1.5 years after corrective surgery. No recurrence of curvature has occurred in that patient several years following removal of the palpable polypropylene stitches.

Minimal residual curvature of 10° was noted during full erection in one patient. However, the patient was satisfied, the erected penis was cosmetically good, and there was no problem with sexual intercourse either to the patient or his partner.

DISCUSSION

Congenital penile curvature is a disabling disease primarily if it is so severe that it interferes with normal sexual intercourse [2]. Several techniques have been described for correcting the deformity. However, none of them was without complication.

Plication of the longer aspect of tunica albuginea is one of the commonly used surgical procedures. Authors described different methods for plication of tunica albuginea; each method has its pros and cons [2,8,9]. In the present study, long-term results of simple dorsolateral plication of the tunica albuginea were described. Hsieh et al [10] also studied the modified technique using double, interrupted, U-shaped sutures and absorbable suture material as a simple and effective method for treating CPC. Suture-related complications rarely happened. The long-term outcome was satisfactory, and most patients were pleased with the procedure.

Toshihiko and his colleagues [11] studied a different technique. The tunica albuginea was exposed and a number of vertical incisions were made through its superficial layers. The superficial layer of the tunica albuginea was then resected using scissors. Inverted plication sutures were then placed in the raw surface of the corpus cavernosum using 2-0 nylon. In addition, 2-0 polyglactic acid (Vicryl) sutures were placed on either side of each nylon suture knot. All 27 patients were able to sustain intercourse. There were no new cases of erectile dysfunction, penile pain, or penile shortening and there were no recurrences of penile curvature.

Similar success was achieved in 19 out of 20 patients (95%) in the current investigation. The authors reviewed the results of 14 investigations of tunica albuginea plication for the treatment of congenital penile curvature, involving 299 patients. None of the patients had Peyronie's disease or other secondary causes of penile curvature. The results are shown in Table 1. The mean success rate was 86% (range, 74%-100%). These data verify the reliability and effectiveness of plication procedures in the treatment of congenital penile curvature.

The plication stitches were made at 10 o'clock and 2 o'clock on both sides of the neurovascular bundles, avoiding dissection and/or injury of its branches. Several authors reported plication

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Table 1. Results of Corporeal Plication for Correction of Congenital Penile Curvature in Previous Literature.
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Authors [reference number]	Date	N	Success	
			n	% N
Salem et al [present study]	2009	20	19	95
Chien & Aboseif [9]	2003	22	21	95
van der Drift et al [20]	2002	28	21	75
Hauck et al [18]	2002	23	17	74
Hayashi et al [22]	2002	10	10	100
Hsieh et al [16]	2001	11	10	91
Schultheiss et al [28]	2000	40	40	77.5
Benejam et al [23]	1999	27	27	100
Baskin & Lue [1]	1998	10	10	80
Thiounn et al [24]	1998	25	25	100
Rehman et al [25]	1997	6	6	100
Tay & Lim [12]	1995	15	15	80
Klevmark et al [26]	1994	48	48	81
Nooter et al [27]	1994	22	22	100
Daskalopoulos et al [29]	1993	12	12	100
Total		299	256	90*

*Mean success rate; range, 74%-100%

at the dorsolateral aspects of the corpora cavernosa to avoid trauma to the nerves of the neurovascular bundles [3,8,9,12]. There is a consensus among urologists that it is difficult to protect all nerve fibers of the neurovascular bundle when it is dissected and elevated for plication of the tunica albuginea. Therefore, disorders of glanular sensation may be inevitable. Tingling sensation has been reported after dissection of the neurovascular bundle for tunica albuginea plication [1,13]. Baskin and Lue [1] advocated plication of tunica albuginea at 12 o'clock. Their arguments were that the thickness of tunica albuginea is greatest at 12 o'clock and the area is nerve-free. However, the plication stitches at 12 o'clock should be situated between deep dorsal veins and arteries, which are liable to trauma. Thus, Baskin and Lue recommended the use of optical magnification. Plication at 10 o'clock and 2 o'clock avoids injury of neurovascular bundles as well as circumflex veins. Moreover, it does not need dissection or optical magnification [1].

Intraoperative artificial erection was obtained by intracorporeal injection of saline while a tourniquet was applied around the base of the penis. This technique is the easiest way to induce artificial erection, which can be released and repeated until the optimal correction of curvature is achieved. It permits and facilitates the full thickness of the tunica albuginea to be taken with the plication stitches. Baskin and Lue [1] reported the same method. Others induced artificial erection during tunica albuginea plication by intracavernosal injection of prostaglandine E_1 [9]. Persistent penile erection during the operative time may reduce repetition of suturing; however, biting of full thickness of the tunica within the plication stitches may become difficult. Moreover, it may induce tearing of the tunica while tying the sutures. The tunica is composed of 2 layers of collagen bundles: the outer longitudinal and inner circular layers [14]. The force of prolonged intraoperative rigid erection may allow nonabsorbable sutures to cut through the fibers of the outer layer and pull away the inner circular fibers [15]. However, induction of erection using intracavernosal injection of prostaglandin E_1 may be suitable for diagnostic purposes in an outpatient clinic for accurate estimation of the angle and site of maximum deviation.

Shortening of the penis is a disadvantage of tunical plication that has been reported by several authors [9,16,17,18,19]. Tunical plication or excision procedures entail shortening of the longer aspect of corporeal bodies. However, the degree of shortening in the present study was minimal (0.5-1.5 cm). The shortening had no impact on sexual activity as reported by the vast majority of patients, including those who were married and resumed sexual intercourse within 6-8 weeks after surgery. The shortening may cause a temporary psychological effect on young, unmarried patients. Thus, preoperative and postoperative sexual counseling should be considered [20].

The palpable subcutaneous knots of nonabsorbable sutures sometimes caused discomfort during sexual intercourse and required removal for 1 patient. The removal of plication stitches after stabilization of tunical plication had no impact on corrective adjustment of the tunica albuginea. It seems that plication stitches induce intrinsic tunical fibrosis and tunical shortening becomes strong and stable. The authors believe that this is the first report about removal of nonabsorbable plication stitches used for correction of penile curvature. Some authors tried to minimize the problem by inversion of plication stitches and/or use of soft nonabsorbable sutures [21].

When tunical plication is carried out carefully using nonabsorbable sutures, recurrence is unexpected unless the patient practices sexual intercourse or has repeated rigid erections during the first 6 weeks postoperatively. One patient had recurrent penile curvature due to rigid erections during the abstinence period, which may have torn the tunica. This patient needed a second corrective surgery.

Tunica albuginea plication of the dorsolateral aspect of corpora cavernosa for correction of congenital penile curvature is a simple technique. It is not time consuming. Adjustment and readjustment are feasible and dissection or mobilization of the neurovascular bundles is unnecessary. There is no possibility of injury in dorsal penile vessels. Postoperative complications are minimal. This technique is recommended as the first choice in management of most cases of congenital penile curvature.

Conflict of Interest: None declared

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