

## Is Degloving the Best Method to Approach the Penile Corporoplasty With Yachia's Technique?



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<b>OBJECTIVE</b>	To assess functional outcomes after surgical correction of congenital and acquired penile curvatures using Yachia's technique (YT) with degloving (DG) and without degloving (WDG) of the penis.
<b>MATERIALS AND METHODS</b>	A penile deformity with angle $\geq 30^\circ$ , difficulty in vaginal penetration, and severity of erectile dysfunction secondary to penile curvatures were the indications for a surgical treatment with YT. The preoperative characteristics of the patients, postoperative outcomes (change in angulation, palpation of sutures, penile shortening, and patient satisfaction), operative time, and hospital stay were recorded. A total of 64 patients were included in this review and divided into 2 groups: 34 in group I (YT with DG) and 30 in group II (YT-WDG).
<b>RESULTS</b>	The mean operative time was $65.87 \pm 21.32$ minutes for group I and $48.17 \pm 23.82$ minutes for group II ( $P < .02$ ). The mean hospital stay was $3.09 \pm 0.96$ and $2.87 \pm 0.93$ days in DG and WDG, respectively ( $P = .324$ ). There were no significant differences in recurrence rates and complications (palpation of sutures: group I: 14.7% vs. group II: 13.3%; penile shortening: group I: 8.9% vs. group II: 10%). At follow-up of 20.8 months, all treated patients were able to insert the penis in the partner's vagina, were satisfied overall with sexual intercourse.
<b>CONCLUSION</b>	The outcomes of the DG and WDG techniques were similar, even if the YT-WDG presents better results in terms of less healing and operative time. UROLOGY 126: 204–208, 2019. © 2019 Elsevier Inc.

Congenital and acquired penile curvatures represent rare disorders with an incidence of 0.4%–1%, even if recent studies observed a higher incidence in up to 9%.<sup>1,2</sup> It is considerably higher than the prevalence reported in the past decade, because social stigma prevents many patients from seeking medical care.<sup>2</sup> Peyronie's disease (PD) is an acquired penile curvature characterized by formation of fibrotic plaques primarily to the tunica albuginea that can result in penile angulation, shortening, pain, and erectile dysfunction (ED).<sup>3</sup> Surgical correction of the curvatures is indicated when the deformity inhibits vaginal penetration or erectile function.<sup>3,4</sup> Two corporoplasty procedures are the Nesbit and the Yachia's technique (YT).<sup>4</sup> The YT is a modification of the Nesbit procedure (an ellipse of the tunica albuginea excised on its convex side), in which 1

or more longitudinal incisions are made on the convex side of the tunica and then closed horizontally with absorbable sutures.<sup>5</sup> In these techniques, degloving (DG) of the penis is described by many surgeons.<sup>5,6</sup> Less frequently, some make a penile corporoplasty without degloving (WDG) of the penis.<sup>7</sup> The purpose of this study was to assess functional outcomes and patient satisfaction after surgical correction of the penile curvatures using YT with DG and WDG of the penis in a monocentric experience.

### PATIENTS AND METHODS

We performed an institutional retrospective review study of patients undergoing surgical treatment with YT for penile curvature congenital or acquired by a single surgeon (LD) at our tertiary academic referral center between January 2007 and March 2018. A penile deformity with angle  $\geq 30^\circ$ , difficulty in vaginal penetration, and severity of ED secondary to penile curvatures were the indications for a surgical treatment with YT. All patients affected by penile curvature acquired were in a chronic phase of the disease. An informed consent for surgical treatment was obtained from all patients. Clinical data and operative outcomes of 75 patients who underwent penile corporoplasty were reviewed. Preoperatively the curvatures were assessed from self-photographs of orthogonal, frontal, and sagittal planes, and an ultrasound evaluation of penis was done before and after

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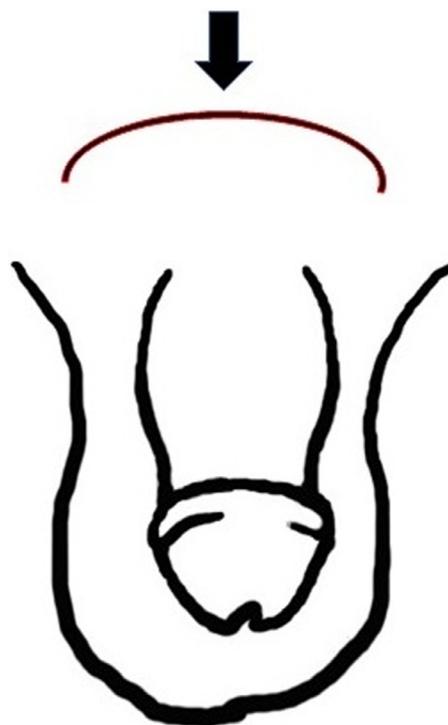
intracavernosal injection of 10  $\mu$ g Prostaglandin E<sub>1</sub>. The preoperative characteristics of the patients (age, direction of curvature, degree of angulation, the five-item of International Erectile Function Index [IIEF-5] score, and presence of plaque), postoperative outcomes (change in angulation, palpation of sutures, penile shortening, patient satisfaction, and postoperative IIEF-5), operative time, and hospital stay were recorded. Patients without at least 6 months of follow-up or incomplete clinical data were not included in this study. Follow-up was planned, involving a clinical evaluation during the first month, a clinical evaluation after the third and sixth month after surgery. All patients were subsequently reviewed with the postoperative survey of Chahal et al<sup>8</sup> to determine their sexual satisfaction status, changes in erectile function, development of palpable nodules, and quality of sexual experiences. Degree of angulation was recorded at follow-up with self-photographs of orthogonal, frontal, and sagittal planes.

### Yachia Corporoplasty Technique With DG

Surgery is performed with the patients under either epidural or general anesthesia. During surgery, Foley catheter (14Fr-16Fr) is inserted for every patient to prevent an inadvertent injury to urethra and removed on first postoperative day. To define the localization of the curvature, a tourniquet is set at the base of the penis. Artificial erection is induced by injection of sterile saline solution into the corpora cavernosa through a 20-gauge butterfly needle to determine the localization and the degree of the curvature. The surgical procedure with DG technique involved a coronal incision to 1 cm from the glans line. A careful DG with preparatory isolation of the dissection plan between dartos and Buck's fascia was made. After exposing the corpora cavernosa, the site of the maximum curvature is recorded and marked transversely on tunica albuginea. The body curvatures are measured with a goniometer. In patients who had required to correct cavernosa body deviation, the effect of the opposite correction was simulated using Allis clamps. Then a longitudinal incision is made between the marks left by the Allis clamp jaws. The edges of incision are pulled from the middle with a pair of hooks, and finally the horizontal incision is closed by a running suture of absorbable 2-0 polydioxanone (PDS, Ethicon, Somerville, NJ) with inverted knots. At the end of the procedure, a new artificial erection is induced to confirm the integrity of the suture and the degree of deviation. A circular dressing with light pressure was subsequently applied for 24 hours, and the Foley catheter was removed the following day. Antibiotic prophylaxis was dispensed routinely during surgery (cefazolin 2 g in single doses) and at discharge (amoxicillin-clavulanate 875-125 mg every 8 hours) for 10 days. We do not suppress nocturnal erection, but patients are advised to abstain from sexual intercourse for 2 months.

### Yachia Corporoplasty Technique WDG

After an artificial erection to determine the localization and the degree of the curvature, a transverse infrapubic skin incision is made to correct the curvature for the corpora cavernosa ventral deviation (Fig. 1). Colles' fascia is opened with forceps. The corpora cavernosa are degloved through the infrapubic surgical incision. The dorsal neurovascular bundle is isolated with a Babcock clamp, and a tourniquet is placed at the root of the penis. The tunica albuginea is then completely isolated from Buck's fascia being careful not to damage the neurovascular bundle. A longitudinal and bilateral paraneurovascular bundle incision is made on the tunica albuginea and is closed in a horizontal by a

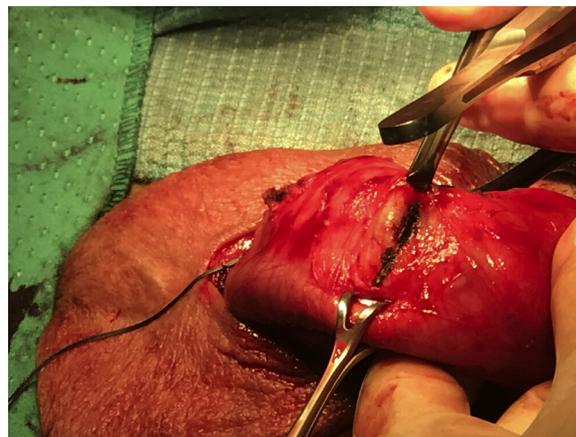


**Figure 1.** (Color version available online.) Transverse infrapubic skin incision for the correction of the corpora cavernosa ventral deviation.

running suture of absorbable 2-0 polydioxanone (PDS, Ethicon) with inverted knots. For the corpora cavernosa dorsal deviation, a trans-scrotal approach is made. After an exhibition of the corpora cavernosa, 1 or more paraurethral longitudinal incisions are made and sutured according to YT (Fig. 2). At the end of the surgery in all patients, a Foley catheter is inserted and removed on first postoperative day.

### Statistical Analysis

The data were analyzed in a common database. Statistical analysis was performed with SPSS 23.0 (IBM Corp. Armonk, NY).



**Figure 2.** (Color version available online.) For the corpora cavernosa dorsal deviation, a trans-scrotal approach is made. After an exhibition of the corpora cavernosa, one or more paraurethral longitudinal incisions are made and sutured according to Yachia technique.

Normally and non-normally distributed variables were presented as mean  $\pm$  standard deviation (compared using Student's *t* test) and median (compared using the Mann-Whitney *U* test), respectively. A *P* value  $<.05$  was considered statistically significant.

## RESULTS

Seventy-five patients operated for PD or penile curvatures using YT were invited by telephone to answer a postoperative survey of Chahal about treatment satisfaction.<sup>8</sup> For different reasons, telephone contact was impossible in 11 cases. A total of 64 patients having congenital or acquired penile curvature were included in this review and divided into 2 groups: 34 patients in group I (men underwent corporoplasty DG) and 30 patients in group II (men underwent corporoplasty WDG). Patient characteristics are summarized in Table 1. The diagnosis of penile curvature was PD in 42 patients, congenital curvature in 19 patients, and acquired curvature (after a penile surgery) in 3 patients. The 2 groups were similar in age, IIEF-5, direction, and degree of curvature. No early complications occurred in any case. The mean operative time was  $65.87 \pm 21.32$  minutes for group I and  $48.17 \pm 23.82$  minutes for group II ( $P < .02$ ). The mean hospital stay was  $3.09 \pm 0.96$  and  $2.87 \pm 0.93$  days in DG and WDG, respectively ( $P = .324$ ). Results regarding outcomes and disablement of sexual life of patients are shown in Table 2. There were no significant differences in recurrence rates and complications (palpation of sutures: group I: 14.7% vs. group II: 13.3%; penile shortening: group I: 8.9% vs. group II: 10%; postoperative IIEFF-5 score: group I:  $19.81 \pm 4.80$  vs. group II:  $20.01 \pm 4.63$ ). One patient in the group II underwent reparation due

to inadequate surgical correction ( $P = .526$ ). One patient in group I reported gland hypoesthesia. Four patients reported an unpleasant subjective satisfaction to view the cicatricial outcome of the circumcised prepuce. All patients had resumed their sexual activity at 1 month postoperatively. At follow-up, 2 patients (5.9%) in group I and 1 patient (3.3%) in group II presented (moderate/severe) ED needing treatment with phosphodiesterase type 5 inhibitors. At follow-up of 20.8 (6-44) months, all treated patients were able to insert the penis in the partner's vagina, all patients were satisfied overall with sexual intercourse, 7 patients reported residual pain and discomfort for the knots of the sutures at six months after surgery.

## DISCUSSION

The penile reconstructive surgery represents the standard of care for patients with congenital or acquired penile curvature without significant risks.<sup>1,2</sup> In a study to assess the psychosocial impact of penile reconstructive surgery for penile deformities, Tal et al<sup>9</sup> found that correction of curvature led to important improvements in sexual intercourse, libido, and satisfaction. Several reasons, such as the severity of the curvature, the location of plaque, the patient's age, medical comorbidities, and preoperative ED, are key determinants of surgery indication.<sup>2,10</sup> The success of this type of the surgery depending on technique used, but it does not reflect superiority of 1 procedure over another, as direct comparisons across the observational studies cannot be made.<sup>11</sup> The first technique to correct penile curvature was

**Table 1.** Distribution of preoperative clinical characteristics in patients affected by penile curvatures

Patients Characteristics ( <i>n</i> = 64)	Group I With Degloving ( <i>n</i> = 34)	Group II Without Degloving ( <i>n</i> = 30)	<i>P</i>
Age (y), median (range)	46.4 (17-72)	43.7 (19-68)	NS
Diagnosis of curvature, <i>n</i> (%)			NS
Peyronie's disease	23 (67.6)	19 (63.4)	
Congenital	9 (26.5)	10 (33.3)	
Acquired	2 (5.9)	1 (3.3)	
Direction of curvature, <i>n</i> (%)			NS
Ventral	12 (35.3)	9 (30)	
Dorsal	9 (26.5)	11 (36.7)	
Lateral	13 (38.2)	10 (33.3)	
Degree of curvature ( $^{\circ}$ ), mean $\pm$ SD	$39.21 \pm 8.51$	$37.76 \pm 9.34$	NS
IIEF-5 score, mean $\pm$ SD	$17.55 \pm 4.83$	$17.12 \pm 4.37$	NS

IIEF-5, International Erectile Function Index; NS = not significant; SD = standard deviation.

**Table 2.** Outcomes and disablement of sexual life of patients with and without degloving

	Group I With Degloving ( <i>n</i> = 34)	Group II Without Degloving ( <i>n</i> = 30)	<i>P</i>
Operative time (minutes), mean $\pm$ SD	$65.87 \pm 21.32$	$48.17 \pm 23.82$	$P < .02$
Hospital stay (d), mean $\pm$ SD	$3.09 \pm 0.96$	$2.87 \pm 0.93$	NS
Palpation of knots, <i>n</i> (%)	5 (14.7)	4 (13.3)	NS
Penile shortening (cm), <i>n</i> (%)	3 (8.9)	3 (10)	NS
Residual pain, <i>n</i> (%)	5 (14.7)	2 (6.6)	$P < .01$
Gland hypoesthesia, <i>n</i> (%)	1 (2.9)	0 (0)	NS
Postoperative IIEF-5 score, mean $\pm$ SD	$19.81 \pm 4.80$	$20.01 \pm 4.63$	NS
Postoperative ED score, <i>n</i> (%)	2 (5.9)	1 (3.3)	NS

ED, erectile dysfunction; IIEF-5, International Erectile Function Index; NS, not significant; SD, standard deviation.

described by Nesbit.<sup>12</sup> Various modifications to Nesbit's technique were suggested to improve penile lengthening and girth after its introduction. In 1985, Essed and Schroder did not involve incision or excision of the tunica albuginea, but simply utilized multiple deep plication sutures into the tunica at the point of maximal curvature.<sup>13</sup> Yachia<sup>14</sup> subsequently proposed a modification of the Nesbit's technique, in which 1 or more longitudinal incisions are made in the convex side of the tunica albuginea and then closed in a horizontal suture. These techniques imply circumcision and complete DG of the penis. Circumcision with DG is commonly assessed as a part of any corrective penile surgery and has been the standard teaching in Europe. This is to prevent the risk of edema or ischemia of the prepuce.<sup>15</sup> Savoca et al<sup>16</sup> showed that a secondary circumcision was inevitable to prevent the occurrence of postoperative edema and phimosis. However, the literature confirms that if a patient has a normal retractable foreskin and has not had previous penile surgery, the risk of preputial complications is <1%.<sup>17</sup> In our experience, it is common practice to also circumcise men who have not been before circumcised. Subsequently, we easily made the dissection between the dartos and Buck's fascia through a relatively avascular plane and avoid the risk of postoperative edema. The management of congenital or acquired penile curvatures with YT-WDG preserves the foreskin of the penis maintaining similar cosmetic results to the preoperative state and minimizing the change in glans sensitivity.<sup>16,17</sup> In our case series, 62% of patients (21 of 34) in group II vs. 27% of patients (8 of 30) in group I reported an unchanged change in sensation on the head of the penis since the operation ( $P < .01$ ). However, the complete DG offers undeniable advantages over other procedures. It is time-consuming, given the meticulous operative planning, and permits to emulate more precisely the correction on the operating table.<sup>18</sup> In our experience, this technique with circumcision certainly extends the healing (median patient stay in the hospital was  $2.87 \pm 0.93$  days in group II vs.  $3.09 \pm 0.96$  days in group I [ $P = .324$ ]) and operative time ( $65.87 \pm 21.32$  minutes for group I and  $48.17 \pm 23.82$  minutes for group II [ $P < .02$ ]). In a recent study, similar results were observed by Alei et al<sup>19</sup> in terms of less healing and operative time after their double-breasted corporoplasty technique WDG for congenital ventral penile curvature performed in 93 patients. Recently, there has been raised interest in the use of absorbable sutures to help prevent the complication of palpable suture knots with associated postoperative pain. Hsieh et al<sup>20</sup> observed on their use of absorbable suture in 114 men undergoing plication technique that overall 86% of patients had complete correction at 6 months postoperatively. However, about 28% of patients developed recurrent deformity and only a few felt it necessary to have a repeat the surgery. In our cohort of patients, we observed 10.9% of patients (7 of 64; 5 [group I] vs. 2 [group II]) who were able to feel the knots of absorbable sutures at 6 months postoperatively, and 3 of these patients had pain or discomfort to touch the knots.

For suturing the incisions in a horizontal on the tunica albuginea, we chose to use in all patients an absorbable suture that minimizes the aspects of postoperative retention of knots and fibrosis. According to the results of other authors, we believe that the nonabsorbable suture with the knots buried in the tunica albuginea can be recommended for recurrent cases, although residual postoperative fibrosis and a painful syndrome may be associated with its use. There are few data regarding the outcomes of the corporoplasty WDG in the literature.<sup>21,22</sup> To our knowledge, this is the first study to describe the corporoplasty with Yachia's technique WDG. Dugi and Morey<sup>22</sup> showed a successful rate of 93% after penoscrotal plication WDG in 48 patients affected by dorsal and/or lateral curvature. Recently, Kadirov et al<sup>7</sup> conducted a retrospective analysis of 52 patients who underwent penile plication WDG for the treatment of PD or congenital penile curvature, and the overall surgical success rate was 92.3%. The authors affirmed that the neurovascular bundle can be damaged during surgical technique involving the dorsal side of the penis. In our series, the dorsal neurovascular bundle is isolated with a Babcock clamp, and a tourniquet is placed at the root of the penis. After a good exposure longitudinal and bilateral paraneurovascular bundle incision is made on the tunica albuginea and is closed in a horizontal. We reported an overall surgical success rate of 98%. The limitations of the present study are evident. The retrospective nature of our study may result in unrecognized biases. First, all surgeries were performed at a single high-volume institution by a single experienced surgeon, which could have influenced outcomes. Our data must be validated with future multicenter studies. Second, curvature recurrence, nodularity, postoperative erections, and loss of penile length were patient-reported and not validated objectively with a pharmacologically induced erection.

## CONCLUSION

A number of authors have observed that the corporoplasty with YT is not a panacea for congenital or acquired penile deformities. However, it provides certain advantages in terms of safe and effective surgery both if performed DG or WDG approach. This technique may be used for a variety of penile deformities, including multiplanar and severe curvatures with minimal risk of injury to the dorsal neurovascular bundle, de novo ED, or shortening of the penis. The outcomes of the DG and WDG techniques were similar, even if the YT-WDG presents some advantages. It preserves the foreskin of the penis maintaining similar cosmetic results to the preoperative state, minimizing the change in glans sensitivity and allowing to obtain better results in terms of less healing and operative time.

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