SKILL AND TALENT

Rotation of the corpora cavernosa for the treatment of congenital penile curvature

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Abstract
Introduction: Congenital penile curvature (CPC) is caused by a disorder in the embryonic development of the urethra and corpora cavernosa. The condition causes difficulty for penetration, requiring surgical correction when it prevents intercourse.

Material and methods: We present the cases of 2 men in their 40s who had ventral curvature greater than 60° of 2 years of evolution, with maintained erections. The patients underwent surgery for rotation of the corpora cavernosa. After the complete denudation of the penis, athermal release of the neurovascular bundle of the penis from the ventral side to the dorsal was performed. Once the curvature was verified using artificial erection, an incision was performed in the tunica albuginea of both corpora cavernosa, continuously suturing both internal and external margins with resorbable monofilament. The rectification of the curvature was then checked, and the mucocutaneous plane was reconstructed.

Results: The surgical time was 120 min and there were no intraoperative complications. Both patients were discharged 24 h after the surgery. At 1 week, the patients experienced spontaneous night-time erections and were able to maintain sexual relations 1 month after the surgery. At 6 months, the residual curvature was less than 20°, the penile shortening was less than 1 cm and the International Index of Erectile Function-5 was 25 for both cases.

Conclusions: Surgery for rotation of the corpora cavernosa helps correct CPC without significant penile shortening or erectile dysfunction. In our opinion, the procedure is an appropriate treatment for patients with CPC but requires studies with long-term follow-up in order to consider it the technique of choice.
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Introduction

Congenital penile curvature (CPC) is a pathological process that occurs in the last years of adolescence or early adulthood, its estimated incidence being 4–10% in the general population and 0.8% in patients with hypospadias.\(^1\)

CPC arises as a result of altered signaling pathways responsible for the embryonic development of the urethra and the corpora cavernosa, determining an increase in the ratio between elastic and collagen fibers in the tunica albuginea and the corresponding curvature.\(^2\)

The curvature is ventral in 48% of the cases,\(^3\) and it conditions difficulty to achieve penetration, surgical correction being the treatment of choice in cases where it makes sexual intercourse impossible.

The choice of the surgical technique is determined by the size and degree of penile curvature. In cases of long penis and curvatures <60°, excision techniques (Nesbit) or plication of the tunica albuginea on the convex side are used, whose main risk is the shortening of the penis. In patients with short penis or curvatures >60°, enlargement techniques of the concave side by means of grafts are used preserving the penile length, although they are at risk of developing de novo erectile dysfunction.\(^4\)

The rotation of the corpora cavernosa, first described by Shaeeer in 2006,\(^5\) makes it possible to preserve the length of the penis without risk of developing erectile dysfunction, existing to date few cases described in the literature.

Patients and methods

We present 2 men in the 4th decade of life complaining of congenital ventral penile curvature in erection above 60°, which prevents penetration over a year ago.

External genitalia showed no fibrotic plaques, or other alterations in any of the 2 cases.

We measured the length of the penis in detumescence in consultation with a millimeter ruler, being 15 and 12 cm. The curvature was observed by means of self-photographies in 3 projections. None of the 2 patients had erectile dysfunction. Sexual function was assessed using the IIEF-5 questionnaire, in both cases being 20.

Surgical technique

Circumcision is performed under spinal anesthesia, complete denudation of the penis up to Buck’s fascia being performed by means of subcoronal approach.

On both sides of the urethra, 1 cm away from this, on the ventral surface, Buck’s fascia is incised, initiating the release of this and of the neurovascular bundle. Dissection continues with scissors on both sides toward the dorsal side, coagulating small bleeding vessels selectively with bipolar forceps at 20 w.

After the release of the neurovascular bundle is completed up to the dorsal surface on both sides, indemnity thereof is checked and it is kept out with an elastic band.
We placed a tourniquet at the base of the penis and by means of intracavernous injection of saline, we provoked an artificial erection, showing the ventral curvature (Fig. 1).

On the dorsal surface of both corpora cavernosa, we conducted 2 parallel incisions with cold knife of the external longitudinal layer of the tunica albuginea, without delving into the inner circular layer, extending through the entire length 5 mm away from the corresponding urethral edge. We sutured the inner edge of both incisions between each other by means of a 4/0 absorbable monofilament continuous suture, as well as the 2 outer edges (Fig. 2).

We checked the curvature correction through a new artificial erection (Fig. 3) and we rebuilt Buck’s fascia and the mucocutaneous plane with loose Vicryl 3/0 sutures, leaving a pressure bandage.

The patient was discharged the following day with prior replacement of the bandage with a less compressive one. At 72 h, the first review of the surgical wound is made and the bandage is removed permanently.

Sexual intercourse is allowed one month after the operation. Check-ups are made after a month, at 3, 6, and 12 months postoperatively. Erectile function, correction of the curvature, and penile length are evaluated in the corresponding revision at the 6th month by IIEF-5, millimeter measurement, and self-photographs, respectively.

Results

The operative time was 120 min, with no intraoperative complications. Twenty-four hours after surgery, the patients were discharged. One week after surgery, the patients had spontaneous nocturnal erections. In both cases they were able to maintain satisfactory sexual relations one month after the operation, there being no postoperative complications. At 6 months, we observed residual curvature below 20°, 25 IIEF-5, and loss of length of the penis below 1 centimeter in both cases. The current follow-up is 12 and 8 months. The clinical characteristics of both pre- and post-surgical patients are summarized in Table 1.

Discussion

The aim of the surgical treatment of CPC is to correct the curvature and allow for satisfactory sexual intercourse, so the potential risks and benefits of different surgical options must be discussed with the patient so he can make a decision about treatment with realistic expectations.

Shortening techniques of the convex side, with or without excision of the tunica albuginea, present penis straightening rates above 80%. These procedures have the advantage of being low complexity techniques with short surgical time, allowing to be performed with local

<table>
<thead>
<tr>
<th>Variable</th>
<th>Case 1</th>
<th>Case 2</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>33</td>
<td>31</td>
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<tr>
<td>Previous penile length (cm)</td>
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<td>12</td>
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<tr>
<td>Preoperative IIEF-5</td>
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<td>20</td>
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<td>Presurgical curvature</td>
<td>65°</td>
<td>85°</td>
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<tr>
<td>Posterior penile length (cm)</td>
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<td>11.5</td>
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<tr>
<td>Postsurgical IIEF-5</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Postsurgical curvature</td>
<td>10°</td>
<td>15°</td>
</tr>
<tr>
<td>Follow-up time (months)</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
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anesthesia on an outpatient basis. Conversely, palpation of suture knots, penile shortening of up to 2 cm, and relapse of curvature are the main complications of these procedures. In the review of the various series published by Makovey et al., the frequency of these complications reaches 100%, 50%, and 33% in patients undergoing Nesbit type surgery, and 86%, 67%, and 43% in the patients undergoing plication techniques, respectively.

Enlargement techniques of the concave side require the use of grafts, involving greater technical complexity and surgical time, as well as risk of developing de novo erectile dysfunction. However, the use of grafts avoids the complications of techniques of shortening of the albuginea as loss of penile length or palpation of suture knots, with curvature correction rates over 90%.

The saphenous and dorsal penile veins are the most frequently used autologous material, there existing series of patients with long-term follow-up, showing that there can be erectile dysfunction (50%) and persistence of the curvature (5–35%). Da Ros et al. used albuginea grafts in 33 patients, demonstrating the persistence of curvature and de novo erectile dysfunction in 16% and 19.3% of cases, respectively. Xenografts, such as bovine pericardium, or synthetic materials such as Dacron, have the advantage of not being obtained surgically, but they entail additional cost and can generate a local inflammatory reaction that conditions the retraction of the graft, there existing recurrence of the curvature in 40% of cases.

Rotation surgery of the corpora cavernosa to treat CPC was described by Shaeer in 2006 in a 22-year-old male with a 90° ventral curvature, achieving complete correction of it, preserving the penile length and erectile function. The basic principle of surgery is to change the concavity of both corpora cavernosa from the ventral side of the penis to the lateral one rotating one against the other rather than synergistically, thereby neutralizing the inducing effect of the curvature.

In 2008 Shaeer published his series of 22 patients operated using this technique, with a minimum follow-up of 16 months. The average penile curvature and length of the series was 66° and 15.4 cm respectively. In this paper, the good initial results are maintained achieving curvature correction in all cases, with no cases of recurrent curvature, erectile dysfunction, or penile shortening with an average postoperative length of 15.7 mm. Although an overall increase in penile length of 3 mm with this technique is described, none of the cases with curvatures higher than 50° had an increase in the length, as in our cases, in which the curvatures were over 60°. Among the major disadvantages of the technique are the inability to correct lateral curvatures and loss of thickness of the penis, which can reach 12%, although with little clinical importance.

Conclusions

In our opinion, the rotation surgery of the corpora cavernosa is an effective therapeutic alternative to plication techniques or lengthening of the tunica albuginea to treat CPC, avoiding the complications of these techniques, although a larger number of studies and follow-ups is required to consider it the technique of choice in this disease process.

Conflict of interest

The authors declare that they have no conflict of interest.

References