A single relaxing incision for penile curvature correction in Peyronie’s disease, based on the geometric principle

Ramírez-Pérez Erick Alejandro,1 Romero-Arriola Hazael,2 López-Silvestre Julio César.3

ABSTRACT

Peyronie’s disease is a pathology that is characterized by a deformity of the penis during erection that can be curved, indented, hourglass-shaped, or shortened. It can also be accompanied with erectile dysfunction. Current treatment techniques consist of applying healthy tunica albuginea, which results in a shortening of the total length of the penis.

The technique that we used is based on a single circumferential relaxing incision that is bifurcated at its ends.

The single relaxing incision with the application of the geometric principle is a standard procedure that can be used to correct any type of penile curvature.

Keywords: Peyronie’s disease, surgical treatment, incision, new technique, Mexico.

RESUMEN

La enfermedad de Peyronie es una enfermedad que se caracteriza por una deformidad del pene durante la erección, ya sea curvatura, indentación, deformidad en forma de reloj de arena y acortamiento. Puede estar acompañada de disfunción eréctil. En la actualidad, las técnicas utilizadas consisten en aplicar la albugínea sana, lo que se traduce en un acortamiento de la longitud total del pene.

La técnica que utilizamos a continuación, se basa en una sola incisión de relajación circunferencial, misma que se bifurca en sus extremos.

La incisión de relajación única aplicando el principio geométrico es un procedimiento estándar, que puede ser utilizado para corregir cualquier tipo de curvatura peniana.

Palabras clave: Enfermedad de Peyronie, tratamiento quirúrgico, incisión, técnica nueva, México.
INTRODUCTION

Congenital penile curvature or that caused by Peyronie's disease affects the length of the penis and can be associated with constriction of the penile circumference. It can also be accompanied with erectile dysfunction.

Current techniques use the application of healthy tunica albuginea, which results in a shortening of the total penile length.

In 30% of the patients with Peyronie's disease, the plaque is not palpable and can be multifocal; the changes in the tunica albuginea are diffuse and not limited to one single site. Plaque excision provides very uncertain results and the principle patient complaint is penile deformity. However, relaxing incisions in the tunica albuginea can correct any type of curvature associated or not with Peyronie's disease. Different types of incisions have been suggested, but there is no one ideal technique. The technique we are describing herein is based on a single circumferential relaxing incision that is bifurcated at its ends. Used in conjunction with the geometric principle, the exact incision site in the tunica albuginea is located and the incised wound will later be covered by a graft, almost perfectly correcting the curvature.

The objective of this article is to show the technique and results in the management of penile curvature due to Peyronie's disease through the use of a single relaxing circumferential incision and the application of porcine intestinal submucosal graft, based on the geometric principle.

CASE PRESENTATION

A 54-year-old man presented with a 45-degree angle penile curvature secondary to Peyronie's disease that made coitus impossible. The curvature was preoperatively evaluated with the application of intracavernous alprostadil.

SURGICAL TECHNIQUE

1) A subcoronal penile incision is made, and the entire length of the penis is denuded and exposed (Figure 1).

2) An erection is then induced through puncture and administration of saline solution in either one or both of the corpora cavernosa in order to find the point of maximum curvature (PMC) (Figure 2).

3) In any type of curvature, two paraurethral incisions (A-A') are made, Buck's fascia is dissected and separated, together with the dorsal neurovascular bundle of the tunica albuginea, along the circumference of the penis (Figure 3).

4) Two tangential lines are drawn on the straightest proximal (B-B') and distal (C-C') axis of the penis (Figure 4). A circumferential line is drawn on the bisector angle formed by those lines (PCM).

5) The width (W) of the incised wound to be created should be equal to the difference between the longest (Figure 5A) and the shortest (Figure 5B) parts of the penis, corresponding to the difference between the distance separating the two circumferential lines perpendicular to the axis that was drawn on the straightest part of the penile segments; in other words, outside the area of the curvature.

6) The difference between D-E and D'-E' (W) is equal to the size of the incised wound on each side of the urethra, in the case of dorsal curvature (Figure 6A). The length of the incised wound (L) is equal to the distance between the two paraurethral incisions (Figure 6B).
7) The incised circumferential line, bifurcated at its ends, forms a rectangular incised wound marked as F and F’. Its position is the distance that is equivalent to one fourth of the W (incised wound width) from the paraurethral incisions (Figure 7A). The resulting bifurcation angle is 120º, producing a simple and stable incised wound (Figure 7B).

8) The penis acquires a straight form once a 5 mm incision is made on each side of the intracavernous septum, at its intersection with the transverse incision. A 5 mm dissection is carried out under the edges of the tunica albuginea between the corpora cavernosa and the four sides of the incised wound in order to facilitate suturing with the graft to be used (Figure 8).

9) The previously measured graft is symmetrically sutured with 5-0 Monocryl and continuous sutures on the incised wound made in the tunica albuginea (Figure 9).

10) An artificial erection is again created to evaluate the definitive curvature correction (Figure 10).

11) The prepuce is placed in its normal position and sutured with the habitual technique of chromic 4-0 simple interrupted suture (Figure 11).
During the last decade there have been great advances in the understanding and management of Peyronie's disease and the improvements in medical and surgical management are obvious.

In general, Peyronie's disease is a pathology that is characterized by a deformity of the penis during erection that can be curved, indented, hourglass-shaped, and shortened. This condition commonly presents with a palpable induration or penile plaque, with or without pain during erection.

The mean age at which Peyronie's disease presents is 53 years and its prevalence is 0.4%. It has been associated with certain pathologies such as Dupuytren's contracture, plantar fascial contractures, tympanosclerosis, diabetes, trauma, urethral instrumentation, gout, Paget's disease, the use of beta blockers, and familial inheritance. In the past Peyronie's disease was thought to have a gradual resolution, but today some case series report that 14% of the patients with this pathology resolve it spontaneously, 40% have disease progression, and 47% present with disease stabilization. The pain that presents with erection has been observed to gradually decrease over time. Up to 77% of the patients with this disease are affected by it psychologically.

Peyronie's disease is commonly associated with erectile dysfunction. The four factors contributing to this are: severe deformity, mainly in lateral or ventral curvatures, that impedes coitus; penile instability that is produced in patients with extensive disease and conditioned by circumferential plaque; anxiety or depression caused by having the disease; and vascular dysfunction that presents in 30% of the patients. This latter could be secondary to arterial disease or veno-occlusive dysfunction, conditioned by a reduction in tunica albuginea compliance that does not allow for adequate compression of those veins during erection.

Trauma has been associated as a triggering factor for Peyronie's disease. Excessive penile flexion or local trauma can cause microscopic vascular injury with subsequent bleeding in the space below the tunica albuginea or a tear in that structure at the level of the septum. This sets off aberrant local cicatrization mechanisms that begin to act with an excessive fibrin deposit and cytokine and tissular growth factor overexpression that stimulates matrix protein overproduction and inhibits the action of the metalloproteinases. This generates the production of disorganized elastic collagen fibers that condition the loss of elasticity in the tunica albuginea.

The clinical presentation of the disease is classified as early and late. Patients in the early phase normally present with a nodule or some plaque and painful erection that may or may not be accompanied with deformity. The symptom triad is hardened plaque, a stable deformed penis during erection, and erectile dysfunction. Diagnosis is based on medical and psychosexual interrogation that should include discerning whether there is rigidity during erection, shortening of the penis, induration, hourglass-shaped deformity, pain with or without erection, and the psychological impact of the disease.

The majority of patients with Peyronie's disease can be treated with no need for vascular evaluation.
However, ultrasound is useful for studying the site and amount of plaque and whether or not there is calcification. If a corrective procedure with graft is being planned, Doppler ultrasound with intracavernous medication is suggested for evaluating vascular function and collateral venous flow between the dorsal and cavernous arteries. Treatment of Peyronie’s disease is variable. There are multiple therapies for its management that are described in different publications that range from conservative medical treatment to radiation, shockwave, diathermic, and surgical management, among others.

Surgical management is reserved for those patients with important curvatures (> 45º) or narrowing of the tunica albuginea that interferes with coitus. Penile reconstruction should be carried out once the disease has stabilized, which is generally 12 to 18 months after its onset. Preoperative evaluation of erectile function is very important for defining the best management. In general, surgical procedures in these cases in particular are divided into three categories: procedures to shorten the tunica albuginea, procedures to lengthen the tunica albuginea, and prosthetic procedures. The procedures for shortening the tunica albuginea are performed on the convex side of the penis, on the side that is contralateral to the plaque. Nesbit was the first to discover this principle and over time certain modifications have been made that have created new techniques, but the principle is the same. Generally this procedure is adequate for patients that have no erectile function alterations and that have sufficient length with no deformity or narrowing of the circumference of the penis.

The procedures for lengthening the tunica albuginea, as in our present case, are more demanding because they involve more complex reconstruction maneuvers. These procedures are indicated for more complicated situations in which there is important penile curvature and deformity. Devine and Horton successfully began the use of free grafts. Many types of autologous grafts have been used that include temporalis fascia, dura mater, tunica vaginalis, saphenous, and more recently, mucosal grafts. Cadaveric grafts have also been used such as those from porcine intestinal submucosa, bovine pericardium, and synthetic grafts made from polyester and polytetrafluorethylene, all with a wide variety of results. Plaque excision used to be considered standard technique. However, new surgical management options were sought due to the excision-associated complication of erectile dysfunction. In 1991 Gelbard and Hayden proposed tunica albuginea incision only plus the free graft application and erectile dysfunction was considerably reduced. There are different types of incisions, such as the H incision, with success rates from 75 to 95%. Egydio et al. have also proposed the relaxing incision using the geometric principal, like the procedure in this publication, with very satisfactory results. We believe this technique can correct any type of penile curvature whether or not it is associated with Peyronie’s disease. No material yet exists that has the same characteristics as the tunica albuginea, however, the studies focused on the understanding of Peyronie’s disease are promising. In the meantime, we have to know and understand this pathology in order to offer our patients the best therapeutic option.

CONCLUSIONS

The single relaxing incision using the geometric principle is a standard procedure that can be used to correct any type of penile curvature, regardless of the characteristics of Peyronie’s plaque, without affecting the total length of the penis.

REFERENCES