Prazosin-related low-flow priapism: treatment with proximal corpus cavernosum to spongiosum shunt


ABSTRACT

Priapism is defined as the painful erection of the penis that lasts for more than four hours and that is not associated with sexual stimulation. Depending on its etiology, priapism can be classified as low-flow (ischemic), high-flow (nonischemic) and intermittent. Low-flow priapism has been associated with hematologic diseases, neoplastic processes, psychotropic drugs such as phenothiazines and trazodone, antihypertensive agents such as prazosin, as well as with hemodialysis, heparin, and parenteral nutrition. Low-flow priapism is considered to be a urologic emergency because it behaves like compartment syndrome with necrosis and fibrosis of the cavernous tissue, leading to erectile dysfunction. These complications present in relation to the length of time of progression and treatment aggression and this is why different medical and surgical managements are currently described for achieving penile detumescence. The case is presented of a patient diagnosed with difficult-to-manage low-flow priapism associated with prazosin.

RESUMEN

Se define al priapismo como la erección del pene dolorosa y persistente por más de cuatro horas, que no está asociada a la estimulación sexual. Dependiendo de la etiología, el priapismo se puede clasificar como de bajo flujo (isquémico), de alto flujo (no isquémico) e intermitente. El priapismo de bajo flujo se ha asociado a enfermedades hematológicas, procesos neoplásicos, drogas psicótropas como fenotiazinas y trazodona, antihipertensivos como el prazosin, además de hemodiálisis, heparina, nutrición parenteral. El priapismo de bajo flujo es considerado una urgencia urológica, ya que se comporta como un síndrome compartamental con necrosis y fibrosis del tejido cavernoso, que lleva a la disfunción eréctil. Estas complicaciones se presentarán según el tiempo de evolución y la agresividad del tratamiento, es por ello que en la actualidad se describen diferentes manejos tanto médicos como quirúrgicos, para lograr la detumescencia del pene. Se presenta el caso de paciente con diagnóstico de priapismo de bajo flujo de difícil manejo, que se asoció a la ingesta de prazosin, al...
INTRODUCTION

Priapism is a persistent erection of the penis for more than four hours that is not related to sexual stimulation. Priapism is classified as ischemic priapism (low-flow, veno-occlusive disease), nonischemic priapism (high arterial flow), and intermittent priapism. 1

Idiopathic cases of priapism are the most frequent (approximately 50%). Other medical conditions that can result in priapism are hematologic diseases, mainly falciform cell anemia and leukemia, traumatisms, and neoplastic processes. Thirty percent of cases are drug-related, and psychotropic drugs (phenothiazines and trazodone), hypertensive agents (mainly prazosin), and heparin are among the most frequent. Over the last few years, intracavernous injection of vasoactive drugs (papaverine, phentolamine, and prostaglandin) has been responsible for priapism in patients complaining of erectile dysfunction. 1,2

Low-flow priapism is caused by an imbalance in vasconstriction and vasodilation mechanisms that results in compartment syndrome of the penis with hypoxia, hypercapnia, and acidosis. This syndrome can lead to irreparable damage, as well as to fibrosis of the erectile tissue. When treatment reestablishes blood flow, this leads to tissue reperfusion syndrome, releasing large quantities of free radicals that cause more necrosis and fibrosis. 1,2

The aim of the present article is to present a case of a 26-year-old man diagnosed with difficult-to-manage low-flow priapism associated with prazosin, who was treated with proximal cavernosum-spongiosum shunt.

CASE PRESENTATION

The patient is a 26-year-old man with a past medical history of chronic renal failure secondary to right renal hypoplasia and left renal agenesis of 2-year progression, treated with peritoneal dialysis, and difficult-to-manage high blood pressure of 2-year progression, treated with prazosin. He presented with persistent and painful erection of 36-hour progression that was not associated with sexual stimulation. Gasometry of the corpus cavernosum reported: PO2: 8 mmHg; PCO2: 108 mmHg; pH: 7.04, resulting in low-flow priapism classification.

Corpora cavernosa irrigation with epinephrine was carried out with poor results. The Al-Ghorab distal corpus cavernosum-spongiosum shunt was performed, attaining total detumescence. However, 24 hours later, penile tumescence recurred (Figure 1), with severe distal edema of the penis. Corpora cavernosa gasometry reported: PO2: 4 mmHg; PCO2: 124 mmHg; pH: 6.79. The Quackels proximal corpus cavernosum-spongiosum shunt was carried out (Figures 2 and 3), with total detumescence and no priapism recurrence.

DISCUSSION

Priapism is rare and unpredictable. The related literature is neither extensive nor rigorous and is made up of case reports and small series. Priapism is characterized by persistent erection of the penis for more than four hours and that is not associated with sexual stimulation. It is classified as low-flow, intermittent, and high-flow and the low-flow presentation is a urologic emergency, due to its consequences of erectile dysfunction. Low-flow priapism etiology includes hematologic dyscrasias, falciform cell disease, vasoactive drugs, neoplastic disease, parenteral nutrition, hemodialysis, heparin, and drug use (cocaïne, marihuana). In some cases prazosin has been related to priapism etiology. 2,3 The dearth of cases reported in the literature obliges the publication of ours.

Prazosin in an antihypertensive drug that possesses alpha-blocking action and it is used for treating high blood pressure and benign prostatic hyperplasia. It is a selective inhibitor of the alpha-1 subtype of the alpha-adrenergic receptors and has been known to cause priapism. There are different theories regarding the drug and its relation to priapism. One theory is based on the plasma protein binding properties of prazosin, and in patients with continuous ambulatory peritoneal dialysis, accompanied with hypoproteinemia, it can predispose an increase in the free fraction of prazosin.
Another theory is that prazosin can increase penile erection due to its alpha-adrenergic blocking properties, interfering in the sympathetic control of penile detumescence. 

Prazosin has been related to low-flow priapism etiology - a urologic emergency due to its resultant erectile dysfunction. There are only a few cases reported in the literature of priapism associated with prazosin. In 1984, Adams et al. reported one case, in 1983 Ylitalo et al. reported two cases, in 1980 Burke et al. reported one case, and in 1979 Bhalla et al. reported two cases (Table 1).

Table 1. Reported cases associated with prazosin.

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Number of patients</th>
<th>Dosage mg/day</th>
<th>Duration months</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ylitalo, et al (1983)</td>
<td>2</td>
<td>3 to 10</td>
<td>3 a 4</td>
<td>Reinal failure recurred with challenger</td>
</tr>
<tr>
<td>Burke, et al (1983)</td>
<td>1</td>
<td>20</td>
<td>1</td>
<td>Reinal failure recurred with challenger</td>
</tr>
<tr>
<td>Bhalla, et al (1979)</td>
<td>2</td>
<td>6 to 20</td>
<td>3</td>
<td>Normal renal function</td>
</tr>
</tbody>
</table>

Initial treatment for low-flow priapism should consist of puncture-aspiration of the corpora cavernosa, together with the intracavernous administration of sympathomimetic agents such as phentolamine; this treatment is very effective if the priapism is treated within 12 hours of its onset.

If detumescence of the penis is not achieved with these initial methods, then more aggressive treatment should be resorted to. The first reasonable approach is with the Winter procedure, taking various biopsies of the albuginea in the distal zone of the corpus cavernosum with a TruCut® biopsy needle. A more aggressive open surgical modification of this type of diversion is the Al-Ghorab distal cavernosum-spongiosum communication procedure. The last line of action is a proximal diversion, such as the Grayhack saphenous-cavernosum technique or the Quackels cavernosum-spongiosum technique. These last two procedures are very useful in difficult cases.
The management objective in all priapism patients is to achieve penile detumescence and preserve erectile function. Prazosin is related to the etiology of low-flow priapism, a urologic emergency. The proximal corpus cavernosum-spongiosum diversion with the Quackels technique is a reliable and effective alternative in low-flow priapism management when initial medical and surgical treatments have failed.

REFERENCES