

# Management of priapism with a trial of exercise in the emergency department

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## ABSTRACT

Priapism is characterized by persistent penile erection in the absence of sexual arousal or desire that does not subside with orgasm. Although relatively uncommon, it is a genitourinary emergency that necessitates prompt work-up and appropriate management, as there is a time-dependent relationship between total duration of erection and an increasing risk of permanent erectile dysfunction. Confirming the type of priapism is key to proper management, but the majority of cases presenting to the emergency department are ischemic in nature. Conservative management strategies for ischemic priapism are sparsely described in the literature but generally include ice pack application to the area, cold showers, masturbation and rarely, exercise. These strategies lack sound evidence, but the risks of attempting them are minimal as long as access to more definitive treatment is not delayed. Lower-limb exercise as a first-line treatment warrants further study in the undifferentiated emergency department priapism population. The case we present and discuss here illustrates the potential benefits of a trial of acute lower-limb exercise, specifically stair climbing, as a treatment for medication-induced priapism. If effective, this simple non-invasive management strategy may decrease the time to effective treatment, requires minimal resource utilization, and ultimately, avoids the need for more invasive treatment.

## RÉSUMÉ

Le priapisme se caractérise par une érection persistante du pénis devant l'absence d'excitation ou de désir sexuels, ne cédant pas à l'orgasme. Bien que le trouble soit relativement peu fréquent, il s'agit d'une urgence génito-urinaire qui nécessite une exploration rapide et une prise en charge appropriée du fait qu'il existe une relation temporelle entre la durée totale de l'érection et le risque accru de dysfonctionnement érectile permanent. Un élément crucial d'une prise en charge appropriée est la reconnaissance du type de priapisme et, dans la majorité des cas examinés au service des urgences, le trouble est de nature ischémique. On trouve, çà et là dans la documentation médicale, des interventions de prise en charge conservatrice de ce type de priapisme, qui comprennent généralement l'application de glace sur la région touchée, des douches froides et la masturbation, mais rarement des exercices. Ces mesures reposent sur des données probantes insuffisantes, mais les risques qu'elles comportent sont minimes dans la mesure où elles ne retardent pas l'application du traitement indiqué. Les exercices des membres inférieurs comme traitement de première intention justifient une étude approfondie chez les patients traités pour priapisme, toutes causes

confondues, au service des urgences. Il sera question, dans l'exposé, des avantages possibles d'un essai d'exercices des membres inférieurs de courte durée, plus précisément de la montée et de la descente d'escaliers, comme traitement du priapisme d'origine médicamenteuse. Si la mesure se montrait efficace, il s'agirait là d'une simple intervention de prise en charge non effractive qui permettrait de réduire le temps écoulé avant la mise en œuvre d'un traitement efficace, qui exige très peu de ressources et qui éviterait, en fin de compte, la nécessité de traitements effractifs.

**Keywords:** conservative treatment, emergency department, ischemic, physical activity, priapism, urology

## INTRODUCTION

Priapism is characterized by a persistent penile erection in the absence of sexual arousal or desire that does not subside with orgasm. Although relatively uncommon,<sup>1,2</sup> it is a genitourinary emergency that necessitates prompt work-up and appropriate management, as there is a time-dependent relationship between total duration of erection and increasing risk of permanent erectile dysfunction.<sup>3</sup>

There are three principal types of priapism: ischemic (veno-occlusive and low flow; generally painful), non-ischemic (arterial high flow; generally non-painful), and stuttering or intermittent ischemia.<sup>4</sup> The vast majority of cases presenting to the emergency department (ED) are ischemic in nature.<sup>2</sup> The condition is generally diagnosed on history and physical examination alone but further investigations, including corporal blood gas analysis, hematological screening, and a penile ultrasound, are sometimes beneficial.<sup>5</sup> The differential for the underlying etiology of a presentation of priapism is quite broad. Priapism may be precipitated by trauma, neoplasm, neurologic conditions, pharmacologic substances, or underlying hematologic diseases such as sickle cell disease (SCD).<sup>6</sup>

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We present and discuss a case of pharmacologically induced ischemic priapism presenting to the ED treated with a trial of acute lower-limb exercise, specifically stairclimbing, leading to full detumescence.

### **CASE REPORT**

A 34-year-old male presented to our ED with a new onset and first presentation of persistent erection. His erection started minutes after injecting an intracavernosal pharmacotherapy consisting of papaverine, phentolamine, and prostaglandin E1 (colloquially known as a triple cocktail). Upon presentation to the ED, it had been five hours since the onset of the erection. There had not been any trauma, and on a review of systems, he denied any other current symptoms either constitutional (e.g., weight loss, fever, fatigue, and nocturnal hyperhidrosis) or infectious. He had already attempted conservative treatment including applying ice packs to the area, taking a cold shower, and achieving an orgasm, but all were ineffective at reducing his erection.

The only pertinent positive on past medical history was a recent evaluation and work-up of erectile dysfunction by a urologist. The patient had not shown improvement of erectile dysfunction symptoms with oral agents, so he was given a prescription for the aforementioned combination medication by his urologist with instructions to inject the triple cocktail shortly before the onset of an erection. The patient denied any diagnoses with a chronic disease or taking any medications in the recent past, including prescription, over-the-counter, and homeopathic. He never had any surgeries or hospitalizations. It was specifically reconfirmed that neither he nor anyone in his immediate family was known to have any hematological diseases, namely, SCD.

He did not smoke cigarettes or use any street drugs but consumed alcohol socially amounting to less than five standard drink equivalents per week.

The patient's vital signs at triage were stable with a blood pressure of 129/85 mm Hg, a heart rate of 92 beats/minute, a respiratory rate of 16 breaths/minute, an oxygen saturation of 98% on room air, and an oral temperature of 36.2°C. His vital signs did not change in a clinically significant way during his time in the ED.

On physical exam, the patient appeared well, visibly anxious, and non-toxic and was alert and oriented to

name, time, and place. There were no pertinent positive findings on respiratory, cardiovascular, or abdominal exams. On a genitourinary exam, the patient was found to have a tender, engorged, and erythematous penis, with no signs whatsoever of pelvic or penile trauma. There was no lymphadenopathy.

No laboratory, diagnostic, or other investigations were performed, and no consulting services were alerted at this time. The patient declined pain-relieving medications. The patient was instructed to climb up and down a set of hospital stairs vigorously and continuously for ten minutes. The patient obliged, and full detumescence was achieved after seven minutes of continuous stairclimbing. Although the patient was initially skeptical that this simple intervention would be effective, he tolerated the trial of physical activity very well.

The patient was kept in the ED for 30 minutes to ensure there was no recurrence of his symptoms before being discharged home. He was also instructed not to use his combination intracavernosal medication before discussion with the prescribing urologist, with whom he was already confirmed to see in two weeks for a follow-up appointment. He was advised to return to the ED if he again developed a persistent erection or any other worrisome symptoms.

### **DISCUSSION**

Confirming the type of priapism is key to proper management in the ED. In this case, the history of erectile dysfunction, coupled with the prescribed treatment and timing of the last dose, followed by the persistent and painful erection, along with a physical examination that demonstrated a rigid cavernosum, was sufficient to narrow the differential diagnosis to ischemic priapism. Prolonged erection is a known and relatively common complication following an intracavernosal injection of erectile dysfunction treatment medications.<sup>7,8</sup> Thus, it was not necessary to retrieve a penile blood gas sample, conduct an ultrasound exam, or perform any other investigations. Time is of the essence with ischemic priapism, as the reduced venous outflow can lead to hypoxia, hypercarbia, acidosis, and, if left untreated, irreversible injury, which has been shown to occur usually after four to six hours of ischemia.<sup>9</sup>

Conservative management of ischemic priapism described in the literature generally includes ice packs,

cold showers, masturbation, and, rarely, exercise.<sup>10</sup> The former three were attempted by our patient before presenting to the ED. These recommendations lack sound evidence, but the risks of attempting them is minimal as long as it does not delay access to more invasive treatment; plus, they are often tried at home by patients before presenting to the ED. Once management is in the hands of the ED physician, pain control is of the utmost importance. The first invasive treatment generally attempted is aspiration of blood from the lateral corpus cavernosum, often with a local ring block.<sup>11,12</sup> If aspiration proves unsuccessful, cold normal saline can be injected into and then aspirated from the corpus cavernosum, in addition to or followed by an injection of alpha-adrenergic substances such as phenylephrine.<sup>13</sup> Other oral sympathomimetic options have also been shown to be somewhat effective, for example, terbutaline.<sup>14</sup> One recent randomized controlled trial of 68 patients with a pharmacologically induced prolonged erection lasting longer than 2.5 hours demonstrated that terbutaline was significantly more effective than a placebo (42% versus 15%, respectively;  $p < 0.05$ ).<sup>15</sup>

Ischemic priapism refractory to all aforementioned treatments would, in most cases, necessitate an emergent urology consult and may necessitate a shunt at the bedside or in an operating room.<sup>5</sup>

As previously described, our patient reached full detumescence before any procedure or pharmacological treatment was offered. Physical activity, specifically stairclimbing, is haphazardly mentioned in the grey literature as a conservative treatment, in the same category as ice packs, for ischemic priapism.<sup>8,10,16</sup>

A recent small prospective study investigating erectile dysfunction evaluated both exercise and oral salbutamol in patients who developed a prolonged erection.<sup>16</sup> As part of the work-up for erectile dysfunction, all patients in this study were administered intracorporeal injections of vasoactive substances, followed by a penile Doppler ultrasound. Of these 369 patients with erectile dysfunction, 53 (14.4%) of the patients developed priapism in this controlled setting.<sup>16</sup> In this subset of patients with pharmacologically induced ischemic priapism, stairclimbing was successful at reversing the erection in 21 patients (40%). Of those remaining, 18 (34%) were reversed using oral salbutamol, and those remaining who failed both more conservative treatments were reversed with an injection and aspiration of saline or phenylephrine.

Exercise as a first-line treatment, specifically stair-climbing, warrants further study in the undifferentiated ED priapism population. If effective, this non-invasive management strategy may avoid more invasive treatments and decrease the time to effective treatment. The underlying physiological explanation for exercise-induced detumescence has not been elucidated, but increased oxygen demand in skeletal muscle leading to blood flow diversion away from the penis to the lower limbs is a logical hypothesis. This strategy may be of particular interest to our colleagues in more rural settings where a urology consultation may be many kilometres or hours away. That being said, no matter the setting, if a urological consultation is warranted, non-invasive management options should delay consultation.

## CONCLUSIONS

The risk of serious complications, notably erectile dysfunction, resulting from priapism is high. Thus, timely and effective management is of the utmost importance. The case we presented and discussed illustrates the potential benefits of first-line treatment with a trial of acute lower-limb exercise for medication-induced priapism. If effective, this simple management strategy avoids invasive procedures and results in minimal resource utilization.

**Competing interests:** None declared.

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