PROCEDURAL SERIES

The occasional low-flow priapism

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INTRODUCTION

Priapism refers to a state of penile erection that is painful, occurs without sexual stimulation and persists for at least 4 h.[1] Possible aetiologies include trauma, the use of various drugs (e.g., erectile dysfunction pharmacotherapy, antihypertensives, antidepressants, anticoagulants, recreational drugs and hormone supplements), corporal injections, neurologic conditions (e.g., cerebrovascular accidents and brain/spinal injuries), malignancies (primary or metastatic), haematologic abnormalities (e.g., sickle cell disease and thalassaemia) and metabolic disorders (e.g., amyloidosis and diabetes), or it could be idiopathic.[2,3]

Priapism is typically diagnosed clinically,[3] and it can be classified based on its aetiology and presentation. There are three different subtypes of priapism, as follows:[4]

1. Low-flow (or ischaemic) occurs when there is little or no intracavernous blood flow. It is typically painful, and irreversible damage can occur after 4–6 h, making it a medical emergency.
2. Stuttering (or intermittent) involves recurrent, alternating periods of ischaemia and detumescence (typically self-limited and lasts about 3 h). There is a risk of permanent injury, implying the importance of early intervention.
3. High-flow (or non-ischaemic) occurs when there is unregulated blood flow into the corpus cavernosa. The cavernosa may not be fully rigid, and the condition may be non-painful and non-emergent.

Priapism is relatively uncommon; however, because it can be a medical emergency, it requires prompt evaluation and possible procedural intervention.[5] In fact, the incidence of priapism-related erectile dysfunction and impotence is associated with the duration of symptoms.[6] As such, physicians in rural emergency departments should be familiar with an approach to its management.

This procedural series article will focus on one approach to treating low-flow priapism. Additional methodologies, as well as the management of high-flow and stuttering priapism, are discussed elsewhere in the literature.

CASE HISTORY

A 24-year-old Caucasian male from rural Newfoundland presented with an erection that had been present since awakening that morning and was sustained over 8 h. The patient

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reported a similar episode of priapism 2 weeks prior that resolved spontaneously. He was in good general health. Medications included buprenorphine/ naloxone, salbutamol, fluticasone, sertraline and zopiclone. He denied any known drug allergies. He also denied any alcohol or recreational drug use. Physical examination revealed a healthy-looking male with stable vital signs. The patient had a rigid erection that was tender to palpation. There was no erythema or effusion over the penis or scrotum. There were no signs of trauma or discharge from the meatus.

EQUIPMENT LIST

All the equipment detailed in Table 1 should be procured prior to initiating procedural intervention for low-flow priapism in an emergency department:

The types of antiseptic, anaesthetic and sympathomimetic may vary based on location and availability. Furthermore, the gauges of the needles used may vary slightly based on the preferences of the treating physician and nursing staff.

THE PROCEDURE

As with any procedure, there may be times when patient-specific considerations (e.g., anticoagulant use, localised cellulitis and allergies) may necessitate delayed intervention or alternate means of treatment, and these factors should be screened for, prior to performing any procedural or medical interventions. The following describes a technique for treating low-flow priapism and is based on methodologies described by several sources:[1,4,6]

1. With the patient in a supine position, prep the skin on the penile shaft, scrotum, lower abdomen and upper legs, using an antiseptic solution.
2. Place a sterile drape around the base of the penile shaft, exposing the penis, and a small portion of the lower abdomen [Figure 1].
3. Perform a dorsal penile nerve block using a small-bore needle. To do so, insert the needle at the dorsal base of the penile shaft at the 10 and 2 o'clock positions angled slightly towards the midline. First, aspirate to ensure that the needle is not intravascular and then inject roughly 2 mL of lidocaine 1% (without epinephrine) [Figure 2].

Table 1: Equipment list for treating low-flow priapism

Item #	Procedure Equipment
1	Sterile gloves
2	Sterile drape
3	Sterile dressings and tape
4	Sterile basin
5	Antiseptic skin prep (e.g., chlorhexidine, povidone-iodine)
6	Syringes, 5 and 10 mL
7	Straight needles, 1.5″ 18G (for drawing up medications)
8	Straight needles, 1.5″ 19- or 21-G
9	*Optional*: Butterfly infusion needles, 19- or 21-G
10	Local anaesthetic (e.g., lidocaine 1% without epinephrine)
11	*Possible requirement*: Phenylephrine* diluted with normal saline to a concentration of 200-500 µg/mL (i.e., combine 0.4–1 mg of phenylephrine in 2 mL of normal saline)

*Other sympathomimetics can be used, but phenylephrine is recommended because it is a selective alpha-1 adrenergic receptor agonist and is therefore less likely to have systemic effects. The sympathomimetic and normal saline should be readily available; however, it may be prudent to delay drawing up this medication, as it may not be required

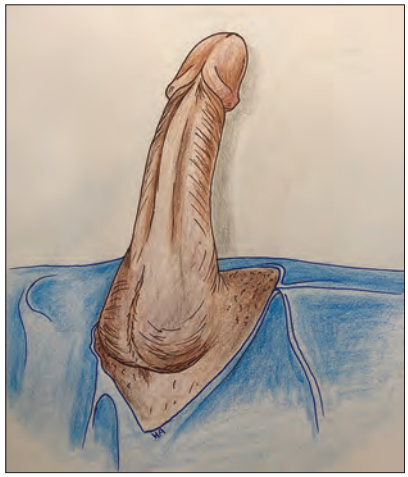


Figure 1: Penile erection surrounded by sterile drape.

4. Option 1*: Insert a butterfly infusion needle (19- or 21-G) somewhere between the base and the mid-shaft of the right cavernosal body around the 10 o'clock position [Figure 3]. Keep the needle *in situ* for several minutes and drain a quantity of blood into a small, sterile basin. Initially, dark venous blood may emerge from the corpora, but drainage should continue until red, well-oxygenated blood appears and a sufficient amount has been removed as to cause the penis to become less engorged and the pain to be reduced
   - Option 2*: Insert a 10-mL syringe with a 1.5″ straight needle (19- or 21G) between

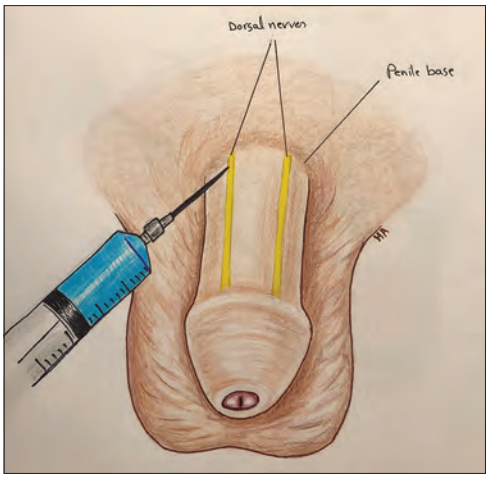


Figure 2: Approach to a dorsal penile nerve block.

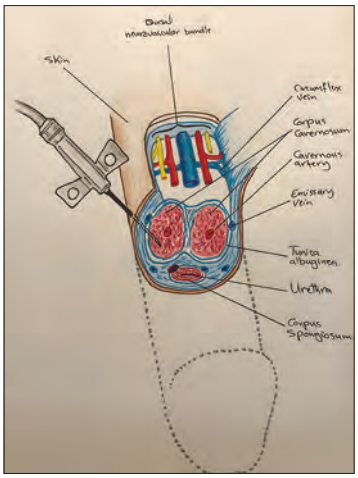


Figure 3: Approach to draining the right corpus cavernosum using a butterfly infusion needle.

the base and the mid-shaft of the right cavernosal body around the 10 o'clock position. It may be necessary to detach and empty the syringe into a sterile basin several times until enough fresh, red blood has been aspirated as to cause the penis to become less engorged and the pain to be reduced.

*Note: Ventral approaches should be avoided due to the risk of injury to the urethra and corpus spongiosum.

5. There is anatomical communication between the two cavernosal bodies, meaning drainage/aspiration of only one side of the penis may be required. However, if the erection persists, options 1 or 2 of step 4 should be repeated by placing a second butterfly infusion needle or straight needle/syringe into the left cavernosal body at the 2 o'clock position for drainage or aspiration. Remove the needle once enough blood has been drained or aspirated as to cause the penis to become flaccid.
6. If the erection does not resolve or quickly recurs, additional drainage or aspiration is not recommended. Instead, an injection of phenylephrine* 0.4–1 mg diluted in 2 mL of normal saline (giving a concentration of 200–500 µg/mL) should be administered into the corpus cavernosa, with half the dose going into the left cavernosal body and the other half into the right. This can be repeated every 5–10 min up to a maximum total dose of 1 mg until the erection resolves.

*Note: Side effects of sympathomimetics (e.g., phenylephrine) include hypertension, headache, reflex bradycardia, tachycardia, palpitations and arrhythmias. Patients should be monitored for these symptoms. Malignant or poorly controlled hypertension is a relative contraindication to treatment with this class of medication.

POSSIBLE TREATMENT OUTCOMES

After completing the procedures described above, two primary outcomes are possible:

Outcome 1 – Resolution: If priapism resolves in the emergency department, arrange for follow-up in an outpatient urology clinic the following day (or as soon as possible).

Outcome 2 – Persistence: If priapism persists for over 1 h despite the first- and second-line procedural interventions described above, surgical intervention may be indicated. Emergent urological consult should be sought and transport to a tertiary care centre may be required.

PATIENT PROCEDURE IN THE EMERGENCY DEPARTMENT AND OUTCOME

The patient was prepped and anaesthetised as described above, and drainage of the cavernosal bodies was done using a butterfly infusion needle. Following the drainage, the patient's penis became flaccid for only a short time (seconds) before becoming engorged again. At this time, 0.5 mL of phenylephrine in 2 mL of normal saline was prepared and injected into the cavernosal bodies bilaterally (i.e., approximately 1.25 mL into both the left and right corpus cavernosa). Within minutes of the phenylephrine injection,

the patient's priapism resolved. Arrangements were made for follow-up in a urology clinic, and the patient was discharged home.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his clinical information to be reported in the journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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