Acute Ischemic Priapism

Bryce Baird, MD[1] ▪ Augustus Anderson[2] ▪ Christian A. Ericson, MD[1] ▪ Ray W. Pak, MD[3] ▪ Gregory A. Broderick, MD[3]

Abstract

We present a case of a healthy, 36-year-old man with acute ischemic priapism. Several causes of priapism are discussed within the manuscript including medications and blood dyscrasias. The diagnosis and treatment of priapism is also covered. Acute ischemic priapism is an emergent condition that primary care providers, particularly family medicine and emergency department providers, need to be comfortable evaluating and treating. Particularly in more rural communities, primary care providers may need to intervene, even surgically, to resolve the acute event and preserve erectile function. Timely intervention is necessary to maximize the best patient outcomes.

Key words: acute ischemic priapism, penile pain

A healthy 36-year-old man with a prolonged, painful erection lasting 4 hours presented to the emergency department (ED). The patient had recently started taking trazodone for insomnia, with a warning that trazodone may be associated with priapism. He hoped that his erection would subside on its own. There were no other health concerns.

Physical examination

The patient appeared healthy with normal vital signs; he was alert and reported a moderately painful, sustained erection. Both testicles were palpable with no abnormalities, phallus was otherwise normal with no evidence of trauma, and cremaster reflex was intact bilaterally.

Diagnosis

Based on his history and physical exam, the patient's condition was diagnosed as acute ischemic priapism. While painful erections point to a diagnosis of acute ischemic priapism as opposed to nonischemic priapism, a more objective diagnosis can be obtained via corporal blood gas **(Table)**. A sample of blood gas from the corpora cavernosa should be obtained according to 2021 American Urological Association (AUA) guidelines; however, treatment should not be delayed for diagnostics. Before inserting a needle, the penis should be cleaned with an iodine-based solution or other prep solution. To obtain a corporal blood gas sample, first attach an 18-gauge needle to an arterial blood syringe; then, insert the needle around the 3- or 9-o'clock position close to the base of the penis and aspirate blood.

Discussion

Priapism is a persistent erection continuing 4 hours beyond sexual activity or without relation to sexual activity or stimulus.[1,2] All patients with priapism must be evaluated emergently.[3] The two main pathophysiologic variants of priapism include ischemic (low-flow) and nonischemic (high-flow) priapism.[4]

AFFILIATIONS:
[1]Resident Physician, Department of Urology, Mayo Clinic Jacksonville, Jacksonville, FL
[2]Medical Student, Tulane College of Medicine, Jacksonville, FL
[3]Department of Urology, Mayo Clinic Jacksonville, Jacksonville, FL

CITATION:
Baird B, Anderson A, Ericson CA, Pak RW, Broderick GA. Acute ischemic priapism. *Consultant*. Published online July 5, 2022. doi:10.25270/con.2022.06.00014

Received December 21, 2021; accepted January 6, 2022.

DISCLOSURES:
The authors report no relevant financial relationships.

CORRESPONDENCE:
Bryce Baird, MD, Mayo Clinic Jacksonville, 4500 San Pablo Road, Jacksonville, FL 32224 (baird.bryce@mayo.edu)

Table. Penile blood gas diagnostic values

SOURCE	PO_2 (MM HG)	PCO_2 (MM HG)	PH
Normal nonischemic blood	>90	<40	7.4
Normal mixed venous blood	40	50	7.35
Ischemic blood from aspirate	<30	>60	<7.25

The primary focus of this article is acute ischemic priapism as it necessitates early intervention.

Acute ischemic priapism often presents with fully rigid corpora, penile pain, and abnormal penile blood gas.[5] Management should not be delayed by the use of conservative therapies, such as oral medications or cold compresses because persistent ischemic priapism, especially greater than 36 hours in duration, predisposes the patient to a high risk of erectile dysfunction.[6] An efficient medical, surgical, and sexual history should be obtained from the patient with an emphasis placed on current erectile function and the importance of sexual health. Patients should be informed that increased priapism duration is associated with an increased risk of erectile dysfunction.

One study of 230 priapism cases revealed that 35% of cases were idiopathic, 21% involved drug or alcohol use, 12% were due to trauma, and 11% were due to sickle cell disease (SCD).[7] Our patient's case falls into the drug-associated category as his priapism was attributed to the use of trazodone. Other drugs that can cause priapism include cocaine, marijuana, antidepressants, antipsychotics, and alpha-blockers, such as prazosin.[3]

Blood dyscrasias are a risk factor for priapism. (SCD) is often the primary etiology of ischemic priapism in adults and is the primary etiology in as many 63% of ischemic pediatric priapisms.[8] Primary care providers caring for patients with SCD should counsel patients to be aware of priapism. Additionally, primary care providers should consider involving hematologists and urologists in the care of patients with SCD as preventive measures may be taken with medications, such as oral or injectable alpha-blocker drugs, terbutaline, estrogens, antiandrogens, baclofen, gabapentin, and even phosphodiesterase inhibitors.[5]

Another rare but notable blood dyscrasia that can cause acute ischemic priapism is chronic myeloid leukemia (CML). An estimated 1% to 5% of men with underlying leukemia may experience priapism.[9] Several case reports show CML as a cause of priapism.[9-11] In one such study, a 19-year-old man presented with an erection lasting longer than 24 hours.[10] The patient had two previous episodes, which resolved on their own in the previous month. Physical examination of this patient revealed a palpable liver and spleen with pale conjunctiva. Additionally, the patient's white blood count was nearly 300,000/mm^3. Based on AUA guidelines, the patient was treated emergently for ischemic priapism with aspiration and irrigation.[10]

The AUA states that systemic treatment of the underlying CML or other causes of priapism should not be the only treatment for ischemic priapism.[6] CML typically presents with systemic symptoms, including fatigue, night sweats, malaise, weight loss, and abdominal pain.[11] However, priapism should be noted as a possible presentation of CML and may even be seen as the initial presentation of CML.[10,11] Priapism should even be treated without respect to the underlying etiology as it is an emergent condition. Once priapism resolves, the patient can be evaluated by the respective treatment team such as hematology or, in the case of CML, oncology.

First-line therapy for acute ischemic priapism involves the injection of intracavernosal phenylephrine with corporal aspiration with or without saline irrigation.[6] Phenylephrine has been shown to have a 28% higher rate of detumescence compared with other

Figure 1. Phenylephrine packaging and syringe with 1000 mcg (100 mcg/mL).

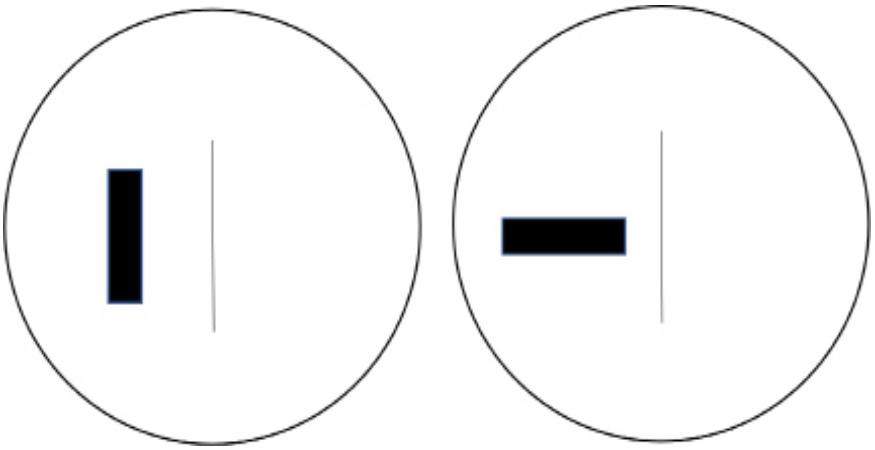

Figure 2. Blade positioning on the glans for shunting (dark line represents blade, thin line represents urethra).

injectable agents.[12,13] Overall, patients have better outcomes with decreased need for surgical intervention if phenylephrine is used with aspiration and saline irrigation (15%–28% requiring surgery), compared with phenylephrine alone (43%–63% requiring surgery).[6,14] Patients should have vital monitoring during phenylephrine injection; the most common effect involves hypertension with compensatory bradycardia.[15]

A dorsal penile nerve block was administered for our patient using 0.5% bupivacaine without epinephrine through a 22-gauge needle. One case report and one surgical fundamentals series chapter outline the supplies and techniques needed to perform the dorsal penile nerve block.[16,17] After local anesthesia is administered, a large-bore (19-gauge) needle is placed into the base of the penis at the 3- or 9-o'clock position. Unilateral needle placement can be used as blood crosses over between the corpora. Some centers use bilateral 19-gauge needles for simultaneous aspiration and irrigation upfront or if the unilateral method fails. Typically, needle placement alone with gravity drainage or manual decompression of the penis will eliminate the blood. Otherwise, a syringe can be hooked into the needle and aspiration can be performed. Aspiration with a syringe may cause compression of the erectile tissue and make it difficult for blood to travel through the needle; therefore, we typically use gravity or manual decompression.

Phenylephrine should be injected through the established needle access. Phenylephrine typically comes in a 10-cc syringe that has 1000 mcg of phenylephrine in 10-cc of injectable solution total **(Figure 1)**. Typically, 100 to 200 mcg are injected every 5 minutes, up to 1000 mcg in a healthy adult. Our patient had successful detumescence after receiving a total of 500 mcg of phenylephrine with multiple rounds of aspiration and irrigation with injectable saline. This would likely be the extent of an ED staff or family practice provider's intervention. However, for the sake of completeness, this article will briefly cover shunts.

If the patient fails to respond to aspiration, irrigation, and injections of phenylephrine, surgical management may be needed. The T-shunt is the most common shunt we use and is performed with a 10-blade scalpel inserted through the glans penis deep into the corpora, 4 mm lateral to the meatus. Take care to avoid the urethra. The blade should then be rotated 90 degrees away from the urethra and removed **(Figure 2)**. This shunt can be performed bilaterally if needed. Deoxygenated blood is milked out of the shunt incision until the penis achieves detumescence. Further intervention past this point necessitates a urologist, and a transfer to a center with a urologist would likely be needed if the patient continued to have priapism.

Acute ischemic priapism is an emergent condition that primary care providers, particularly family medicine and ED providers, need to be comfortable evaluating and treating. Particularly in more rural communities, primary care providers may need to intervene, even surgically, to resolve the acute event and preserve erectile function. Timely intervention is necessary to maximize the best patient outcomes.

Patient Outcome

The patient achieved detumescence with 500 mcg of phenylephrine and several rounds of aspiration and irrigation with saline. We checked on the patient about 30 minutes after detumescence was achieved to ensure this was sustained. We recommended the patient successfully void before discharge from the ED. The patient was told to expect bruising and some swelling. We also recommended the patient elevate his scrotum, apply ice, and take acetaminophen and ibuprofen to mitigate pain and swelling. The patient was instructed to call if fevers, swelling, purulent discharge, or extreme pain occurred.

Approximately 1 week later the man was healing well with no signs of infection, swelling, or abnormality besides expected bruising. The patient was recommended not to take trazodone again and to follow-up as needed with the urologist.

References

1. Ericson C, Baird B, Broderick GA. Management of priapism: 2021 update. *Urol Clin North Am.* 2021;48(4):565-576. doi:10.1016/j.ucl.2021.07.003
2. Montague DK, Jarow J, Broderick GA, et al. American Urological Association guideline on the management of priapism. *J Urol.* 2003;170(4-1):1318-1324. doi:10.1097/01.ju.0000087608.07371.ca
3. Broderick GA, Kadioglu A, Bivalacqua TJ, Ghanem H, Nehra A, Shamloul R. Priapism: pathogenesis, epidemiology, and

management. *J Sex Med.* 2010;7(1-2):476-500. doi:10.1111/j.1743-6109.2009.01625.x

4. Broderick GA. Chapter 28: Priapism. In: Partin AW, Dmochowski RR, Kavoussi LR, Peters CA, Wein AJ, eds. *Campbell-Walsh-Wein Urology.* 12th ed. Elsevier; 2021.
5. Broderick GA. Priapism and sickle-cell anemia: diagnosis and nonsurgical therapy. *J Sex Med.* 2012;9(1):88-103. doi:10.1111/j.1743-6109.2011.02317.x
6. Bivalacqua TJ, Allen BK, Brock G, et al. Acute ischemic priapism: an AUA/SMSNA guideline. *J Urol.* 2021;206(5):1114-1121. doi:10.1097/JU.0000000000002236
7. Pohl J, Pott B, Kleinhans G. Priapism: a three-phase concept of management according to aetiology and prognosis. *Br J Urol.* 1986;58(2):113-118. doi:10.1111/j.1464-410x.1986.tb09008.x
8. Nelson JH, 3rd, Winter CC. Priapism: evolution of management in 48 patients in a 22-year series. *J Urol.* 1977;117(4):455-458. doi:10.1016/s0022-5347(17)58497-9
9. Chang MW, Tang CC, Chang SS. Priapism—a rare presentation in chronic myeloid leukemia: case report and review of the literature. *Chang Gung Med J.* 2003;26(4):288-292.
10. Nerli RB, Magdum PV, Hiremath SC, et al. Priapism—a rare presentation in chronic myeloid leukemia: case report. *Urol Case Rep.* 2016;4:8-10. doi:10.1016/j.eucr.2015.08.005
11. Sossa Melo CL, Orozco CAO, Peña Castellanos AM, et al. Priapism as the first manifestation in chronic myeloid leukemia: a case report and focused review of literature. *Clin Case Rep.* 2021;9(11):e04901. doi:10.1002/ccr3.4901
12. Muruve N, Hosking DH. Intracorporeal phenylephrine in the treatment of priapism. *J Urol.* 1996;155(1):141-143.
13. Martin C, Cocchio C. Effect of phenylephrine and terbutaline on ischemic priapism: a retrospective review. *Am J Emerg Med.* 2016;34(2):222-224. doi:10.1016/j.ajem.2015.10.029
14. Ridyard DG, Phillips EA, Vincent W, Munarriz R. Use of high-dose phenylephrine in the treatment of ischemic priapism: five-year experience at a single institution. *J Sex Med.* 2016;13(11):1704-1707. doi:10.1016/j.jsxm.2016.09.010
15. Richards E, Lopez MJ, Maani CV. Phenylephrine. [Updated 2021 Jul 13]. In: *StatPearls* [internet]. Treasure Island (FL): StatPearls Publishing; 2022. https://www.ncbi.nlm.nih.gov/books/NBK534801/
16. Hernandez JM, Hamilton D, Upadhye S. Self-inflicted nailgun-induced penetrating penile injury: case report and discussion. *CJEM.* 2017;19(3):238-241. doi:10.1017/cem.2016.334
17. Kinnaird A, Fairey A, Khadaroo R, Rourke K, Brindley P. Chapter 9: Urology SINS. *Can J Gen Intern Med.* 2014;9(4):126-133. doi:10.22374/cjgim.v9i4.2