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EDITED BY
Patrick Van De Voorde,
Ghent University Hospital, Belgium

REVIEWED BY
Pieter Jan Van Asbroeck,
East Limburg Hospital, Belgium
Karen Peeters,
Antwerp University Hospital, Belgium

*CORRESPONDENCE
Jade Vranckx
jade.vranckx@hotmail.com
Fabien Guerisse
fabienguerisse@outlook.be

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Case Report: Hard to be a dick

Jade Vranckx[1,2]*, Fabien Guerisse[2]* and Gilles Dosin[3]

[1]Department of General Pediatrics, University Hospital Brussels, Jette, Belgium, [2]Centre Hospitalier Universitaire de Charleroi - Hopital Civil Marie Curie, Charleroi, Belgium, [3]Centre Hospitalier Universitaire (CHU) Helora association sans but lucratif (asbl), Mons, Belgium

Introduction: Priapism is a rare urological condition defined as a persistent, painful erection unrelated to sexual stimulation. It is classified as ischemic or non-ischemic. Ischemic priapism is more common and results from venous outflow obstruction, whereas non-ischemic priapism is caused by unregulated arterial inflow and often resolves spontaneously.

Case presentation: A 55-year-old man presented with a 24-h painful erection following sexual intercourse during which an unknown partner injected papaverine into his corpora cavernosa. Examination showed a rigid penis with a flaccid glans, suggesting ischemic priapism. Cavernosal aspiration and saline irrigation under local anesthesia were attempted unsuccessfully, as were intracavernosal epinephrine injection and a caverno-glanular shunt. Blood gas analysis of aspirated cavernosal blood revealed arterial characteristics, leading to the diagnosis of non- ischemic priapism. The patient was referred to an interventional radiology unit, where Doppler ultrasound identified a cavernous arterial fistula that was successfully embolized.

Discussion: Priapism is a urological emergency that can lead to permanent erectile dysfunction if ischemic in nature and not promptly treated. Ischemic (low-flow) priapism represents the vast majority of cases and is associated with venous obstruction, tissue ischemia, and fibrosis. Common triggers include medications such as papaverine, substance abuse, and hematologic disorders. Initial treatment consists of analgesia and intracavernosal a-adrenergic agonists, followed by aspiration, irrigation, or surgical shunting if necessary. Non-ischemic (high-flow) priapism should be suspected when conventional ischemic treatments fail. Diagnosis is confirmed by cavernosal blood gas analysis demonstrating normal oxygenation and pH levels, and by Doppler ultrasound detecting arterial flow. It is typically caused by trauma-induced arterial fistula, or less commonly by anatomical abnormalities or idiopathic mechanisms. Because venous drainage is preserved, pain is often minimal and the erection partially rigid. Management is usually conservative, but persistent cases are effectively treated with selective arterial embolization, with an excellent prognosis and no long-term complications.

Conclusions: This case highlights the importance of differentiating between ischemic and non-ischemic priapism in patients with prolonged erections. Failure of ischemic first-line treatments should raise suspicion for a high-flow mechanism. Blood gas analysis and Doppler ultrasound are key to diagnosis, enabling appropriate management and preventing unnecessary interventions.

KEYWORDS
high flow priapism, ischemic priapism, low flow priapism, non-ischemic priapism, papaverine, priapism

Introduction

Priapism is a severe urological condition characterized by a permanent, painful erection unrelated to sexual arousal. It can be classified into ischemic (low-flow) and non-ischemic (high-flow) types (1).

Ischemic priapism is more common and occurs due to venous occlusion in the corpora cavernosa, which can result in permanent erectile dysfunction if untreated (1, 2). It may be triggered by medications such as papaverine (3), substance abuse, or hematologic disorders (1, 4).

Non-ischemic priapism is less common and caused by arterial leakage. Since venous drainage is maintained, the condition generally resolves spontaneously. When symptoms persist or cause significant discomfort, endovascular embolization is the treatment of choice (1, 4).

Patient case

A 55-year-old male with a history of hypercholesterolemia and hypertension treated with bisoprolol presented to the Emergency Department with a painful erection that had appeared 24 h earlier. He reported having sexual intercourse with an unknown partner who injected papaverine in his corpora cavernosa.

Clinical examination revealed a turgid penis with a flaccid glans and no signs of ischemia on the teguments. Vital signs were normal.

Ischemic priapism following the papaverine injection was immediately suspected. Cavernosal aspiration and saline irrigation were performed under local anesthesia (penile bloc with 1% lidocaine hydrochloride), but these measures were unsuccessful. Intravenous epinephrine injection also failed, as did the attempt at creating a caverno-glanular shunt.

Blood from the corpora cavernosa was sent for blood gas analysis. With a pH higher than 7, 25, and PO2 higher than 90, it appeared to be of arterial origin, pointing to a diagnosis of non-ischemic priapism. The patient was then referred to an interventional radiology center where a cavernous arterial fistula was identified. He was closely monitored. The priapism resolved after 72 h with no need of embolization.

The patient was seen again a month later for a follow-up consult. No fistula was found on the ultrasound, but he kept an erectile dysfunction and is now treated with sildenafil.

Discussion

Priapism is a rare urological condition (0.5–1.5 cases per 100,000 person-years) involving a persistent, painful penile erection unrelated to sexual stimulation. It can be classified as ischemic (low-flow) non-ischemic (high-flow) (1). Ischemic is the most common subtype, representing more than 95% of cases (2). It results from venous cavernosal occlusion, leading to blood pooling in the corpora cavernosa, which can cause ischemia, fibrosis, and permanent erectile dysfunction if not treated promptly. It can be induced by medication (e.g., alpha- adrenergic antagonists, anticoagulants, antipsychotic drugs), substance abuse (e.g., alcohol, cannabis, cocaine) or hematologic conditions [e.g., sickle cell disease, hyper coagulable states, or hyperviscosity states (1, 2)]. One example of a medication that can cause ischemic priapism is papaverine hydrochloride, a phosphodiesterase inhibitor used to induce vasodilation in the corpora cavernosa to treat impotence. While intended to promote erection, it can lead to ischemic priapism, especially when injected in excess or if the body fails to metabolize it effectively (3).

First-line therapy for ischemic priapism involves pain management, followed by intracavernous injection of α-adrenergic agonists (usually phenylephrine, although ephedrine and ethoxamine can also be used). Second-line options include aspiration and irrigation of the corpora cavernosa with saline. If conservative treatment fails, surgical shunts may be required (1, 2, 4).

If first line treatments do not work, non-ischemic priapism should be considered. Diagnosis can be confirmed by blood gas analysis of blood from the corpora cavernosa. Ischemic priapism is characterized by hypoxia and acidosis, indicating tissue ischemia, while non-ischemic priapism shows normal oxygenation and pH levels (1, 4). Doppler ultrasound can also help distinguish low from high blood flow (5).

Non-ischemic priapism can result from perineal trauma, anatomical abnormalities, or be idiopathic. It occurs due to arterial leakage, which leads to increased blood flow in the penis, but venous drainage is maintained, thus preventing compartment syndrome. The corpora cavernosa does not become completely rigid, and the pain is usually less severe and does not worsen with palpation. It may resolve spontaneously, so conservative management is generally considered the gold standard. If symptoms persist or cause significant discomfort, end- vascular embolization is the recommended treatment. Overall, it has a better prognosis than ischemic priapism, with no significant long-term complications (2, 4).

Conclusions

This case highlights the importance of differentiating between ischemic and non-ischemic priapism in patients presenting with prolonged erections. When there is no positive response to first-line treatment for ischemic priapism, non-ischemic priapism should be considered, even if there was prior use of drugs or medication. Blood gas analysis and Doppler ultrasound are essential diagnostic tools for distinguishing between the two types of priapism.

While ischemic priapism requires urgent treatment to restore normal blood flow and prevent tissue damage, non-ischemic priapism often resolves spontaneously and typically requires less aggressive management.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements. Written informed consent was obtained from the [individual(s) AND/OR minor(s)' legal guardian/next of kin] for the publication of any potentially identifiable images or data included in this article.

Author contributions

JV: Conceptualization, Data curation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. FG: Writing – review & editing. GD: Writing – review & editing.

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