Case Report

Reversed priapism, thrombosis of the dorsal penile vein: A case report

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ABSTRACT

Priapism is an unintentional prolonged penile erection, lasting equal to or greater than 4 hours, in the absence of sexual stimulation or after having finished it. It is a rare pathology that can represent a urological emergency. The present report describes the case of a 25-year-old patient who presented priapism after suffering a one-meter fall on the genital area. Patient is a 25-year-old male with macroscopic hematuria without clots, testicular pain 4/10 on the numerical pain scale, stabbing type, without irradiation, secondary to a fall that occurred 3 months earlier, which resulted in a blow to the genital area. He presented an evolution of 20 days with detumescence and erectile dysfunction. Penile Doppler was performed and inverted priapism, arteriolaracunar fistula at the base of the left corpus cavernosum, plus severe erectile dysfunction, were diagnosed. After a cavernography and an arteriography, a thrombolysis was performed. The patient continued with anticoagulant treatment with clopidogrel and enoxaparin and did not present complications after thrombolysis. A detailed clinical history, physical examination and a Doppler ultrasound study can provide a clear and timely diagnosis for the patient. Cavernography and arteriography have shown satisfactory results. In the present case, thrombolysis treatment with alteplase provided favorable results.

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Introduction

Priapism is a condition in which the penile erection is persistent and extends for hours after sexual stimulation or in the absence of it [1–4]. In typical cases, only the corpora cavernosa are affected. Several types of this condition are known, which are presented below:

Ischemic priapism (veno-occlusive, low flow): Persistent erection without sexual stimulation characterized by low or no cavernous blood flow and the presence of gases in cavernous blood (hypoxic, hypercarbic and acidic) [2–4]. The corpora cavernosa appear rigid and sensitive to palpation [5]. Patients often express pain [1,2,4]. There are a variety of etiological factors that can contribute to the failure of the detumescent mechanism in this condition [6,7]. Suffering from this type of priapism is considered an emergency [2,4,6,7]. Resolution of this condition is characterized by the return of the penis to a flaccid and painless state [5–8]. However, in several cases, there may be persistent penile swelling, ecchymoses, and partial erections that may mimic unresolved priapism. Resolution of priapism can be confirmed by cavernous blood gas or blood flow measurements [7,8].

Non-ischemic priapism (arterial, high flow): Persistent erection in the absence of sexual stimulation caused by unregulated cavernous arterial inflow [3]. The gases present in the cavernous blood are not of the hypoxic or acidic type [2,8]. Typically, the penis is neither completely stiff nor painful. The most frequent etiology is previous injuries [1,2]. This type of priapism does not require emergency treatment [3,6,7].

Resolution of nonischemic priapism is the return of the phallus to a fully flaccid state [8,9].

Recurrent (intermittent) priapism: Recurrent variation of ischemic priapism in which an involuntary and painful erection occurs repeatedly with intervals of detumescence [1,10,11].

Clinical case

A 25-year-old man presented for consultation with macroscopic hematuria without clots, testicular pain 4/10 on the numerical pain scale, stabbing type, without irradiation, after a 1-meter fall that resulted in a blow to the area, 3 months before going to the urologist at the General Hospital of Mexico. The patient did not present any family pathological history of interest; in his non-pathological personal history, smoking and drug addiction were denied, but he showed positive alcoholism once a week, without reaching the level of drunkenness; and he denied having a personal medical history, chronic degenerative disease, surgery, trauma or fractures.

The patient reported priapism of 20-day evolution with subsequent detumescence and erectile dysfunction, which is why he went to the urologist to perform a penile Doppler study. Through urinalysis, he showed the following pathology: hemoglobin 0.03 g/dl, few epithelial cells, leucocytes: 1-2 per field, erythrocytes: 1-2 per field, and bacteria: few. External penile Doppler ultrasound (performed at a location other than the General Hospital of Mexico) revealed the following: increased vascular registry; the communication of the lacunar artery corresponding to the communication between the left cavernous artery and the helicine artery with RI of 0.86 and biphasic flow. The patient’s diagnosis was resolved priapism plus arteriolaracunar fistula at the base of the left corpus cavernosum and severe erectile dysfunction, which is why the patient was referred to the Interventional Radiology area of the hospital to schedule a diagnostic cavernography and arteriography. In the procedure, the patient underwent a puncture with a wall needle for the subsequent placement of the vascular introducer with a 5 Fr caliber hemostatic valve, ensuring the arterial approach. Subsequently, cavernography was performed with direct puncture to the right corpus cavernosum, identifying adequate filling in both, with slow venous drainage. No image of fistula or contrast extravasation was observed, so it was decided to proceed with arteriography by inserting a urethral catheter. The left pudendal artery was selectively catheterized without visualizing abnormal staining in the arterial phase (Fig. 1). In the venous phase, drainage was observed due to collateral flow, since the dorsal vein of the penis and the deep lateral plexus were not identified, as well as parietal thrombosis of the left pudendal vein. Subsequently, an ultrasound was performed directed at the dorsal vein of the penis, demonstrating echogenic material inside, without showing a signal to the application of the color Doppler modality. The vascular introducer was removed and manual compression was performed until hemostasis was achieved. The procedure was terminated without any incidents or accidents to comment on.

Diagnostic impression revealed thrombosis of the dorsal penile vein and deep lateral plexuses with irregularity of the left pudendal vein. In accordance with the diagnosis, the patient was scheduled for thrombolysis. In the evaluation of his clinical and laboratory records, no contraindications were found for performing the procedure. Due to the procedure, the patient underwent general anesthesia, provided by the anesthesiology service, and was placed in the supine position; subsequently, asepsis and antisepsis of the genital area were performed. Under ultrasonographic guidance, the corpora cavernosa were identified and it was decided to puncture the right one, administering 20 cc of contrast to perform the phlebography. Filling was identified in both bodies, without observing adequate blood flow of the deep dorsal vein of the penis, as well as of the deep lateral plexus and pudendal veins, so it was decided to perform thrombolysis with 50 mg of alteplase for infusion at 1 hour through the same puncture site of the previous phlebography. Subsequently, control phlebography was performed and the deep dorsal penile vein was visualized with restored blood flow without apparent sites of thrombosis and/or stenosis, with filling of the lateral deep plexus and left pudendal vein with drainage towards the ipsilateral internal iliac vein (Fig. 2). It was not possible to re-permeabilize the right pudendal vein. The access was removed 30 minutes after finishing the procedure, with slight edema at the puncture site. No incidents or accidents were reported.

The diagnostic impression showed patency of the lateral deep plexus penile dorsal vein and the left pudendal vein. The patient was given absolute rest for a period of 6 hours, with monitoring of the puncture site and the temperature and color of the genitals; he was also prescribed a triple anticoagulation
Fig. 1 – (A) Selective angiography with digital subtraction of the internal pudendal artery. Adequate opacification of the internal pudendal artery and its branches is observed. (B) Venous drainage of the penis through collateral veins. No opacification of the deep dorsal vein of the penis is observed.

Fig. 2 – (A) Selective angiography with digital subtraction of the internal pudendal artery. Adequate opacification of the internal pudendal artery and its branches was observed. (B) Venous drainage of the penis through collateral veins. No opacification of the deep dorsal vein of the penis.

Discussion

In the year 1981, Bernstein-Han et al. observed a case of priapism in a 69-year-old patient while he was on bed rest, whose erection presented suddenly and even lasted until he was admitted to the hospital. In addition, the patient in question stated that he did not consume tobacco, alcohol or any kind of medication. During his hospital stay, the patient was in active decubitus with a nutritional status that was classified as good; likewise, the state of his skin and appendages presented a good trophic state. The patient’s treatment consisted, in the
first place, in the application of continuous epidural anesthesia through a catheter for 18 hours; later, he was examined by a hematologist who declared that there was no presence of blood disease. The patient presented improvement after the practice of a cavernous spongy shunt and after a week he found himself with a noticeable improvement in health. However, a secretion culture was detected from a surgical wound that was positive for gram-negative germs, for which he underwent antibiotic treatment according to the antibiogram; at the end of a week, the patient died due to septicemia from these same germs [1–3]. On the other hand, the cases of priapism with the longest duration were documented by Kilinc et al. [3,4] and by Khater et al. [4–6]. In the first of these, the period of this condition lasted 48 hours, while in the second it lasted 72. In the case of Kilinc et al., priapism occurred in a 59-year-old man, who expressed pain 2 hours after taking the second dose of tamsulosin, a drug that was prescribed for the treatment of lower urinary tract symptoms related to in-framesical obstruction. The patient had no history of injury, sexual activity, alcohol or drug use, and had never experienced priapism. Through magnetic resonance imaging, a low signal was found in the right corpus cavernosum with a high signal of edema extending subcutaneously towards the base of the penis and an extra-tunica edema without the presence of the tunica albuginea rupture. They proceeded to aspirate the blood from the thrombotic segment whose pH value was 6.85, which indicated hypoxia. After irrigating the corpus cavernosum with a saline solution, a shunt was performed in the nearby corpus cavernosum, resulting in complete detumescence. No further incidents were recorded in the postoperative period [3,6,7].

Regarding the case reported by Khater et al., the first of them stated that a 61-year-old patient with a history of hypertension and paraplegia due to a gunshot wound to the spine area 30 years ago presented an erection which had lasted for 18 hours. The patient in question had a uroflow obstruction and had taken 0.4 mg of tamsulosin at bedtime the night before the priapism. The patient’s treatment consisted of aspiration and irrigation, in addition to an injection of phenylephrine, which resulted in the return of his phallus to a normal state [4,6,8,10,11]. On the other hand, Unal et al. [5,8,9] documented the relationship between alpha blockers and the appearance of priapism. In the article in question, it was reported that a 52-year-old man presented priapism due to the intake of silodosin. In addition, the ultrasound showed that there was a decrease in the level of bleeding in the area of the penis. Although the patient underwent irrigation and aspiration, the erection persisted, requiring the application of a deep cavernous shunt, resulting in decreased erection. However, the patient in question had erectile dysfunction after one month of treatment. In the second of these cases, a 54-year-old man with a history of hypertension and lower urinary tract problems developed priapism due to taking tamsulosin to treat his urinary tract problems. Ultrasound showed that the patient suffered from ischemic priapism, so aspiration was performed in the corpus cavi-

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Fig. 3 – Left: Selective catheterization of the left penile artery. Adequate arterial phase opacification. Right: Venous phase with collateral drainage, without opacification of the deep dorsal vein of the penis. Another reassessment was made of the patient 2 months after the first. He attended the consultation with a tomography of the abdomen and pelvis in simple and contrasted phase without evidence of significant findings. A penile Doppler ultrasound was performed that same day. The ultrasound reported the following: his right and left penile dorsal artery and superficial and deep dorsal vein, cavernous and bulbocavernousus artery were identified with preserved course and caliber, adequate flow and spectrum without hemodynamically significant changes. The patient presented an evolution toward improvement, although he required continuation with antiplatelet management.
Conclusions

Priapism is a common condition with no specific established cause. Prior to diagnosis, patients should undergo clinical and imaging studies to determine the cause of priapism. Doppler ultrasound, cavernography and/or arteriography seem to be the treatments that show satisfactory results; to perform it, the patient must be prepared, informing him of the type of procedure to which he will be subjected and that, at the same time, its execution will determine the eradication of such condition. For postoperative care, based on the follow-up of the clinical case, a schematic anticoagulation treatment (acetylsalicylic acid, clopidogrel and enoxaparin) seems to show favorable results in the patient’s recovery, since it shows improvements in erection after undergoing thrombolysis surgery. In these patients, adequate diagnosis and therapeutic choice, with multidisciplinary approach, may prevent severe complications and improve the prognosis of the patient. Intervention radiologists are key members of this team and, at times, are at the vanguard of the management and treatment of these patients.

Patient consent

Informed consent was obtained from the patient's family.

Ethical responsibilities

The authors state that for this research no experiments were performed on humans or animals.

Data confidentiality

The authors state that this article does not include patient data.

Right to privacy and informed consent

The authors state that this article does not include patient data.

Protection of people and animals

The authors state that the procedures followed comply with the ethical standards of the responsible committee on experimentation and the World Medical Association and the Declaration of Helsinki.

REFERENCES

[1] Montague DK, Jarow J, Broderick GA, Dmochowski RR, Heaton JPW, Lue TF, et al. American Urological Association guideline on the management of priapism. J Urol 2003;170(4 Part 1):1318–24. doi:10.1097/01.ju.0000087608.07371.ca.
[2] Bernstein-Han L, Mosso F, Sember M. Presentación de un caso de priapismo. Rev Argent Urol 1981;47(2):24–5. https://www.revistasau.org/index.php/revista/article/download/2397/2346.
[3] Klinic M, Piskin M, Guven S, Gurbuz R, Odev K, Kaynar M. Partial priapism secondary to tamsulosin: a case report and review of the literature. Andrologia 2009;41(3):199–201. 10.1111/j.1439-0272.2008.00908.x.
[4] Khater U, Ramasamy R, Shah HN. Tamsulosin-induced priapism: report of two cases and review of literature. J Endourol Case Rep 2020;6(3):174–6. doi:10.1089/cen.2019.0157.
[5] Unal S, Micoogullari U, Okulu E, Kaygıl O. Priapism—a rare side effect of alpha blockers: report of 2 cases and literature review. Rev Int Androl 2022;20(3):211–16. doi:10.1016/j.androl.2020.12.006.
[6] Bagheri SM, Tabrizi Z. Deep dorsal penile vein thrombosis in a patient with COVID-19 infection: a rare complication and the first reported case. Clin Case Rep 2021;9:e05117. doi:10.1002/ccr3.5117.
[7] Evans DT, Ward OE. Dorsal vein thrombosis of the penis presenting to an STD clinic. Genitourin Med 1994;70(6):406–9. doi:10.1136/sti.70.6.406.
[8] Hsu GL, Hsieh CH, Wen HS, Chen YC, Chen SC, Mok MS. Penile venous anatomy: an additional description and its clinical implication. J Androl 2003;24(6):921–7. doi:10.1002/j.1939-4640.2003.tb03145.x.
[9] Nazir SS, Khan M. Thrombosis of the dorsal vein of the penis (Mondor’s disease): a case report and review of the literature. Indian J Urol 2010;26(3):431–3. doi:10.4103/0970-1591.70588.
[10] Roslan M, Przudzik M, Borowik M, Wronka H, Kozielec Z, Michalak M, et al. Thrombosis of the deep dorsal penile vein and corpora cavernosa of the penis as the first symptoms of colon cancer. Case report and literature review. OncoReview [Internet] 2020;10(39):98–102. https://www.journalsmededu.pl/index.php/OncoReview/article/view/1100.
[11] Kennebrew GJ Jr, Daggett B, Ritz RB. Traumatic penile pain: a case of dorsal vein thrombophlebitis after intercourse. Case Rep Emerg Med 2018;2018:4205628. doi:10.1155/2018/4205628.