Successful Endovascular Microembolization for Post-Traumatic High-Flow Priapism: A Case Report

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Financial support: None declared
Conflict of interest: None declared

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Patient: Male, 51-year-old
Final Diagnosis: High-flow priapism
Symptoms: Priapism
Clinical Procedure: Endovascular microembolization
Specialty: Radiology • Surgery

Objective: Rare disease

Background: High-flow (non-ischemic) priapism is a rare urological condition usually related to blind trauma to the penis or perineum causing an arterial-lacunar fistula. It can be treated conservatively, but in some cases when conservative treatment fails, the interventional approach is indicated. In the past, only surgical treatment was available, which was associated with a significant risk of complications. Endovascular techniques use a novel approach and offer clinical benefits for the patient.

Case Report: A 51-year-old man was admitted to the hospital after referral from the urology department with high-flow priapism related to blunt trauma. Angio-computed tomography showed extravasation of contrast medium to the corpus cavernosum, and angiography revealed a fistula between the distal segment of the left internal pudendal artery and corpora cavernosa. A successful endovascular microembolization of the arterial-lacunar fistula with the use of microcoils was performed. The postprocedural period was uneventful and the patient was discharged. Despite incomplete angiographic follow-up at 6 months, the initial symptoms were fully resolved with the absence of any erectile dysfunction and no recurrence of priapism occurred.

Conclusions: Post-traumatic high-flow priapism can be safely and effectively treated by endovascular means. Microembolization has proven to be successful and beneficial to preserve sexual functions.

Keywords: Priapism • Embolization, Therapeutic • Endovascular Procedures

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/943467

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Introduction

High-flow, known also as non-ischemic, priapism is a rare condition characterized by persistent partial penile tumescence, unrelated to sexual arousal, caused by uncontrolled arterial inflow to the corpora cavernosa [1,2]. It was first described in 1960 by Burt et al. when a patient developed symptoms following blunt trauma [3]. High-flow priapism is much less common than low-flow (ischemic) priapism and it accounts for only 5% of priapism cases [4]. Non-ischemic priapism is usually related to trauma to the penis or perineum, although in some rare cases it occurs after shunting procedures for ischemic priapism [5]. Contrary to low-flow priapism, high-flow priapism is not associated with penile pain, blood gases are normal, and full rigidity is not observed. High-flow priapism is caused by unregulated inflow to the corpora cavernosa. It can be caused by a damaged branch of the cavernous artery that arises from the internal pudendal artery and formation of arterial-lacunar fistula [4,6,7]. In contrast to low-flow priapism, it is not a urological emergency and does not require immediate treatment [2,8]. However, if left untreated, it can lead to permanent impairment of erectile functions and serious deterioration of sexual health [9]. High-flow priapism is usually confirmed with the use of color Doppler ultrasonography, computed tomography (CT), or magnetic resonance imaging. According to the European Association of Urology Guidelines on Priapism, when conservative measures (eg, ice compression) fail, invasive treatment is required [2]. Originally, surgical ligation of the cavernosal artery was used, which was associated with a high rate of complications, including erectile disfunctions (EDs). Currently available endovascular technology offers a new possibility to treat these patients quickly, effectively, and with a low complication rate.

The objective of this report was to describe an innovative, minimally invasive, endovascular intervention to treat post-traumatic high-flow priapism by selective microembolization. The applied technique was based on a successful operation performed in our department.

Case Report

A 51-year-old man was referred to our university hospital vascular center from the urology department with persistent painless priapism following blunt perineum trauma, which he suffered 6 weeks prior to his admission. The onset of the priapism was delayed, as it occurred 3 days after the incident. In our outpatient center he underwent duplex ultrasound imaging, which showed inappropriate blood flow in the cavernosal arteries. No ultrasonographic results were available at the time of admission. The patient had no history of chronic disease or drug use. He had not undergone prior surgeries or interventions. Laboratory test results were normal. On physical examination, the patient’s penis was tumescent and only partially erect. There was only mild tenderness on palpation. After admission, a computed tomography angiogram was performed, which showed extravasation of contrast medium to the corpus cavernosum, but the exact localization of extravascular contrast could not be determined (Figure 1A). In addition, a small hematoma at the base of the penis was detected. At this stage, considering the history of trauma, no further imaging was required.

Endovascular Procedure

Vascular access was obtained from the right (contralateral) common femoral artery using the Seldinger technique and a 6-French vascular sheath. With the use of the up and over technique, the guidewire was introduced to the left common iliac artery. Digital subtraction angiography (DSA) was done from the left internal iliac artery and showed the presence of a fistula between the branch of the distal segment of the internal pudendal artery and corpora cavernosa (Figure 2A). After cannulation, a micro-arteriography was done, which did not show the presence of the dorsal penile artery. Therefore, we decided to close the distal segment of the internal pudendal artery with the use of 3 WAVE™ Extra Soft Coils (Penumbra SMART COIL® System) (Figure 3). A control non-selective angiography showed remnant filling of the fistula from the right.

Figure 1. Angiographic CT in horizontal plane. Panel A (left) shows the preprocedural exam, with the arrow pointing at contrast medium extravasation. Panel B (right) displays the postprocedural exam, with the arrow pointing at a minimal contrast leakage into the corpora cavernosa.
Despite incomplete angiographic success, it was decided not to continue the intervention and to perform dedicated follow-up.

Post-Procedure Follow-Up

In the days following the procedure, the symptoms resolved completely and the patient was discharged without evidence of priapism. After the hospital stay, he had regular check-ups at 1, 2, and 6 months after the procedure. No ED or recurrence of priapism were reported, and he was able to resume age-appropriate sexual activity and regular sexual intercourse. No complications related to access site or the endovascular procedure itself were detected. At the 6-month post-procedure follow-up, another computed tomography angiography was performed, which showed minimal contrast media leakage into the corpora cavernosa (Figure 1B). As the symptoms subsided, the patient did not require further urological evaluation.

Discussion

We present a successful case of endovascular treatment of post-traumatic high-flow priapism due to arterial-lacunar fistula. Despite incomplete angiographic results (remnant filling) at the end of the procedure, the symptoms fully resolved and sexual functions were preserved. This is essential, as most patients with this condition are sexually active and ED can seriously impair their quality of life.
High-flow priapism is not an emergency; therefore, conservative treatment might be an alternative option [10,11]. It has been suggested that in some cases non-ischemic priapism resolves on its own [10]. Spontaneous resolution has been shown to occur in 62% of patients [1,4,12]. However, it is important not to postpone treatment for too long as it can lead to corporal fibrosis and permanent ED [13]. Our patient, who was a sexually active, 51-year-old man, received the treatment without delay.

Numerous case reports and review articles describe various materials used to perform angioembolization. They are commonly divided into 2 categories: temporary occlusive agents include autologous blood-clot and gelatin sponge, and permanent occlusive agents include metallic microcoils, plugs, particles, and tissue glue [14]. Although the rate of symptomatic improvement differs significantly before application of temporary and permanent agents, there was no significant difference regarding overall improved erectile function [15]. Another recent review, which analyzed different types of embolic materials, also showed comparable outcomes [16]. Microcoils were suggested to have a more sustained effect, with more accurate positioning in the desired vessel [17], but other permanent agents were also assumed to be associated with more EDs [5,16]. Arterial embolization, regardless of the material used, has a success rate of 89% [5]. The overall reported failure/recurrence rate is high, at 30-40% [4]. In our case, we used microcoils, as we have the most experience with the use of these embolic materials and believed their use would lead to the most sustained result. Long-term follow-up is necessary to further determine the durability of the treatment.

Percutaneous microembolization can lead to potential complications such as ischemia/necrosis, inflammation, abscess formation, and ED [4,18,19]. However, the reported rate of complications in the literature is very low, with an ED rate of 15% [16]. In our patient, no complications associated to the endovascular procedure itself were observed.

In contrast to the currently available endovascular technology, surgical treatment is rarely used. When endovascular embolization fails, surgery can be a potential therapeutic option. Successful surgical ligation of the arterial-lacunar fistula has been described in the literature [20,21]. However, this type of intervention is associated with a significant risk of complications such as ED (reported to be as high as 50%), penile gangrene, gluteal ischemia, purulent cavernositis, and perineal abscesses [5,22]. In our patient, we would only have considered surgical treatment after failure of endovascular intervention.

Conclusions

This case report described a 51-year-old man with high-flow priapism due to post-traumatic formation of arterial-lacunar fistula. As conservative management failed, this rarely encountered pathology was treated by endovascular means. Percutaneous microembolization of the fistula in distal internal pudendal artery was performed. This led to a complete alleviation of symptoms with preserved sexual function and good quality of life.

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References:


