BILATERAL SUPERSELECTIVE ARTERIAL MICROCOIL EMBOLIZATION IN POST-TRAUMATIC HIGH-FLOW PRIAPISM: A CASE REPORT

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Priapism is a prolonged penile erection unrelated to sexual stimulation. High-flow arteriogenic priapism is uncommon and usually occurs after genitoperineal trauma, which may damage a feeding cavernosal artery, leading to an arteriovenous fistula and, occasionally, to an associated pseudoaneurysm. The defects rarely occur bilaterally. Herein, we report successful treatment of high-flow priapism secondary to a traumatic pseudoaneurysm fed from the bilateral cavernosal artery. Diagnosis was made after cavernosal blood gas analysis, color Doppler ultrasonography, and superselective angiography. Treatment consisted of superselective arterial embolization using metallic microcoils and resulted in simultaneous detumescence of the penis with no complications. The patient regained morning erection on the second postoperative day and erectile function remained normal 8 months after treatment. This case shows that bilateral arteriocavernosal fistulae can be successfully treated with superselective arterial embolization without affecting potency and highlights the importance of warning men about the possibility of developing high-flow priapism following a perineal trauma.

Key Words: priapism, pseudoaneurysm, arterial embolization

High-flow priapism is an uncommon disease and usually occurs following an arteriocavernous fistula caused by laceration of the cavernosal artery or one of its branches, leading to an arteriovenous fistula and, occasionally, to an associated pseudoaneurysm [1–3]. The defects rarely occur bilaterally. Recent concerns about erectile dysfunction with bilateral use of permanent metallic coils appear to be debatable [4, 5]. Herein, we report successful treatment of high-flow priapism secondary to a traumatic pseudoaneurysm fed from the bilateral cavernosal artery using superselective arterial embolization, without affecting potency.

CASE PRESENTATION

A 21-year-old man suffered from a persistent soft erection after closed perineal trauma following a motorbike accident. Because there was no pain, initially he paid little attention. However, when discomfort in the perineum developed progressively over the following days and the soft erection did not subside, he came to our hospital for help.

Physical examination revealed no tenderness or bruising over the perineum and genital organs. Duplex Doppler ultrasonography identified turbulent arterial
flow in the corpora cavernosa at the base of the penis (peak systolic velocity, 40 cm/second; end diastolic velocity, 12 cm/second) before embolization (Figures 1a and 1b). Gas analysis of cavernosal aspirate showed high oxygen saturation (pH 7.357, pO₂ 196 mmHg, pCO₂ 44.9 mmHg, HCO₃⁻ 25.5 mmol/L, O₂% 99.6%), suggesting high-flow priapism. Superselective pudendal angiography demonstrated a pseudoaneurysm arising from the bilateral cavernosal artery (Figures 2a and 2b). Superselective embolization of the left branch of the cavernosal artery using metallic microcoils resulted in complete occlusion of the feeding defect (Figures 3a and 3b). However, repeat arteriography of the right cavernosal artery showed that the pseudoaneurysm persisted. Superselective embolization with metallic microcoils was repeated, and was successful in achieving complete resolution (Figures 3c and 3d), leading to simultaneous detumescence of the penis.

The patient regained morning erection on the second postoperative day with no complications after treatment. Follow-up gas analysis of cavernosal aspirate revealed an apparent decrease in oxygen satu-
tion (pH 7.376, pO₂ 63 mmHg, pCO₂ 46.4 mmHg, HCO₃⁻ 27.5 mmol/L, O₂% 90.8%). Eight months later, the patient stated that sexual arousal remained normal and erectile function was satisfactory without recurrent priapism.

**DISCUSSION**

Priapism is prolonged pathologic erection unrelated to sexual stimulation, and arises from an abnormal imbalance between the arterial blood supply to the penis and the venous return. Two forms of priapism are recognized: veno-occlusive or low-flow priapism and arterial or high-flow priapism [6, 7].

High-flow arteriogenic priapism is uncommon and usually occurs after genitoperineal trauma, which may cause laceration of the cavernosal artery or one of its branches, leading to an arteriovenous fistula and, occasionally, to an associated pseudoaneurysm [1–3].

A history of perineal trauma and soft painless erection on physical examination provide important information for diagnosis. However, to clearly differentiate high-flow from low-flow priapism, arterial gas analysis of the cavernosal aspirate and duplex Doppler ultrasonography are useful [8]. In patients with an abnormal duplex Doppler pattern (i.e., markedly increased color flow within the corpus cavernosum suggestive of cavernosovenous fistula or cavernosal arterial pseudoaneurysm), selective arterial angiography, with or without embolization, can effectively identify and correct the causative lesion [9]. Magnetic resonance imaging has also been reported in the diagnosis of recanalization of the embolized cavernosal artery [1].

The aim of treatment for high-flow priapism is to reverse the priapism by temporarily occluding the cavernosal artery, allowing the laceration to heal and, at a later date, restoring cavernosal artery flow and preserving erectile function [10]. Despite the fact that this entity has become clinically well recognized, its treatment remains somewhat controversial [1].

Ilkay and Levine successfully treated four cases of traumatic high-flow priapism with conservative treatment consisting of observation after arteriography or percutaneous autologous clot embolization. They proposed that high-flow priapism may resolve spontaneously following arteriography without embolization [10]. Arango et al also successfully treated one patient with watchful waiting due to the small size of the arteriocavernosal fistula [11]. However, there are few cases of spontaneous resolution of high-flow priapism in the literature.

Alternative to observation, arterial clot embolization with superselective arteriography is a widely accepted treatment approach and has achieved a cumulative success rate of more than 90% [12]. Among embolization materials, blood autologous clots and gelfoam have been most popular. They were thought to be essential to reestablish arterial flow and decrease the risk of impotence because they produce only temporary interruption of arterial blood flow [13, 14]. However, they are not radiopaque, so precise occlusion while avoiding non-target vessels is difficult, leading to a risk of excessive perineal tissue necrosis and infection [15, 16]. To avoid these difficulties and to achieve precise deposition, embolization using metallic microcoils has been used [12]. This is usually the therapeutic procedure of choice in unilateral use, but because the permanent nature of the occlusion means that it could prevent the restoration of potency, its utilization in bilateral defects has been discouraged [5]. However, Gujral et al reported successful bilateral use of superselective arterial microcoil embolization with preservation of erectile function and return to normal 6 weeks after the procedure [4].

To our knowledge, this is the first case of bilateral arteriocavernosal fistulae simultaneously feeding one pseudoaneurysm and causing high-flow priapism. Although recent concerns about erectile dysfunction with bilateral use of permanent metallic coils appear to be controversial, our experience suggests that superselective arterial metallic microcoil embolization is safe in treating high-flow priapism and that bilateral arteriocavernosal fistulae embolization may be performed without affecting potency. In fact, we initially did not know whether potency would return after embolization, but the patient had a normal morning erection on the second postoperative day, much sooner than in Gujral et al’s experience. We believe that this satisfactory result was possible because of early identification of the causative lesion but also because precise embolization was achieved by superselective angiography, avoiding occlusion of the bilateral cavernous artery.

Based on this case, we highlight the importance of warning men about the possibility of developing high-flow priapism following perineal trauma.
REFERENCES


