

Endovascular Embolization of Posttraumatic High-Flow Priapism: Uncommon Arteriovenous Fistula of the Corpus Cavernosum

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Abstract

Background

priapism is a persistent penile erection lasting more than four hours without sexual arousal or stimulation. Non-ischemic high-flow priapism is an uncommon finding.

Case presentation:

we report on a high-flow priapism, an uncommon arteriovenous fistula of the corpus cavernosum after a straddle trauma which was successfully treated by super selective trans-arterial embolization using a temporary embolic agent. At follow up no recurrent episodes of priapism occurred without symptoms of erectile dysfunction or other complications.

Conclusion

Super selective embolization has a high rate of technical success with preservation of erectile function in this case without complications.

Background

There are two types of priapism: ischemic and non-ischemic, sometimes referred to as low-flow and high flow priapism, respectively. Non-ischemic priapism is most frequently caused by genitoperineal trauma¹ resulting in a high-flow arterio-lacunar fistula of the corpus cavernosum. For clinical management and the risk of ischemia it is crucial to distinguish between a high-flow and a low-flow priapism. The history and physical examination is usually sufficient to distinguish between the two types. Additional cavernous blood gas sampling and/or Doppler ultrasonography² can confirm either of the two forms of priapism. The goal of management of priapism is to achieve detumescence of the penile erection while preserving erectile function.

Case Presentation

A 65-year-old man with priapism presented with a painless erectile penis since two weeks after a straddle injury while riding a bicycle. Physical examination revealed a full erection of the penis. There were no clinical signs of ischemia. Laboratory tests revealed no abnormalities. A blood gas sample of the corpus cavernosum showed a pH of 7,4. The differential diagnosis included a non-ischemic high-flow priapism. The Urology team consulted the Interventional Radiologists for diagnostic angiography because the high suspicion of a high-flow arteriovenous fistula. An angiogram demonstrated a blush of contrast into the corpus cavernosum from the left internal pudendal artery, pathognomonic for an arterial-lacunar fistula (Figure 1). Following the angiography, superselective trans-arterial embolization was performed using

Spongostan as temporary embolic agent (Figure 2). Spongostan was used because of the risk of permanent erectile dysfunction and ischemic complications when using a permanent embolic agent. The patient was discharged the same day following treatment. The next day the erection was reduced and the patient reported tenderness of the penile skin. At three months, no recurrent episodes of priapism occurred without symptoms of erectile dysfunction or other complications. No re-intervention was needed.

Discussion

Penile erection is established by relaxation of smooth muscle of cavernosal arteries and tissue. This leads to increased arterial inflow and decreased venous outflow (figure 3). Priapism can occur at any age and has a wide variety of causes. It mostly involves the corpora cavernosa, although some cases have been reported with the involvement of the corpus spongiosum and the glans penis².

Ischemic priapism, also known as low-flow or veno-occlusive priapism, is the most common type of priapism. The prolonged erection is caused by impaired relaxation and paralysis of cavernosal smooth muscle. This in turn results in a compartment syndrome in which hypoxia and acidosis may lead to structural damage of erectile tissue. In adults, the administration of medication is usually the cause of low-flow priapism². Quick management is necessary to decrease the risk of irreversible damage.

Non-ischemic priapism, also known as high-flow or arterial priapism is less common and is usually the result of a fistula between the cavernosal artery and corpus cavernosum. Trauma is the most common cause of high-flow priapism in adults. The trauma will result in a laceration of the perforating arteries from the penile artery. On clinical presentation, the erection is incomplete and not painful, in contrast to the low-flow priapism. Due to the inflow of oxygenated blood in the corpus cavernosum, the cavernosal blood gas sample has a high pO₂ (> 90 mmHg) and pH (>7.4) levels². Spontaneous resolution of priapism is reported in many cases³ and observation or compression therapy is therefore the initial treatment. In case of persistent priapism, the treatment is selective trans-arterial embolisation of the arterio-lacunar fistula. Different embolic agents are used, all with a high rate of technical and clinical success. The choice of embolic agent should be based on operator experience and fistula characteristics². In this case, Spongostan, a temporary embolic agent was used with both technical and clinical success. While embolizing the fistula, caution must be given of potential communication of the contralateral internal pudendal artery contributing to persistent filling of the fistula.

Conclusion

This case describes an uncommon type of priapism secondary to a post-traumatic high flow arterio-lacunar fistula of the corpus cavernosum. History, physical examination and a blood gas sample of the corpus cavernosum are crucial to differentiate between a low-flow priapism and a high-flow priapism. The first treatment of high-flow priapism is conservative. Subsequent management in case of persisting priapism consists of endovascular trans-arterial embolization of the fistula. Super selective embolization

has a high rate of technical success with preservation of erectile function in this case without complications.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Consent for publication was obtained for the individual person's data included in the case report.

Availability of data and material

Not applicable

Competing interests

The authors declare that they have no competing interest.

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Authors' contributions

MO wrote the manuscript, interpreted radiodiagnostics and contributed to endovascular treatment. JF assisted in interpretation of radiodiagnostics, contributed to endovascular treatment and drafting of the manuscript. LZ and BB supervised critical revision of the manuscript and contributed to clinical care. All authors discussed the results and commented on the manuscript.

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Not applicable

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Figures



Figure 1

Aortogram showing a blush of contrast into the corpus cavernosus, pathognomonic for an arterial-lacunar fistula.

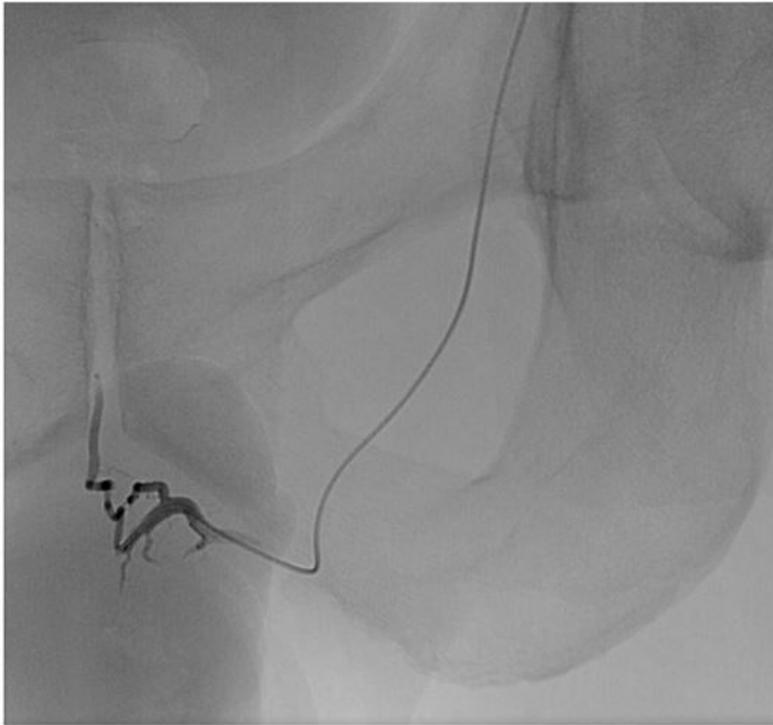
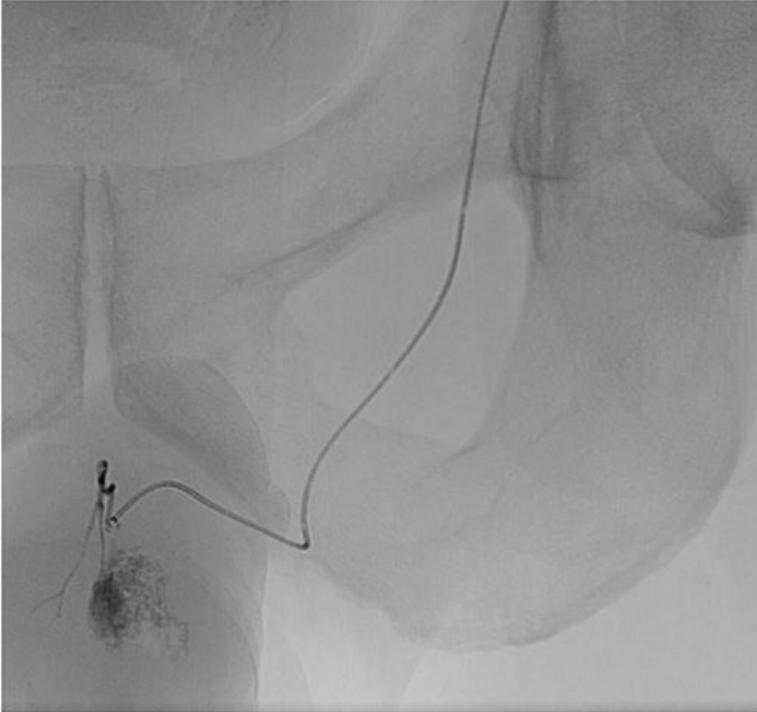


Figure 2

2A. After superselective catheterization an angiography of the left internal pudendal artery demonstrating the arterio-cavernosal fistula. The branch of the left internal pudendal artery contributing to the fistula

near the fistulous point was embolized. 2B. Completion angiography after successfully embolization of the fistula using Spongostan, a temporary embolic agent. End-result is complete occlusion of the fistula.

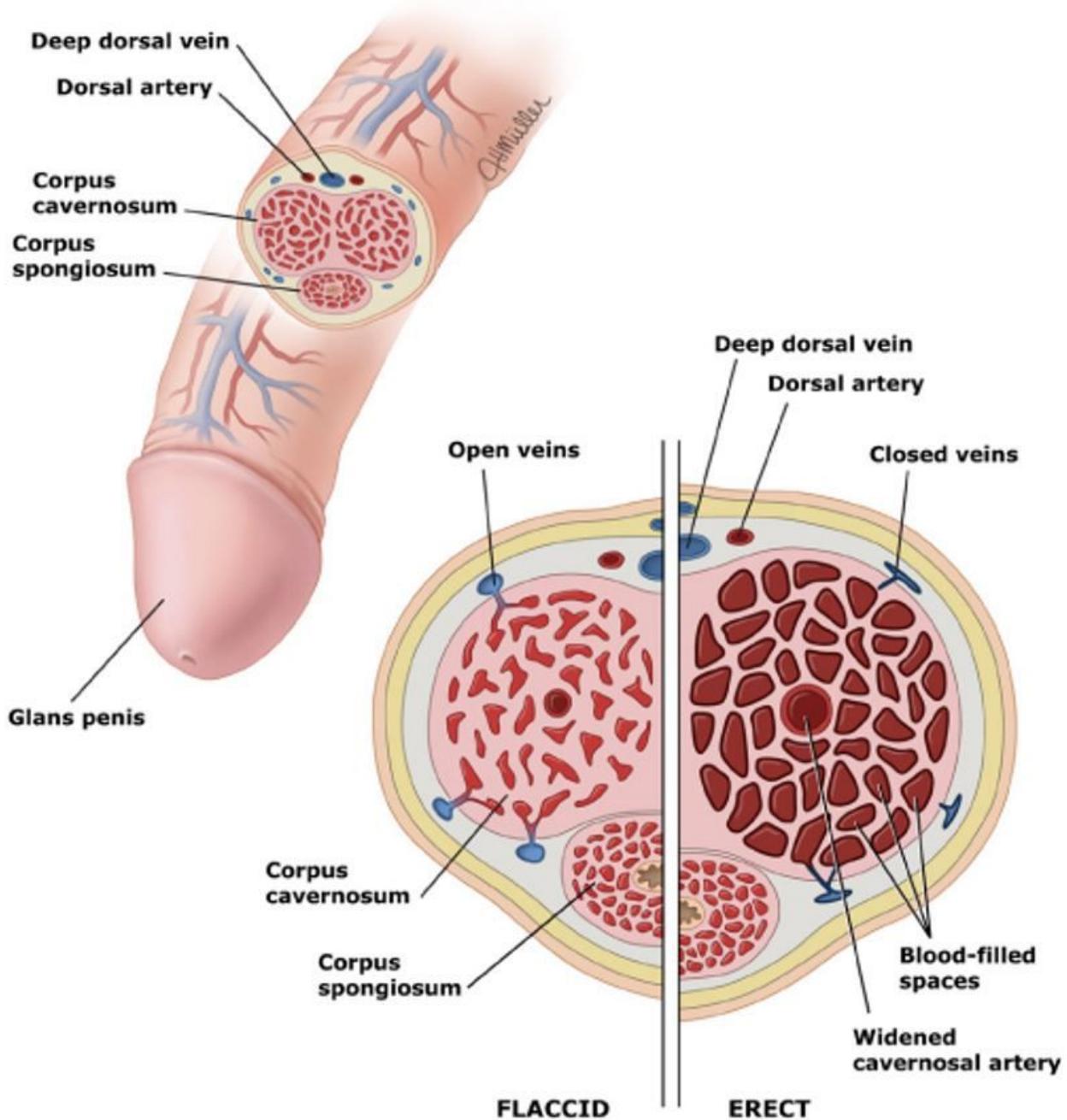


Figure 3

Anatomy of the penis Source: Deveci, S., O'Leary, M., Hockberger, R. and Givens, J., 2021. UpToDate. [online] Uptodate.com. Available at: <https://www.uptodate.com/contents/priapism> [Accessed 1 October 2021].