

POST-TRAUMATIC ARTERIAL PRIAPISM EVALUATION WITH COLOR DOPPLER ULTRASONOGRAPHY: A CASE REPORT

Noriyoshi SUZUKI, Yoshikazu SATO and Taiji TSUKAMOTO

From the Department of Urology, Sapporo Medical University, School of Medicine

Kazumitsu KOITO

From the Department of Radiology, Sapporo Medical University, School of Medicine

Hiroshi MARUTA

From the Department of Urology, Muroran General Hospital

Shinichi HISASUE

From the Department of Urology, Saiseikai Otaru Hokusei Hospital

The patient was a 19-year-old man who was examined due to persistent penile erection, which appeared following a blow to the perineal region during work. Color Doppler ultrasonography of the corpora cavernosa revealed a cavity in one part of the cavernous artery that suggested a blood leak, and a diagnosis of high flow type priapism due to trauma was made. Bilateral internal pudendal arteriography demonstrated dilation and extravasation in one part of the right cavernous artery, then transarterial embolization was performed superselectively in the right cavernous artery using an autologous clot. However, 2 weeks after treatment, slight penile erection reoccurred. Color Doppler ultrasonography revealed reformation of the cavity at the treated lesion, and embolization was again performed using a gelatin sponge. Following embolization, the course proceeded satisfactorily without any relapse. Color Doppler ultrasonography, which is non-invasive and can be easily performed, is considered to be an effective means for diagnosis and follow up of arterial high flow priapism.

(Acta Urol. Jpn. 45 : 65-68, 1999)

Key words : Priapism, Ultrasonography, Embolization

INTRODUCTION

Priapism is a relatively rare idiopathic disease or a disease with various causes. We experienced a case of traumatic high flow priapism that occurred following a blow to the perineal region. Arterial embolization using an autologous clot was first performed, but due to a relapse, a second embolization using a gelatin sponge was performed.

Here, we report the usefulness of color Doppler ultrasonography for both diagnosis and post-operative follow up in such a case of high flow priapism.

CASE REPORT

A 19-year-old man received a blow to the perineal region after accidentally falling from a stepladder during work. One hour after the accident, he experienced a persistent penile erection. As he had persistent erection and penile pain, he was referred to our institution.

Hematuria was not detected in the urinalysis, and no notable abnormal findings were seen in the peripheral blood or in biochemical tests of the blood. The results of cavernous blood gas analysis (pH 7.429, P_{O_2} 80.7 mmHg and P_{CO_2} 41.8 mmHg) showed

that the blood was bright red and close to arterial blood.

Color Doppler ultrasonography performed on the penis showed a cavity with arterial pulsations and a turbulent blood flow in the right corpora cavernosa near the crus (Fig. 1).

Cavernosography showed extravasation of the contrast medium in the crus and a flow of the contrast medium to the veins immediately after injection.

As there was no clear obstruction to the venous system, the persistent penile erection was diagnosed as a high flow priapism, that was caused by damage to the artery flowing into the corpora cavernosa from a blow to the perineal region. No urethral injury was found. Selective internal pudendal arteriography on the right side revealed a cavernous arterial blush consistent with a lacerated branch of the cavernous artery. An angiographic catheter was advanced through the right cavernous artery, and embolization was performed with a 4.5 ml autologous clot (Fig. 2). Immediately after embolization, the fistula was completely occluded and the penis became flaccid. The cavity also disappeared from the color Doppler ultrasonography.

Two weeks later, he felt again mildly persistent erection, and a cavity-reformation was revealed on

color Doppler ultrasonography (Fig. 3). A second embolization was performed using a gelatin sponge,

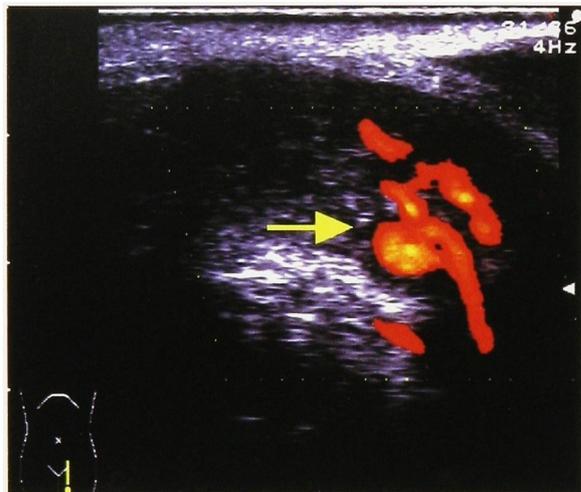


Fig. 1. Color doppler ultrasonography. Transverse view demonstrates right intra-corporal arteriovenous fistula (arrow).



Fig. 2. Selective arteriogram of right pudendal artery. Arrow demonstrates the present of a fistula at base of corpus cavernosum.

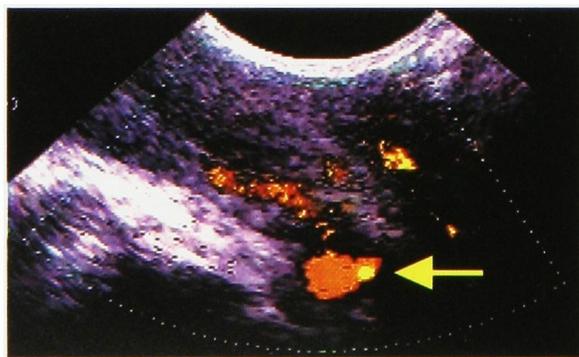


Fig. 3. Color doppler ultrasonography reveals recurrent arteriovenous fistula at the treated site (arrow).

which takes a longer time to be absorbed than an autologous clot. Following the second embolization, penile relaxation was obtained and the cavity disappeared on color Doppler ultrasonography. Although the patient has not yet achieved full erection, Rigi scan which was performed 14 days after embolization demonstrated normal nocturnal penile tumescence. The post-operative course was uneventful without recurrence of priapism up to a year.

DISCUSSION

Priapism is a morbid condition of persistent penile erection, which arises when the blood flow to the corpora cavernosa is obstructed, leading to an increase in pressure inside the corpora cavernosa. Priapism can be classified into two types, the low flow and the high flow types, according to the differences in blood dynamics^{1,2}. In the high flow type, the cavernous artery is damaged due to a traumatic injury such as that in the present case. This results in the formation of an A-V fistula between the artery and the cavernous sinus, and the inflow of arterial blood into the penis exceeds the outflow of blood from the penis, which is the cause of this type of priapism.

To identify the lesion in the blood vessel, cavernosography and internal pudendal arteriography have been used. However, color Doppler ultrasonography allows very detailed observation of the blood flow. It can show the turbulent flow due to the outflow of arterial blood from the damaged blood vessel, and a diagnosis of high flow priapism can be obtained in almost all cases by the use of this method³. As color Doppler ultrasonography can be performed easily and is non-invasive, it is considered to be a very useful method not only for diagnosis but also, as in the present case, for monitoring for relapse following therapy⁴⁻⁶.

High flow priapism is generally treated by embolization of the damaged blood vessel, and an autologous clot is most widely used as the embolus. An autologous clot causes very little damage to tissue compared to emboli such as coils. It also allows reopening of the blood vessel by thrombolysis and therefore has the advantage of preventing post-operative impotence. However, there have also been reports of relapse following this method of embolization⁷⁻⁹. Relapse also occurred in the present case and the patient was treated successfully by a second embolization using a gelatin sponge, which has a longer absorption time than an autologous clot. Thus, although embolization using an autologous clot is a useful method for treating high flow priapism, in the case of relapse, an embolus having a longer absorption time may be considered. On the other hand, surgical treatment of high-flow priapism often results in post-operative impotence, and there is opinion¹⁰ that high flow priapism should

not be treated but just followed if there are no obvious subjective symptoms such as pain, and if sexual intercourse is possible. Thus, observation of the course should be considered as one option in the treatment of high flow priapism.

CONCLUSION

We reported a case of post-traumatic arterial priapism and proved it to be valuable as part of the diagnostic evaluation

REFERENCES

- 1) Hauri D, Spycher M and Bruhlmann W : Erection and priapism : a new physiopathological concept. *Urol Int* **38** : 138-145, 1983
- 2) Bruhlmann W, Poulidis G, Hauri D, et al. : A new concept of priapism based on the results of angiography and cavernosography. *Urol Radiol* **5** : 31-36, 1982
- 3) Gudinchet D, Fournier D, Jichlinski P, et al. : Traumatic priapism in a child : evaluation with color flow Doppler sonography. *J Urol* **148** : 380-381, 1992
- 4) Feldstein VA : Post traumatic High-flow priapism evaluation with color flow Doppler sonography. *J Ultrasound Med* **12** : 589-593, 1993
- 5) Harding JR, Hollander JB and Bendick PJ : Chronic priapism secondary to a traumatic arteriovenous fistula of the corpus cavernosum. *J Urol* **150** : 1504-1506, 1993
- 6) Brock G, Breza J, Lue TF, et al. : High flow priapism : a spectrum of disease. *J Urol* **150** : 96, 1993
- 7) Mizutani M, Nakano H, Sagami K, et al. : Treatment of post-traumatic priapism by intra-cavernous injection of α -stimulant. *Urol Int* **41** : 312-314, 1986
- 8) Gonzalez EA, Pamplona M, Rodriguez A, et al. : High flow priapism after blunt perineal trauma : resolution with bucrylate embolization. *J Urol* **151** : 426-428, 1994
- 9) Stefani SD, Capone M and Carmignani G : Treatment of post-traumatic priapism by means of autologous clot embolization. *Eur Urol* **23** : 506-508, 1993
- 10) Lawrence SH, Haluk K, Russel M, et al. : Evolving concepts in the diagnosis and treatment of arterial high flow priapism. *J Urol* **155** : 541-548, 1996

(Received on July 2, 1998)

(Accepted on September 2, 1998)

カラードップラー超音波が有効であった外傷後に生じた
動脈性持続勃起症の1例

札幌医科大学泌尿器科学教室（主任：塚本泰司教授）

鈴木 範宜，佐藤 嘉一，塚本 泰司

札幌医科大学放射線科

小井戸 一 光

市立室蘭総合病院泌尿器科

丸 田 浩

済生会小樽北生病院泌尿器科

久 末 伸 一

症例は19歳，男性。仕事中に会陰部を強打，その後より持続する陰茎勃起が出現するため受診。カラードップラーにて右陰茎海綿体脚部に血液の leak と思われる cavity を認め，high-flow type の外傷性 priapism と診断した。両側内陰部動脈造影を施行したところ，右海綿体動脈の一部に造影剤の溢流像を認めたため，自己血凝血塊を用いた動脈塞栓術を施行した。しかし治療2週間後より再び持続性勃起を認める

ようになり，カラードップラーで前回と同じ部位に cavity の再発を認めたため，今回は自己血凝血塊よりもさらに吸収時間の長い gelatin sponge を用いて再度，動脈塞栓術を施行した。その後は再発を認めることなく経過している。本症の診断と治療後の経過観察において，カラードップラーは侵襲もなく容易に行うことができるため，有用であると考えられた。

(泌尿紀要 45 : 65-68, 1999)