

Superselective Embolization of Traumatic Cavernosal Arterio-Lacunar Fistula

Erol H. Aksungur,¹ MD, Medih Çeliktas,¹ MD, Süreyya K. Soyupak,¹ MD, Mehmet İnal,¹ MD, Bülent Soyupak,² MD, Figen B. Binokay,¹ MD, Caner Özer,¹ MD.

Arterio-lacunar fistula causing arterial priapism is a rare complication of blunt perineal trauma. An arterio-lacunar fistula was detected with color Doppler imaging and confirmed with angiography in a 19-year-old man who had perineal trauma. Superselective transarterial embolization of the arterio-lacunar fistula was done with the autologous clot. A post-embolization arteriogram showed occlusion of the fistula. Full erection was restored after two weeks. We conclude that arterial priapism caused by arterio-lacunar fistula can be effectively treated by superselective embolization with autologous clot via the cavernosal artery. *Ann Med Sci* 2000;9:75-77

Key words: Embolization; arteriolacunar fistula; cavernosal artery.

Priapism is persistent erection in the absence of sexual desire or stimulation. It can be caused by two different mechanisms. The venous form is more often seen and is caused by ischemic persistence of the normal veno-occlusion. Another less common form of priapism is an arterial disease caused by penile trauma¹. There is an arteriolacunar fistula between a lacerated cavernosal artery and venous sinusoids of the cavernosal body. History of trauma and absence of penile pain are the most important diagnostic aspects of the arterial priapism. Color Doppler ultrasonography is the noninvasive method which shows the fistula. Selective pudental angiography confirms the diagnosis and superselective transcatheter embolization is an effective treatment method.

In this paper, we report the result of superselective embolization of an arteriolacunar fistula in a 19-year old man with an arterial priapism.

Case Report

A 19-year old sexually healthy man fell on a metallic water pipe and this led to a straddle injury. A painless erection developed 3 days after the trauma. He was admitted on the fifth day because of persistent erection.

On examination, there was a large ecchymosis on the right groin. The skin of the penis was of normal color but semirigid cavernosal bodies were palpated except in the lax glans. There was an 80 degree erection. Color Doppler ultrasonography showed an increased systolic (149 cm/sn) and diastolic (47 cm/sn) velocity of the proximal part of the right cavernosal artery. An irregular margined 1.5 cm lacuna was noted near the proximal part of the artery (Figure 1a). There was to and fro flow pattern between the artery and this lacuna. These findings confirmed the laceration of the artery and fistula between the artery and the injured venous sinusoids of the cavernosal body. Selective pudental and superselective cavernosal angiography were done and confirmed the arteriolacunar fistula (Figure 2a). After diagnostic angiography, the right cavernosal artery was coaxially catheterized with a microcatheter and the fistula was embolized with the auto-clot (Figure 2b). Detumescence occurred after this procedure. Color Doppler ultrasonography revealed normalization of the arterial flow and shrinkage of the lacuna (Figure 1b). Color Doppler ultrasonography was done monthly for six months. Recanalization of the artery was detected on the first control examination and there was no fistula formation. Sexual function was reported by the patient to be normal during this period.

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Cukurova University Faculty of Medicine, Departments of Radiology¹ and Urology², Adana-TÜRKİYE

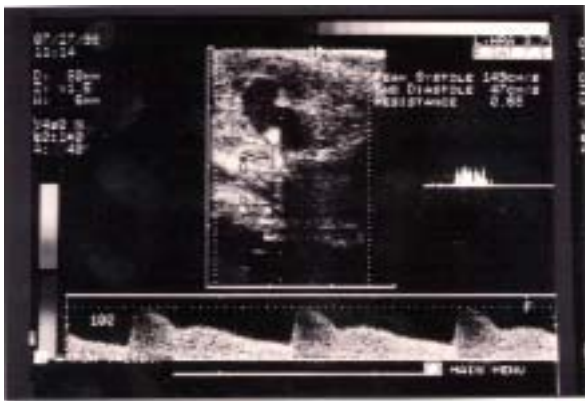


Figure 1a. Color Doppler ultrasonography shows an increased systolic (149cm/sn) and diastolic (47 cm/sn) velocity of the proximal part of the right cavernosal artery.

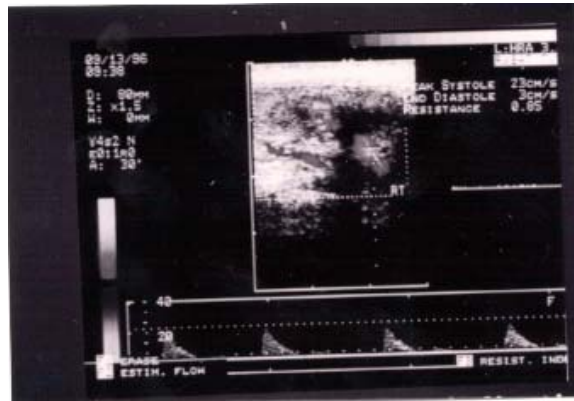


Figure 1b. Color Doppler ultrasonography revealed normalization of the arterial flow after embolization.

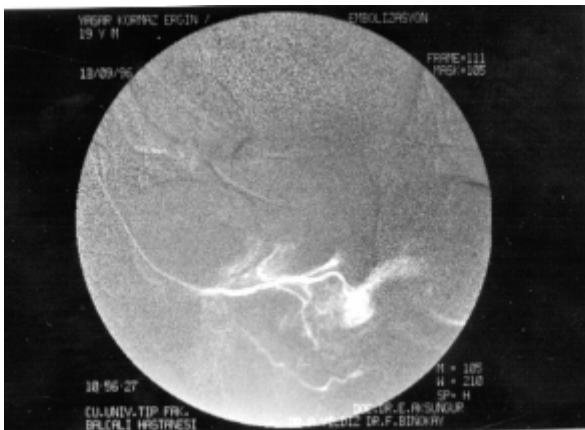


Figure 2a. Angiography confirms the arteriolacunar fistula. There is a contrast extravasation from proximal part of cavernous artery.



Figure 2b. After the superselective embolization, the distal part of the cavernous artery and the fistula are occluded. the right

Discussion

Blunt perineal or penetrating trauma may cause laceration of the cavernous artery¹. Since the cavernous arteries are located at the center of the cavernosal bodies, laceration of the artery causes arterio-lacunar fistula formation between the cavernous artery and cavernosal body. The majority of arterial priapism cases occur after a delay, making the etiology speculative². It was suggested that a prolonged erectile stimulus is required to establish the syndrome of arterial priapism, and the generated stress releases vasodilatory substances that perpetuate the high inflow and high outflow state³. Ricciardi et al. suggested that the mechanism of injury to the artery secondary to a blunt trauma involves compression of the arterial segment against a bony prominence, which causes ischemic injury to the vessel². After a delay, the necrosed seg

ment causes a blowout with unregulated outflow into the corpora cavernosa².

The diagnosis of arterial priapism can be made with history and physical examination mainly by visualizing a painless erection that is priapismic. Simply placing a needle in the corpora and withdrawing bright red arterial blood confirms the diagnosis. An arteriogram, is therefore, basically performed after the diagnosis has been made by simply looking for the offending artery and the site of the arteriolacunar fistula. However, the use of color Doppler ultrasonography may eliminate the need for angiographic study. But angiography can be used as a therapeutic method for embolization of the fistula.

Presently, there are 4 treatment alternatives for arterial priapism, including mechanical, pharmacological, radiological and surgical¹. Mechanical intervention consists of prolonged external compression of the perineum for several hours, including local application of ice. Since there is no precision in the location and quality of the proximal arterial inflow occlusion, these maneuvers are often unsuccessful. Pharmacologic therapy is with metaraminol bitartrate and methylene blue¹. Both agents counteract smooth muscle relaxation. However, the use of metaraminol can be associated with sustained hypertension up to 200 mm. Hg¹. Methylene blue can initially

be successful but priapism may recur. Resection of the fistula or ligation of the artery has been reported as effective therapies, but a risk of impotence with high level ligation of pudental or penil arteries has been reported¹. Selective cavernous artery ligation offers the advantage of not disrupting blood flow to unaffected arteries and decreases the risk of impotence².

Superselective transcatheterial embolization is an alternative method. Described by Wear et al in 1977⁴, embolization with an autologous clot or absorbable gelatin sponge produces a transient interruption of arterial flow through the lacerated vessel as in this case⁵⁻⁹. Dissolution of the embolic agent enables reestablishment of the arterial flow. Proximal embolization from the penile or pudental artery may cause widespread ischemia which is not desired. Because of this, highly selective embolization from affected cavernosal artery will diminish morbidity. If the fistula recanalizes after embolization with dissoluble agents, permanent agent such as bucrylate or PVA can be used for a second intervention^{5,10,11}.

References

1. Bastuba MD, Saenz de Tejada I, Dinlenc CZ, Sarazen A, Krane RJ, Goldstein I. Arterial priapism: Diagnosis, treatment and long-term followup. J. Urol 1994; 151:1231-1237.
2. Ricciardi R, Bhatt GM, Cynamon J, Bakal CW, Melman A. Delayed high flow priapism: pathophysiology and management. J Urol 1993; 149: 119-121.
3. Witt MA, Golstein I, Saenz de Tejada I, Greenfield A, Krane RJ. Traumatic laceration of intracavernosal arteries: the pathophysiology of nonischemic, high flow, arterial priapism. J Urol 1990; 143:126.
4. Wear JB, Jr. Crummy AB, Munson BO. A new approach to the treatment of priapism. J Urol 1977; 117:252-254.
5. Gonzalez EA, Pamplona M, Rodriguez A, Garcia-Hidalgo E, Nunez V, Leiva O. High flow priapism after blunt perineal trauma: resolution with bucrylate embolization. J Urol 1994;151: 426-428.
6. Walker TG; Grant PW; Goldstein I; Krane RJ; Greenfield AJ. "High-flow" priapism: treatment with superselective transcatheter embolization. Radiology 1990, 174: 1053-1054.
7. Kang BC; Lee DY; Byun JY; Baek SY; Lee SW; Kim KW. Post-traumatic arterial priapism: colour Doppler examination and superselective arterial embolization. Clin Radiol 1998; 53: 830-834.
8. Steers WD; Selby JB Jr. Use of methylene blue and selective embolization of the pudental artery for high flow priapism refractory to medical and surgical treatments. J Urol 1991; 146: 1361-1363
9. Gimbergues P; Raynaud F; Ravel A; Perez N; Guy L; Boiteux JP; Boyer L. Treatment using percutaneous arterial embolization of post-traumatic priapism in children. Prog Urol 1998; 8: 258-261
10. Göktaş S, Tahmaz L, Ataç, Erduran D, Peker AF, Harmankaya Ç. Embolization therapy in two subtypes of priapism. International Urology and Nephrology 1996;28; 723 – 727
11. Göktaş S, Tahmaz K, Ataç K, Erduran D, Oğur E. High-flow priapism due to bilateral arteriosinusoidal fistulae. BJR 1996; 77: 165 - 166