Pelvic congenital arteriovenous malformation diagnosed by transrectal ultrasonography: A case report

Kenjiro Suzuki, MD; Nobuyuki Tanaka, MD; Takashi Ebine, MD; Tetsuo Momma, MD, PhD

Department of Urology, National Hospital Organization Saitama Hospital, Saitama, Japan

Cite as: *Can Urol Assoc J* 2012;6(2):e61-63. http://dx.doi.org/10.5489/cuaj.10190

Abstract

Arteriovenous malformations (AVMs) of the pelvis are relatively rare and difficult to treat because of multiple and extensive feeding vessels. We report the case of a 69-year-old male with pelvic congenital AVM that was detected during tests for dysuria. He visited our hospital complaining of voiding difficulty. Digital rectal examination revealed a pulsating mass that was palpable on the right side of the prostate. Transrectal ultrasonography showed multiple hypoechoic lesions adjacent to the prostate and colour Doppler ultrasonography revealed the flow regions corresponded to the hypoechoic lesions. Computed tomography demonstrated large-to-small tubular vessels adjacent to the prostate, while pelvic angiography showed many small feeder arteries extending mainly from the right internal iliac artery. He was diagnosed as having pelvic congenital AVM. Uroflowmetry revealed slight voiding difficulty without residual urine. The patient decided against treatment and requested we monitor his clinical course.

Introduction

Arteriovenous malformations (AVMs) of the pelvis are relatively rare, usually congenital lesions, and are difficult to treat because of multiple and extensive feeding vessels.[1] Selective angiography of the iliac arteries is still the best method for diagnosing pelvic AVM, although the usefulness of computed tomography (CT) has also been recognized.

Transrectal ultrasonography (US) is one test used in the routine evaluation of dysuria in male patients, and can assist with ruling out diseases, such as prostate cancer and benign hyperplasia. We describe a patient with congenital pelvic AVM who complained of voiding difficulty, and we also discuss the use of transrectal US to diagnose pelvic AVM.

Case report

A 69-year-old male visited our hospital with the chief complaint of voiding difficulty, which has persisted for more than 12 months. He was taking medications for dysuria, including an alpha-1 blocker, which had been prescribed by another doctor. There was no history of abdominal or pelvic trauma or surgery.

Rectal examination revealed a normal-sized prostate; however, a pulsating mass was palpable on the right side. Transrectal US showed a normal image and normal prostate size (prostate volume was 16.8 cm^3); however, multiple hypoechoic lesions with a heterogenous sonographic pattern were located adjacent to the prostate. Colour Doppler US demonstrated flow regions, with a light colour in the same lesions (Fig. 1). Routine laboratory values and urine analysis were normal. The serum prostate specific antigen (PSA) level was normal (0.52 ng/mL). We suspected congenital pelvic AVM and performed a pelvic enhanced CT.

Pelvic CT showed large to small tubular vessels adjacent to the prostate, and AVM and aneurysmal changes were observed mainly on the right side of the pelvis (Fig. 2, Fig. 3). Pelvic angiography revealed a large AVM being supplied mainly by the right internal iliac artery (Fig. 4). Many small feeder vessels, including from the left internal iliac artery, that drained directly into the bilateral internal iliac vein, were observed. The final diagnosis was pelvic congenital AVM.

Uroflowmetry was performed to evaluate voiding difficulty. The volume voided was 312 mL, maximum flow-rate 13.0 mL/sec, average flow-rate 7.3 mL/sec, voiding time 49.0 sec, time to max flow 12.0 sec and post-void residual volume 34 mL. These uroflowmetry findings indicated slightly damaged urinary function. At the patient's request, we monitored his clinical course without further intervention.

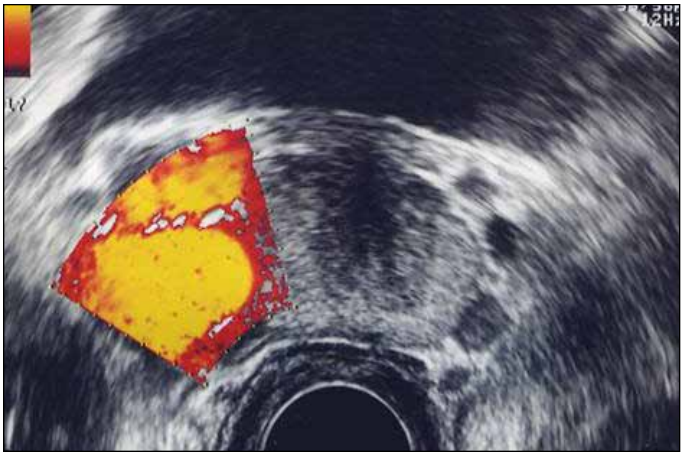

Fig. 1. Colour Doppler ultrasonography demonstrated flow lesions with mixing light color in the both side of the prostate.

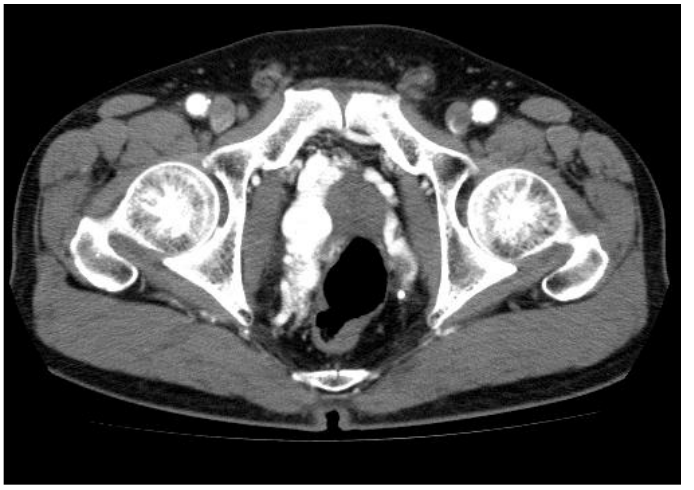

Fig. 2. Transrectal ultrasonography showed multiple hypoechoic lesions with the heterogenous sonographic pattern adjacent to the prostate.

Discussion

AVM is an abnormal shunt between arteries and veins without intervening capillary beds, and is classified into acquired or congenital. Acquired AVMs are often caused by trauma or surgical procedures,[2,11] while the etiology of congenital AVMs is considered focal, spontaneous failures of vascular development occur between the fourth and tenth weeks of embryonic life. AVMs are usually located in the brain, neck, lung and kidney. Pelvic AVMs are relatively rare, especially in males.

Presentations of pelvic AVM in males can be either subtle or dramatic, and patients have presented with pelvic and flank abdominal pain,[3] painless gross hematuria,[4] hemotospermia,[5] urinary frequency, ureteric obstruction and massive bleeding during transurethral resection of the prostate with a diagnosis of prostate hyperplasia.[6] The AVM in this case was discovered during routine examinations for dysuria, such as a rectal examination and transrectal US. The AVM was located adjacent to the prostate, and the patient's symptoms were likely related to the AVM, considering the size of the prostate.

Selective angiography of the iliac arteries is still the best diagnostic method; it shows the pelvic AVM, as well as the multiplicity and extension of feeders, even if they are only small. Contrast-enhanced CT has also become a valuable tool to diagnose AVM and can detect changes in the size of the lesion. However, these examinations may be too intensive as initial tests when diagnosing pelvic AVM. Therefore, like our case, routine examinations for dysuria are useful when screening for pelvic AVM and evaluating prostate hyperplasia to avoid unnecessary transurethral procedures.

Findings similar to those of the present transrectal US findings for pelvic AVM were reported for multiple tubular hypoechoic lesions.[7] In our case, the presentation of the pelvic AVM in transrectal US was similar to that of Ishii and colleagues,[7] and the colour Doppler images led us to suspect pelvic AVM.

Ligation of the inflow artery and excision of the focus were often performed in the past, yet their failure and recurrence rates are still high. Recently, many cases undergo transcatheter arterial embolization because hemorrhaging can be controlled and local and regional complications can be stabilized.[4,5,6,8] However, if elimination of the nidus is unsuccessful or if the symptoms have not improved after embolization, further intervention is necessary. Due to the difficulty of surgical resection, an alternative consisting of

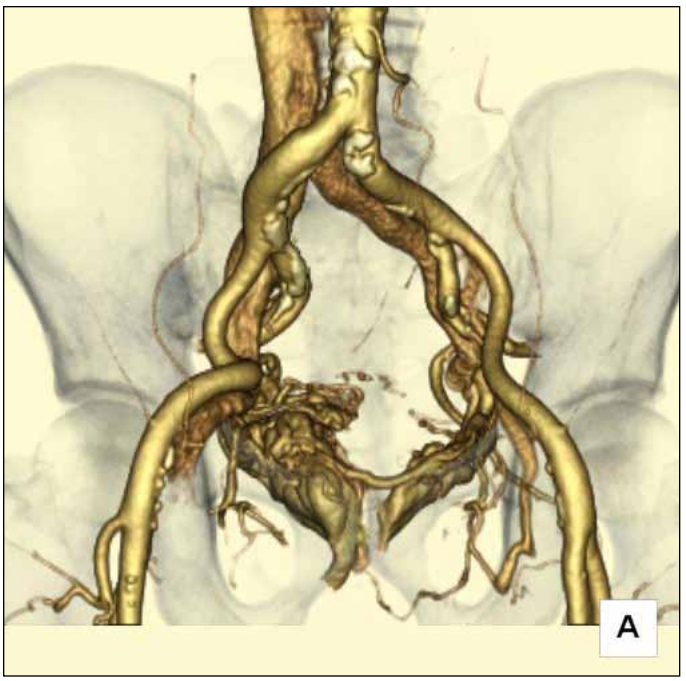

Fig. 3. Dilated and winding blood vessels which is the branch of the right internal iliac artery gather on the right side of the prostate.

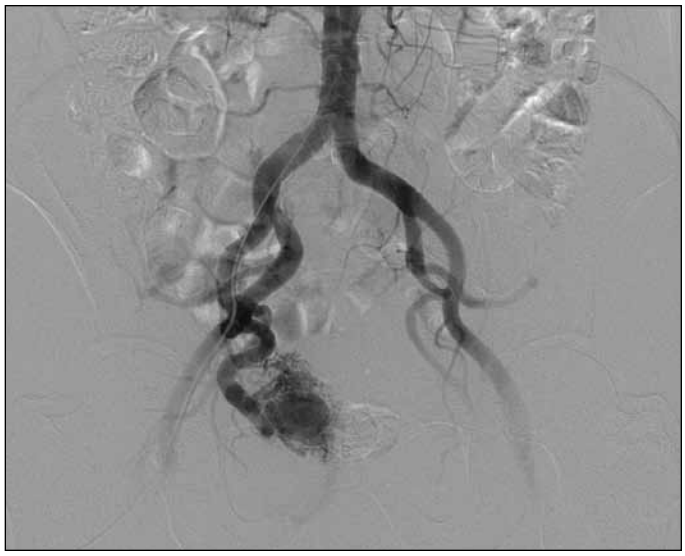

Fig. 4. Angiography shows the dilated vessel, and the feeding artery is the right obturator artery.

intra-operative embolization of the venous compartment under control of feeding and draining vessels may an effective method.[9,10] In our case, urethral obstruction caused by the pelvic AVM was not serious and the patient chose to forego further examinations. Therefore, we decided to monitor his clinical course.

Conclusion

Pelvic congenital AVMs are relatively rare and present a variety of symptoms even though subtle symptoms, such as dysuria, may exist. Routine examinations, like rectal examination and transrectal US, may be valuable for screening unusual cases and eliminating the need for intensive examinations.

Competing interests: None declared.

This paper has been peer-reviewed.

References

1. Trout HH, Mcallister HA, Giordano JM, et al. Vascular Malformations. *Surgery* 1985;97:36-41.
2. Calligaro KD, Sedlacek TV, Savarese RP, et al. Congenital pelvic arteriovenous malformation: long-term follow-up in two cases and a review of the literature. *J Vasc Surg* 1992;16:100-8. http://dx.doi.org/10.1016/0741-5214(92)90425-8
3. Vos LD, Borm EP, Vroegindeweij D, et al. Congenital pelvic arteriovenous malformation: a rare cause of sciatica. *Clin Neurol Neurosurg* 1995;97:229-32.http://dx.doi.org/10.1016/0303-8467(95)00032-F
4. Tanaka M, Iida K, Matsumoto S, et al. A case of pelvic arteriovenous malformation in a male. *Int J Urol* 1999;6:374-6. http://dx.doi.org/10.1046/j.1442-2042.1999.00077.x
5. Suzuki K, Nishimi D, Morioka H, et al. Hematospermia associated with congenital arteriomalformation of internal iliac vessels. *Int J Urol* 2007;14:370-2. http://dx.doi.org/10.1111/j.1442-2042.2007.01576.x
6. Touyama H, Hatano T, Ogawa Y. Massive prostatic bleeding after transurethral resection of the prostate in a patient with a congenital pelvic arteriovenous malformation. *J Urol* 1998;160:1803. http://dx.doi.org/10.1016/S0022-5347(01)62417-0
7. Ishii T, Hiagashionna T, Hiratsuka Y, et al. Transrectal ultrasound findings of pelvic arteriovenous malformation. *J Urol* 2001;166:999.http://dx.doi.org/10.1016/S0022-5347(05)65892-2
8. Manabe Y, Uegaki M, Asazuma A, et al. Two cases of congenital pelvic arteriovenous malformation in male. *Hinyokika Kiyo* 2011;57:25-8.
9. Houbballah R, Mallios A, Poussier B, et al. A New Therapeutic Approach to Congenital Pelvic Arteriovenous Malformations. *Ann Vasc Surg* 2010;24:1102-9. http://dx.doi.org/10.1016/j.avsg.2010.02.053
10. Mallios A, Laurian C, Houbballah R, et al. Curative Treatment of Pelvic Arteriovenous Malformation - An Alternative Strategy: Transvenous Intra-operative Embolisation. *Eur J Vasc Endovasc Surg* 2011;41:548-53. Epub 2011 Jan 28.
11. Richards AJ, Hatrick A, Eden CG. Large Pelvic Arteriovenous Malformation Complicating Laparoscopic Radical Prostatectomy. *Urology* 2008;72:1359-61. http://dx.doi.org/10.1016/j.urology.2008.01.001

Correspondence: Dr. Nobuyuki Tanaka, Department of Urology, National Hospital Organization Saitama Hospital, 2-1 Suwa, Wako-shi, Saitama 351-0102, Japan; urotanaka@gmail.com