Embolization of Benign Prostatic Hyperplasia

BY SANDEEP BAGLA, MD

Benign prostatic hyperplasia (BPH) affects more than 15 million men in the United States. Pathologically, this most common benign tumor of the prostate undergoes smooth muscle and adenomatous glandular hyperplasia, usually beginning in the third or fourth decade of life. Patients typically present with symptoms such as frequency, nocturia, urgency, weak stream, and feeling of incomplete emptying. Although medical therapy or lifestyle modification may be suitable for most patients, those with moderate or severe symptoms will likely require surgical intervention. Currently available transurethral procedures, such as transurethral resection or photoselective vaporization, work by increasing the luminal diameter of the prostatic urethra. These come at a significant cost of complications, including incontinence, impotence, bleeding, or retrograde ejaculation.

Because BPH is also hypervascular,[1,2] particularly in the central gland, interventional radiologists have used prostatic artery embolization (PAE) to reduce the size of these hypervascular nodules and improve symptoms from BPH. Results from clinical trials[3] have demonstrated a significant reduction in symptoms from BPH with a very low risk of complication. Significant technical challenges exist with PAE, including tortuous anatomy with small distal target vasculature and the need for high-quality imaging and embolic material injection.

CASE PRESENTATION

A 62-year-old man with severe lower urinary tract symptoms from BPH was referred to the clinic for evaluation of PAE. His peak urine flow rate was severely decreased at 2 mL/sec, and his prostate was enlarged to 90 cc (Figure 1). He was in good health, sexually active, and wanted to avoid transurethral therapy because of the risk of sexual side effects. After discussion with the patient and consulting urologist, the patient was scheduled for the procedure.

PROCEDURE DESCRIPTION

A 6-F (2-mm) vascular sheath was placed in the right common femoral artery, and a 6-F (2-mm) guid-

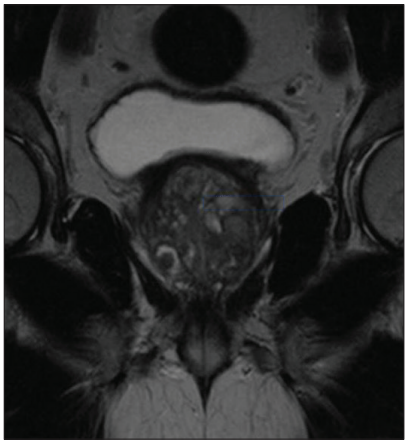

Figure 1. Corona T2-weighted MRI shows nodular enlargement of BPH impinging on the bladder above.

Figure 2. Digital subtraction angiography of the left hypogastric artery depicts the tortuous left prostatic artery (white arrow).

Figure 3. Microcatheter selection of the left prostatic artery with hypervascular gland. The catheter is small enough to allow for adequate antegrade flow during embolization. Note that the preshaped tip is directed laterally.

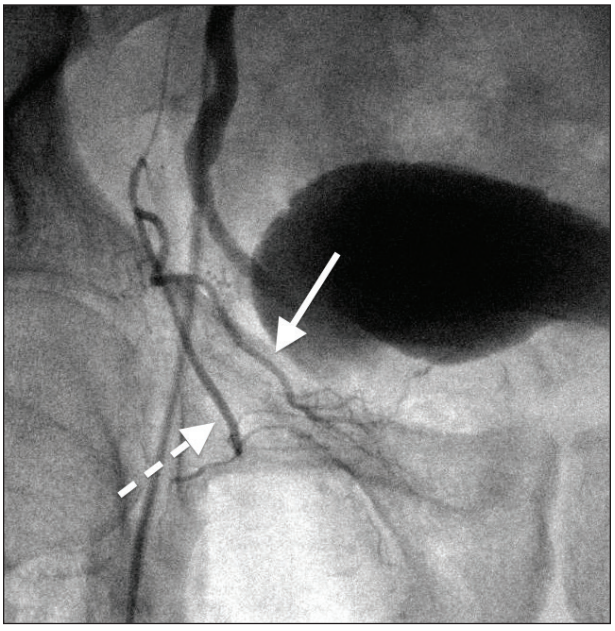

Figure 4. Injection performed through the microcatheter allowed for good visualization of an obturator branch (dashed white arrow) and the prostatic artery (solid white arrow).

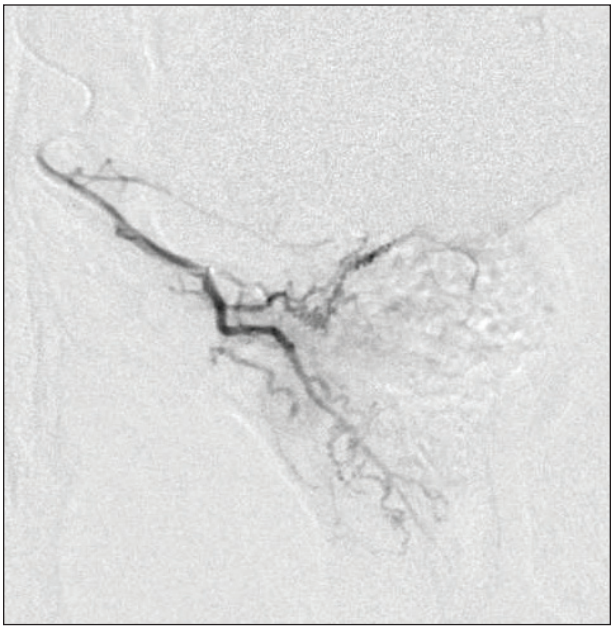

Figure 5. Careful catheter manipulation to select the prostatic artery without a wire in this case.

ing catheter was placed in the left hypogastric artery. Digital subtraction angiography depicts a tortuous left prostatic artery (Figure 2), which is typical in appearance. A preshaped 2.4-F (0.79-mm) Direxion™ Torqueable Microcatheter was used to select the left prostatic artery, and subselective angiography was performed (Figure 3).

Embolization was performed proximally through the Direxion™ Microcatheter and then advanced distally without a wire to allow for further embolization. Smaller-size spherical particulate (100 µm) and gelfoam were used in the main trunk. On the right side, the prostatic artery originated from the obturator artery (Figure 4), and the preshaped tip was directed into the prostatic artery to perform selective angiography and embolization (Figure 5). Embolization was performed to stasis, and the patient was discharged without complications. He noted more than 50% reduction in his symptoms by 1 month and has continued to do well at his routine follow-up.

DISCUSSION

Tortuosity and size of the prostatic artery remain the greatest challenges to PAE. Ideal microcatheters are ≤ 2.4 F (0.79 mm) and allow for torque and manipulation without kinking, high-pressure injection rates, and the ability to deliver embolic agents. In this case, the Direxion™ Microcatheter allowed for reliable torqueability of the distal preshaped tip. This can be used to select the prostatic artery when originating from a distal nontarget vessel, as on the right side in this patient. It is also useful when the operator would like to advance within the target vessel with careful rotation. Although not used in this case, high-pressure angiography can allow for better imaging if guide catheters cannot be taken distally. Embolic agents of varying size were also delivered through the catheter with ease. Overall, the Direxion™ Microcatheter performed safely and reliably in our experience with PAE and can be useful in overcoming challenges associated with the procedure. ■

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