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### **Male Infertility Caused by Varicocele** *Highly Effective, Nonsurgical Treatment Is Underutilized*

A varicocele is a varicose vein of the testicle and scrotum that may cause pain, testicular atrophy (shrinkage) or fertility problems. Veins contain one-way valves that work to allow blood to flow from the testicles and scrotum back to the heart. When these valves fail, the blood pools and enlarges the veins around the testicle in the scrotum to cause a varicocele. Open surgical ligation, performed by a urologist, is the most common treatment for symptomatic varicoceles. Varicocele embolization, a nonsurgical treatment performed by an interventional radiologist, is a highly effective, widely available technique to treat symptomatic varicoceles that is greatly underutilized in this country.<sup>5</sup>

#### **Prevalence**

- Approximately 10 percent of all men have varicoceles—among infertile couples, the incidence of varicoceles increases to 30 percent.<sup>5</sup>
- Highest occurrence in men aged 15-35
- As many as 70-80,000 men in America may undergo surgical correction of varicocele annually.<sup>5</sup>

#### **Varicocele Symptoms**

**Pain** – Aching pain when an individual has been standing or sitting for long periods of time and pressure builds up on the affected veins. Typically, painful varicoceles are prominent in size.

**Fertility Problems** – There is an association between varicoceles and infertility. The incidence of varicocele increases to 30 percent in infertile couples.<sup>5</sup> Decreased sperm count, decreased motility of sperm, and an increase in the number of deformed sperm are related to varicoceles. Some experts believe these blocked and enlarged veins around the testes cause infertility by raising the temperature in the scrotum and decreasing sperm production.

**Testicular Atrophy** – Shrinking of the testicles is another sign of varicoceles. Often, once the testicle is repaired it will return to normal size.

#### **Efficacy**

Embolization is equally effective in improving male infertility and costs about the same as surgical ligation.<sup>1</sup> Pregnancy rates and recurrence rates are comparable to those following surgical varicocelectomy. In one study, sixty percent conceived who were treated for infertility.<sup>4</sup>

In another study, sperm concentration improved in 83 percent of patients undergoing embolization compared to 63 percent of those surgically ligated. Patients who underwent both procedures expressed a strong preference for embolization.<sup>2</sup>

### **Diagnosis**

- Typical on left side of scrotum
- Visible on physical exam—scrotum looks like a “bag of worms”
- Testicle can shrink in size/atrophy
- When varicoceles are not clearly present, the abnormal blood flow can often be detected with a noninvasive imaging exam called color flow ultrasound or through a venogram—an X-ray in which a special dye is injected into the veins to “highlight” blood vessel abnormalities.

### **Treatment**

Currently, there are two treatment options for men with varicoceles: catheter-directed embolization or surgical ligation.

**Catheter-directed embolization** – This is a nonsurgical, outpatient treatment performed by an interventional radiologist using imaging to guide catheters or other instruments inside the body. Through mild IV sedation and local anesthesia, patients are relaxed and pain-free during the approximately two-hour procedure.

For the procedure, an interventional radiologist makes a tiny nick in the skin at the groin using local anesthesia, through which a thin catheter (much like a piece of spaghetti) is passed into the femoral vein, directly to the testicular vein. The physician then injects contrast dye to provide direct visualization of the veins so he or she can map out exactly where the problem is and where to embolize, or block, the vein. By using coils, balloons or particles, the interventional radiologist blocks the blood flow in the vein, which reduces pressure on the varicocele. By embolizing the vein, blood flow is redirected to other healthy pathways. Essentially, the incompetent vein is “shut off” internally by preventing blood flow, accomplishing what the urologist does, but without surgery.

**Surgical treatment of varicocele** – After the patient receives anesthesia, an incision is made in the skin above the scrotum, cutting down to the testicular veins, and tying them off with sutures. Although patients leave the hospital the same day, there is a two- to three-week recovery period.

### **Recovery Time**

- Average of one to two days for complete recovery for embolization, compared to two to three weeks for surgery<sup>5</sup>
- 24 percent of surgical ligation patients required overnight hospital stay, compared to none for embolization<sup>5</sup>

## **Benefits of Embolization**

- No surgical incision in the scrotal area<sup>5</sup>
- Effective as surgery, as measured by improvement in semen analysis and pregnancy rates<sup>2</sup>
- Less recovery time—patients are able to return to normal daily activities immediately and without hospital admittance<sup>2</sup>
- A patient with varicoceles on both sides can have them fixed simultaneously through one vein puncture site, compared to surgery, which requires two separate open incisions
- No general anesthesia<sup>5</sup>
- No sutures<sup>5</sup>
- No infections<sup>5</sup>
- Cost-effective

## **About Interventional Radiologists**

Interventional radiologists are doctors who specialize in minimally invasive, targeted treatments that have less risk, less pain and less recovery time compared to open surgery. They use their expertise in interpreting X-rays, ultrasound, MRI and other diagnostic imaging studies to understand, visualize and diagnose the full scope of the disease's pathology and to map out the procedure tailored to the individual patient. Then during the procedure, they image as they go to guide tiny instruments, such as catheters, through blood vessels or skin, to treat diseases at the site of the illness nonsurgically.

Interventional radiology is a recognized medical specialty by the American Board of Medical Specialties. Interventional radiologists complete preliminary training in Diagnostic Radiology and advanced training in Vascular and Interventional Radiology. The American Board of Radiology certifies their specialized training.

## **For Further Information**

For more information on varicoceles or interventional radiology, visit the SIR Web site at [www.SIRweb.org](http://www.SIRweb.org).

## **References**

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