

male factor infertility, scrotal pain, or asymptomatic testicular atrophy.

The pathophysiology of varicoceles is poorly understood but involves dilation of the internal spermatic vein and transmission of increased hydrostatic pressure across dysfunctional venous valves. Stasis of blood in the venous system disturbs the counter-current heat exchange that is responsible for maintaining testicular temperature and may result in testicular parenchymal damage and impaired spermatogenesis.

Varicoceles are the most common cause of both primary infertility (patient has fathered no children) and secondary infertility (patient has fathered at least one child), accounting for 33% of cases. However, most men with palpable varicoceles are able to father children without difficulty. In a man with infertility and a palpable varicocele, semen analysis commonly reveals a low sperm count and abnormal sperm morphology and motility. After surgical correction of a varicocele in a patient with infertility, semen parameters improve in 60% to 80% and subsequent pregnancy rates range from 20% to 60%.

It is prudent to perform scrotal ultrasonography on any patient with chronic testicular pain. Varicoceles are commonly found during this evaluation, but usually only palpable (clinical) varicoceles are considered as a source of pain. If a nonpalpable varicocele is found on an ultrasound examination, the patient should not be told that it is the cause of his pain. More than 80% of men with chronic pain from a palpable varicocele have improvement in their pain after surgical correction.

Common operative techniques for treatment of a varicocele include high retroperitoneal ligation of the internal spermatic vein, microsurgical inguinal and subinguinal varicocelectomy, laparoscopic varicocelectomy, and gonadal vein embolization. The inguinal approach using microscopic magnification has the highest success and lowest complication and recurrence rates. The most common complication is hydrocele formation, whereas a rare complication is inadvertent ligation of the testicular artery resulting in testicular atrophy and loss. Surgical intervention for subclinical (nonpalpable) varicoceles is not indicated.

SPERMATOCELE (EPIDIDYMAL CYST)

Spermatoceles and epididymal cysts are dilations of the tubes that connect the testicle to the epididymis (ductuli efferentes). Although they are technically the same thing, many clinicians refer to small lesions as epididymal cysts and larger ones as spermatoceles. These cystic lesions are very common and are found in 29% of asymptomatic men on ultrasonography. After a vasectomy, 35% of men develop a new small spermatocele; therefore, distal obstruction likely contributes to their development.

On physical examination, spermatoceles are somewhat mobile, firm masses that are separate and distinguishable from the smooth border of the testicle. It may be possible to transilluminate larger lesions. They are filled with a clear fluid that usually contains abundant amounts of sperm. If the lesion cannot be transilluminated, it is advisable to perform an ultrasound study of the scrotum to distinguish a spermatocele from a solid mass. Of note, the vast majority of solid masses of the epididymis are benign. Small spermatoceles and epididymal cysts normally have no clinical significance and are typically

not the source of a patient's chronic testicular pain. They can be surgically removed if they are large or are causing discomfort for the patient.

ACUTE EPIDIDYMITIS

Acute epididymitis is a clinical syndrome that may manifest with fever, acute scrotal pain, and impressive swelling and induration of the epididymis. Pathophysiologically, epididymitis is most often caused by retrograde bacterial spread from the bladder or urethra. In men younger than 35 years of age, the most common causative agents are those organisms associated with urethritis—namely, *Neisseria gonococcus* and *Chlamydia trachomatis*. In older men, acute epididymitis is usually caused by a coliform bacteria such as *Escherichia coli* and often occurs in association with another lower urinary tract infection or bladder outlet obstruction.

The most important consideration in diagnosing acute epididymitis is differentiating this disease from acute testicular torsion. Physical examination can be nonspecific, although focal epididymal swelling and tenderness are suggestive, and the presence of white cells and bacteria in the urine is indicative of an infectious etiology. Scrotal sonography with Doppler flow can be extremely helpful in differentiating acute epididymitis from torsion in difficult cases.

Patients with acute epididymitis have significant inflammation that can also involve the testicle (epididymo-orchitis). Patients with severe epididymitis involving the testicle are often systemically ill. In most instances, initial treatment should consist of antibiotics, nonsteroidal anti-inflammatory medications, and possibly oral narcotics. In some cases, broad-spectrum antibiotics or even hospital admission may be necessary. In general, patients younger than 35 years of age should be treated with ceftriaxone and doxycycline or a single dose of azithromycin. Older patients are usually empirically treated with a fluoroquinolone or trimethoprim sulfamethoxazole for 2 to 4 weeks. Complications associated with acute epididymitis include abscess formation, testicular infarction, infertility, and chronic epididymitis or orchalgia.

HYDROCELE

A hydrocele is a serous fluid collection located between the parietal and visceral layers of the tunica vaginalis of the scrotum. Noncommunicating hydroceles usually surround the testicle and spermatic cord. Communicating hydroceles are actually indirect inguinal hernias; they contain only fluid and not bowel or fat because the opening into the peritoneal cavity is small. Communicating hydroceles can be distinguished from noncommunicating hydroceles on physical examination by gently pushing the fluid out of the scrotum and into the peritoneum. Communicating hydroceles are more commonly identified in the pediatric age group.

Patients with a noncommunicating hydrocele usually have complaints of heaviness in the scrotum, scrotal pain, or an enlarging scrotal mass. Usually the diagnosis is easily made based on the physical examination and transillumination of the scrotum. If the testis is not palpable, an ultrasound study should be performed to rule out a testicular tumor associated with a secondary or reactive hydrocele. Noncommunicating hydroceles are caused

