Intracavernosal Injection Therapy

Pharmacologic injection therapy involves the injection of vasodilator agents into the corpora cavernosa to produce erection by dilating the corporal artery smooth muscle. More than 90% of patients with ED respond to this type of therapy. Commonly used agents include alprostadil, papaverine, and phentolamine (Regitine). These medications can be used alone or in combination. As monotherapy, alprostadil is most commonly used. Of the three, only alprostadil has been evaluated in rigorous clinical trials and has specific marketing approval from the U.S. Food and Drug Administration for the treatment of ED. Phentolamine is used to potentiate the action of papaverine and can be used in combination with both alprostadil and papaverine. These vasoactive drugs can be formulated with different combinations of medications and concentrations to achieve increased efficacy and decreased side effects. *Bimix* and *trimix* are terms used to refer to a combination of two or three of these medications, respectively.

The common side effects of this type of treatment are bruising and penile pain (50%). Penile pain is more common in young patients and is usually worse with alprostadil. Therefore, a combination using lower-dose alprostadil or just papaverine and phentolamine might be beneficial in younger patients. Other, more serious risks of injection therapy include priapism and corporal scarring (Peyronie's disease). Priapism has been reported to occur in 1% to 4% of patients. Prolonged erections occur more commonly in patients with neurogenic ED, especially young men with spinal cord injury. Significant acquired penile curvature (Peyronie's disease) is seen uncommonly and usually follows several years of injection therapy. Penile curvature appears to be less common with use of alprostadil than with papaverine. The most common problem with pharmacologic injection therapy is not complications from therapy but rather the fact that 50% to 60% of patients stop using the technique within 1 year.

As with intraurethral alprostadil, initial treatment should be performed under the supervision of a physician. The medication can be injected using a self-contained medication-syringe kit or a 29-gauge (5/8-inch) insulin syringe with medication drawn from a refrigerated vial. It is advisable to start with a small test dose and slowly titrate the dosage for desired affect over several weeks. The patient should not use the medication more than once in 24 hours and should be instructed to seek medical care promptly for prolonged painful erections lasting longer than 4 hours. Typically, administration of the test dose should be carried out in the morning, and the patient should be expected to stay in close proximity to the medical office to monitor for priapism. If a patient experiences priapism after a test dose, he should seek prompt medical attention within 4 hours of injection. Priapism usually resolve without sequelae after intracavernosal injection of 0.5 to 1 mL of a 250 µg/mL solution (0.5 mg diluted in 2 mL of normal saline) of phenylephrine in a setting where blood pressure and heart rate are monitored. Formal guidelines for the treatment of priapism are available on the website of the American Urologic Association (AUA).

Vacuum Constriction Devices

Vacuum constriction devices enclose the penis in a plastic tube with an airtight seal at the penile base. Air is pumped out of the cylinder, creating a vacuum. Blood flows into the corporal bodies, leading to penile erection. A constriction band slid from the cylinder to the base of the penis maintains the erection. Simultaneous use of a vacuum device and a PDE5 inhibitor is safe and may improve outcomes. Some of the common side effects that affect patient satisfaction with these devices are coldness, numbness, and bruising of the penis.

Penile Prosthesis

A penile prosthesis, either semirigid or inflatable, is implanted in the operating room. Most patients prefer the inflatable devices because they provide a more natural erection when inflated and a flaccid penis when deflated. Although implantation of a penile prosthesis is more invasive than the other techniques, this device is the most effective long-term option for impotence treatment. Ninety percent of patients and partners are satisfied with the result.

Important interval improvements have been made in the design of implantable penile prostheses to make them more durable and resistant to infection. Improvements in the connection between tubing and corporal cylinders have cut the mechanical failure rate to less than 5% in 5 years. Components also have special coatings that either contain antibiotics or absorb antibiotics applied topically at the time of implantation. These improvements have cut the rate of postoperative infection in half.

C. Benign Prostatic Hyperplasia

BPH, a nonmalignant enlargement of the prostate gland, is a common condition in the aging male patient. It is estimated that more than 90% of all men will develop histologic evidence of BPH during the course of their lifetime; of those, at least 50% will develop lower urinary tract symptoms (LUTS) that prompt them to seek medical care. Broadly speaking, LUTS can be divided into two groups: obstructive voiding symptoms and overactive bladder symptoms (Table 71-4).

Although most patients who seek medical care for BPH do so because of the associated LUTS, these same symptoms can also result from other illnesses such as diabetes mellitus, spine disease, Parkinson's disease, multiple sclerosis, and cerebrovascular disease (Fig. 71-3). It is important to evaluate all patients for these non–BPH-related conditions to ensure optimal management. It is also important to pay close attention to medication use because a number of medications used in the elderly population can result in various urologic symptoms, including both obstructive and overactive bladder voiding symptoms.

PATHOPHYSIOLOGY

Prostate growth and the subsequent development of BPH occur under the influence of testosterone and the more metabolically active dihydrotestosterone (DHT). Testosterone produced by the testes is converted to DHT by the action of the enzyme