Urinary Incontinence

Urinary incontinence is a very common problem affecting as many as 13 million people in the United States. Approximately 85 percent of those afflicted are women. Many of these people suffer in silence unnecessarily, since incontinence can be managed or treated.

Anatomy and Function

Coordinated activity between the urinary tract and the brain controls urinary function. The bladder stores urine because the smooth muscle of the bladder (detrusor muscle) relaxes and the bladder neck and urethral sphincter mechanism are closed. The urethral sphincter is a circular muscle that wraps around the urethra. During urination, the bladder neck opens, the sphincter relaxes and the bladder muscle contracts. Incontinence occurs if closure of the bladder neck is inadequate (stress incontinence) or the bladder muscle is overactive and contracts involuntarily (urge incontinence).

Causes and Risks

Urinary incontinence is the involuntary loss of urine. It is not a disease but rather a symptom that can be caused by a wide range of conditions. Incontinence can be caused by diabetes, a stroke, multiple sclerosis, Parkinson's disease, some surgeries or even childbirth. More than 15 million Americans, mostly women, suffer from incontinence. Although it is more common in women over 60, it can occur at any age. Most health-care professionals classify incontinence by its symptoms or circumstances in which it occurs. In the normal population, the incidence of incontinence in the female over 65 is more than 25 percent and in the male it is about 15 percent.

Stress urinary incontinence: Stress incontinence is leakage that occurs when there is an increase in abdominal pressure caused by physical activities like coughing, laughing, sneezing, lifting, straining, getting out of a chair or bending over. The major risk factor for stress incontinence is damage to pelvic muscles that may occur during pregnancy and childbirth.

Urge urinary incontinence: Also referred to as "overactive bladder," this type of incontinence is usually accompanied by a sudden, strong urge to urinate and an inability to get to the toilet fast enough. Frequently, some patients with urge incontinence may leak urine with no warning. Risk factors for urge incontinence include aging, obstruction of urine flow, inconsistent emptying of the bladder and a diet high in bladder irritants (such as coffee, tea, colas, chocolate and acidic fruit juices).

Mixed urinary incontinence: Mixed incontinence is a combination of urge and stress incontinence.

Overflow urinary incontinence: Overflow incontinence occurs when the bladder does not empty properly and the amount of urine produced exceeds the capacity of the bladder. It

is characterized by frequent urination and dribbling. Poor bladder emptying occurs if there is an obstruction to flow or if the bladder muscle cannot contract effectively.

Diagnosis

As with any medical problem, a good history and physical examination are critical. A urologist will first ask questions about the individual's habits and fluid intake as well as their family, medical and surgical history. A thorough pelvic examination looking for correctable reasons for leakage, including impacted stool, constipation and hernias will be conducted. Usually a urinalysis and cough stress test will be conducted at the first evaluation. If some findings suggest further evaluation, other tests may be recommended — such as a cystoscopy or even urodynamic testing. This outpatient test is usually done with a tiny tube in the bladder inserted through the urethra and sometimes with a small rectal tube, as well.

Treatment

MEDICATION

Stress incontinence may be treated with drugs that tighten the bladder neck, such as pseudoephedrine or imipramine. Just as pseudoephedrine causes constriction of the blood vessels in the nose, it also causes the muscles at the bladder neck to contract. Because of its effect on the smooth muscle in blood vessels, it should not be used in patients with a history of hypertension. Imipramine is a tricyclic antidepressant. In addition to causing the bladder muscle to relax, it also causes the smooth muscles at the bladder neck to contract. Urge incontinence is also treated with drugs that have anticholinergic properties. Anticholinergics allow for relaxation of the bladder smooth muscle. A commonly used anticholinergic is oxybutynin chloride. This drug works well to treat urge incontinence but has side effects including dry mouth, confusion, constipation, blurred vision and an inability to urinate. New drugs or new formulations of older drugs have been developed in an effort to reduce side effects. Oxybutynin is now formulated in a slow-release tablet taken once daily. The slow release of this new drug allows for a steady level of the drug and fewer side effects.

Tolterodine tartrate is another new anticholinergic that is different than the older ones in that it has less effect on the salivary glands and therefore causes less dry mouth. It is also available in a slow-release, one-a-day form. Postmenopausal women with incontinence may benefit from hormone treatment. Normally the bladder neck and the urethra are closed at rest. With loss of estrogen, the tissues become weakened or dried and normal closure is lost. Hormone replacement improves the health of these tissues and allows for closure to be regained through increased tone and improved blood supply.

MINIMALLY INVASIVE MANAGEMENT

Some of the causes of incontinence are temporary and easily reversible. Reversible causes include urinary tract infection, vaginal infection or irritation, medication, constipation and restricted mobility. However, in some cases, further medical intervention is necessary. Minimally invasive treatment options are those treatments that do not involve surgery and should be the first line of treatment for patients. However, they may also be used in conjunction with surgical therapy.

Fluid Management: This option consists of instructing a patient to increase or reduce their fluid intake. Incontinent patients may need to reduce the amount of caffeine or other dietary irritants (such as acidic fruit juices, colas, coffee and tea), while at the same time increase water intake to produce an adequate amount of non-irritating, non-concentrated urine. A recommended water intake is six to eight glasses per day.

Bladder Training: A diary is the starting point for bladder training. Patients are instructed to record fluid intake, urination times and when their urinary accidents occur. The diary allows the patient to see how often they actually urinate and when incontinence occurs. The diary is also used to set time intervals for urination. Patients who urinate infrequently are instructed to do "timed urination" where they urinate by the clock every one to two hours during waking hours. By achieving regular bladder emptying they should have fewer incontinent episodes. Timed urination may be effective in patients with both urge and stress incontinence.

Bladder Retraining: Bladder retraining is used for patients with urinary frequency. The goal of retraining is to increase the amount of urine that the patient can hold within their bladder. Patients are instructed to keep a diary to determine their urination interval. Patients are then instructed to gradually increase their urination interval by 15 to 30 minutes per week. The goal is to have patients urinating every two to four hours while awake with less urgency and less incontinence.

Pelvic Floor Exercises: Also known as Kegel exercises, this type of minimally invasive treatment focuses on strengthening the external sphincter muscle and the pelvic muscles. Patients who are able to contract and relax their pelvic floor muscles can improve their strength by doing the exercises regularly. Other patients require help from a health-care professional to learn how to contract those muscles. Biofeedback and electrical stimulation can be used to aid patients in doing pelvic floor exercises. During electrical stimulation, a small amount of stimulation from a sensor placed in the vagina or rectum is delivered to the muscles of the pelvic floor. Like any exercise program, the patient must continue to do the exercises to maintain the benefit. Patients with stress incontinence benefit from pelvic floor exercises by increasing resistance at the urethra and by increasing the strength of the voluntary pelvic floor muscles. Patients can also be taught to compensate by contracting the pelvic muscles with certain activities like coughing.

Pelvic floor muscle exercises are effective for urge incontinence, since a contraction of the pelvic floor can interrupt a contraction of the bladder smooth muscle and stop or delay an accident.

SURGICAL MANAGEMENT

In most cases of incontinence, minimally invasive management (fluid management, bladder training, pelvic floor exercises and medication) is prescribed. However, if that fails, surgical treatment can be necessary.

Stress Incontinence: One of the surgical treatments for this condition in males is the use of urethral injections of bulking agents to improve the function of the sphincter. The injections are done under local anesthesia and can be repeated. Unfortunately, the cure rate is only 10 to 30 percent. Another alternative is to perform a urethral compression procedure with the use of a vascular graft or a segment of cadaveric tissue to compress the urethra in the area between the scrotum and the rectum. The results are very preliminary and at this time only experimental. The most effective treatment for male incontinence is implantation of an artificial sphincter. The device is inserted under the skin and consists of a cuff around the urethra, a fluid-filled, pressure-regulating balloon in the abdomen and a pump in the scrotum which is controlled by the patient. The fluid in the abdominal balloon is transferred to the urethra cuff, closing the urethra and preventing leakage of urine.

Stress incontinence in the female is treated at the beginning with behavior modification and pelvic exercise. Sometime techniques like biofeedback or electrical stimulation of the pelvic muscles can help. But when the symptoms are more severe and conservative measures are not helping the treatment is surgery. In selected cases bulking agents can be used to increase continence. The operation is done under local anesthesia and is minimally invasive but the cure rates are lower compared to open surgical procedures.

Anterior repair (Kelly plication) is a common option used by gynecologists but has not given good long-term results. Another option is abdominal surgery (Burch suspension) in which the vaginal tissues are affixed to the pubic bone. The long-term results are good but the surgery requires longer recuperation time and is generally only used when other abdominal surgeries are also required. The most common and most popular surgery for stress incontinence is the sling procedure. In this operation a strip of tissue is applied under the urethra to provide compression and improve urethral closure. The operation is minimally invasive and patients recuperate very quickly. The tissue used to create the sling can be a segment of the patient's abdominal wall, specially treated fascia, skin from a cadaver or a synthetic material.

Urge Incontinence: For urge incontinence there is a large array of treatment options available. The first step should be behavior modification — drinking less fluids; avoiding caffeine, alcohol or spices; not drinking at bedtime and urinating around the clock and not at the last moment. Exercising the pelvic muscle (Kegel exercises) also helps. It is

important to keep a log on the frequency of urination, number of accidents, the amount lost, the fluid intake and the number of pads used if required. The mainstay of treatment for overactive bladder is medication. This consists of the use of bladder relaxants that prevent the bladder from contracting without the patient's permission. The most common side effect of the medication is dryness of the mouth, constipation or changes in vision. Sometimes, reduction of medication takes care of the side effects.

Other alternatives can be considered in patients who fail to respond to behavior modification and/or medication. A new and exciting technology is the use of a bladder pacemaker to control bladder function. This technology consists of a small electrode that is inserted in the patient's back close to the nerve that controls bladder function. The electrode is connected to a pulse generator and the electrical impulses control bladder function. There is more than 60 to 75 percent cure or improvement with this technology. In more difficult cases, the bladder can be made bigger using a segment of small intestine. This operation, called augmentation cystoplasty, is very successful in curing incontinence but its main drawback is the need in 10 to 30 percent of the patients to perform self-catheterization to empty their bladder.

Overflow Incontinence: For overflow incontinence, the treatment is to completely empty the bladder and prevent urine leakage. Patients with diabetic bladder or patients with prostatic obstruction often develop this type of incontinence. Overflow incontinence due to obstruction should be treated with medication or surgery to remove the blockage. If no blockage is found, the best treatment is to instruct the patient to perform self-catheterization a few times a day. By emptying the bladder regularly the incontinence disappears and the kidneys are protected.