Female Stress Incontinence

Surgical Treatment: Is it for you?

Urinary incontinence, or the involuntary leakage of urine, is a symptom which has many different causes. Therefore, there is no one “best” treatment. Rather, optimal treatment requires an accurate diagnosis and selection of therapy that is customized to the individual patient. The focus of this article is surgical therapy for patients with stress incontinence, but it is first necessary to review the anatomy of the lower urinary system, the classification of incontinence, and provide a perspective about the general types of treatments available.

The lower urinary tract is composed of the urinary bladder (the organ which stores urine) and the urethra (the channel through which the urine exits the body) with the muscular sphincter. The two major types of urinary incontinence are stress incontinence and urge incontinence. With stress urinary incontinence (SUI), physical stress (exercise, coughing, sneezing, etc.) puts pressure on the top of the bladder. The urethra is unable to stay closed and urine leaks out. In this situation, the abnormality or weakness is in the urethra (see figure above). Urge incontinence, or overactive bladder, is caused by abnormal, undesired bladder contractions (the bladder muscle does not normally contract until a person is at the toilet and is ready to urinate). This abnormal contraction pushes urine out through the urethra and causes leakage.

In this situation, the abnormality is in the bladder because it is contracting inappropriately (see figure below). When these two conditions occur together (which they commonly do), it is referred to as mixed urinary incontinence. The purpose of this article is to explain the surgical treatment of SUI. Therefore the remainder of the discussion will focus on SUI alone.

Causes of Stress Urinary Incontinence

The urethral abnormality that accompanies stress incontinence may be due to one of either two causes. First, the urethra may be poorly supported. The urethra should have strong support from ligaments, tendons, and muscles so that it remains closed during exercise, coughing, and straining. These structures can be injured or weakened by childbirth, pelvic surgery, obesity, frequent prolonged straining, and strenuous exercise such as weight lifting, long distance running, high impact aerobics, etc. The urethra then drops and opens when exposed to physical stress or straining. Loss of urethral support is frequently associated with loss of support for the other pelvic organs (prolapse), particularly the bladder. The two conditions are nevertheless independent; stress incontinence can occur without pelvic prolapse and vice-versa. In the same way, treatments to correct one of the conditions may not necessarily correct the other.

The second cause of SUI is poor urethral function, or intrinsic sphincter...
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Deficiency (ISD). Stress incontinence can occur even when the urethra is in a perfectly normal and well-supported position. At one time it was thought that this was a rare problem that occurred after nerve injuries, radiation to the pelvis, or extensive pelvic surgery. We now know that this is a common condition and may be due to aging, hormonal changes, nerve injury during childbirth, pelvic surgery, and other factors. In this situation, the walls of the urethra simply are not able to create an effective seal. It is analogous to a faucet that needs to have a washer replaced to correct a slow drip. While there is no specific test for ISD it is now generally believed that most women with SUI have at least some degree of ISD.

Evaluation of Incontinence
When incontinence is severe enough to cause embarrassment or limits your activities, it is time to talk to your doctor. To determine which treatment is best for you, the doctor will take a detailed history of your general health and your bladder symptoms. It is helpful for you to be prepared for this visit by keeping a bladder record for a few days detailing the time of each urination and keeping track of the amount and circumstances of any urine leakage (see note below). It is very helpful if you can measure the volume of each urination for one full 24 hour period. This type of record can tell the doctor a great deal about your bladder function without invasive testing.

The doctor will want to know about all of your medical history, particularly details of childbirth and any pelvic surgery. As part of an evaluation for incontinence, it is important to consider other problems that may be related or that could be addressed at the same time. The doctor will ask you about bladder infections, difficulty urinating, gynecologic problems, problems with your bowels including stool incontinence, and neurologic problems such as back injury, stroke, or other neurologic diseases. If you have had prior treatment for incontinence—medical, surgical or other therapies—the details of this will be important in making a decision about future treatment. The doctor will then perform a physical examination and test your urine for infection or other problems. The doctor may catheterize you (pass a small tube through the urethra to drain the bladder) to determine if you are emptying the bladder completely. The doctor may then fill your bladder and examine you while coughing and straining to see if stress incontinence can be demonstrated. This simple type of office evaluation is adequate for many patients and treatment can often be started at this point. For other patients X-rays of the bladder, bladder function tests (urodynamic studies) which measure the bladder and urethral sphincter pressures, and cystoscopy may be required. Cystoscopy is an examination of the inside of the bladder and urethra using a small telescope, usually performed in the doctor’s office.

Note: Four-day voiding records are available free from the NAFC Web site at www.nafc.org/Uploads/OnlineUroLog.pdf

Surgery for SUI
Surgical treatment of stress urinary incontinence (SUI) has been the mainstay of therapy, particularly in the United States, for many years. While surgery is still generally acknowledged to be the most effective treatment for stress incontinence, the myriad of operations that have been described attests to the fact that there is no one “best” operation for all patients. Even experienced surgeons disagree as to the preferred treatment; the only way to answer this question would be through large randomized trials comparing the different operations. The National Institutes of Health have recently funded a cooperative group to perform such studies; while this will take many years to produce clear results it will greatly improve our understanding of surgical outcomes and our ability to counsel patients appropriately. In the meantime we must depend on accumulated experience and the doctor’s judgment.

There has been a dramatic change in the number and types of incontinence operations performed in the past 10 years. The vast majority of SUI procedures are now one of a several different “slings” which will be discussed...
in more detail below. The anterior colporrhaphy is an operation for bladder prolapse that has been used for stress incontinence in the past. Most experts feel that it is less effective than other operations and should no longer be used to treat SUI. Previously, the most common operations for SUI were bladder neck suspension procedures. Suspensions involve placing sutures (stitches) between the ligaments and tendons that support the bladder neck and urethra and tying these stitches to a strong supporting structure, usually the pubic bone or an attachment of connective tissue or a ligament right at the pubic bone. In this way, the bladder neck and urethra are stabilized against coughing, straining, and exercising so that the urethra will not open and leak. Suspension procedures can be performed through the vagina or through the abdomen. The abdominal procedures are commonly referred to as retropubic suspensions since this is the specific name of the incision and surgical approach. Although suspensions are less popular than slings, the Burch procedure is still considered to be a good choice for patients with ordinary stress incontinence and no prior operation. It is not recommended for patients who have had prior unsuccessful surgery. The vaginal procedures are often referred to as needle suspension procedures, because a long needle is used to transfer the sutures from the vagina to the abdominal side of the pelvis where they are tied behind the pubic bone to provide strong support. These had been very popular as a less invasive alternative to abdominal suspensions and slings but the long term results seem less satisfactory and new sling techniques are equally tolerable for the patient.

The most important change in the practice of surgical treatment of stress urinary incontinence in the past ten years has been the great increase in the number of pubovaginal sling procedures performed. The basic concept of the sling is that a piece of strong material is placed underneath the urethra as a supporting “hammock”. The sling thus corrects the poor anatomic support of the bladder neck and may additionally provide a degree of compression and coaptation to the urethra. There are many different sling procedures and the distinguishing features among them have important implications for the patients. Slings can be classified by the material used to create the sling and the position of the sling along the urethra.

The classic sling operation was described in the early 1900s and has been commonly used since the 1980s. The sling is made from connective tissue (fascia) harvested from the patient (autologous tissue). This strong tissue is almost always available, is strong and reliable, and presents no chance of disease transmission or rejection. In most cases the fascia covering the rectus muscles of the abdomen is used, taken through a low abdominal (bikini type) incision. Some surgeons prefer to use fascia from the thigh. The sling is placed under the bladder neck, right where the urethra joins the bladder. The autologous sling appears to have the highest long-term success rate and most surgeons now consider this operation to be the “gold standard” to which other operations are compared. It is appropriate for any patient with stress incontinence.

The autologous sling requires both abdominal and vaginal incisions and is technically more difficult for the surgeon than other incontinence operations. It is also associated with a longer recover period for the patient. Many efforts have been made to create an easier operation; as yet none have been proven equal to the autologous sling. It should be noted that the first study of the NIH cooperative group is comparing the autologous sling to the Burch procedure in the treatment of uncomplicated stress incontinence.

Many biologic materials other than the patient’s own tissue have been used to make slings. This eliminates the need for the abdominal procedure to harvest the sling reducing operative time and post-operative pain. Slings have been made from human material (usually fascia taken from the cadavers of organ donors) and from animals (pigskin is the most popular although there are others). These grafts are specially treated to reduce the risk of “rejection” or early breakdown of the material, but it appears that the success rate is somewhat
lower than with autologous material. These slings can be fixed in position with small metallic bone anchors (screws developed for orthopedic procedures), totally eliminating the need for an abdominal incision, but good comparative studies have not yet been performed and it is unclear if this change in technique affects outcome.

An important new development has been the introduction of synthetic slings placed at the mid portion of the urethra instead of at the bladder neck. These operations have primarily been used for ordinary SUI patients who have loss of urethral support (hypermobility) and no prior surgery. These mid urethral slings are placed very loosely and appear to be less likely to cause problems with urination. Although synthetic materials had been used in the past the complication rate (infection and erosion) was unacceptably high. Newer materials, a percutaneous (through the skin with minimal incision and dissection) approach, and a “tension-free” placement in the mid urethra have led to these operations becoming the most popular procedures in Europe and nearly so in the US. The initial operation, the TVT (tension-free vaginal tape), has been performed for over five years and an impressive number of early reports attest to its short term effectiveness.

Because the sling is made of permanent material there is optimism that the long-term results will also be good. The primary question relates to the long term safety of permanent material around the urinary tract and the risk of erosion into the bladder or urethra years down the road. Also, the mid-urethral slings are not as effective when patients have had prior surgery. A high quality randomized study demonstrated equal effectiveness to the Burch procedure at six months follow-up. The procedures are easier for the patient, generally performed as an outpatient and often under sedation only. There are now a number of competitive products offering slightly different tapes and/or methods of placing the sling.

The Operation and the Postoperative Course

In the vast majority of cases, surgical procedures for stress urinary incontinence can be performed under either regional (spinal or epidural) or general anesthesia. Many surgeons perform the percutaneous, mid-urethral slings under local anesthesia plus sedation. When only an incontinence procedure is performed, hospitalization is typically minimal – outpatient surgery or an overnight stay. When additional operations are performed to correct pelvic prolapse then hospitalization may be somewhat longer. It is unusual for a patient to be in the hospital for more than two nights after a routine operation.

At the time of discharge, the patient should be able to walk without assistance, go up and down short flights of stairs, eat a regular diet, and manage the bladder. Transient urinary retention (the inability to empty the bladder) may be expected for several days or up to two weeks. The time is typically shorter with the Burch procedure and midurethral slings, longer with the bladder neck sling procedures. The patient may have an indwelling urethral catheter for several days, may start intermittent catheterization (passing a small straw like tube into the bladder several times a day to empty), or a suprapubic tube (a small catheter exiting the bladder through the lower abdomen) may be placed during the operation. The expectations and method of postoperative bladder drainage should be discussed and determined prior to surgery.

Patients should have no dietary restrictions and can resume light activities immediately. It is typically recommended that patients avoid heavy lifting, strenuous exercise, and sexual intercourse for about one month. Some patients who have non-strenuous employment may be able to go back to work between one and two weeks but it is generally advised not to plan on an early return to work or to schedule any important activities in the first three weeks. Many patients have significant fatigue or discomfort that might interfere with such plans.

In most cases, a patient who has only a simple incontinence operation will feel “back to normal” at two to three weeks, whereas a patient who has a major prolapse repair along with incontinence surgery may take four weeks or more to regain full strength and stamina. An individual’s response to
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The decision to have surgery to treat stress incontinence is often a difficult one. When there are other symptomatic problems such as a prolapse or a significant gynecological disorder, then the choice of surgery becomes easier since these can be corrected at the same time. When a patient has only stress incontinence, the analogy to an athlete with an injured knee may be helpful. The athlete has an injury primarily involving the ligaments and tendons supporting the knee. This athlete may be able to compensate for the weakened ligaments by strengthening the surrounding muscles to stabilize the knee joint. This is similar to pelvic floor muscle exercises to help correct stress incontinence. When a person has a severe injury or wants to resume vigorous athletic activity, they are more likely to require surgical correction. Patients with less active lifestyles and less severe problems are more likely to be satisfied with non-surgical methods such as physical therapy/biofeedback. Other less invasive options that can be considered are vaginal support devices (pessaries), the urethral insert (plug) called FemSoft, and urethral injection therapy. Devices are particularly attractive for the patient with low level, predictable incontinence who may only want to control leakage when exercising or dancing. With urethral injections a material in injected into the urethra with a needle that is usually passed through a cystoscope. The procedure was developed to be done under local anesthesia and there is essentially no recovery time. While not quite as effective as surgery, some patients, particularly the elderly and those who have failed surgery in the past, prefer this simple approach. The patient who has only stress urinary incontinence without significant urgency is more likely to be completely satisfied with the results of surgery, but mixed urinary incontinence is not a contraindication to surgery. Many patients with mixed urinary incontinence will not respond at all to medication but may become completely dry after successful surgery for the stress leakage. The problem is that we cannot accurately predict which of these patients will have persistent urgency after surgery and all patients should understand that this is possible and accept this as a possible outcome before agreeing to surgery. The urge incontinence can still be separately treated if it does persist after correction of the SUI component.

In summary, any patient in reasonable health for whom SUI is a significant social problem should seriously consider surgical treatment. The patient should also evaluate the non-surgical alternatives, and it is frequently appropriate to spend a three-month period of time in a serious effort to strengthen the pelvic floor muscles prior to surgery. There are a great number of different operative procedures for the treatment of stress urinary incontinence and the patient should carefully discuss the alternatives with her physician.

For Further Information

To receive more information about your options, call 1-800-BLADDER or visit www.nafc.org. You can also sign up to become a consumer subscriber, and you will receive our quarterly newsletter, Quality Care. Every issue includes helpful information about causes and treatments for incontinence. You will also receive the Resource Guide – Products and Services for Incontinence, a complete directory of incontinence products and services; Discoveries, a companion to the Resource Guide that updates you on the latest products and innovations for treatment and continence care management; subscribers-only Web site access to the newsletter, Resource Guide, and Discoveries online; a copy of Your Personal Guide to Bladder Health, a thorough booklet covering a variety of topics from diet and daily habits to pelvic muscle exercises; access to our Continence Resource Service database of healthcare professionals; and free NAFC educational leaflets. ($25 annually)