Problems in Family Practice

Incontinence in the Female Patient

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Incontinence, the distressing accompaniment of old age and the frequent annoyance of young women, should be adequately diagnosed and treated. Although the physiology of bladder function is not completely understood, and urologists and gynecologists continue to change their opinions about just which bladder deformities or what changes in pressure profiles are important, enough is known to help the patient. The woman who is afraid to leave home and has sexual inhibitions and personal difficulties because of her "leaking bladder" can be helped to a fuller life. The family physician can distinguish between stress incontinence and detrusor instability. Adequate treatment of detrusor instability and proper referral of patients with stress incontinence are within the purview of the family physician. This paper describes diagnostic procedures easily performed in the office, preventive measures from childhood through the postmenopausal periods, and the options and effectiveness of treatment.

From September 1, 1979, through August 31, 1980, women over 21 years of age made 31,352 visits to the Family Practice Center in Bangor, Maine. Only 64 of these visits included the problem of stress incontinence. If every female patient were asked, however, 50 percent would be found to leak urine at some time. By contrast, 933 had symptoms of cystitis. The 50 percent of all women who leak urine and the 933 women with cystitis would profit by preventive measures that can delay or eliminate the onset of symptomatic incontinence. Some of the symptomatic patients have been referred to consultants, but most have not and show improvement with conservative measures.

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Definitions

Incontinence is usually divided into stress incontinence and detrusor instability. Stress incontinence is the involuntary loss of urine through an intact urethra at the time of increased intravesical pressure produced by physical activity. It implies that the intravesical pressure is greater than the urethral pressure. There is no desire to void, nor are there premonitory symptoms before the loss of urine. The bladder may be full or almost empty. The patient is frequently embarrassed.

Idiopathic detrusor instability, usually referred to as urgency incontinence, results in the loss of urine by involuntary and uninhibited detrusor contractions. Usually, there is no demonstrable etiologic factor. Urine loss is greater in urgency incontinence than in stress incontinence.

There are other conditions accompanied by abnormal detrusor activity that are important to consider in the differential diagnosis of incontinence. *Pure urgency incontinence* accompanies

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inflammatory lesions of the urethra, trigone, bladder, and vagina. Urgency, frequency, and dysuria accompanied by episodes of urgency leakage are characteristic.

Bladder neuropathies interfere with normal reflex activity in the spinal cord. The most frequent neurological lesions are multiple sclerosis and diabetic neuritis. Whereas the incontinence is usually an overfilling phenomenon, it may come from uninhibited detrusor activity.

Psychogenic urinary incontinence, which is produced by voluntary efforts of the patient, is usually a habit pattern developed over a period of time, and the voluntary nature of the contractions may not be apparent to the patient or to the physician.

Overflow incontinence is similar to stress incontinence, although the increased intravesical pressure is caused by overfilling of the bladder. It is most commonly seen in the postoperative and postpartum patient who has had some trauma to the bladder, with a resulting lack of normal detrusor activity. Urinary tract anomalies, either congenital or posttraumatic, that cause involuntary loss of urine are not included in this discussion.

Many patients have a combination of stress incontinence and detrusor instability. The detrusor element should be treated first, and a period of time should be allowed to elapse before the results of the treatment are evaluated and the need for surgery considered. Treatment of the detrusor factor often will relieve the symptoms, obviating the need for surgery.

Physiology and Anatomy

Normal urinary bladder retention and emptying are the result of a complicated system of muscular and neural activity. For voiding to occur, the voluntary muscles of the pelvic floor must relax. This is followed by involuntary retraction of the detrusor muscle and expulsion of the urine. Bladder wall tension, urethral pressure, and ease of opening of the internal sphincter affect urine flow rate. The detrusor muscle is also influenced by voluntary neural impulses arising in the cerebral cortex. This muscle is an end organ of the parasympathetic nervous system and can be stimulated to contract by acetylcholine. It is, therefore, affected by anticholinergic medications. Other nervous system pathways are involved, but their direct influence is not yet well understood.

In the incontinent female patient the proximal two thirds of the urethra is an intra-abdominal structure. Any increase in intra-abdominal pressure will increase pressure in the urethra and counteract pressure in the bladder. In the patient with stress incontinence the urethra has fallen, and the greater portion is no longer intra-abdominal. Bladder pressure may then rise above urethral pressure when intra-abdominal pressure is increased. Intraurethral pressure is highest in the young and slowly decreases with age. Measurements may be significant in women under 50 years of age, but after 50 years all intraurethral pressures are low, and the measurement is no longer significant. The greatest intraurethral pressure is in the midportion of the urethra. A relatively small descent of the urethra can bring the point of maximum pressure beyond the influence of the abdominal cavity. In the older patient with little prolapse of the urethra, the already low urethral pressure cannot protect against increases in intra-abdominal pressure or small contractions of the detrusor muscle. Stamey has conclusively shown that operative success with stress incontinence occurs only if the urethrovesical junction is moved forward and upward, replacing some portion of it inside the abdomen.[1] The urethrovesical angle is relatively unimportant, as it is impossible to diagnose continence or incontinence by measurement of this angle. Indeed, some postoperative patients who are now continent continue to have a "bad" angle. If the urethrovesical junction prolapses again, the incontinence recurs.

The urethra has two layers of muscles. The inner one is longitudinal and connects with the inner layer of the detrusor muscle. The outer layer is semicircular and consists of fibers that loop around the urethra at various degrees of obliquity, none of them surrounding the urethra. They do form a heavy muscular layer that functions as a sphincter and in the resting state produces the intraurethral pressure. This pressure is greatest at the midportion of the urethra. Cholinergic drugs that cause contraction of the detrusor muscle will also contract the urethal musculature and increase intraurethral pressure. At voiding, however, the urethral musculature relaxes, allowing voiding to take place. Voiding is a reflexogenic relationship

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mediated by the "micturation center" in the spinal cord, which coordinates the actions of the detrusor muscle and the urethral musculature. Outside the urethra lie the urogenital diaphragm muscles which surround the urethra and are under voluntary control. The urogenital diaphragm is involved in urethral closure, and these muscles are exercised in perineal or Kegel exercises. In the continent patient, coughing, lifting, and sneezing cause a reflex constriction of the urogenital diaphragm. In the incontinent patient this does not occur, and the increase in intra-abdominal pressure "goes right down the urethra" instead of being thwarted by the urogenital diaphragm.[1-3]

Diagnosis

True stress incontinence is corrected by surgery. Detrusor instability is not corrected by surgery and can indeed be made worse. It behooves the family physician to make the differentiation in the obvious cases, to find the 20 percent of patients with an etiologic cause for detrusor instability, and to know which patients should be referred.

History

One should inquire about past history of congenital anomalies, trauma (including obstetrical and surgical), diabetes, enuresis, neurological disease, and abuse of medications. History of the present complaint is then developed. It is important to determine when the incontinence occurs, how much urine is lost, whether urgency is present, and whether frequency, nocturia or any dysuria does occur. It is also important to find out how long the complaint has been present and whether the disability is increasing.[4]

Physical Examination

If the patient has signs of any disease, especially of the pelvic organs, a specific examination for incontinence should follow. The procedure outlined by Stamey is easy, productive, and appropriate in the family physician's office.

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Table 1. Differential Diagnosis

Stress Incontinence	Detrusor Instability
Normal micturition	Urgency, urge incontinence
No nocturia, no frequency	Nocturia and frequency
Small spurts	Dribbles constantly or may lose large amount at once
Able to interrupt flow	Not able to interrupt flow
Occurs with increased intra-abdominal pressure	Occurs after changing position and following a short delay
No premonitory sensations	May have premonitory sensations
Tolerates bladder filling	Loses water around catheter when filling bladder
Urine loss prevented by bladder neck elevation	Urine loss occurs in spite of bladder neck elevation

1. The patient is hydrated until the bladder is full, and then she is asked to void into a pan placed beneath the toilet seat. The volume is measured.

2. The patient is immediately catheterized to determine the residual volume. Using an open syringe attached to the catheter, the bladder is refilled with sterile water. At the first sign of fullness, the catheter is removed.

3. The patient is asked to cough. If there is no leakage, the patient is elevated to the 45° angle and asked to cough again while the physician observes the meatus. If there is still no leakage, the patient is asked to stand, a kidney basin is placed between her legs, and she is asked to cough again.

4. The patient who leaks in the supine or 45° position is then tested for leakage after elevation of the bladder neck. A long, curved forceps or one finger is inserted into the vagina, being careful not to make pressure at any point along the urethra. Pressure is made at the level of the bladder neck, while lateral to it, pushing the urethrovesical junction upward and forward. In stress incontinence this will prevent the loss of urine when coughing.[1]

After the history and physical examination are completed and the results of the urinalysis are received, a presumptive diagnosis can be made and a plan of treatment formulated.

Table 1 shows the differences between stress incontinence and detrusor dysfunction. The patient with stress incontinence typically loses a few drops of urine in small spurts when coughing or increasing the intra-abdominal pressure. She has voluntary control except when the spurts occur, does not have nocturia or urge to urinate frequently, and has no premonition that leaking will occur. The patient with detrusor instability loses large amounts of urine at a time, cannot stop the urine flow in midstream, and is often incontinent while she is changing her position. She has nocturia, a frequent urge to urinate, and urgency, and fluid may escape around the catheter when the bladder is being filled.

In the differential diagnosis, the following conditions should be considered and ruled out: residual urine, urinary tract infection of any kind (if the patient has a history of urinary tract infection, a culture should be done), other pelvic infections, any abnormal pelvic masses (eg, ovarian cysts and leiomyomata uteri may cause incontinence), diabetes, neurological disease, previous surgery that may have caused scarring, atrophy of the vaginal tissues that may respond to estrogen cream, and reactions to drugs (eg, diuretics, sympathomimetic and parasympathomimetic drugs, progesterone therapy).

Having ruled out other causes, the physician must then distinguish between stress incontinence and detrusor instability. The occasional patient who does not leak when the above tests are done but who otherwise fits the picture of stress incon-

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tinence will have minimal disability and can be treated conservatively.

Treatment

Stress Incontinence

Stress incontinence can be further divided into grades. Grade 1 incontinence involves loss of urine with sudden increases in intra-abdominal pressure, but never at night. Grade 2 involves urine loss when walking, standing from a sitting position, or sitting up in bed. Grade 3 involves almost constant urine loss. It is associated with operative failures, pelvic fractures, and similar injuries. Grade 1 incontinence can usually be treated conservatively. Grades 2 and 3 incontinence should be referred.[1,3]

The treatment of stress incontinence begins with the elimination of any bladder or urinary tract infection and correction of any other predisposing causes. The patient is then given a modified Kegel routine (Table 2). Demonstration of urethrovesical junction elevation at the time of explanation of the exercises should be done. The patient who cannot selectively contract the urogenital diaphragm and elevate the junction should be told to practice stopping the stream while voiding. When proficient, she can go on to the exercise list. All patients given the exercises should be rechecked in two to three weeks to make sure they are doing the exercises correctly. An attempt is made to have the patient learn to contract the urogenital diaphragm, and perhaps the levator ani muscles, without moving the abdominal muscles or the buttocks. When the patient does this well, she is encouraged to practice contracting the muscles while coughing, lifting, and sneezing. If contraction during sneezing is impossible, she is asked to cross her legs to prevent unusual pressure at this time. Results depend considerably on the physician's enthusiasm and attention. The results are well worth the effort and will be carried over into the prevention program.

Detrusor Instability

Abnormal function of the detrusor muscle in the absence of any contributing factors is not so easily treated. If the dysfunction is of recent onset and

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moderately annoying to the patient, cystoscopy should be done to rule out bladder tumor, interstitial cystitis, and other urological disease. The patient with frequency, no infection, and little actual incontinence may have the "urethral syndrome." This syndrome usually responds to urethral dilatation.

This leaves the patients with idiopathic detrusor instability. Treatment in these patients is not always satisfactory. Surgery is contraindicated for mild degrees of prolapse or cystocele; the leakage may become worse. The physician should be sure that there is no element of bladder infection. Treatment then revolves around drug therapy, re-education of bladder control, elimination of anxiety, and mechanical measures to help control the problem.[4] In the older age group the proportion of the patients with incontinence resulting from detrusor instability may approach 50 percent. Even in younger patients it may be present and should not be overlooked.

Drug therapy includes anticholinergic and antidepressant drugs. One longtime favorite has been propantheline (Pro-Banthine), often combined with phenobarbital. Tincture of belladonna is also popular. Recent studies have indicated that imipramine (Tofranil) or indomethacin (Indocin) may be superior. Flavoxate hydrochloric acid (Urispas) and hyoscyamine tablets (Cystospaz-M) have been used effectively. Whatever drug is used, it should be given in divided doses and increased until the patient is having dry mouth. Chewing gum may help with this side effect. Later, the dosage may be reduced, but the drug has to be continued for a long time, as symptoms will usually recur when it is stopped unless other factors have changed. Diazepam has been used, but it is more likely to be habit-forming than some of the other drugs.[5,6]

Behavioral modification is also helpful and can be done at the same time as the drug therapy. Formal biofeedback training may be possible, but many communities do not offer such treatment. Lacking such facilities, the patient is asked how often she now has leakage. She is instructed to void somewhat sooner than that and then to prolong consciously the time interval in small steps. She is also asked to measure her urine and make an attempt to hold a gradually larger amount in the bladder before voiding.

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Table 2. Exercises for Vaginal Relaxation

1. When bladder is full, start to void, stop, and then finish. Practice until this can be done easily.
2. Pull in rectum, hold it for three seconds, repeat after relaxing. Do this 50 times daily. It can be done in any position, sitting, standing, lying. Do not do it all at once. Pick several times a day to remember to do it. Check progress by putting a finger in the vagina and pulling in around the finger. Progress should be made each week.
3. Practice pulling in and lifting, coughing, and sneezing. Sneezing is the hardest and legs may have to be crossed or buttocks pulled tight together to keep from leaking while sneezing.
4. Particularly when lifting, remember to pull in at the same time. Otherwise all of the pressure from lifting goes against the bladder and vagina.

Table 3. Early Postpartum Exercise Program

First Postpartum Day (or same day, depending on time of delivery)
- Ankle circles
- Quadriceps and gluteal setting
- Costal and diaphragmatic breathing (cesarean section)

Second Postpartum Day
- Pelvic tilt
- Pelvic floor exercises: supine, legs extended, crossed at ankles
- Squeeze buttocks together and hold; press thighs together and hold; pull lower abdomen in and hold; pull anal floor in and hold—relax after each contraction and repeat five times each.
- Single and double knee to chest with pelvic tilt
- Partial sit up and pelvic tilt

Home: Written instructions

Source: Prepared by the Physiotherapy Department, Waldo County General Hospital, Belfast, Maine

All patients with detrusor problems will also benefit from perineal exercises and should be instructed to do them. The best effect will occur when they finally learn to stop their urinary outflow in midstream and then complete the emptying of the bladder.

General Measures

Any patient who says she leaks urine must be taken seriously. Immediate treatment may prevent a worse problem later. If the patient has an asymptomatic vaginal relaxation in which the cystocele or cervix does not protrude from the vagina, she can be treated adequately in the family physician's office. This care may be more helpful than an operation; and the patient can always be referred to a surgeon when the need is proven. Patients should be seen frequently enough to maintain their enthusiasm and to follow their progress.

Many adjunctive remedies are available. The patient with gross incontinence who is waiting

for an operation or who has contraindications to operation can attend a wedding, graduation, or 60-year anniversary by wearing incontinence pants. Many patients are rendered continent temporarily by using super tampons in the vagina during the day and removing them at night. Estrogen vaginal cream for patients with vaginal atrophy is helpful. It may correct some problems.

Many of these patients are old and some will exhaust a physician's patience. Allow enough time for an unhurried visit and be amply rewarded by a grateful patient.

Prevention

Prolapse of the urethrovesical junction begins early in life. Obstetrical delivery is often the precipitating factor. Every postpartum patient should be investigated for relaxation of the junction and instructed in proper exercise for the urogenital diaphragm (Tables 2 and 3). This should be a lifelong exercise, repeated at intervals throughout each day. Many women at the menopause cannot contract these muscles at all. Lack of exercise causes atrophy here as in any striated muscle.

All women should be watched for signs of anterior vaginal wall prolapse and instructed as above. Urinary tract infections should be assiduously treated, followed, and prevented. The patient with more than one episode of cystitis should be treated long enough to prevent another recurrence. Sometimes this requires treatment for two months; sometimes it may involve prophylactic treatment for two years. Children from birth on should be watched for urinary tract infections and treated. The patient who does not respond to these measures should be referred for cystometric examination and cystoscopy.

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