CONTENTS

1. Contents p:1
2. Message from the President,

   Prof. Dr. Nida BAYIK p:2
3. Message from the Editor,

   Prof. Dr. Fisun VURAL p:.3
4. Patient Assessment in Urinary Incontinence,

   Op. Dr. Hilal ŞERİFOĞLU p 4-10
5. Treatment of Urinary Incontinence,

   Prof. Dr. Birol VURAL P:11-25
6. Pharmacotherapy in Overactive Bladder,

   Op. Dr. A. Deniz E. COŞKUN P:26-31
7. Midurethral Sling Surgery,

   Prof. Dr. Fisun VURAL p.32-39
8. Literature Corner,

   Dr. Sena DURAN p:40-49
9. Evidence-Based Approach in Urinary Incontinence (NICE Guideline),

   Op. Dr. İrem YILDIRIM p:50-66
10. Patient Information Forms in Urinary Incontinence,

    Dr. Ege ÖZGÜR p:67-79
11. Questionnaires Used in Urinary Incontinence p:79-89



President of JİNKOZ Association

Prof. Dr. Nida BAYIK



EDITOR

Urinary incontinence is a condition seen in one-third of women. Considering the aging world population, we will encounter more incontinence patients in the coming years. In this issue of our journal, diagnostic methods for urinary incontinence, surgical and non-surgical treatment methods are explained. Additionally, questionnaires used in urinary incontinence, international guidelines, current literature, and patient information forms are included, gathering all the information you want to access about urinary incontinence in a single issue.
I would like to thank all my colleagues who contributed to our bulletin.

Prof. Dr. Fisun VURAL

PATIENT ASSESSMENT IN URINARY INCONTINENCE



Op. Dr. Hilal ŞERİFOĞLU

Tuzla State Hospital, Department of Obstetrics and Gynecology

---

Urinary incontinence can be simply defined as the involuntary leakage of urine. The International Continence Society (ICS) defines it as involuntary urine leakage that causes social and hygienic problems and affects the patient's quality of life (1). Studies show that the amount of urine leaked is not strongly related to the feeling of discomfort (2). For incontinence treatment, a detailed medical history and careful evaluation are necessary to determine the appropriate approach for the patient, and the necessary treatment can be initiated. Incontinence can be temporary or permanent. Temporary conditions include delirium, infection, atrophic vaginitis-urethritis, psychological issues, pharmacological agents, excessive urine production, restricted mobility, and constipation. When these causes are addressed, incontinence improves (3,4).

Permanent incontinence in women is classified into four types: Stress Incontinence, Urge (Overactive Bladder), Mixed Type, and Functional Type.

1-Stress Incontinence: This type of urine leakage occurs during activities that increase intra-abdominal pressure, such as exercise, sneezing, coughing, climbing stairs, or lifting heavy objects. Stress incontinence happens when the intravesical pressure exceeds the urethral closure pressure due to increased intra-abdominal pressure. It is caused by urethral hypermobility or urethral sphincter deficiency. Typically, there is no urgency before leakage, and nocturnal enuresis or nocturia is rarely seen (5,6).

2-Urge Incontinence: This occurs in patients with an overactive detrusor muscle, where urine leakage happens before reaching the toilet when the urge to urinate is felt. Nocturia is also commonly seen. Nocturia is defined as waking up one or more times at night to urinate (7). Stress incontinence is more common in young women, while urge incontinence is more common in older women (8).

3-Mixed Incontinence: This type is usually seen with aging, where both overactivity of the detrusor muscle and urethral sphincter deficiency/hypermobility develop, leading to both stress and urge incontinence.

4-Functional Incontinence: This type is usually seen in older women who cannot reach the toilet in time due to reduced mobility or musculoskeletal disorders.

INITIAL ASSESSMENT

1) Medical History

Questions directed to patients presenting with urinary incontinence can help determine the type of incontinence and the treatment plan. Examples of questions that can be asked during the medical history include:

-When did the symptoms start, and how often do they occur during the day?

-Does the patient feel the urge to urinate and then experience leakage?

-Does leakage occur during coughing, sneezing, running, or lifting heavy objects?

-Is there a need to rush to the toilet when the urge to urinate is felt, or does leakage occur before reaching the toilet?

-How much urine is leaked when incontinence occurs?

-Is there nighttime urine leakage?

-Is there difficulty starting urination? Does the patient need to push or press on the bladder?

-How many births has the patient had? What were the birth weights of the babies? Is there a history of difficult deliveries?

-Does the patient have regular menstrual periods? (Menopause status should be questioned)

-Is the patient receiving any hormone replacement therapy?

-Is there a history of chronic conditions that increase intra-abdominal pressure, such as COPD or constipation?

-Does the patient have diabetes?

-What medications is the patient taking? (Diuretics should be specifically questioned.)

-Has the patient undergone any incontinence surgery or any gynecological operations before?

-Is there a history of pelvic radiotherapy?

Additionally, symptom and quality of life questionnaires can be completed. Some of these forms include: “International Consultation on Incontinence Questionnaire (ICIQ), Incontinence Impact Questionnaire (IIQ-7), Urogenital Distress Inventory (UDI-6), Patient Reported Outcome Measures (PROMS), Health Related Quality Of Life (HRQoL) Measures, Overactive Bladder Questionnaire (OAB-q) (8). Keeping a voiding diary is also important for both diagnosis and evaluating treatment response, with studies recommending a 3-7 day diary (8,9). Patients are asked to record their daily fluid intake, number of toilet visits, average urine output, and the circumstances of any urine leakage. This information helps determine the total 24-hour urine volume, daily frequency of urination, urine volume, and functional bladder capacity.

2) Physical Examination

As with any patient, the examination begins when the patient enters the room, and patients should be considered as a whole. Being overweight can increase intra-abdominal pressure and may be related to diabetes, while difficulty walking may suggest a lumbar hernia or another neurological problem. During the abdominal examination, palpation and percussion are used to check for masses.

In the pelvic examination, the presence of pelvic organ prolapse such as cystocele, rectocele, or uterine prolapse should be evaluated, and any anatomical abnormalities or differences should be noted. The presence of masses in the vagina or at the urethral opening should be checked, and atrophy should be assessed. Pelvic floor muscle strength evaluation includes assessing the pudendal nerve, bulbocavernosus reflex, and anal reflexes with S2-S4. Anal sphincter tone assesses the pelvic plexus, and contraction strength assesses the pudendal nerve (10,11).

Bulbocavernosus Reflex: The external anal sphincter contracts when the outer surface of the labium majus is stroked.

Anal Reflex: The anal sphincter contracts with perianal skin stimulation.

Stress test: This evaluates urinary incontinence when the bladder is full, preferably while the patient is standing, by increasing intra-abdominal pressure (coughing, straining).

Q Tip Test: While the patient is in the lithotomy position, a sterile cotton swab is inserted into the urethra and the patient is asked to strain. If the angle of the swab with the horizontal plane exceeds 30 degrees with increased intra-abdominal pressure, urethrovesical hypermobility is considered. Patients, especially those in menopause, may experience significant pain during this procedure.

3) Tests to be Conducted in Initial Evaluation:

a) Urinalysis: It is essential to perform this test to detect metabolic disorders such as infection, hematuria, or glucosuria in the urine.

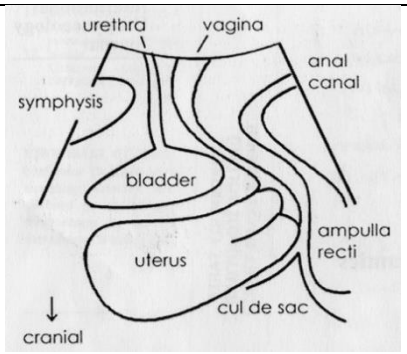
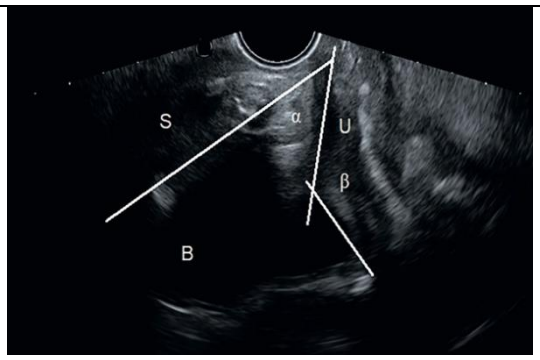
b) Measurement of residual urine volume: Incontinence can develop if the bladder is not adequately emptied. As residual volume increases, functional bladder capacity decreases, leading to overflow incontinence. A volume measured within the first 10 minutes post-void of less than 50cc is considered normal, while more than 200cc is considered abnormal.

c) Pad test: Although rarely used in clinics, it provides objective results. A pad with a known weight is given to the patient to use for 24 hours. In office conditions, the patient is asked to exercise with a full bladder, performing movements such as sitting, standing, and climbing stairs. The pad is weighed after exercise. An increase of more than 1 gram after 1 hour and 4 grams or more after 24 hours indicates urinary incontinence.

4) Imaging Methods

a) Transperineal Ultrasound (USG): Perineal ultrasound can be used to measure urethral mobility without the discomfort caused by the sterile swab during the Q-tip test. In the evaluation of stress incontinence with USG, the sensitivity and specificity of the α angle are greater than the β angle in primary stress incontinence (14). Pubourethral angle

(α angle): The angle between the parallel line passing longitudinally through the pubic symphysis and the urethral axis. Posterior urethrovesical angle (β angle): The angle between two lines at the location where the line passing through the bladder base intersects the long axis of the urethra (Figure 1).

Figure 1: Schematic drawing of structures seen with transperineal USG (12)	Figure 2: Demonstration of urethrovesical angle and pubourethral angle with transperineal USG (13)
	
	S: Symphysis Pubis U: Urethra B: Bladder

Studies have found that perineal ultrasonography correlates with Q-tip test results, and a change of more than 16 degrees in the alpha angle between rest and Valsalva suggests stress incontinence (13). Another parameter measured by ultrasound is detrusor muscle thickness, and it has been reported that a thickness greater than 5mm may be associated with detrusor instability (10,13). Additionally, funneling at the urethral meatus is associated with decreased urethral closure pressure (15).

b) Dynamic MRI (Magnetic Resonance Imaging): Measurements made with perineal USG can be performed in more detail with dynamic pelvic MRI. The main advantage of MRI is the detailed imaging of pelvic floor muscles, allowing the detection of tears,

asymmetry, thinning, and other conditions in structures supporting the urethra and bladder. If there is no pathology in the pelvic floor to explain incontinence, internal sphincter deficiency may be considered.

5) Advanced Investigations

a) Urodynamics: Although it provides objective results, it is not routinely recommended for every patient. Urodynamics is suggested if the type of incontinence is not understood after the basic evaluations mentioned, if there is a mismatch between history-voiding diary-symptoms, if residual volume is increased, if surgery is considered, if there is pelvic organ prolapse, if there is a history of prolapse surgery, or if there is a neurological problem that may affect examination and treatment.

b) Cystoscopy: Although not routinely recommended, it is suggested for patients with a history of incontinence surgery and POP repair, those who have undergone radiotherapy to the pelvic region, those with obstructive voiding symptoms, and those with hematuria (16).

c) Neurophysiological Tests: These tests are used to determine the neuromuscular functions of the pelvic floor and are not preferred today.

References

1) Andersen JT, Blaivas JG, Cardozo L, et al. ICS 7th report 5. on the standardization of terminology of lower urinary tract function—Lower urinary tract rehabilitation techniques. Neurourol Urodyn 1992; 11: 593–603.
2) United States. Urinary Incontinence in Adults Guideline Update Panel, and United States. Agency for Health Care Policy. Urinary incontinence in adults: acute and chronic management. No. 96. Department of Health and Human Services, 1996.
3) Imam KA. The role of the primary care physician in the management of bladder dysfunction. Rev Urol 2004; 6: S38-S44.5
4) Dowling-Castronovo A, Bradway C. Urinary incontinence. In Boltz M, Capezuti E, Fulmer T, et al (ed) (Managing Editor: O'Meara A): Geriatric Nursing Protocols For Best Practice, 4th Edition. New York, Springer Publishing Company, LLC, 2012, pp. 387-

5) Rovner ES, Walls M. Diagnosis of overactive bladder. In Kreder K, Dmochowski RR (ed) (Translation Editor: Ergen A): Evaluation and Treatment of Overactive Bladder. Ankara, Güneş Medical Bookstores, 2010, pp. 27-36.
6) Kobashi KC. Evaluation of patients with urinary incontinence and pelvic prolapse. In Wein AJ, Kavoussi LR, Novick AC, et al (ed): Campbell-Walsh Urology, 10th Edition. Philadelphia, Elsevier Saunders, 2012, pp. 1896-1908. 93.
7) Haylen, Bernard T., et al. "An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction." Neurourology and Urodynamics: Official Journal of the International Continence Society 29.1 (2010): 4-20.
8) Lucas MG, Bedretdinova D, Bosch JLHR, et al. Guidelines on Urinary Incontinence. © European Association of Urology (EAU). Urinary Incontinence- 2014.
9) Yap TL, Cromwell DC, Emberton M. A systematic review of the reliability of frequency-volume charts in urological research and its implications for the optimum chart duration. BJU Int 2007; 99: 9-16.
10) Yap P, Tan D. Urinary incontinence in dementia-a practical approach. Aust Fam Physician 2006; 35: 237-41.
11) Wyman JF, Choi SC, Harkins SW, et al. The urinary diary in evaluation of incontinent women: A test-retest analysis. Obstet Gynecol 1988; 71: 812-17.
12) Dietz HP, Clarke B. Translabial color doppler urodynamics. Int Urogynecol J Pelvic Floor Dysfunct 2001;12(5):304-7.
13) Turkoglu A, Coskun ADE, Arinkan SA, Vural F. The role of transperineal ultrasound in the evaluation of stress urinary incontinence cases. Int Braz J Urol. 2022 Jan-Feb;48(1):70-77. doi: 10.1590/S1677-5538.IBJU.2020.1100. PMID: 34528775; PMCID: PMC8691236.
14) Ouslander JG. Management of overactive bladder. N Engl J Med 2004; 350: 786-99.
15) Seçkiner İ. Evaluation and classification of urinary incontinence. Turkish Urology Competency Boards, 8th Urology Competency Exam Preparation Course, Lecture Notes Book. Ankara, Kızılcahamam, 2012, pp. 167-70.
16) Kobashi KC. Evaluation of patients with urinary incontinence and pelvic prolapse. In Wein AJ, Kavoussi LR, Novick AC, et al (ed): Campbell-Walsh Urology, 10th Edition. Philadelphia, Elsevier Saunders, 2012, pp. 1896-1908.

URINARY INCONTINENCE TREATMENT



Prof. Dr. Birol VURAL

Specialist in Obstetrics and Gynecology, BV Clinic, Şişli

Nearly 50% of women experience urinary incontinence (UI) at some point in their lives, and 10 to 20% of these women have bothersome levels of urinary leakage. This is a common issue that negatively affects quality of life and is a social and hygienic problem. Urinary leakage should not be perceived as a normal part of aging. Urinary tract infections, pregnancy and childbirth, menopausal hormone deficiency, smoking, being overweight,

certain medical conditions (such as diabetes, multiple sclerosis, and Parkinson's disease), medications (diuretics, anxiolytics, sedatives, and antidepressants), and some genital surgeries (which damage the muscles and ligaments supporting the bladder) can cause urinary leakage (1, 2).

The treatment of urinary incontinence should progress step by step with the aim of improving quality of life. The risks, side effects, and benefits of treatment should be carefully balanced and aligned with the patient's goals and expectations. While most women with incontinence see an improvement in symptoms with treatment, some may not completely prevent urinary leakage. Expectations regarding the effect of treatment should be discussed with the patient at the start of treatment (3).

The treatment of urinary incontinence should be tailored according to the severity of symptoms. Treatment can initially begin with conservative methods that may help control some symptoms.

A) Conservative Treatments

A suitable treatment plan is made considering the patient's history, examination, degree of incontinence, and quality of life. Conservative treatments are generally the first choice for cases of mild urge or stress incontinence. If positive results are not achieved despite effectively tried conservative treatment approaches, advanced treatments or surgical treatments should be considered (3).

Before treatment, a quality of life assessment questionnaire is conducted. Various questionnaires are available that can assist in the basic assessment of the impact of incontinence on the patient's quality of life, focus on treatment goals, and evaluate treatment effectiveness (4).

1) Bladder Diary/Bladder Retraining or Behavioural Therapy

A minimum 3-day voiding diary (recording daily voiding and fluid intake) provides information on baseline symptom severity, fluid intake, voiding frequency, and bladder volume. The voiding diary can also help in the objective assessment of symptom severity and in observing the effect of treatment. Expectations regarding the effect of treatment should be discussed with the patient at the start of treatment (5).

Bladder retraining or behavioural therapy is a simple and effective method used in the treatment of urge incontinence, mixed incontinence, and bladder problems. Bladder habits are recorded on a schedule, and according to this schedule, the time between voiding is gradually increased by resisting the urge/frequency sensation (6,7). Evidence shows that behavioural therapies provide a clinically significant reduction in urge incontinence. Behavioural therapy yields positive results gradually within a few weeks (8). Although behavioural therapy is recommended as an initial treatment approach, there are some barriers. Primarily, the woman's adherence to the practice and motivation are important.

2) Lifestyle Changes, Fluids, and Diet

A few small changes in lifestyle can help alleviate incontinence symptoms. Weight loss in obese women has many benefits, including improvement in urinary leakage symptoms. Restricting fluid intake 4 hours before bedtime can improve sleep quality in patients with nocturia. Intake of fizzy drinks, caffeine, and alcohol should be limited (9,10). Although commonly recommended and generally low-risk, other lifestyle changes focusing on dietary modifications, fluid restriction, and caffeine reduction have been less researched (11). One study reported that these approaches improved urinary and bowel incontinence symptoms in the support group (12). Constipation can worsen urinary leakage and increase the risk of urinary retention. Therefore, constipation should be treated (13). Smoking is associated with an increased risk of urinary leakage (14,15). There are no studies evaluating whether quitting smoking reduces urinary leakage beyond the general health benefits.

3) Pelvic floor muscle strengthening (Kegel) exercises

a) Pelvic floor muscle exercises (Classic Kegel): These exercises focus on the contraction of the levator ani muscles (pubococcygeus, coccygeus, iliococcygeus). The aim is to squeeze, support, and strengthen the pelvic muscles. According to the guidelines of the American College of Physicians, pelvic floor muscle (Kegel) exercises are recommended for all women with urinary incontinence (urge and stress incontinence), especially those with stress incontinence (16). Pelvic floor (Kegel) exercises strengthen the pelvic floor muscle system to provide support for urethral compression and reflexively inhibit detrusor contractions. The exercise is performed as follows: The patient, with knees bent, tightly contracts the muscles around the vagina and anus as if pulling them inward. Kegel exercises involve contracting the pelvic floor muscles 8-12 times, each lasting 8-10 seconds, three times a day (17). Patients should try to perform pelvic floor

muscle contractions (Kegel) daily and continue for at least 15 to 20 weeks (18). The European Association of Urology (2018) reported that pelvic floor muscle training is effective in improving urinary incontinence and quality of life in women with stress urinary incontinence (SUI) and mixed urinary incontinence (A level of evidence) (19).

b) Vaginal cones: This is an instrument-based method used to strengthen the pelvic floor muscles. There are 3-9 cones, with weights ranging from 20g to 100g. The aim is to increase muscle strength by providing strong contractions in the pelvic floor muscles. The treatment creates a biofeedback sensation through voluntary or involuntary pelvic floor contractions. It is recommended to be applied twice a day in 15-minute sessions. The patient is asked to hold the lightest vaginal cone in the vagina for at least one minute while standing, thereby exercising the pelvic floor muscles. According to the European Association of Urology (2018) guidelines, pelvic floor exercises with vaginal cones are effective in treating SUI, urge urinary incontinence, mixed urinary incontinence, and improving quality of life (A level of evidence) (19). However, its effect on mixed urinary incontinence is found to be lower than on SUI (20). The Cochrane systematic review by Herbison and Arnold (2009) reported that vaginal cones have similar effectiveness to pelvic floor exercises (classic Kegel) and electrostimulation, and they can be recommended as a treatment option (19).

c) Biofeedback: This involves recording physiological activity and converting it into visual and/or sensory signals, which are then reflected to the patient (such as showing the patient perineal contractions by placing a finger on the perineum, allowing the patient to watch perineal contractions with a mirror, or using transvaginal ultrasound to show perineal contractions). Involuntary or unperceived body processes are monitored. It is applied three times a week for 25-35 minutes and should be continued for 15-20 sessions. Effective results are obtained at the end of these sessions (21).

d) Electrical Stimulation: Electrical stimulation can be used in the treatment of SUI, urge urinary incontinence, and mixed urinary incontinence. Different frequencies of electrical stimulation are used for each type of incontinence. High frequency is preferred in the presence of SUI, while low frequency is preferred in urge urinary incontinence. In electrical stimulation, the pudendal nerve is stimulated, and passive contraction of the pelvic floor muscles is achieved (22). There is no standard treatment protocol in this regard. The European Association of Urology (2018) recommends that electrical

stimulation should not be used alone in the treatment of SUI, but can be combined with behavioural therapies in urge incontinence (19).

e) Magnetic Stimulation: The mechanism of action is not fully understood. The patient sits on a chair that generates magnetic power or uses a mobile device to contract the pelvic floor muscles. In this method, a total of 16 sessions are applied, with the patient sitting for 20 minutes twice a week for eight weeks. The magnetic stimulation chair received FDA approval in 1998. A systematic review by Lim et al. (2015) showed that magnetic stimulation may be effective in the treatment of SUI, but evidence of its short- and long-term effects is weak (19). The European Association of Urology Guidelines (2018) reported that magnetic stimulation may benefit pelvic floor muscle training in the short term (B level of evidence) (19).

4) Topical vaginal oestrogen therapy

Menopausal genitourinary syndrome (GSM) is associated with urinary frequency and dysuria and can also lead to incontinence. Vaginal oestrogen therapy is recommended for peri- or postmenopausal women with stress or urge incontinence and vaginal atrophy due to GSM. Topical oestrogen therapy is associated with an improvement in symptoms (23).

B) URGE INCONTINENCE TREATMENT

1) **First-line treatments:**

The initial approach in the treatment of urge incontinence is conservative treatment methods. If these methods are not effective, medications that help alleviate the spasms and contractions felt in the bladder can be used. As a last resort, if the symptoms are very severe and significantly affect quality of life, invasive or surgical treatments may be recommended.

According to the guidelines of the American Urological Association (AUA) and the Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), the first-line treatment for non-neurogenic urge incontinence is behavioural therapy (6,7). Behavioural therapies pose no risk to patients and have been shown to improve UI outcomes compared to no treatment, so they should be offered to everyone (24). First-line treatments include bladder training, fluid intake modification, pelvic floor muscle training, and biofeedback. Patients should be advised to reduce intake of bladder irritants such as caffeine, alcohol, acidic/citrus fluids, and artificial sweeteners. Bladder training aims to help patients

increase the interval between voiding and enhance bladder capacity. Patients can practice timed voiding and use techniques like Kegel exercises to suppress urgency (25).

2) **Second-line treatments:**

Second-line treatments involve pharmacological management of the bladder (6.7). Two types of medications are used for this purpose:

a) Anticholinergic (antimuscarinic) drugs: These prevent urinary incontinence by blocking muscarinic receptors in the bladder, which are responsible for detrusor muscle contraction during the voiding phase. A systematic review of anticholinergics found them to be relatively effective and safe, but with different side effect profiles (26). Common side effects include dry mouth, dry/itchy eyes, constipation, blurred vision, indigestion, and cognitive impairment. Extended-release formulations may offer a more favourable side effect profile with a lower risk of dry mouth compared to immediate-release counterparts (27). Anticholinergic drugs are contraindicated in patients with a history of narrow-angle glaucoma, gastroparesis, or cognitive impairment.

b) Beta 3-agonist drugs: Beta 3-agonists enhance the relaxation of the detrusor muscle, facilitating the storage phase of urine. While the efficacy of beta 3-agonists is similar to that of anticholinergics, their side effects differ. The first FDA-approved beta 3-agonist, Mirabegron, has side effects including nasopharyngitis, increased systolic blood pressure, headache, and interactions with other medications. This drug is contraindicated in uncontrolled hypertension. The latest approved beta 3-agonist, Vibegron, does not increase systolic blood pressure and shows no interactions with other medications (28,29,30). Currently, there are eight approved drugs in the United States from the anticholinergic and beta 3-agonist classes (Table 1).

Drug	Class
Solifenacin	Anticholinergic
Fesoterodine	Anticholinergic
Trospium	Anticholinergic
Tolterodine	Anticholinergic
Darifenacin	Anticholinergic
Oxybutynin	Anticholinergic
Mirabegron	Beta 3-agonist

Vibegron	Beta 3-agonist

Table 1. Medications used for overactive bladder conditions (25)

3) Third-line treatments

In the third-line treatment of overactive bladder in patients with urge incontinence, neuromodulation therapies such as peripheral tibial nerve stimulation (PTNS) and sacral nerve stimulation (SNS), or chemodenervation with Onabotulinumtoxin A, are used (6,7).

a) Percutaneous peripheral tibial nerve stimulation (PTNS) is a treatment that directly stimulates the nerves responsible for bladder control and can be used for urge incontinence. This method is indicated for overactive bladder problems where urge incontinence symptoms are difficult to resolve with other treatments. PTNS is designed to indirectly stimulate the nerve roots responsible for bladder control. In this treatment, a fine 34-gauge needle electrode is inserted near the tibial nerve around the ankle and connected to a stimulator device. The impulses travel along the nerve, stimulating the nerves controlling pelvic floor and bladder function in the L4-S3 nerve plexus of the spinal cord. Treatment is administered in weekly 30-minute sessions over 12 weeks, followed by monthly maintenance. This therapy helps regulate bladder function and alleviate overactive bladder symptoms. PTNS is contraindicated in pregnancy, and in the presence of a pacemaker or defibrillator. It should also not be used in peripheral nerve disease, peripheral oedema, or neurogenic bladder conditions (25, 31).

b) Sacral nerve stimulation (SNS) was approved by the FDA in 1997. SNS modulates bladder, urinary sphincters, and pelvic floor reflexes through S3 sacral nerve stimulation. This is expected to resolve >50% of urinary incontinence issues. The procedure is performed in two stages. The first stage is a non-surgical trial procedure to confirm that SNS prevents at least 50% of urinary incontinence. Once confirmed, the second stage involves surgically implanting the sacral nerve stimulation system (pulse generator) under the skin in the upper buttock. There is a risk of infection complications with the surgical procedure. The use of a defibrillator and pacemaker is a contraindication for this procedure (25).

c) Botulinum toxin (Onabotulinumtoxin A = BTX-A) received FDA approval for the treatment of urge incontinence in 2011. Botulinum toxin inhibits acetylcholine release

from the presynaptic cholinergic junction, preventing detrusor muscle contraction through chemodenervation. BTX-A is administered under sedation, in an office setting, and with cystoscopy. The effect of the treatment lasts for 6 months. Complications of BTX-A treatment include urinary retention, urinary tract infection, and haematuria (25).

d) Acupuncture: It has been shown that acupuncture along the sacral spine can suppress overactive bladder symptoms (32).

A) STRESS URINARY INCONTINENCE TREATMENT

1) Pessary use

In the treatment of stress incontinence, lifestyle changes and pelvic floor exercises are the first-line approach. If these are not effective, the use of incontinence pessaries is recommended. They are suggested as an alternative to surgery when both pelvic organ prolapse and stress urinary incontinence are present. Pessaries are silicone devices inserted into the vagina. In cases of pelvic organ prolapse (POP), they provide anatomical correction, and in stress incontinence, they support the bladder neck. In the USA alone, approximately 135,000 women undergo surgery for SUI each year; about 11% of these cases are patients over 80 years old. Therefore, it should be remembered that pessary use is a good alternative for patients who cannot undergo surgery (33). The Canadian Urological Association guidelines also recommend considering pessaries along with PFMT in the initial treatment of SUI. An RCT with 446 women showed that after 3 months, 40% of women using a pessary alone improved, compared to 49% with behavioural therapy alone. However, at 12 months, 32% of participants in both groups reported resolution of symptoms (34, 35).

The effectiveness of the treatment depends on the education and follow-up provided to the patient. In pessary applications, it is important to find a pessary that fits the patient's pelvis. Pessaries that are too large can cause ulceration in the vagina, while those that are too small may fall out. Therefore, a patient with a pessary should be re-evaluated one hour after insertion to confirm there is no discomfort or displacement, and that the patient can urinate comfortably. Causes of unsuccessful application include an enlarged introitus (four-finger width), a short vaginal length of <6 cm, and posterior compartment defects (36). Pessaries

suitable for the type of pelvic organ prolapse, such as Hodge, Gellhorn, Gehrung, ring, and inflatable pessaries, are available on the market. In cases of stress incontinence, a knobbed pessary is used (Figure 1) (37). Patients should be taught daily pessary care, including insertion, removal, and washing with soapy water. Although there is no standard protocol in the literature for pessary care, it is beneficial to see patients with a pessary every 3-6 months.



Figure 1. Knobbed pessary.

2) Urethral bulking injections

Also known as periurethral or transurethral injection therapy, urethral bulking injections result in lower success rates compared to other surgeries and often require additional "top-up" injections to achieve maximum effectiveness. However, due to their less invasive nature and quick recovery, these procedures are among the primary treatments for SUI. They are considered for patients with intrinsic sphincter deficiency who cannot tolerate surgery (38). In January 2020, a randomized study comparing a polyacrylamide bulking gel material with a mid-urethral sling showed a 16% lower complication rate in the bulking injection group, with satisfaction rates of 64% (injection group) versus 95% (mid-urethral sling), leading to FDA approval in the United States (39).

2) Pharmacological treatment

The use of oral pharmacological agents in the non-surgical treatment of SUI is limited due to their unproven effectiveness and high incidence of bothersome side effects. These drugs include duloxetine and alpha-adrenergic agonists. Duloxetine is a potent inhibitor of serotonin (5-hydroxytryptamine = 5-HT) and norepinephrine (NE) reuptake at the neuromuscular junction. It stimulates the pudendal nerve, causing urethral sphincter contraction. Although duloxetine is approved by the European Medicines Agency, it is not approved by the FDA (40).

The most commonly reported side effects of duloxetine use include nausea, dry mouth, constipation, diarrhoea, loss of appetite, fatigue, dizziness, headache, tremor, sweating, hot flushes, blurred vision, decreased libido, delayed ejaculation, and orgasm problems. However, the most feared side effects are reported cases of suicide following duloxetine use (41). As the side effects of duloxetine are dose-dependent, treatment should start at the minimum dose (20mg). A review of duloxetine found that 68% of patients discontinued the drug due to side effects within 4 weeks of starting treatment, and at the end of 1 year, only 9% of patients continued treatment, with 82% opting for surgical treatment. Despite the European Association of Urology (EUA) stating that the use of pharmacotherapy in SUI treatment is limited due to its effectiveness and side effects, it has rated the evidence level of duloxetine as 1B. The NICE guideline advises against the routine use of duloxetine as a secondary treatment for SUI, suggesting it may be considered for women who are not candidates for surgery or who prefer medication as an alternative to surgery (42,43).

3) Surgical treatment

Surgical treatment should be performed in cases of pure stress incontinence or stress-predominant mixed incontinence if there is no response to conservative treatments or if the patient does not wish to undergo first-line conservative treatments. There are many surgical methods for the treatment of stress incontinence, some of which have been abandoned today. According to the NICE guideline, the following surgeries should not be used in the treatment of stress incontinence: Anterior Colporrhaphy, needle suspension, paravaginal defect repair, porcine dermis sling, and Marshall-Marchetti-Krantz operation. The surgical methods for stress incontinence accepted by the NICE guideline are colposuspension surgeries, rectus fascia slings, and mid-urethral slings (42).

The Burch colposuspension operation has been used for years as a first-line surgical treatment for urinary incontinence. Sutures placed on either side of the urethra are attached to the Cooper's ligament to stabilize the hypermobile urethra. It is a method with high cure rates (68%-88%) and low recurrence rates. Advantages of this method include not affecting vaginal length, correcting mild cystocele cases, and yielding good surgical outcomes. Long-term success rates are around 70%, with a possibility of developing rectocele and voiding dysfunction (44).

The Burch colposuspension operation is a successful procedure. However, due to their minimally invasive nature and higher success rates, mid-urethral sling (MUS) surgeries have

become more prominent today. Five-year follow-up results of MUS cases have reported success rates of up to 90% (45). The first MUS operation used was the tension-free vaginal tape (TVT) surgery. Due to the risk of intraoperative bladder perforation in TVT operations, the transobturator tape (TOT) surgery was developed. Although TVT has slightly better surgical success compared to TOT, it has a higher rate of intraoperative complications. TVT is particularly indicated for cases of stress incontinence with intrinsic sphincter deficiency (46, 47). Lastly, single-incision mini-sling surgery has gained popularity, but we lack long-term results for this surgery (48).

4) Other methods

Electrical stimulation of the pelvic floor provides improvement compared to the untreated group but is not more effective than pelvic floor exercises (49). Studies on magnetic field therapy have shown clinical improvement, but the duration of this effect is unclear (50). In recent years, minimally invasive vaginal laser applications have also been used in the treatment of stress incontinence. While observational studies are promising, the lack of randomized studies and uncertainty about the duration of treatment efficacy mean that ACOG does not recommend it for SUI treatment (51).

References

1. Almousa S, Van Loon A B. The Prevalence of Urinary Incontinence in Nulliparous Adolescent and Middle-Aged Women and the Associated Risk Factors: A Systematic Review. Maturitas 2018; 107:78-83.
2. Lukacz ES, Santiago-Lastra Y, Albo ME, Brubaker L. Urinary Incontinence in Women: A Review. JAMA 2017; 318:1592.
3. Schabert VF, Bavendam T, Goldberg EL, Trocio JN, Brubaker L. Challenges for managing overactive bladder and guidance for patient support. Am J Manag Care 2009;15 (4 suppl):S118-S122.
4. Yalcin I, Bump RC. Validation of two global impression questionnaires for incontinence. Am J Obstet Gynecol 2003; 189:98.
5. Nambiar AK, Bosch R, Cruz Fetal. EAU guidelines on assessment and nonsurgical management of urinary incontinence. Eur Urol 2018;73(4):596-609.

6. Gormley EA, Lightner DJ, Burgio KL et al. Diagnosis and treatment of overactive bladder (non-neurogenic) in adults: AUA/SUFU guideline. J Urol 2012;188 (6Suppl) : 2455-2463.
7. Lightner DJ, Gomelsky A, Souter L, Vasavada SP. Diagnosis and treatment of overactive bladder (nonneurogenic) in adults: AUA/SUFU guideline amendment 2019.J Urol 2019; 202(3): 558-563.
8. Burgio KL, Goode PS, Locher JL et al. Behavioral Training With and Without Biofeedback in the Treatment of Urge Incontinence in Older Women: A Randomized Controlled Trial. JAMA 2002, 288, 2293–2299.
9. Gleason JL, Richter HE, Redden DT, et al. Caffeine and urinary incontinence in US women. Int Urogynecol J 2013; 24:295.
10. Dallosso HM, McGrother CW, Matthews RJ, et al. The association of diet and other lifestyle factors with overactive bladder and stress incontinence: a longitudinal study in women. BJU Int 2003; 92:69.
11. Imamura M, Williams K, Wells M, McGrother C. Lifestyle interventions for the treatment of urinary incontinence in adults. Cochrane Database Syst Rev 2015; :CD003505.
12. Brown HW, Braun EJ, Wise ME, et al. Small-Group, Community-Member Intervention for Urinary and Bowel Incontinence: A Randomized Controlled Trial. Obstet Gynecol 2019; 134:600.
13. Wood LN, Anger JT. Urinary incontinence in women. BMJ 2014; 349:g4531.
14. Dallosso HM, McGrother CW, Matthews RJ, et al. The association of diet and other lifestyle factors with overactive bladder and stress incontinence: a longitudinal study in women. BJU Int 2003; 92:69.
15. Tähtinen RM, Auvinen A, Cartwright R, et al. Smoking and bladder symptoms in women. Obstet Gynecol 2011; 118:643.
16. Culbertson S, Davis AM. Nonsurgical Management of Urinary Incontinence in Women. JAMA 2017; 317:79.
17. Pelvic floor muscle training: a practical guide. British Medical Journal. BMJ 2022; 327: 3070186. Sept 2022. https://www.bmj.com/content/378/bmj-2022-070186 (Accessed on September 15, 2022).
18. Hay-Smith J, Berghmans BK, et al. Adult conservative management. In: Incontinence, 4th Ed., Abrams P, Cardozo L, Khoury S, Wein A (Eds), Health Publications Ltd, Paris 2009. p.1025.

19. Buran G, Gerçek E. Current and Evidence-Based Practices in the Conservative Treatment of Urinary Incontinence in Women: A Literature Review. EGE HFD, 2019, 35 (3):155-161.
20. Nambiar AK, Bosch R, Cruz, F, Lemack GE, Thiruchelvam, N, Tubaro A, et al. Guidelines on Assessment and Nonsurgical Management of Urinary Incontinence. European urology 2018; 73(4): 596-609.
21. Collins B, & Bradshaw E. Optimising Pouch Function Using Biofeedback. in the Ileoanal Pouch Springer, Cham 2019: 153-9.
22. Sharifi-Rad L, Ladi-Seyedian S.S, Manouchehri N, Alimadadi H, Allahverdi B, Motamed F, & Fallahi, G. H. Effects of Interferential Electrical Stimulation Plus Pelvic Floor Muscles Exercises on Functional Constipation in Children: A Randomized Clinical Trial. The American journal of Gastroenterology 2018; 113 (2):295.
23. Christmas MM, Iyer S, Daisy C, et al. Menopause hormone therapy and urinary symptoms: a systematic review. Menopause 2023; 30:672.
24. Balk E, Adam GP, Kimmel H et al. Nonsurgical treatments for urinary incontinence in women: a systematic review update. 2018. Available from: https://www.ncbi.nlm.nih.gov/books/NBK534625/
25. Denisenko AA, Clark CB, D'Amico M, Murphy AM. Evaluation and management of female urinary incontinence. Can J Urol 2021; 28 (Suppl 2): 27-32.
26. Chapple CR, Khullar V, Gabriel Z, Muston D, Bitoun CE, Weinstein D. The effects of antimuscarinic treatments in overactive bladder: an update of a systematic review and meta-analysis. Eur Urol 2008; 54(3): 543-562.
27. Madhuvrata P, Cody JD, Ellis G, Herbison GP, Hay-Smith EJ. Which anticholinergic drug for overactive bladder symptoms in adults. Cochrane Database Syst Rev 2012;1:CD005429.
28. Huang CK, Lin CC, Lin AT. Effectiveness of antimuscarinics and a beta-3 adrenoceptor agonist in patients with overactive bladder in a real-world setting. Sci Rep 2020;10 (1):11355.
29. Chapple CR, Cardozo L, Nitti VW, Siddiqui E, Michel MC. Mirabegron in overactive bladder: a review of efficacy, safety, and tolerability. Neurourol Urodyn 2014; 33(1):17-30.
30. Staskin D, Frankel J, Varano S, Shortino D, Jankowich R, Mudd PN Jr. International phase III, randomized, double-blind, placebo and active controlled study to evaluate

the safety and efficacy of vibegron in patients with symptoms of overactive bladder: EMPOWUR. J Urol 2020;204(2):316-324.

31. Gaziev G, Topazio L, Iacovelli V et al. Percutaneous tibial nerve stimulation (PTNS) efficacy in the treatment of lower urinary tract dysfunctions: a systematic review. BMC Urol 2013;13:61
32. Yang L, Wang Y, Mo Q, Liu Z. A comparative study of electroacupuncture at Zhongliao (BL33) and other acupoints for overactive bladder symptoms. Front Med. (2017) 11:129–36. doi: 10.1007/s11684-016-0491-6
33. DeMaagd GA, Davenport TC. Management of urinary incontinence. Pharm Therap. 2012;37:345–361.
34. Richter HE, Burgio KL, Brubaker L, et al. Continence pessary compared with behavioral therapy or combined therapy for stress incontinence: a randomized controlled trial. Obstet Gynecol. 2010;115:609–617
35. Bettez M, Tu LM, Carlson K, Corcos J, Jolivet M, Bailley G. 2012 Update: guidelines for adult urinary incontinence collaborative consensus document for the Canadian Urological Association. Can Urol Assoc J. 2012;6:354–363
36. Ghadeer Al-Shaikh, Sadiqa Syed, Somaia Osman, Abdulrahman Bogis, Ahmed Al-Badr. Pessary use in stress urinary incontinence: a review of advantages, complications, patient satisfaction, and quality of life. Int J Womens Health. 2018; 10: 195–201.
37. Meyer I, Richter H. Challenges and New Insights in the Management of Urinary Incontinence in Older Women. Current Geriatrics Reports 2022 11 (1)
38. Braga A, Caccia G, Papadia A, Treglia G, Castronovo F, Salvatore S, Torella M, Ghezzi F, Serati M. Urethral bulking agents for the treatment of recurrent stress urinary incontinence: A systematic review and meta-analysis. Maturitas. 2022 Sep;163:28-37.
39. Itkonen Freitas AM, Mikkola TS, Rahkola-Soisalo P, et al. Quality of life and sexual function after TVT surgery versus Bulkamid injection for primary stress urinary incontinence: 1 year results from a randomized clinical trial. Int Urogynecol J 2021; 32:595.
40. Mangır N, Uçar M, Gülpınar Ö, Özkürkçügil C, Demirkesen O, Tarcan T. Duloxetine in the Treatment of Women with Urinary Incontinence: A Systematic Review and Meta-analysis of Efficacy Data from Randomized Controlled Clinical Trials. J Urol Surg, 2023;10(1):1-8

41. Spielmans GI, Spence-Sing T, Parry P. Duty to Warn: Antidepressant Black Box Suicidality Warning Is Empirically Justified. Front Psychiatry 2020;11:18.
42. National Institute for Clinical and Health Excellence. Urinary incontinence: the management of urinary incontinence in women. Clinical guidelines CG171. NICE website. Accessed at http://guidance.nice.org.uk/CK171
43. Thüroff JW, Abrams P, Andersson KE, Artibani W, Chapple CR, Drake MJ, et al. EAU guidelines on urinary incontinence. Eur Urol. 2011 Mar;59(3):387-400.
44. Nikolaus Veit-Rubin, Jean Dubuisson, Abigail Ford, Jean-Bernard Dubuisson, Sherif Mourad, Alex Digesu, Burch Colposuspension. Neurourol Urodyn. 2019 Feb; 38(2): 553–562.
45. Mangir N, Aldemir Dikici B, Chapple CR, MacNeil S. Landmarks in vaginal mesh development: polypropylene mesh for treatment of SUI and POP. Nat Rev Urol 2019;16:675-689.
46. Ulmsten U, Henriksson L, Johnson P, Varhos G. An ambulatory surgical procedure under local anaesthesia for treatment of female urinary incontinence. Int Urogynecol J 1996;7:81-6.
47. Delorme E. Transobturator urethral suspension: mini-invasive procedure in the treatment of stress urinary incontinence in women. Prog Urol 2001;6:1306-13.
48. Kennelly M, Moore R, Keil K, Nguyen J, Lukban J (2008) Short-term assessment of MiniArc (TM) sling for the treatment of female stress urinary incontinence. Int Urogynecol J 19:S24–S24
49. Stewart F, Berghmans B, Bø K, Glazener CM. Electrical stimulation with non-implanted devices for stress urinary incontinence in women. Cochrane Database Syst Rev 2017; 12:CD012390.
50. Sun K, Zhang D, Wu G, et al. Efficacy of magnetic stimulation for female stress urinary incontinence: a meta-analysis. Ther Adv Urol 2021; 13:17562872211032485.
51. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Gynecology. Female Sexual Dysfunction: ACOG Practice Bulletin Clinical Management Guidelines for Obstetrician-Gynecologists, Number 213. Obstet Gynecol 2019; 134:e1.

PHARMACOLOGICAL TREATMENT OF OVERACTIVE BLADDER



Op. Dr. Ayşe Deniz Ertürk Coşkun

University of Health Sciences, Haydarpaşa Numune Training and Research Hospital, Department of Obstetrics and Gynecology

---

A functional bladder should be an organ that can store urine and voluntarily contract to empty under appropriate conditions. During filling, the bladder should act as a reservoir with low internal pressure. As the bladder fills at physiological rates, it should expand like an elastic

balloon while trying to keep intravesical and detrusor pressures stable. The sensation of needing to urinate during the bladder filling phase should correspond to the amount of urine. Most women first feel their bladder filling at 75-150 ml, feel the urge to urinate at 300-400 ml, and experience a strong urge to urinate at 400-700 ml (1).

In the syndrome of Overactive Bladder (OAB), which is a disruption of this physiological process, one of the common symptoms in women is a sudden and strong urge to urinate. This sudden urgency can be felt when the bladder is full or not yet completely full. As a result of this feeling, urinary incontinence may or may not occur. Another symptom, known as frequency, is urinating more often than usual. These symptoms may be accompanied by nocturia, which is the need to urinate at night. These symptoms can be caused by involuntary contractions of the detrusor muscle. These contractions, which can be observed during the filling phase in urodynamics and may or may not cause symptoms at that moment, are defined as detrusor overactivity. Detrusor overactivity is not a requirement for diagnosing OAB. The diagnosis is made by symptom inquiry, which is why different figures are reported regarding its prevalence in women, ranging from 7% to 43% (2,3). Considering that its prevalence increases with age and that one-third of those with OAB symptoms also experience urinary incontinence, the extent of the affected population can be seen. OAB ranks high among the most common chronic diseases and also places a significant economic burden on the healthcare system when considering the resources used for its treatment.

In women with overactive bladder symptoms, other conditions that may cause bladder irritation, such as infections, stones, or tumors, should first be ruled out. The next initial step includes lifestyle changes such as losing weight, quitting smoking, avoiding foods that irritate the bladder, and preventing constipation, as well as behavioral therapies including pelvic floor muscle exercises and bladder training. If the effect on improving quality of life is not satisfactory with these methods, medical treatment options may be considered.

To understand overactive bladder and its pharmacological treatment, it is appropriate to review the neurophysiology of the bladder and urination. The autonomic part of innervation consists of sympathetic and parasympathetic parts. Sympathetic nerves provide bladder relaxation, while parasympathetic nerves provide bladder contraction. Sympathetic nerves exit the spinal cord at the T10-L2 levels. Noradrenaline, the neurotransmitter of the sympathetic system, binds to α and β adrenergic receptors, and then postganglionic fibers travel to the bladder via the hypogastric nerve. When noradrenaline binds to the β-receptors on the bladder, it relaxes the detrusor muscle of the bladder. Parasympathetic nerves, which are effective in

bladder contraction, exit the spinal cord at the S2-S4 levels. The parasympathetic system uses acetylcholine as a neurotransmitter. Acetylcholine binds to muscarinic receptors in target organs. Of the five known types of muscarinic receptors in the bladder, the M2 and M3 subtypes are predominant. About 80% of the muscarinic receptors in the bladder are M2 receptors, and when activated, they inhibit the relaxation caused by the sympathetic system. The remaining 20% of muscarinic bladder receptors, which are M3 receptors, cause detrusor muscle contraction (4).

Antimuscarinic drugs have been used for a long time in the medical treatment of overactive bladder. In recent years, β3 adrenergic agonists have also been used in treatment, either alone or in combination with antimuscarinics.

Anticholinergic Treatment

Antimuscarinics work by preventing acetylcholine from binding to the muscarinic receptors mentioned above. They prevent bladder contraction, reduce the sensation of urination, and increase bladder capacity. However, these receptors are found not only in the lower urinary system but also in other parts of the body such as the salivary glands, parotid gland, gastrointestinal system, heart, eyes, and brain. Therefore, each group of these drugs has different rates of systemic side effects. A total of seven different antimuscarinic drug groups are used in treatment, including Oxybutynin, Tolterodine, Darifenacin, Fesoterodine, Solifenacin, Trospium, and Propiverine.

The oldest of these in use is Oxybutynin. It is partially selective for M3 receptors, which reduce bladder contractions, and can bind to muscarinic receptors in other organs, especially the parotid gland. Therefore, it has side effects such as dry mouth, constipation, gastrointestinal discomfort, blurred vision, dizziness, and cognitive impairment. This relatively economical agent, which has been on the market for a longer time, is offered as a first-choice treatment by the insurance system in some countries and occasionally in our country. Its long-acting form, which has less gastric absorption, reduces the active metabolite formed by the liver's first-pass effect, and its transdermal adhesive form completely eliminates this active metabolite, thereby reducing side effects to some extent.

Tolterodine is the longest-used antimuscarinic among its class. It is not selective for any muscarinic receptor. Similar side effects are observed, though less so in its extended-release form. Darifenacin is a highly selective antimuscarinic for M3 receptors, making it safer in

terms of central nervous system and cardiac side effects. Solifenacin is also an M3 selective antimuscarinic. Fesoterodine is a competitive non-selective antimuscarinic with similar properties to tolterodine. Trospium is a quaternary amine with some antimuscarinic activity. Its passage through the blood-brain barrier to the CNS is limited, making it preferable for use in elderly patients or those with cognitive impairments due to fewer CNS side effects (5). Propiverine is both an antimuscarinic and a calcium channel blocker. It is not selective for the bladder, and similar antimuscarinic side effects may occur. According to a 2023 Cochrane review examining studies comparing antimuscarinics with placebo, the use of antimuscarinic drugs by individuals with overactive bladder syndrome leads to improvements in symptoms and quality of life compared to placebo treatment. However, side effects are more common with all antimuscarinics compared to placebo, and discontinuation due to side effects is higher with all antimuscarinics except tolterodine (6). Due to the lack of significant differences in efficacy among antimuscarinic drugs, treatment choice can be based on side effects and economic resources.

The most common side effect leading to discontinuation of treatment is dry mouth (7). Long-acting forms may be preferred for their side effect profile and ease of use. Short-acting forms may be preferred only if symptom reduction is needed on specific occasions. Other common antimuscarinic side effects include constipation, dry eyes, blurred vision, tachycardia, drowsiness, and cognitive impairment. These drugs are contraindicated in patients with uncontrolled tachyarrhythmias, myasthenia gravis, gastric retention, urinary retention, and narrow-angle glaucoma. They should not be preferred in the elderly or those with existing cognitive issues due to potential cumulative effects on cognitive functions (8). If cognitive impairment is a primary concern, Trospium and Darifenacin, which do not cross the blood-brain barrier, may be preferred (9). The unclear long-term effects of antimuscarinics on cognitive load, especially in the elderly, have led to increased use of beta-adrenergic agonists in recent years.

Beta-3 Adrenergic Agonists

Mirabegron and Vibegron act by stimulating β-3 receptors, which predominantly receive sympathetic signals in the bladder, leading to smooth muscle relaxation. Initially recommended for patients unresponsive to antimuscarinics due to their relatively recent introduction, they are now included in guidelines for first-line treatment (10). Due to their adrenergic effects, they lack antimuscarinic side effects. They may be preferred for similar

efficacy and fewer side effects (11,12). Being newer preparations, their costs are relatively high. Possible side effects include headache, nasal congestion, and gastrointestinal complaints. Patients with uncontrolled hypertension should not use Mirabegron. While hypertension can occur during treatment with Mirabegron, it is not commonly seen with Vibegron (13).

If there is no response 4-6 weeks after starting treatment for OAB, and increasing the dose of the current agent is not possible, combination therapy may be considered. Antimuscarinics and beta agonists can be used together. The combination of two anticholinergics is not preferred due to increased side effects, but it may be considered in selected patients where beta agonists cannot be used. It should be noted that combination therapies may increase the risk of urinary retention.

When comparing all agents used in treatment, no single agent stands out in terms of efficacy. Therefore, considering potential short- and long-term side effects and contraindications, selecting the appropriate agent and form for the patient can enhance treatment adherence and success. The patient may continue treatment as long as they benefit and experience no side effects. If symptoms become bothersome again after a treatment break, treatment can be resumed.

References:

1. Walters, Mark D., and Mickey M. Karram. Urogynecology and reconstructive pelvic surgery. Elsevier Health Sciences, 2014.
2. Gormley, E. Ann, et al. "Diagnosis and treatment of overactive bladder (non-neurogenic) in adults: AUA/SUFU guideline." The Journal of urology 188.6S (2012): 2455-2463.
3. Haylen, Bernard T., et al. "An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic organ prolapse (POP)." Neurourology and urodynamics 35.2 (2016): 137-168.
4. Giglio, Daniel, and Gunnar Tobin. "Muscarinic receptor subtypes in the lower urinary tract." Pharmacology 83.5 (2009): 259-269.
5. Coupland, Carol AC, et al. "Anticholinergic drug exposure and the risk of dementia: a nested case-control study." JAMA internal medicine 179.8 (2019): 1084-1093.

6. Still, M., Barron-Millar, E., Nabi, G., & Omar, M. I. (2023). Oral anticholinergic drugs versus placebo or no treatment for managing overactive bladder syndrome in adults. Cochrane Database of Systematic Reviews, (5).
7. Gopal, Manish, et al. "Discontinuation rates of anticholinergic medications used for the treatment of lower urinary tract symptoms." Obstetrics & Gynecology 112.6 (2008): 1311-1318.
8. UPDATE, AUGS. "Clinical Consensus Statement: Association of Anticholinergic Medication Use and Cognition in Women With Overactive Bladder." (2021).
9. Callegari, Ernesto, et al. "A comprehensive non-clinical evaluation of the CNS penetration potential of antimuscarinic agents for the treatment of overactive bladder." British journal of clinical pharmacology 72.2 (2011): 235-246.
10. Farag, F., Sakalis, V. I., Arteaga, S. M., Sihra, N., Karavitakis, M., Arlandis, S., ...&Nambiar, A. K. (2023). What Are the Short-term Benefits and Potential Harms of Therapeutic Modalities for the Management of Overactive Bladder Syndrome in Women? A Review of Evidence Under the Auspices of the European Association of Urology, Female Non-neurogenic Lower Urinary Tract Symptoms Guidelines Panel. European Urology.
11. Chapple, Christopher R., et al. "Safety and efficacy of mirabegron: analysis of a large integrated clinical trial database of patients with overactive bladder receiving mirabegron, antimuscarinics, or placebo." European urology 77.1 (2020): 119-128
12. Athanasiou, Stavros, et al. "Mirabegron in female patients with overactive bladder syndrome: what's new? A systematic review and meta-analysis." European Journal of Obstetrics & Gynecology and Reproductive Biology 251 (2020): 73-82.
13. Wagg, Adrian, et al. "The efficacy and tolerability of the β3-adrenoceptor agonist mirabegron for the treatment of symptoms of overactive bladder in older patients." Age and ageing 43.5 (2014): 666-675.

MIDURETHRAL SLING SURGERY



Prof. Dr. Fisun VURAL

University of Health Sciences, Haydarpaşa Numune Training and Research Hospital, Department of Obstetrics and Gynecology

Urinary incontinence is a condition seen in one-third of women in the reproductive age group, and approximately 50% of these cases are stress urinary incontinence. (1) The first-line treatment for stress urinary incontinence is conservative treatments. These treatments include lifestyle changes, fluid restriction, caffeine restriction, smoking cessation, treatment of constipation, scheduled voiding, weight loss, pelvic physiotherapy, and pessary applications. (2) Surgical treatment is recommended for cases with stress incontinence or stress-predominant mixed incontinence that do not respond to conservative treatment or have severe urinary leakage affecting social life.

The pathophysiology of incontinence was first explained by Bonney in 1923 as a lack of anatomical support. This topic was neglected for many years. In 1961, Enhörning reported that urethral pressure increased with both rest and increased intra-abdominal pressure. (3) Ensuring adequate pressure transmission to the urethra when intra-abdominal pressure increases is extremely important for maintaining urinary continence. In anatomical changes at the bladder neck, such as pelvic organ prolapse, this transmission is disrupted, and incontinence occurs. Surgical procedures aimed at treating stress urinary incontinence aim to support the bladder neck and increase bladder outlet resistance. (4,5)

There are about 200 different types of operations related to incontinence surgery in the literature. Many of these have lost popularity today (Paravaginal defect repair, Kelly plication, Raz, Stamey, Gittes procedures, Marshall-Marchetti-Krantz operation, etc.). (6) For many years, Burch colposuspension was applied worldwide as the gold standard treatment. After the acceptance of the integral theory proposed by Petros and Ulmsten, which suggested that urethral closure occurs at the midurethra rather than the bladder neck, midurethral sling surgeries were developed. (7)

In 1996, Ulmsten first performed the tension-free vaginal tape (TVT) operation. (8) In TVT, a trocar is inserted bilaterally from the paraurethral area, passing through the urogenital diaphragm, Retzius space, rectus muscle, and anterior abdominal fascia, and exits the skin just above the symphysis, allowing the mesh to be passed through. Thus, the paraurethral tissues are supported all around (Figure 1). Cystoscopy is always performed during the procedure due to the risk of bladder injury.

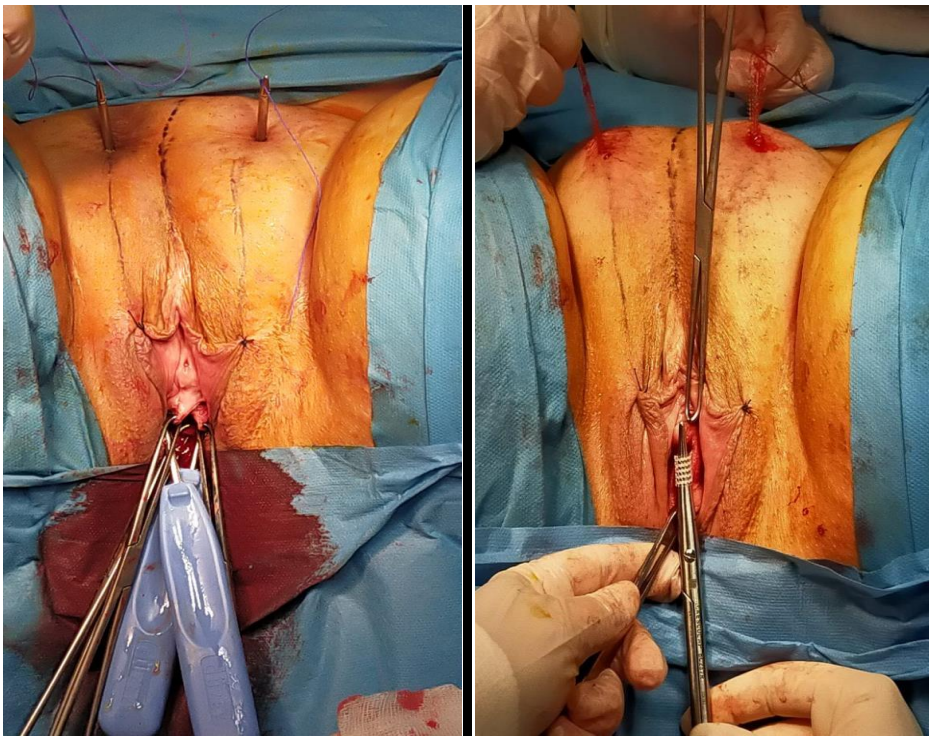


Figure 1 (from the archive of Haydarpaşa Numune Women's Health Clinic): TVT operation. Vertical lines are drawn 2 cm away from the bilateral clitoral plane, with one from the clitoris, marking the points to exit just above the symphysis. The urogenital diaphragm, Retzius, and anterior abdominal fascia are passed with a trocar specific to TVT. The bladder is simultaneously checked with cystoscopy.

TVT surgery has been accepted with a cure rate of around 85% and ease of application. However, the method's disadvantages include complications such as bladder, bowel, and serious vascular injuries during the procedure. Therefore, the search for surgical procedures with the same effectiveness but fewer complications gained significant attention with Delorme's introduction of the transobturator tape operation (TOT) in 2001. (9) Delorme minimized the risk of bladder and bowel injury by passing the mesh arms through the obturator foramen while providing paraurethral support (Figure 2).

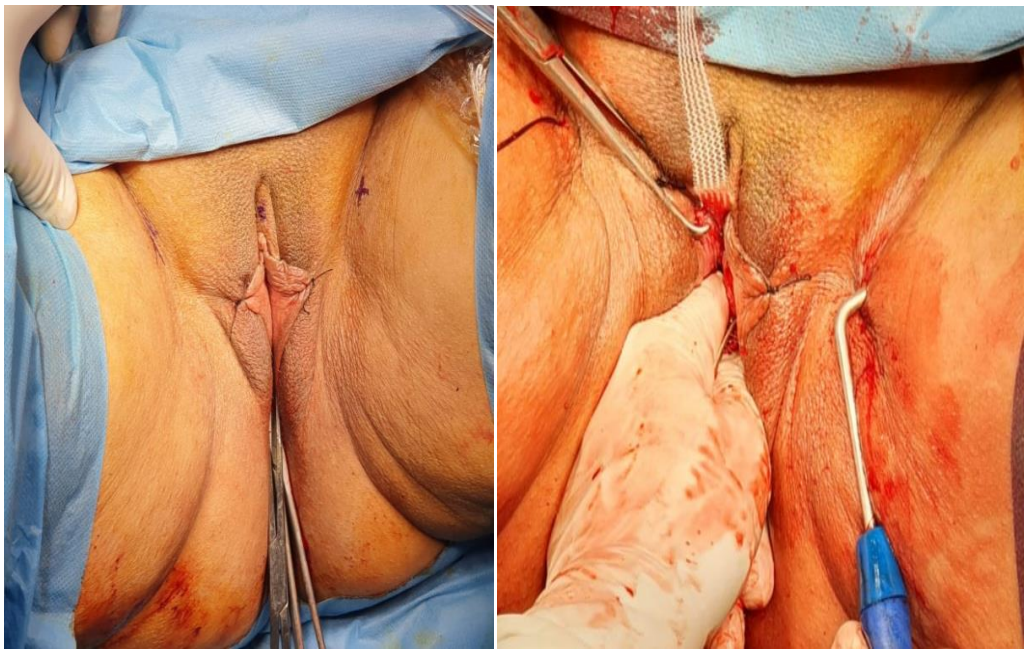


Figure 2 (from the archive of Haydarpaşa Numune Women's Health Clinic). TOT operation. The incision site is marked 1.5 cm lateral to the ischiopubic ramus, lateral to the labia majora passing through the clitoral line. The trocar specific to the TOT operation is passed from outside to inside at a 45-degree angle.

TOT was initially applied from outside to inside, but to reduce complication rates, it was modified by "de Laval." In the modified technique, the needle is used from inside to outside, and this method is called tension-free vaginal tape obturator route (TVT-O). (10) In 2006, minisling procedures were introduced into the literature. (11) They are placed through a single vaginal incision, and the mesh is fixed to the pelvic wall tissue with special handles without passing through the retropubic space or obturator foramen.

Complications

Complications related to midurethral sling operations should be examined in three parts: perioperative, early postoperative, and late postoperative. Perioperative complications include injuries to the bladder, vagina, bowel, vessels, and nerves. In the early postoperative period, hematoma, infection, or urinary retention may occur. In the late period, mesh erosion, groin pain, and de novo urgency may develop. (12) The surgeon performing the sling operation must be aware of potential complications and how to manage them.

Among intraoperative complications, bladder perforation is most commonly seen in TVT cases (0.8-21%). The wide range of bladder perforation rates in TVT cases is related to the surgeon's experience. During TOT surgery, bladder perforation is rare (0.5%), and this complication is more likely to occur in cases with previous surgery or concurrent pelvic organ prolapse (13,14). In the event of bladder perforation, bladder catheterization for about 7 days is sufficient.

One of the early postoperative complications is urinary retention. The primary cause is the tension of the sling. However, it should be kept in mind that urinary retention may occur due to pain and edema in the first postoperative days. In such cases, catheterization for 7-10 days is recommended if necessary. If the condition does not improve, the mesh should be loosened. Loosening can be performed within the first 10-14 days post-surgery, as fibrosis will develop afterward, making it impossible. In cases with long-term urinary retention or residual urine over 150 ml, surgical lysis is recommended (15).

In a 10-year follow-up, vaginal extrusion may occur in 5% of patients, but most of these cases are asymptomatic. Symptoms of vaginal extrusion may include dyspareunia, hispareunia (discomfort in the partner), palpable band in the vagina, pain, and vaginal bleeding-discharge. If the mesh erosion area is small, and there is no infection or symptoms, the patient can be followed up with local estrogen. The aim is to allow for vaginal epithelialization. Coitus is prohibited for 6 weeks, and local estrogen is used. In persistent cases, mesh removal is necessary (12,16). The mesh segment at the erosion site can be focally resected, or complete resection can be performed. In the case of segmental resection, continence can be maintained (17).

Post-surgery, 'de novo urgency' may develop. De novo urgency occurs at similar rates in both TVT and TOT cases (8%). This condition may be due to mixed-type urinary incontinence, mesh erosion, bladder outlet obstruction, atrophic vaginitis, or urinary tract infection. In cases with mesh erosion and bladder outlet obstruction, mesh excision should be performed. After ruling out possible conditions, anticholinergic treatment is added if necessary (18). Groin pain is a condition observed after TOT surgery (5-26%). This condition usually resolves spontaneously within a few months (19).

Discussion

Historically, Burch colposuspension was once the most popular surgery, but midurethral slings have risen to the forefront due to their short operation times and minimally

invasive nature. Over the past 25 years, midurethral sling surgery has become the most performed stress incontinence surgery due to its ease of application, low complication rates, short recovery time, and high success rates. However, the use of mesh and the complications associated with it remain topics of debate.

In the European Association of Urology (EAU) guidelines, the highest success rates were reported for traditional sling surgeries (89.4%), retropubic MUS surgeries (89.1%), open colposuspension (76.7%), TOT surgeries (64.1%), laparoscopic colposuspension (48.9%), single incision sling (SIS) surgery (39.8%), bladder neck needle suspension (26.9%), with the lowest rate for anterior vaginal repair (12.5%) (20). Despite varying success rates, the choice of surgery depends on many factors such as whether the patient has accompanying apical prolapse, previous incontinence surgery, concurrent operations, the patient's comorbid conditions, and the preferences of the patient and surgeon.

In a meta-analysis by Fusco et al. involving 15,855 patients, the results of TOT, TVT, and Burch Colposuspension were compared. The current analysis confirms the superiority of midurethral sling operations over Burch colposuspension (21). However, it should be remembered that Burch colposuspension is a good surgical option, especially in cases where abdominal surgery is already being performed. Additionally, in cases where recurrent surgery is required after a failed midurethral sling, Burch colposuspension is a good surgical option.

In cases of intrinsic sphincter deficiency with severe incontinence, TVT surgery should be preferred. Otherwise, the choice between TVT or TOT should be based on the surgeon's experience and the patient. In the Cochrane meta-analysis comparing TVT and TOT, the success rates for the first 5 years were found to be similar. TVT success was reported as 87.2%, and for TOT, it was 85.7% (22). In the meta-analysis by Fusco et al., TVT was found to be slightly more successful than TOT, but increased intraoperative complications and lower urinary tract voiding problems were reported with TVT (21).

Studies on minisling show that they are quite successful in the short term. In a Cochrane meta-analysis including 62 studies with 8,051 patients, the 12-month treatment outcomes of minisling were found to be similar to TOT and TVT (23). Although minisling is seen as a good option for the surgical treatment of stress urinary incontinence, long-term safety studies are needed.

In conclusion, midurethral sling surgeries placed via retropubic or transobturator routes are minimally invasive surgeries with good subjective and objective improvement rates in the

treatment of stress urinary incontinence. Detailed information should be provided to patients about the use of mesh before surgery.

References

1. Botlero R, Urquhart DM, Davis SR, Bell RJ. Prevalence and incidence of urinary incontinence in women: review of the literature and investigation of methodological issues. Int J Urol 2008;15:230–4.
2. Carpenter DA, Visovsky C. Stress urinary incontinence: a review of treatment options. AORN J. 2010;91(4):471-8;
3. Enhorning G. Simultaneous recording of intravesical and intra-urethral pressure. A study on urethral closure in normal and stress incontinent women. Acta Chir Scand Suppl. 1961; 276:1–68.
4. Ulmsten U. Some reflections and hypotheses on the pathophysiology of female urinary incontinence. Acta Obstet Gynecol Scand Suppl. 1997; 166:3–8.
5. Cundiff GW. The pathophysiology of stress urinary incontinence: a historical perspective. Rev Urol. 2004; 6:10–18.
6. Veit-Rubin N, Dubuisson J, Ford A, Dubuisson JB, Mourad S, Digesu A. Burch colposuspension. Neurourol Urodyn. 2019;38(2):553-562.
7. Petros PE and Ulmsten UI. An integral theory of female urinary incontinence: experimental and clinical considerations. Acta Obstet Gynecol Scand 1997;166:3-8.
8. Ulmsten U, Henriksson L, Johnson P, Varhos G. An ambulatory surgical procedure under local anaesthesia for treatment of female urinary incontinence. Int Urogynecol J 1996;7:81-6.
9. Delorme E. Transobturator urethral suspension: mini-invasive procedure in the treatment of stress urinary incontinence in women. Prog Urol 2001;6:1306-13.
10. de Leval J. Novel surgical technique for the treatment of female stress urinary incontinence: transobturator vaginal tape inside-out. Eur Urol. 2003;44:724–30.
11. Kennelly M, Moore R, Keil K, Nguyen J, Lukban J. Short-term assessment of MiniArc (TM) sling for the treatment of female stress urinary incontinence. Int Urogynecol J. 2008;19:24.
12. Uğurlucan F, Ertürk E, Yaşa C. Complications of midurethral sling surgery. J Ist Faculty Med 2019;82(4):229-35

13. Linder BJ, Elliott DS Synthetic Midurethral Slings: Roles, Outcomes, and Complications. Urol Clin North Am. 2019;46(1):17-30.
14. McLennan MT, Melick CF. Bladder perforation during tension-free vaginal tape procedures: analysis of learning curve and risk factors. Obstet Gynecol 2005;106:1000–4.
15. Elliott CS, Comiter CV. Evaluation and management of urinary retention and voiding dysfunction after sling surgery for female stress urinary incontinence. Curr Bladder Dysfunct Rep 2012;7:268-74.
16. Zambon JP, Badlani GH Vaginal Mesh Exposure Presentation, Evaluation, and Management. Curr Urol Rep. 2016;17(9):65
17. Doyle PJ, Grimes CL, Balk EM, Wieslander C, Richardson M, Mamik MM, Sleemi A, Alas A, Kudish B, Walter AJ, Aschkenazi S, Mama S, Foda M, Meriwether KV. Surgical Removal of Midurethral Sling in Women Undergoing Surgery for Presumed Mesh-Related Complications: A Systematic Review. Obstet Gynecol. 2022;139(2):277
18. Abraham N, Vasavada S Urgency after a sling: review of the management. .Curr Urol Rep. 2014;15(4):400
19. Duckett J, Baranowski A. Pain after suburethral sling insertion for urinary stress incontinence. Int Urogynecol J. 2013;24(2):195-201.
20. Nambiar A.K., Arlandis S., Bø K., Cobussen-Boekhorst H., Costantini E., de Heide M., et al.: European Association of Urology guidelines on the diagnosis and management of female non-neurogenic lower urinary tract symptoms. Part 1: diagnostics, overactive bladder, stress urinary incontinence, and mixed urinary incontinence. Eur Urol. 2022; 82(49-59)
21. Fusco F, Abdel-Fattah M, Chapple CR, Creta M, La Falce S, Waltregny D, Novara G Updated Systematic Review and Meta-analysis of the Comparative Data on Colposuspensions, Pubovaginal Slings, and Midurethral Tapes in the Surgical Treatment of Female Stress Urinary Incontinence. Eur Urol. 2017;72(4):567-591.
22. Ford AA, Rogerson L, Cody JD, Aluko P, Ogah JA Mid-urethral sling operations for stress urinary incontinence in women..Cochrane Database Syst Rev. 2017 31;7(7):CD006375
23. Emily Carter, Eugenie E Johnson, Madeleine Still, Aalya S Al-Assaf, Andrew Bryant, Patricia Aluko, Stephen T Jeffery, Arjun Nambiar. Single-incision sling operations for urinary incontinence in women. Cochrane Database Syst Rev 2023;10(10):CD008709.

LITERATURE CORNER



Translation: Dr. Sena DURAN

University of Health Sciences, Haydarpaşa Numune Training and Research Hospital

Department of Obstetrics and Gynaecology

-Prophylactic Antibiotics Used to Prevent Infection After Incontinence Surgery in Women with Stress Incontinence

-Single Incision Sling Operations for Urinary Incontinence in Women.

-Long-Term Safety of Synthetic Mid-Urethral Sling Implantation: A Systematic Review for the Treatment of Stress Urinary Incontinence in Adult Women

-A Systematic Review and Meta-Analysis Comparing Adjustable Slings with Other Surgical Methods

-Comparison of Bulking Agents and Surgical Methods in Women with Stress Urinary Incontinence in Terms of Efficacy and Safety: A Systematic Review and Meta-Analysis

-Treatment of Female Stress Urinary Incontinence Using Transobturator Tape (TOT), Tension-Free Vaginal Tape (TVT), and Transvaginal Tension-Free Vaginal Tape-Obturator (TVT-O): A Systematic Review and Meta-Analysis

---

Prophylactic Antibiotics Used to Prevent Infection After Incontinence Surgery in Women with Stress Incontinence

Cochrane Database SystRev. 2022; 2022(3): CD012457.

Introduction: Surgical options for the treatment of stress urinary incontinence (SUI) are generally considered after conservative interventions have failed. Surgical procedures are typically divided into two categories: traditional techniques (open surgery) and minimally invasive procedures, such as laparoscopic operations, mid-urethral sling, and injections with urethral bulking agents. Postoperative infections, such as surgical site or urinary tract infections, are common complications. Prophylactic antibiotics may be administered preoperatively or intraoperatively to minimize the risk of postoperative bacterial infections.

Objective: To evaluate the effects of prophylactic antibiotics in preventing infection after incontinence surgery in women with stress urinary incontinence.

Methods: We searched the Cochrane Incontinence Specialised Register, which includes trials identified from CENTRAL, MEDLINE, MEDLINE In-Process, MEDLINE EpubAhead of Print, CINAHL, ClinicalTrials.gov, and WHO ICTRP. We also hand-searched journals and conference proceedings up to 18 March 2021. Additionally, we reviewed the reference lists of relevant articles.

Selection criteria: We included randomized controlled trials (RCTs) and quasi-randomized controlled trials evaluating prophylactic antibiotics in women undergoing incontinence surgery for the treatment of stress urinary incontinence.

Data collection and analysis: Two review authors independently selected potentially eligible trials, extracted data, and assessed the risk of bias. We expressed results as risk ratios (RR) for dichotomous outcomes and mean differences (MD) for continuous outcomes, both with 95% confidence intervals. We assessed the certainty of the evidence using the GRADE approach.

Results: We identified one quasi-randomized controlled trial and two randomized controlled trials, including a total of 390 women. One study performed retropubic urethropexy surgery requiring a transverse suprapubic incision, while the other two studies conducted mid-urethral sling surgery. It should be noted that none of the included studies clearly specified the timing of outcome assessment.

The effect of prophylactic antibiotics (cefazolin) on surgical site infections is uncertain (RR 0.56, 95% CI 0.03 to 12.35; 2 studies, 85 women; very low-certainty evidence). Similarly, the effect of prophylactic antibiotics (cefazolin) on urinary tract infections or bacteriuria is uncertain (RR 0.84, 95% CI 0.05 to 13.24; 2 studies, 85 women; very low-certainty evidence). The effect of prophylactic antibiotics (cefazolin) on febrile morbidity is also uncertain (RR 0.08, 95% CI 0.00 to 1.29; 2 studies, 85 women; very low-certainty evidence). The effect of prophylactic antibiotics (cefazolin) on mesh exposure is uncertain (RR 0.32, 95% CI 0.01 to 7.61; 1 study, 59 women; very low-certainty evidence). None of the three studies reviewed reported adverse effects related to antibiotic use, sepsis, or bacteremia.

Discussion: The data from the three included studies are limited, and overall, the certainty of the evidence is very low. Additionally, the three studies evaluate different surgical procedures and antibiotic dosages.

In conclusion, there is insufficient evidence to support or refute the use of prophylactic antibiotics to prevent infection following incontinence surgery. Furthermore, there is no data on the adverse effects of prophylactic antibiotics. More randomized controlled trials are needed.

Single-Incision Sling Operations for Urinary Incontinence in Women

Cochrane Database SystRev. 2023, 27;10(10):CD008709. DOI: 10.1002/14651858.CD008709.pub4

Summary

Introduction: Stress urinary incontinence imposes a significant health and economic burden on individuals and society. Single-incision slings are a minimally invasive treatment option for stress urinary incontinence. They involve the passage of a short synthetic device through the anterior vaginal wall to support the mid-urethra. The use of polypropylene mesh in urogynecology, including mid-urethral slings, has been restricted in many countries. This is an update of a review (previous search date 2012).

Objectives: To evaluate the effects of single-incision sling operations in the treatment of urinary incontinence in women and to summarize the main findings of related economic evaluations.

Methods: We searched the Cochrane Incontinence Specialised Register, which includes trials identified from CENTRAL, MEDLINE, MEDLINE In-Process, MEDLINE EpubAhead of Print, and two trial registers. We also hand-searched journals, conference proceedings, and reference lists of relevant articles up to 20 September 2022.

Selection criteria: We included randomized or quasi-randomized controlled trials with at least one trial arm involving a single-incision sling in women with stress or predominantly stress mixed urinary incontinence.

Data collection and analysis: We used standard Cochrane methodological procedures. The primary outcome was subjective improvement and cure of urinary incontinence.

Conclusion: In this review, we included 62 studies involving a total of 8051 women. We did not identify any studies comparing single-incision slings with no treatment, conservative treatment, colposuspension, or laparoscopic procedures. Most studies were assessed as having a low or unclear risk of bias, while five studies were identified as having a high risk of bias in outcome assessment. Sixteen trials used the single-incision sling TVT-Secur, which was withdrawn from the market in 2013. The main analysis in this review does not include trials using TVT-Secur. We report separate analyses for these trials, which do not significantly alter the effect estimates. We identified two cost-effectiveness analyses and one cost-minimization analysis. One study (70 women) compared single-incision slings with autologous fascial sling. It is unclear whether single-incision slings have any effect on the risk of dyspareunia (painful intercourse) or mesh exposure, extrusion, or erosion compared to autologous fascial slings. For this comparison, subjective improvement or cure of incontinence at 12 months, patient-reported pain beyond 24 months, the number of women with urinary retention, quality of life at 12 months, and the number of women requiring repeat incontinence surgery or sling revision were not reported. There are 10 studies comparing single-incision slings with retropubic slings. There may be little or no difference in subjective improvement or cure of incontinence at 12 months between single-incision slings and retropubic slings (risk ratio (RR) 0.99, 95% confidence interval (CI) 0.91 to 1.07; 2 trials, 297 women; low-certainty evidence). It is unclear whether single-incision slings increase the risk of

mesh exposure, extrusion, or erosion compared to retropubic minimally invasive slings; the wide confidence interval is compatible with both benefit and harm (RR 1.55, 95% CI 0.24 to 9.82; 3 trials, 267 women; low-certainty evidence). There is uncertainty in determining the number of women experiencing postoperative urinary retention with single-incision slings compared to retropubic slings; the wide confidence interval is compatible with possible benefit and harm (RR 0.47, 95% CI 0.12 to 1.84; 2 trials, 209 women; low-certainty evidence). The risk of repeat incontinence surgery or mesh revision with single-incision slings compared to retropubic slings is uncertain (RR 4.19, 95% CI 0.31 to 57.28; 2 trials, 182 women; very low-certainty evidence). One study reported quality of life, but not in a suitable format. The number of women with patient-reported pain beyond 24 months and those experiencing dyspareunia were not reported for this comparison. We downgraded the evidence due to concerns about risk of bias, imprecision, and inconsistency. There are 50 studies comparing single-incision slings with transobturator slings. The evidence ranges from high to low certainty. There is no evidence of a difference in subjective improvement or cure of incontinence at 12 months between single-incision slings and transobturator slings (RR 1.00, 95% CI 0.97 to 1.03; 17 trials, 2359 women; high-certainty evidence). Single-incision slings may reduce the risk of patient-reported pain at 24 months post-surgery compared to transobturator slings (RR 0.12, 95% CI 0.02 to 0.68; 2 trials, 250 women; moderate-certainty evidence). The effect of single-incision slings on the risk of dyspareunia compared to transobturator slings is unclear, as the wide confidence interval is compatible with possible benefit and harm (RR 0.78, 95% CI 0.41 to 1.48; 8 trials, 810 women; moderate-certainty evidence). There appears to be a similar number of cases of mesh exposure, extrusion, or erosion with single-incision slings compared to transobturator slings (RR 0.61, 95% CI 0.39 to 0.96; 16 trials, 2378 women; high-certainty evidence). Single-incision slings may result in similar or reduced postoperative urinary retention compared to transobturator slings (RR 0.68, 95% CI 0.47 to 0.97; 23 trials, 2891 women; moderate-certainty evidence). Women with single-incision slings may have lower quality of life at 12 months compared to those with transobturator slings (standardized mean difference (SMD) 0.24, 95% CI 0.09 to 0.39; 8 trials, 698 women; low-certainty evidence). It is unclear whether slightly more women with single-incision slings require repeat incontinence surgery or mesh revision compared to transobturator slings (95% CI, compatible with possible benefit and harm; RR 1.42, 95% CI 0.94 to 2.16; 13 trials,

1460 women; low-certainty evidence). We downgraded the evidence due to concerns about indirectness, imprecision, and risk of bias.

Discussion: Single-incision sling operations have been extensively investigated in randomized controlled trials. Single-incision slings may be as effective as retropubic slings and are as effective as transobturator slings in subjective improvement or cure of stress urinary incontinence. It is unclear whether single-incision slings result in better or worse rates of subjective improvement or cure compared to autologous fascial slings. There remain uncertainties regarding adverse events and long-term outcomes. Therefore, long-term data are needed to compare the safety and long-term effectiveness of single-incision slings with other mid-urethral slings.

Long-Term Safety of Synthetic Mid-Urethral Sling Implantation: A Systematic Review for the Treatment of Stress Urinary Incontinence in Adult Women

Cyrille Guillot-Tantay, Philippe Van Kerrebroeck, Emmanuel Chartier-astler, Agnès Dechartres, Florence Tubach. Eur Urol Open Sci 2023 Jun 10:54:10-19. doi: 10.1016/j.euros.2023.05.013

Summary

Context: Mid-urethral slings (MUSs) are the most commonly used treatment for stress urinary incontinence (SUI). While warnings about potential complications are increasing worldwide, there is a particular lack of long-term safety data.

Objective: Our aim is to evaluate the long-term safety outcomes of synthetic MUS in adult women.

Evidence collection: We included all studies evaluating mid-urethral slings (MUS) in adult women with stress urinary incontinence (SUI). All synthetic MUS were considered: transvaginal tape (TVT), transobturator tape (TOT), and mini-slings. The primary outcome was the reoperation rate at 5 years.

Evidence synthesis: After duplicate removal, 44 studies (8218 patients) were included from the 5586 references screened. Among these, nine were randomized controlled trials and 35 were cohort studies. Overall reoperation rates ranged from 0% to 19% for TOT (11 studies), 0% to 13% for TVT (17 studies), and 0% to 19% for mini-slings (two studies) at 5 years. Overall reoperation rates ranged from 5% to 15% for TOT (four studies) and 2% to 17% for TVT (four studies) at 10 years. Safety data beyond 5 years were scarce: 22.7% of articles reported follow-up ≥10 years and 2.3% ≥15 years.

Conclusion: Reoperation and complication incidence rates are heterogeneous, and data beyond 5 years are rare. Our evaluation highlights the heterogeneity of existing safety data and the insufficient quality to guide decision-making, indicating an urgent need to improve the surveillance reliability of mesh.

A Systematic Review and Meta-Analysis Comparing Adjustable Slings with Other Surgical Methods

Bagrat Grigoryan, Gor Shadyan, George Kasyan, Dmitry Pushkar. Int Urogynecol J 2023 Jul;34(7):1351-1367. doi: 10.1007/s00192-023-05535-z.

Abstract:

Introduction and hypothesis: The aim of this study was to compare the effectiveness and safety of different adjustable slings with other surgical methods for treating stress urinary incontinence (SUI) in women.

Methods: Inclusion criteria were randomized controlled trials (RCTs) and non-RCTs evaluating adult women with SUI. Exclusion criteria were other types of urinary incontinence, studies combining conservative interventions and pharmacological treatment, pregnant and breastfeeding patients. Databases were searched up to November 2022 to evaluate articles on the effectiveness and safety of different adjustable slings for treating SUI in women. This systematic review was conducted in accordance with the PRISMA 2020 checklist and registered with PROSPERO. Risk of bias in included studies was assessed using tools recommended by the Cochrane Collaboration.

Conclusion: This systematic review included 18 clinical studies, with 11 studies included in the meta-analysis. Fourteen were randomized controlled trials (RCTs) and four were retrospective studies. Only randomized controlled trials (RCTs) were included in the meta-analyses. There was no statistically significant difference in objective improvement rate, subjective improvement rate, or long-term postoperative complication rate between adjustable single-incision mini-slings (SIMS) and standard mid-urethral slings (SMUS) or MiniArc SIMS (single-incision mini-slings). However, the operation time in the adjustable SIMS (single-incision mini-slings) group was significantly shorter (RR = -4.20, 95% CI: [-7.51, -0.89], p = 0.01).

Discussion: This systematic review and meta-analysis revealed that adjustable SIMS (single-incision mini-slings) are equally effective as SMUS (standard mid-urethral slings) for treating SUI in women. Additionally, the operation time for adjustable SIMS was shorter. However, further studies designed with standard outcome measures and complete follow-up durations will help increase confidence in different options for treating SUI in women.

A Systematic Review and Meta-Analysis Comparing Fillers with Surgical Methods in Terms of Effectiveness and Safety in Women with Stress Urinary Incontinence

Laura Pivazyan, George Kasyan, Bagrat Grigoryan, Dmitry Pushkar. Int Urogynecol J 2022 Apr;33(4):777-78 doi: 10.1007/s00192-021-04937-1.

Summary

Introduction and hypothesis: The aim of this study was to evaluate the effectiveness and safety of fillers compared to surgical methods for female stress urinary incontinence.

Methods: Inclusion and exclusion criteria: Women with stress urinary incontinence were included. Patients with other types of incontinence and those receiving different treatments were excluded. Fillers and any surgical treatment were compared. Electronic databases (PubMed, MEDLINE, and Cochrane Library) were searched from 2000 to 2021 to identify articles comparing the effectiveness and safety of urethral fillers with surgical methods. Risk of bias in included studies was assessed using tools recommended by the Cochrane Collaboration.

Conclusion: Six studies involving a total of 710 patients were included in the quantitative synthesis. Our systematic review and meta-analysis showed that fillers were less effective than surgical procedures in terms of subjective improvement post-treatment (RR = 0.70, 95% CI: 0.53 to 0.92, p = 0.01). There was no statistically significant difference in post-intervention complications between the two methods (RR = 1.30, 95% CI: 0.30 to 5.66, p = 0.73).

Discussion: The main limitation of this systematic review and meta-analysis was the lack of a common objective outcome measure to assess efficacy. However, it shows that fillers are less effective in subjective improvement compared to surgical procedures. The safety analysis showed no significant difference between these methods. Therefore, we believe that initial and final surgery should be considered the best option.

Treatment of Female Stress Urinary Incontinence Using Transobturator Tape (TOT), Tension-Free Vaginal Tape (TVT), and Transvaginal Tension-Free Vaginal Tape-Obturator (TVT-O): A Systematic Review and Meta-Analysis

Huitao Wang, Jinhong Liu, Kewei Fang, Jianhe Liu, Tao Chen, Tongxin Yang, Xin Shi

Int J Gynaecol Obstet 2022 Jun;157(3):527-535. doi: 10.1002/ijgo.13790. Epub 2021 Jul 9

Summary

Objective: To systematically review the safety and efficacy of tension-free vaginal tape (TVT), transobturator tape (TOT), and transvaginal tension-free vaginal tape-obturator (TVT-O) treatments.

Methods: PubMed, Embase, The Cochrane Library, Web of Science, WanFang Data, and CNKI were electronically searched. A total of 22 studies and 3709 patients were included.

Results: The objective improvement rate in TVT was better compared to TOT and TVT-O. The incidence of postoperative thigh/inguinal pain was lower in TVT than in TOT and TVT-O, but the incidence of dysuria was higher in TVT than in TVT-O. The incidence of lower urinary tract infection was higher in TVT than in TOT.

Discussion: Tension-free vaginal tape may achieve better outcomes compared to TOT and TVT-O, but there is a higher risk of dysuria and lower urinary tract infection with TVT in patients with SUI.

URINARY INCONTINENCE IN WOMEN - MANAGEMENT

NICE GUIDELINE



Translation: Op. Dr. İrem Yıldırım

University of Health Sciences, Haydarpaşa Numune Training and Research Hospital, Department of Obstetrics and Gynecology

---

https://www.nice.org.uk/guidance/ng123

1.3 ASSESSMENT OF URINARY INCONTINENCE

HISTORY AND PHYSICAL EXAMINATION

1.3.1. At the initial clinical assessment, categorise urinary incontinence as stress urinary incontinence, mixed urinary incontinence, or urge incontinence/overactive bladder. Initiate initial treatment based on this. In mixed urinary incontinence, direct treatment towards the predominant symptom.

1.3.2. If stress incontinence is predominant in mixed urinary incontinence, discuss the benefits of non-surgical management and overactive bladder medications with the patient before recommending surgery. [2013, amended 2019]

1.3.3. During clinical assessment, attempt to identify relevant predisposing and precipitating factors and other conditions that may require referral to specialist centres. [2006]

Assessment of Pelvic Floor Muscles

1.3.4. Conduct a routine assessment to confirm pelvic floor muscle contraction before supervised pelvic floor muscle exercises for urinary incontinence treatment.

Urinalysis

1.3.5. Perform a full urinalysis to detect the presence of blood, glucose, protein, leukocytes, and nitrites in all women presenting with urinary incontinence complaints.

1.3.6. If patients have symptoms of urinary tract infection (UTI) and urinalysis is positive for both leukocytes and nitrites, send a midstream urine sample for culture and sensitivity testing. Prescribe appropriate antibiotic treatment while awaiting culture results. Refer to the NICE guideline on urinary tract infection (lower): antimicrobial prescribing for more information. [2006, amended 2019]

1.3.7. If patients have symptoms of UTI but urinalysis is negative for leukocytes or nitrites, send a midstream urine sample for culture and sensitivity testing. Antibiotics may be prescribed while awaiting culture results. [2006]

1.3.8. If patients do not have symptoms of UTI but urinalysis is positive for both leukocytes and nitrites, do not prescribe antibiotics without midstream urine culture results. [2006]

1.3.9. If patients do not have symptoms of UTI and urinalysis is negative for leukocytes or nitrites, do not send a urine sample for culture as the likelihood of UTI is low. [2006]

Assessment of Residual Urine

1.3.10 Measure post-void residual urine volume via bladder scan or catheterisation in women with symptoms suggestive of voiding dysfunction or recurrent urinary tract infections. [2006]

1.3.11 Use bladder scanning instead of catheterisation due to better patient acceptability and lower incidence of complications. [2006]

Symptom Scoring and Quality of Life Assessment

1.3.12 When evaluating treatments, use validated questionnaires for the assessment of urinary incontinence symptoms and quality of life. [2006, amended 2019]

Voiding Diaries

1.3.13 Use bladder diaries in the initial assessment of patients with urinary incontinence or overactive bladder. Encourage patients to complete a diary for at least 3 days, covering both work and home routine days. [2006]

Pad test

1.3.14 Do not use pad tests in the routine assessment of women with urinary incontinence. [2006]

Urodynamics

1.3.15 Do not perform multichannel filling and voiding cystometry before primary surgery if a diagnosis of stress urinary incontinence or stress-predominant mixed urinary incontinence has been made based on a detailed clinical history and stress urinary incontinence is demonstrated on examination. [2019]

1.3.16 After a detailed history and physical examination, perform multichannel filling and voiding cystometry before surgery for stress urinary incontinence in women with any of the following:

- urgency-predominant mixed urinary incontinence or urinary incontinence of uncertain type

- symptoms suggestive of voiding dysfunction

- anterior or apical prolapse

- a history of previous surgery for stress urinary incontinence. [2019]

Refer to the rationale and impact section on urodynamic tests for a brief explanation of why the committee made the 2019 recommendations and how they might affect practice.

Full details of the evidence and the committee's discussion are in evidence review A: urodynamic assessment before primary surgery for stress urinary incontinence.

Other tests of urethral competence

1.3.17 Do not use Q-tip, Bonney, Marshall, and Fluid-Bridge tests in the assessment of women with urinary incontinence. [2006]

Cystoscopy

1.3.18 Do not use cystoscopy alone in the initial assessment of women with urinary incontinence. [2006]

Imaging

1.3.19 Do not use imaging (MRI, CT, X-ray) for the routine assessment of women with urinary incontinence. Do not use ultrasound except for the assessment of residual urine volume. [2006]

Indications for referral to a specialist service

1.3.20 Consider the following indications for referral to a specialist service in women with urinary incontinence:

- persistent bladder or urethral pain

- bladder palpable on bimanual or abdominal examination after voiding

- benign pelvic masses

- associated faecal incontinence

- suspected neurological disease

- symptoms of voiding difficulty

- suspected urogenital fistula

- previous continence surgery

- previous pelvic cancer surgery

- history of pelvic radiation therapy. [2006]

1.3.21 Follow the referral recommendations for urinary tract cancer in the NICE guideline on suspected cancer in women with hematuria or recurrent or persistent unexplained UTIs. [2006, amended 2019]

NON-SURGICAL MANAGEMENT OF URINARY INCONTINENCE

Lifestyle interventions

1.4.1 Advise women with overactive bladder to reduce their caffeine intake. [2006]

1.4.2 Advise women with urinary incontinence or overactive bladder who have excessive or insufficient fluid intake to modify their fluid consumption. [2006]

1.4.3 Advise women with urinary incontinence or overactive bladder and a BMI over 30 to lose weight. [2006]

Physical therapies

Pelvic floor muscle training

1.4.4 Offer a trial of supervised pelvic floor muscle training of at least 3 months as a first-line treatment to women with stress or mixed urinary incontinence. [2019]

1.4.5 Pelvic floor muscle training programmes should comprise at least 8 contractions performed 3 times per day. [2006]

1.4.6 Do not routinely use perineometry or pelvic floor electromyography as biofeedback as part of pelvic floor muscle training. [2006]

1.4.7 If the patient benefits from pelvic floor muscle training, continue the exercise programme. [2006]

For a brief explanation of why the committee made the 2019 recommendation and how it might affect practice, see the rationale and impact section on pelvic floor muscle training.

Full details of the evidence and the committee's discussion are in the evidence review H: lifestyle and conservative management options for pelvic organ prolapse section.

Electrical stimulation

1.4.8 Do not routinely use electrical stimulation in the treatment of women with overactive bladder. [2006]

1.4.9 Do not routinely use electrical stimulation in combination with pelvic floor muscle training. [2006]

1.4.10 Consider electrical stimulation and/or biofeedback to help with motivation and adherence to treatment for women who cannot actively contract their pelvic floor muscles. [2006]

Behavioural therapies

1.4.11 Offer bladder training lasting at least 6 weeks as a first-line treatment to women with urge or mixed urinary incontinence. [2006]

1.4.12 If patients do not gain satisfactory benefit from bladder training programmes and the predominant symptom is frequent urination, consider a combination of an overactive bladder drug and bladder training. [2006]

Neurostimulation

1.4.13 Do not offer transcutaneous sacral nerve stimulation (surface electrodes placed over the sacrum, commonly known as transcutaneous electrical nerve stimulation [TENS]) to treat overactive bladder in women. [2013]

1.4.14 Do not offer transcutaneous posterior tibial nerve stimulation for overactive bladder. [2013]

1.4.15 Do not offer percutaneous posterior tibial nerve stimulation (needles placed near the posterior tibial nerve) for overactive bladder except in the following circumstances:

- if a local MDT review has not been undertaken and

- non-surgical management, including overactive bladder drug treatment, has not been effective enough and

- the patient does not want botulinum toxin type A or percutaneous sacral nerve stimulation. [2013, amended 2019]

In April 2019, most botulinum toxin type A preparations were unlicensed for incontinence conditions. Evidence was available only for the licensed botulinum toxin type A preparation (BOTOX, Allergan).

Pads, urinals and toileting aids

1.4.16 Do not offer pads, bedpans, or toileting aids to manage urinary incontinence, except as:

- a coping strategy while awaiting definitive treatment

- an adjunct to ongoing therapy

- a long-term management option only after treatment options have been explored. [2019]

1.4.17 Advise patients using pads for long-term management of urinary incontinence to have a review at least once a year. The review should include:

- routine assessment of continence

- assessment of skin integrity

- changes in symptoms, comorbidities, lifestyle, mobility, medications, BMI, and social and environmental factors

- suitability of alternative treatment options

- effectiveness and quantities of absorbent containment product currently used by the woman. [2019]

1.4.18 Reviews for women using pads for long-term management of urinary incontinence should be conducted either by:

- a registered healthcare professional trained in continence assessment and referral to specialist services, or

- a non-registered healthcare worker under the supervision of a registered healthcare professional trained in continence assessment and referral to specialist services.

Refer to the indications for referral to a specialist service in this guideline. [2019]

For a brief explanation of why the committee made the 2019 recommendations and how they might affect practice, see the rationale and impact section on pad products.

Full details of the evidence and the committee's discussion are in evidence review B: treatment options for women using absorbent containment products.

Catheters

1.4.19 Consider bladder catheterisation (intermittent or indwelling urethral or suprapubic) for women where persistent urinary retention is causing incontinence, symptomatic infections, or renal dysfunction and cannot be otherwise corrected. Healthcare professionals should be aware that indwelling catheters in urge incontinence may not result in continence and should explain this to patients. [2006]

1.4.20 Offer intermittent urethral catheterisation to women with urinary retention who can learn self-catheterisation or have a carer who can perform the technique. [2006]

1.4.21 Carefully assess the impact of long-term indwelling urethral catheterisation. Discuss practicality, benefits, and risks with the patient or, if appropriate, their carer. Indications for long-term indwelling urethral catheters in women with urinary incontinence include:

- chronic urinary retention in women unable to manage intermittent self-catheterisation

- skin wounds, pressure ulcers, or irritations contaminated by urine

- distress caused by bed and clothing changes

- when the patient expresses a preference for this method. [2006]

1.4.22 Consider permanent suprapubic catheters as an alternative to long-term urethral catheters. Be aware that they may be associated with fewer symptomatic UTIs and urethral complication rates compared to indwelling urethral catheters, and inform patients. [2006]

Leakage prevention products

1.4.23 Do not use intravaginal and intraurethral devices for the routine management of urinary incontinence in women. Do not recommend these devices to women except for occasional use when necessary to prevent leakage, for example, during physical exercise. [2006]

Complementary therapies

1.4.24 Do not recommend complementary therapies for the treatment of urinary incontinence or overactive bladder. [2006]

MEDICATIONS FOR OVERACTIVE BLADDER

1.4.25 Before starting treatment with a medication for overactive bladder, explain to patients:

- the likelihood of the medication being successful

- common side effects associated with the medication

- that some side effects of anticholinergic medications, such as dry mouth and constipation, may indicate that the medication is starting to work

- that they may not see significant benefits until they have used the medication for at least 4 weeks and that their symptoms may continue to improve over time

- that the long-term effects of anticholinergic medications used for overactive bladder on cognitive function are uncertain. [2019]

1.4.26 When recommending anticholinergic medications to treat overactive bladder, consider the following patient conditions:

- coexisting conditions (such as poor bladder emptying, cognitive impairment, or dementia)

- current use of other medications affecting total anticholinergic load

- risk of side effects, including cognitive impairment. [2019]

1.4.27 For patients diagnosed with dementia for whom anticholinergic medications are an option, follow the recommendations on medications that may cause cognitive impairment in the NICE guideline on dementia. [2019]

Medication choice

1.4.28 Do not offer flavoxate, propantheline, or imipramine to treat urinary incontinence or overactive bladder. [2013]

1.4.29 Do not offer oxybutynin (immediate release) to older women who may be at higher risk of sudden deterioration in their physical or mental health. [2013, amended 2019]

1.4.30 Offer the anticholinergic medication with the lowest acquisition cost for the treatment of overactive bladder or mixed urinary incontinence in women. [2019]

1.4.31 If the first medication for overactive bladder or mixed urinary incontinence is not effective or well-tolerated, offer another medication with a low acquisition cost (see additional information). [2013]

1.4.32 Offer a transdermal treatment for overactive bladder to women who cannot tolerate oral medications. [2013]

1.4.33 For guidance on mirabegron, refer to the NICE technology appraisal guidance on mirabegron for treating symptoms of overactive bladder. [2013]

1.4.34 Consider desmopressin to reduce nocturia in women with urinary incontinence or overactive bladder associated with nocturia as a troublesome symptom. Be particularly cautious in women with cystic fibrosis and avoid use in those over 65 with cardiovascular disease or hypertension. [2013]

1.4.35 Do not use duloxetine as a first-line treatment for women with predominant stress urinary incontinence. Do not routinely offer duloxetine as a second-line treatment for women with stress urinary incontinence, but it may be offered as a second-line treatment if patients prefer pharmacological treatment over surgical treatment or are not suitable for surgical treatment. If duloxetine is prescribed, counsel patients about side effects. [2006]

For guidance on the safe prescribing of antidepressants (such as duloxetine) and managing withdrawal, refer to the NICE guideline on medicines associated with dependence or withdrawal symptoms.

1.4.36 Do not offer systemic hormone replacement therapy to treat urinary incontinence. [2006]

1.4.37 Offer intravaginal oestrogens to treat overactive bladder symptoms in postmenopausal women with vaginal atrophy. [2006]

Assessment of medication effects

1.4.38 Offer a face-to-face or telephone review 4 weeks after starting a new medication for overactive bladder. Ask the woman if she is satisfied with the treatment and

- if improvement is optimal, continue treatment

- if there is no improvement or it is inadequate, or if there are intolerable side effects, change the dose or try an alternative medication for overactive bladder (see recommendations for when the first medication is not effective and transdermal patch suggestions in the medication choice section) and review again in 4 weeks. [2013]

1.4.39 Offer a review before 4 weeks if adverse effects of a medication used for overactive bladder are intolerable. [2013]

1.4.40 Refer women who have tried medication for overactive bladder but have not been successful or cannot tolerate it to secondary care for further treatment evaluation. [2013]

1.4.41 Offer another face-to-face or telephone review if a medication for overactive bladder or urinary incontinence that was successful in the first 4 weeks is not working after assessment. [2013]

1.4.42 Recommend an assessment in primary care every 12 months for women on long-term medication for overactive bladder or urinary incontinence, or every 6 months if they are over 75 years old. [2013, amended 2019]

Invasive procedures for overactive bladder

1.4.43 For women with overactive bladder who do not respond to non-surgical methods or medication and wish to explore further treatment options,

- recommend urodynamic testing to determine if detrusor overactivity is causing overactive bladder symptoms, and based on the results;

- if detrusor overactivity is causing overactive bladder symptoms, recommend an invasive procedure in line with the bladder wall injection recommendation in the botulinum toxin type A section and the urinary diversion recommendation, or

- if there is no detrusor overactivity, seek advice from the local MDT on further management in line with the recommendation on evaluating treatment with botulinum toxin type A in the botulinum toxin type A section. [2013, amended 2019]

Botulinum toxin type A injection

1.4.44 After review by a local MDT, recommend bladder wall injection with botulinum toxin type A for women with overactive bladder caused by detrusor overactivity who do not respond to non-surgical treatment, including pharmacological therapies. [2019]

1.4.45 For women with overactive bladder symptoms where urodynamic testing does not show detrusor overactivity, consider treatment with botulinum toxin type A after a local MDT review if there is no response to non-surgical treatment and the patient does not wish to undergo other invasive treatments. [2019]

1.4.46 After a local MDT review, inform the patient about the benefits and risks of treatment with botulinum toxin type A, including

- the possibility of complete or partial symptom relief,

- the process of clean intermittent catheterisation, its risks, and how long it may need to continue,

- the risk of side effects, including an increased risk of urinary tract infections,

- the duration of effectiveness of the injections, the lack of extensive evidence on long-term effectiveness, and long-term risks. [2019]

1.4.47 Proceed with treatment with botulinum toxin type A only if the patient is willing, and in the event of significant voiding dysfunction:

- initiate regular clean intermittent catheterisation as needed, or

- if clean intermittent catheterisation is not possible, insert a temporary indwelling catheter. [2013, amended 2019]

1.4.48 Use an initial dose of 100 units of botulinum toxin type A to treat overactive bladder in women. [2019]

1.4.49 Recommend a face-to-face or telephone review within 12 weeks after the initial treatment with botulinum toxin type A to assess response and side effects, and

- if there is symptom relief, instruct the patient on how to self-refer for specialist review immediately if symptoms return and repeat treatment as necessary,

- if symptom relief is inadequate, consider increasing subsequent doses of botulinum toxin type A to 200 units and reassess within 12 weeks.

- if there is no effect, consult with the local MDT. [2019]

1.4.50 If symptom relief was adequate after a 100-unit botulinum toxin type A injection but lasted less than 6 months, consider increasing subsequent doses of botulinum toxin type A to 200 units and reassess within 12 weeks. [2019]

1.4.51 Do not recommend botulinum toxin type B for women with overactive bladder. [2019]

Percutaneous sacral nerve stimulation

1.4.52 Recommend percutaneous sacral nerve stimulation for patients with overactive bladder after local or regional MDT assessment if:

- women do not respond to non-surgical treatment, including medications,

- symptoms have not responded to botulinum toxin type A, or

- they do not accept the catheterisation risks associated with botulinum toxin type A. [2013, amended 2019]

1.4.53 Discuss the long-term outcomes of percutaneous sacral nerve stimulation with women, including:

- the need for test stimulation and the likelihood of test success

- risk of failure

- long-term responsibility

- need for surgical revision

- adverse effects [2013]

1.4.54 Explain to women how to self-refer for rapid specialist review if symptoms return after percutaneous sacral nerve stimulation procedure. [2013]

Augmentation Cystoplasty

1.4.55 Restrict augmentation cystoplasty for the treatment of idiopathic detrusor overactivity to patients who have not responded to non-surgical treatment and are willing and able to self-catheterise. Preoperative counselling for the patient or carer should include common and serious complications: bowel disturbance, metabolic acidosis, mucus production and/or retention in the bladder, UTIs, and urinary retention. Provide information about the risk of malignancy developing in the augmented bladder. Recommend lifelong follow-up. [2006, amended 2013]

Urinary Diversion

1.4.56 Consider urinary diversion for a woman with overactive bladder only when non-surgical treatment has failed and botulinum toxin type A, percutaneous sacral nerve stimulation, and augmentation cystoplasty are unsuitable or unacceptable to the woman. Provide lifelong follow-up. [2006, amended 2013]

In April 2019, most botulinum toxin type A preparations were unlicensed for incontinence. Evidence was available only for the licensed botulinum toxin type A preparation (BOTOX, Allergan).

SURGICAL TREATMENT FOR STRESS URINARY INCONTINENCE

1.5 There is public concern about the use of mesh procedures. There is evidence of benefit for all procedures recommended in this section, including mesh procedures, but limited evidence on long-term adverse effects. In particular, the true prevalence of long-term complications is unknown.

1.5.1 If a patient is considering a surgical procedure for stress urinary incontinence, use the NICE patient decision aid for surgery for stress urinary incontinence to encourage

informed choice and shared decision-making. The discussion with the patient should include:

- the benefits and risks of all surgical treatment options recommended by NICE for stress urinary incontinence, and whether they are available

- uncertainties about long-term adverse effects for all procedures, especially those involving the implantation of mesh materials

- differences between procedures in terms of type of anaesthesia, expected hospital stay, surgical incisions, and expected recovery time

- any social or psychological factors that may affect the patient's benefit. [2013, amended 2019]

1.5.2 If non-surgical treatments for stress urinary incontinence have failed and the patient wishes to consider a surgical procedure, offer her the following options:

- colposuspension (open or laparoscopic) or

- autologous rectus fascial sling.

Include the option of a retropubic mid-urethral mesh sling, but for additional guidance on the use of mid-urethral mesh sling procedures for stress urinary incontinence, refer to the recommendations in the mid-urethral mesh sling procedures section. [2019]

1.5.3 If alternative surgical procedures are not suitable or acceptable for the woman, consider intramural bulking agents to manage stress urinary incontinence. Explain to the patient:

- these are permanent injectable materials

- injections may need to be repeated to achieve effectiveness

- limited evidence suggests they are less effective than the surgical procedures listed in recommendation 1.5.2 and their effects diminish over time

- there is limited evidence on long-term effectiveness and adverse events. [2019]

1.5.4 If an intramural bulking agent is injected, provide the patient with written information about the bulking agent, including its name, manufacturer, date of

injection, and the name and contact details of the surgeon who performed the injection. [2019]

1.5.5 If the procedure chosen by the patient for stress urinary incontinence cannot be performed by the consultant surgeon, refer her to an alternative surgeon. [2019]

1.5.6 Providers should ensure that data on surgical procedures for stress urinary incontinence are recorded in a national registry, as specified in the data collection section of this guideline on surgery and surgical complications. [2019]

MID-URETHRAL SLING OPERATIONS

1.5.7 When recommending a retropubic mid-urethral mesh sling, inform the woman that it is a permanent implant and complete removal may not be possible. [2019]

1.5.8 If a retropubic mid-urethral mesh sling is fitted, provide the woman with written information about the implant, including its name, manufacturer, date of insertion, and the name and contact details of the surgeon who performed the procedure. [2019]

1.5.9 When planning a retropubic mid-urethral mesh sling procedure, surgeons should:

• use a device made from type 1 macroporous polypropylene mesh

• consider using a coloured retropubic mid-urethral mesh for high visibility to facilitate insertion and revision. [2013, amended 2019]

1.5.10 Do not recommend the transobturator approach unless there are specific clinical circumstances (such as previous pelvic procedures) where the retropubic approach should be avoided. [2019]

1.5.11 Do not use the 'top-down' retropubic mid-urethral mesh approach or single-incision sub-urethral short mesh insertion unless part of a clinical trial. [2019]

Artificial Urinary Sphincters

1.5.12 Do not recommend artificial urinary sphincters for women to manage stress urinary incontinence unless previous surgery has failed. [2006, amended 2019]

1.5.13 For women with an artificial urinary sphincter,

- offer postoperative follow-up and

- provide access for assessment if needed. [2006, amended 2019]

Procedures Not to Be Recommended

1.5.14 Do not recommend the following procedures for treating stress urinary incontinence in women:

- anterior colporrhaphy

- needle suspension

- paravaginal defect repair

- porcine dermis sling

- Marshall-Marchetti-Krantz procedure. [2019]

Postoperative Follow-Up

1.5.15 Offer all women who have undergone a surgical procedure to treat stress urinary incontinence a follow-up appointment within 6 months. [2019]

1.5.16 For women who have undergone retropubic mid-urethral mesh surgery, the follow-up appointment should include a vaginal examination to check for mesh exposure or extrusion. [2019]

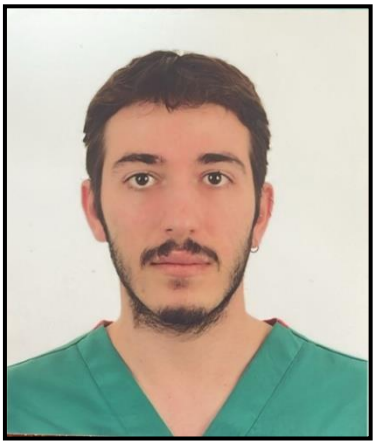
1.5.17 Providers should ensure access to further referrals for women who have undergone surgery for stress urinary incontinence if they have recurrent symptoms or suspected complications. See also the section on assessing complications associated with mesh surgery in this guideline. [2019]

1.5.18 For women whose primary surgical procedure for stress urinary incontinence has failed (including those whose symptoms have returned):

- Seek advice on assessment and management from a regional MDT specialising in complex pelvic floor dysfunction, or

- Explain to the patient that if she does not wish to undergo another surgical procedure, she can receive advice on managing urinary symptoms and request a referral if she changes her mind. [2019]

PATIENT EDUCATION FORMS



Translation: Dr. Ege ÖZGÜR

University of Health Sciences, Haydarpaşa Numune Training and Research Hospital, Department of Obstetrics and Gynecology

---

Urinary Incontinence

Pelvic Floor (Kegel) Exercises

Surgery to Treat Stress Incontinence in Women

Treatments for Urge Incontinence in Women

https://www.uptodate.com/contents/urinary-incontinence-in-women-beyond-the-basics

https://www.uptodate.com/contents/pelvic-floor-muscle-exercises-beyond-the-basics

https://www.uptodate.com/contents/female-stress-urinary-incontinence-choosing-a-primary-surgical-procedure

https://www.uptodate.com/contents/urgency-urinary-incontinence-overactive-bladder-oab-in-females-treatmen

These patient information forms are created by doctors and editors at UpToDate.

Patient Education: Urinary Incontinence (The Basics)

What is urinary incontinence? — "Urinary incontinence" is a medical term used when a person leaks urine or loses control of their bladder. It is often simply called "incontinence."

Urinary incontinence is a very common problem. If you have this problem, there are many treatments that can help you. There are also things you can do on your own to stop or reduce urine leakage, so you don't have to just "live with it."

What are the symptoms of urinary incontinence? — There are different types of urinary incontinence. Each type has different symptoms. The 3 most common types are:

- Stress incontinence – People with stress incontinence leak urine when they laugh, cough, sneeze, or do anything that puts "pressure on" their abdomen.
- Urge incontinence – People with urge incontinence feel a sudden, strong need to urinate. Often, the "urge to urinate" is so strong that they cannot get to the bathroom in time. "Overactive bladder" is another term used for having sudden and frequent urges to urinate. People with an overactive bladder may or may not leak urine.
- Mixed urinary incontinence – People with mixed urinary incontinence have symptoms of both stress incontinence and urge incontinence.

Is there anything I can do to feel better? — Yes. Some steps that can help reduce urine leakage include:

- Reduce the amount of fluids you drink, especially a few hours before going to bed.
- Avoid foods and drinks that worsen your symptoms. Some people find that alcohol, caffeine, spicy or acidic foods irritate the bladder.

- If you are overweight, lose weight.
- If you have diabetes, try to keep your blood sugar as close to normal as possible.
- If you take medicines called diuretics, plan ahead. These medicines increase your need to urinate. Take them when you know you will have access to a bathroom for a few hours.

These techniques can also help you gain bladder control:

- **Bladder retraining – During bladder retraining, you go to the bathroom at set times. For example, you might decide to go every hour. You go to the bathroom even if you don't feel the need. If you need to go earlier, try to wait until the hour is up. Once you get used to going every hour, you will increase the time between bathroom visits. Over time, you can "retrain" your bladder to wait 3 or 4 hours between visits.**
- **Pelvic floor exercises – Pelvic floor exercises strengthen the muscles that control urine flow. These exercises can help you, but people often do them incorrectly. Ask your doctor or nurse how to do them correctly.**

Should I see my doctor or nurse? — Yes. Your doctor or nurse can find out what might be causing your urinary incontinence. They can also suggest ways to fix the problem.

When you talk to your doctor or nurse, ask if any medicines you take could be causing your urinary incontinence. Some medicines can cause urinary incontinence, while others can make it worse.

How is urinary incontinence treated? — Treatment options vary depending on the type of urinary incontinence you have and your gender. Some treatment options include:

- Medicines that relax the bladder
- Surgeries to repair tissues that support the bladder or improve urine flow
- Electrical stimulation of the nerves that relax the bladder

What will my life be like?— Many people with urinary incontinence can regain bladder control or at least reduce the amount of leakage they experience. The important thing is to talk to your doctor or nurse about it. Then work with them to find an approach that will help you.

Patient Education: Pelvic Floor (Kegel) Exercises (The Basics)

What are pelvic floor exercises? — Pelvic floor exercises are exercises that strengthen the muscles that control urine and bowel movements. These exercises are also called "Kegel" exercises. They can help if you have problems with urinary incontinence, gas, or bowel movements. They can also help with a condition called "pelvic organ prolapse" that affects women. In women with pelvic organ prolapse, the organs in the lower abdomen drop down and can press against or bulge into the vagina.

How can I learn Kegel exercises? — First, ask your doctor or nurse for ways to do them correctly. They can help you get started.

You will need to learn which muscles to tighten. Finding the right muscles can sometimes be difficult.

A woman can learn Kegel exercises by:

- Inserting a finger into her vagina and squeezing the muscles around the finger; or
- Pretending to sit on a marble and thinking about lifting it using her vagina

A man can learn Kegel exercises by tightening the muscles in his buttocks as if holding in gas.

Both men and women can learn Kegel exercises by stopping and starting the flow of urine. If you do this, you may find the right muscles in just one or two tries. Some doctors think you should never do this because if it becomes a habit, it can lead to bladder infections.

However you learn Kegel exercises, the important thing is to know that the muscles involved are not in the abdomen or thighs.

Once you learn to tighten the muscles, you can do the exercises in any position (sitting in a chair or lying down). You do not need to do them while on the toilet.

How often should I do the exercises? — Do the exercises 3 times a day, 3 or 4 days a week. Each time, tighten your muscles 8 to 12 times and hold each squeeze for 6 to 8 seconds. Keep up this routine for at least 3 to 4 months. You will likely notice results, but it may take some time.

How do Kegel exercises help? — Kegel exercises can help in the following ways:

- They can help reduce urine leakage in people with "stress incontinence"; these are people who leak urine when they cough, laugh, sneeze, or strain.
- They can help control the sudden urge to urinate in people with "urge incontinence."
- They can help control gas or bowel movements.
- They can reduce pressure or bulging in the vagina due to pelvic organ prolapse. (If you have a bulge in the vagina, see your doctor or nurse to find out why.)

Patient Education: Surgery for Stress Incontinence in Women (The Basics)

What is surgery for stress incontinence in women? — Surgery is a treatment for women with a condition called "stress incontinence." People with this condition leak urine when they laugh, cough, sneeze, or do anything that puts pressure on the abdomen.

There are other treatments for stress incontinence besides surgery. But if these treatments do not work well or you do not want to try them, you may consider surgery.

How do doctors perform surgery to treat stress incontinence in women? — Most surgeries to treat stress incontinence in women are "minimally invasive" surgeries. This involves the doctor making smaller cuts than in normal surgery and using small instruments controlled from outside the body. However, doctors can also perform "open" surgery. This involves making large cuts to operate on the body.

Are there different types of surgery to treat stress incontinence? — Yes, there are many types. These include:

- "Sling procedure" – A sling is a small piece of material placed around the urethra. (The urethra is the tube that carries urine out of the body.) There are different types of slings, but they all provide support to prevent the urethra from leaking urine. The sling can be made of synthetic mesh or tissue taken from the woman's body.
- "Burch procedure" or "retropubic colposuspension" – In this procedure, the doctor attaches the tissue around the urethra to strong bands inside the abdomen. This procedure can be "minimally invasive" surgery (a few small cuts) or "open" surgery (a large cut).
- Injection of material (needle) next to the urethra – The material thickens the area around the urethra. This helps support the urethra and prevent urine leakage. This treatment is often suitable for women who have had surgery and is usually done in a doctor's office.

What are the benefits of surgery? — The main benefit is treating stress incontinence that other treatments have not improved.

What are the risks of surgery? — The risks of surgery vary depending on:

- The type of surgery you have
- Your age and overall health

The risks of surgery include:

- Problems from surgery, such as bleeding, infection, or a tear in the bladder
- Trouble emptying the bladder completely when urinating
- Stress incontinence after surgery – Some women may still have stress incontinence after surgery.
- Urge incontinence, also called "overactive bladder syndrome" – This usually means a constant feeling of needing to urinate or an urgent need to urinate. Some people may also leak urine if they can't reach the toilet in time. This can occur after surgery or worsen in those who had it before surgery.
- Pain during sexual intercourse
- Groin pain – This is the area where the thigh meets the rest of the body.

Are there other options besides surgery for stress incontinence? — Yes, there are other options. These include exercises or a device called a pessary ring, which is used in the vagina daily to support the urethra. Most women try other options first and consider surgery if other treatments do not work.

An important point to remember is that the results of surgery to treat stress incontinence vary for each woman. You are the only person who can decide if surgery is the best treatment for you. If you are unsure, you may want to try other treatments while considering surgery. Talk to your doctor about how much surgery might help.

What should I do if I want to become pregnant? — Doctors usually do not perform surgery to treat stress incontinence in women who want to become pregnant. This is because pregnancy puts stress on the abdomen and urinary tract, which can cause stress incontinence to return even after surgery.

Patient Education: Treatments for Urge Incontinence in Women (The Basics)

What is urge incontinence? — "Incontinence" is a medical term for leaking urine or losing bladder control. People with urge incontinence feel a sudden strong need or "urge" to urinate. Often, this urge is so strong that they can't reach the toilet in time. "Overactive bladder" is another term used for having sudden and frequent urges to urinate. People with an overactive bladder may or may not leak urine.

Urge incontinence is common, especially in women. But there are treatments that can help. There are also things you can do on your own to stop or reduce urine leakage, so you don't have to "just live with it."

Are there things I can do on my own for urge incontinence? — Yes. Some steps that can help reduce urine leakage or urges include:

- Cut down on any foods or drinks that worsen your symptoms. Alcohol, caffeine, spicy or acidic foods, or artificial sweeteners can cause some people to urinate more often or have sudden urges.
- Try not to drink too much right before bed.
- Prevent constipation – Constipation is a common problem that makes bowel movements difficult. It can make urge incontinence worse.

You can also try some things to help with bladder control:

- Bladder training – Bladder training involves going to the toilet at scheduled times to help your bladder hold more urine. For example, you might decide to go to the toilet every hour. Then you force yourself to go every hour, even if you don't think you need to. After getting used to waiting 1 hour, you can try waiting longer between toilet visits. Over time, you can "retrain" your bladder to wait 3 or 4 hours between visits.
- Relaxation can help manage the urge to go. When you feel an urge, stop or sit down. Take a deep breath, tighten your pelvic muscles, and let the "wave" of needing to go pass. Then slowly walk to the toilet and urinate.
- Pelvic floor exercises – Pelvic floor exercises strengthen the muscles that control urine flow. These exercises can help, but people often do them incorrectly. Ask your doctor or nurse how to do the exercises correctly.

How do doctors treat urge incontinence in women? — In addition to bladder training, relaxation, and pelvic floor exercises, treatment sometimes includes medications and sometimes procedures. These are discussed in more detail below.

Medications that relax the bladder – These medications can help control symptoms. Medications include oxybutynin (brand name: Ditropan), tolterodine (brand name: Detrol), fesoterodine (brand name: Toviaz), solifenacin (brand name: VESIcare),

darifenacin (brand name: Enablex), and mirabegron (brand name: Mirbetriq). They come as tablets taken by mouth, patches, or gels applied to the skin.

Medications for urge incontinence can have the following side effects:

- Very dry mouth
- Constipation
- Heartburn
- Difficulty thinking and remembering
- Blurred vision
- Fast heartbeat
- Feeling sleepy

If you are older, ask your doctor if it is safe to take these medicines. If you have trouble thinking or remembering, some of these medicines might make these problems worse.

If you are taking medication for urge incontinence or overactive bladder, you may need to try several different medicines until you find one that works for you.

Vaginal estrogen – If medicines that relax the bladder do not work for you or cause too many side effects, your doctor may discuss other treatments. For some women who experience vaginal dryness after menopause, vaginal estrogen can help with these issues as well as bladder problems.

Procedures to help relax the bladder – If medicines do not relieve your symptoms or you cannot take medicines, your doctor may suggest procedures such as:

- Injection of botulinum toxin (Botox) into the bladder to help relax it – The injection needs to be done once or twice a year. About 1 in 4 women who use these injections may have trouble urinating.
- Treatment with electrical nerve stimulation – This is done with a device placed under the skin, like a pacemaker. Electrical stimulation sends mild electrical signals to the nerves affecting the bladder. These signals do not hurt. This

treatment can help with sudden urges or frequent need to urinate. You may need follow-up procedures after the device is placed.

How effective are treatments for urge incontinence in women? — This depends on your symptoms and the cause of your urge incontinence. For example, if you have another medical condition (such as diabetes), treating that condition may help.

Most women need to try several treatments and sometimes use more than one treatment at a time. For example, your doctor may recommend bladder training, medication to relax the bladder, and vaginal estrogen. It may take a month or longer to know if a treatment is working. If you feel the treatment is not working quickly enough, try not to lose hope.

What will my life be like? — Most women need some form of treatment for urge incontinence for a long time or for life. Treatment for urge incontinence in women can help with symptoms, but it does not treat the cause of incontinence.

Even if treatment does not completely stop urge incontinence, it can make life easier and help you feel much better.

QUESTIONNAIRES USED IN URINARY INCONTINENCE

VOIDING DIARY
OVERACTIVE BLADDER ASSESSMENT FORM (OAB-V8)
UROGENITAL DISTRESS INVENTORY (UDI-6)
ICIQ URINARY INCONTINENCE SHORT FORM (ICIQ-SF)
INCONTINENCE IMPACT QUESTIONNAIRE (IIQ-7)
INCONTINENCE QUALITY OF LIFE QUESTIONNAIRE (I-QOL)
INQUIRY ABOUT URINARY INCONTINENCE RELATED TO SEXUAL INTERCOURSE

VOIDING DIARY

Use this diary to record how much fluid you drink and how much urine you pass each time you go to the toilet. You can easily measure the amount of urine with a measuring cup. Indicate any sudden urge to urinate or episodes of incontinence. This information can help your doctor in managing your symptoms. An example of how to use the diary is shown. Use a new page each day.

time	**Drinks (type and amount)**	**Urine volume (ml)**	**Was there a sudden urge to urinate?**		**Was there any incontinence?**	
EXAMPLE	1 cup of tea, 100cc	400 cc	YES	NOR	YEST	NO
06.00			YES	NO	YES	NO
07.00			YES	NO	YES	NO
08.00			YES	NO	YES	NO
09.00			YES	NO	YES	NO
10.00			YES	NO	YES	NO
11.00			YES	NO	YES	NO
12.00			YES	NO	YES	NO
13.00			YES	NO	YES	NO
14.00			YES	NO	YES	NO
15.00			YES	NO	YES	NO
16.00			YES	NO	YES	NO
17.00			YES	NO	YES	NO
18.00			YES	NO	YES	NO
19.00			YES	NO	YES	NO
20.00			YES	NO	YES	NO
21.00			YES	NO	YES	NO
22.00			YES	NO	YES	NO

23.00			YES	NO	YES	NO
00.00			YES	NO	YES	NO
01.00			YES	NO	YES	NO
02.00			YES	NO	YES	NO
03.00			YES	NO	YES	NO
04.00			YES	NO	YES	NO
05.00			YES	NO	YES	NO

OVERACTIVE BLADDER ASSESSMENT FORM (OAB-V8)

Aşağıdakiler sizi ne ölçüde rahatsız etmektedir?	Hiç	Çok az	Biraz	Epey	Çok	Çok fazla
Gündüz sık idrara çıkma	0	1	2	3	4	5
Rahatsız edici bir idrar sıkışması	0	1	2	3	4	5
Ani, beklenmedik bir idrar sıkışması	0	1	2	3	4	5
Kazara az miktarda idrar kaçırma	0	1	2	3	4	5
Gece idrara gitme	0	1	2	3	4	5
Gece idrar yapma ihtiyacı ile uyanma	0	1	2	3	4	5
Kontrol edilemez bir idrar sıkışması	0	1	2	3	4	5
Aşırı idrar yapma isteği ile birlikte idrar kaçırma	0	1	2	3	4	5
	TOPLAM PUAN					

Tarcan T, Mangır N, Özgür Ö, Akbal C. OAB-V8 Overactive Bladder Questionnaire Validation Study Urology Bulletin (2012), 21, 113-116

UROGENITAL DISTRESS INVENTORY (UDI-6)

How much are you bothered by the following?

	NONE (0)	A SMALL AMOUNT (1)	Moderately (2)	Greatly (3)
1. Frequent urination?				
2. Urine leakage related to urgency?				
3. Urine leakage related to physical activity, coughing, or sneezing?				
4. Small amounts of urine leakage?				
5. Difficulty emptying your bladder?				
6. Pain or discomfort in the lower abdomen or genital area?				

Cam C, Sakallı M, Ay P, Cam M, Karateke A. Validation of the short forms of the Incontinence Impact Questionnaire (IIQ7) and the Urogenital Distress Inventory (UDI-6) in a Turkish population. Neurourol Urodyn. 2007;26(1):129-33.

ICIQ URINARY INCONTINENCE SHORT FORM (ICIQ-SF)

Many people leak urine from time to time. We are trying to find out how many people leak urine and how much it bothers them. We would be grateful if you could answer the following questions thinking about how you have been, on average, OVER THE PAST FOUR WEEKS.

1) Please write your date of birth **2) Gender Female Male**

3) How often do you leak urine?

Never 0 points	About once a week 1 point	Two or three times a week 2 points	About once a day 3 points	Several times a day 4 points	All the time 5 points

4) We would like to know how much urine you think you leak? How much urine do you usually leak? (whether you use a pad or not) (Please tick one box)

NONE 0 points	A SMALL AMOUNT 2 points	A MODERATE AMOUNT 4 points	A LARGE AMOUNT 6 points

5) Overall, how much does leaking urine interfere with your everyday life? Please circle a number between 0 (not at all) and 10 (a great deal)

not at all	0	1	2	3	4	5	6	7	8	9	10	a great deal

ICIQ score: sum of scores 3+4+5. Scores of the questions=

6) When does urine leakage occur? (Please tick all that apply to you)

Never – I do not leak urine….
I leak before I can get to the toilet….
I leak when I cough or sneeze….
I leak when I am asleep….
I leak when I am physically active/exercising….
I leak after I have finished urinating and am dressed….
I leak for no obvious reason….
I leak all the time….

Çetinel B, Özkan B, Can G. THE VALIDATION STUDY OF ICIQ-SF TURKISH VERSION Turkish Journal of Urology: 30 (3): 332-338, 2004

Incontinence Impact Questionnaire (IIQ-7)

Incontinence Impact Assessment

Has losing urine or having a prolapse affected any of the following?

	NONE	SLIGHTLY	A MODERATE AMOUNT	A LARGE AMOUNT
1 Has it affected your ability to do household chores?				
2 Has it affected your ability to do physical activities such as walking, swimming, or other exercise?				
3 Has it affected your ability to participate in entertainment activities (movies, concerts, weddings, etc.)?				

4 Has it affected your ability to travel for more than 30 minutes by car or bus?				
5 Has it affected your ability to participate in social activities outside your home (such as meetings with friends, shopping, etc.)?				
6 Has it affected your emotional health?				
7 Has it caused you to feel frustrated?				

Cam C, Sakallı M, Ay P, Cam M, Karateke A. Validation of the short forms of the Incontinence Impact Questionnaire (IIQ7) and the Urogenital Distress Inventory (UDI-6) in a Turkish population. Neurourol Urodyn. 2007;26(1):129-33.

INCONTINENCE QUALITY OF LIFE QUESTIONNAIRE (I-QOL)

Please provide the most appropriate answer to the following questions

1. I worry about not getting to the toilet in time.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

2. I am afraid of coughing or sneezing.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

3. I need to be careful when getting up from a seated position.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

4. I worry about where the toilet is in new places I visit.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

5. I feel unhappy / sad.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

6. I do not feel comfortable leaving my home for long periods.

7. I am frustrated because my urinary problem prevents me from doing what I want.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

8. I worry about others smelling/ noticing urine odour on me.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

9. I always have urine leakage on my mind.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

10. It is important for me to go to the toilet frequently.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

11. It is important for me to plan every detail in advance because of my urine leakage.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

12. I am afraid that my urine leakage will worsen as I get older.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

13. I have trouble sleeping at night.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

14. I worry about being embarrassed and humiliated because of my urine leakage.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

15. I feel like I am not a healthy person because of my urine leakage.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

16. I feel helpless because of my urine leakage.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

17. I enjoy life less because of my urine leakage.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

18. I am afraid of wetting myself.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

19. I feel like I have no control over my bladder. I feel like I have no control over my bladder at all.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

20. I need to control the amount of fluid I take. I need to monitor what I drink.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

21. My urine leakage limits my choice of clothing.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

22. I am afraid of having sexual intercourse.

1) A lot 2) Quite a bit 3) Moderately 4) A little 5) Not at all

Özerdoğan, N., Beji, N. K., & Yalçın, Ö. (2004). Urinary Incontinence: Its Prevalence, Risk Factors and Effects on the Quality of Life of Women Living in a Region of Turkey. Gynecologic and Obstetric Investigation, 58(3), 145150. https://doi.org/10.1159/000079422

INQUIRY ABOUT URINARY INCONTINENCE RELATED TO SEXUAL INTERCOURSE

Please answer the following questions considering your sexual life in the last 3 months. Mark the answer that best suits you.

1) **How much urine do you lose during sexual intercourse?**
   0) None 0 1) A small amount 2) A moderate amount 3) A large amount

In what proportion of your sexual encounters do you experience urine leakage?

0) None 1) Less than half 2) Half 3) More than half 4) All

How much does urine leakage during sexual intercourse affect your sexual life?

0) None 0 1) A small amount 2) A moderate amount 3) A large amount

How much does urine leakage during sexual intercourse affect your relationship with your partner?

0) None 0 1) A small amount 2) A moderate amount 3) A large amount

If your urine leakage during sexual intercourse continues like this, how would you feel?

0) Good 1) Neither good nor bad 2) Bad

Do you experience any negative emotions such as embarrassment, shyness, fear, disgust, or guilt due to urine leakage during sexual intercourse?

0) None 0 1) A small amount 2) A moderate amount 3) A large amount

Regarding your urine leakage during sexual intercourse, please mark all that apply to your situation.

	NO (0)	YES (1)
a. I do not leak urine during sexual intercourse		
b. I leak urine when my partner is inside me		
c. I leak urine during orgasm (when satisfied) during sexual intercourse		
d. I leak urine when satisfying myself (masturbation)		
e. I leak urine during foreplay		

Is your urine leakage during sexual intercourse related to the sexual position?

	NO (0)	YES (1)
a. I do not leak urine during sexual intercourse		
b. I leak urine in all positions during sexual intercourse		
c. I leak urine when my partner is on top during sexual intercourse		
d. I leak urine when I am on top during sexual intercourse		
e. I leak urine when my partner is behind me during sexual intercourse		
f. I leak urine in other positions during sexual intercourse		

Do you take any precautions to prevent urine leakage during sexual intercourse?

	NO (0)	YES (1)
a. I do not leak urine during sexual intercourse		
b. I leak urine during sexual intercourse but do not take any precautions		
c. I urinate immediately before sexual intercourse		
d. I tighten myself during sexual intercourse		
e. I avoid sexual intercourse		

Tarhan F, Ay P. Development and validity of a questionnaire for coital urinary incontinence: clinical and urodynamic analysis. International Urogynecology Journal. Doi:10.1007/s00192-018-03863-z