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CONTENTS

SHORT COMMUNICATION

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CASE STUDY

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TREATMENT OF STRESS-INDUCED URINARY INCONTINENCE BY TVT-O METHOD (CLINICAL CASE)

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ABSTRACT

Stress urinary incontinence (SUI) is one of the most common diseases accompanied by loss of control over the activity of the bladder. Women are more susceptible to this pathology than men due to the peculiarities of the structure of the genitourinary system, as well as due to pregnancy, childbirth, gynecological operations, and age. Incontinence occurs when a woman coughs, sneezes, laughs, lifts weights, runs, etc. It leads to social isolation and significantly reduces the quality of life of patients.

The article analyzes the case of a patient who was in the gynecological department of the Uzhhorod City Maternity Hospital of the Uzhhorod City Council and complained of urinary incontinence during coughing, sneezing, laughing, and physical exertion. A full clinical and laboratory examination, physical examination, and consultation with narrow specialists were conducted. According to the research data, a diagnosis of stress urinary incontinence was made. Urethropexy with a synthetic loop (TVT-O operation) was performed using the Gynecare TVT Obturator System Tension-free Support for Incontinence. The complex treatment included antibacterial, antithrombotic and infusion therapy.

The effectiveness of the result of surgical treatment was evaluated taking into account subjective and objective criteria for the restoration of anatomical parameters and functional parameters, as well as the patient's quality of life during dynamic follow-up for 2 years. We noted the high efficiency of surgical treatment of stress urinary incontinence using synthetic material.

KEY WORDS: stress urinary incontinence, sling surgery, TVT-O surgery

INTRODUCTION

In the modern world, due to the improvement of socio-economic conditions of life and its increasing duration, medical and social problems associated with stress urinary incontinence (SUI) are becoming increasingly relevant [1]. As defined by the International Committee on Urinary Incontinence (ICUI), stress-induced urinary incontinence (SUI) is sudden involuntary urination during coughing, laughing, or physical activity due to a sudden increase in abdominal pressure. Despite the fact that this condition is not life-threatening or fatal, it has a significant impact on a woman's physical, psycho-emotional, and social status. According to European and American statistics, from 10 to 70% of the female population aged 40-60 years report symptoms of stress urination [2].

The pathomorphology of urinary dysfunction is based on a disturbance in the relationship between the bladder neck and the pubic junction and vagina due to a disturbance in the tone of the pelvic floor muscles with a consistent protrusion of the bladder neck and urethra («vaginal hammock»). As a result of increased abdominal pressure during coughing or physical exertion, the pressure in the bladder increases, which is transferred to the urethra and leads to uncontrolled urination. The risk factors for stress-induced urinary incontinence are age, obstetric complications, exhausting physical work, history of surgical treatment of the genitourinary system and pelvic organs, obesity, diabetes mellitus, and a large number of childbirths [3].

From the pathophysiological point of view, stress urinary incontinence is divided into two types: 1) anatomical – due to prolapse (hypermobility) of the vesicourethral segment and intact sphincteric apparatus of the urethra and bladder neck as a result of weakening of the musculo-fascial support of these organs (occurs in 90-95% of patients with SUI); 2) insufficiency of the urethral sphincter (with or without urethral hypermobility) as a result of endocrine atrophy of the urethral submucosa in postmenopausal women or damage to the urethral sphincter after pelvic surgery, trauma, radiation therapy, neurogenic diseases (occurs in 5-10% of patients with PBS) [4].

It is proposed to classify POP as follows (the type of pelvic organ prolapse according to Baden-Walker is indicated in parentheses): SUI grade I, type I – the patient loses urine only in an upright position, there is no pelvic organ prolapse. SUI I, type IIA (cystocele I, rectocele I) – the patient loses urine only in an upright position and has initial degrees of prolapse of the anterior and posterior vaginal walls. SUI grade II, type III – the patient loses urine in vertical and horizontal positions, the urodynamic parameters of the urethral sphincter are below normal, there is no pelvic organ prolapse. POP II, type IIIA (cystocele II, rectocele II, metrocele II) – the patient loses urine in vertical and

horizontal positions, the urodynamic parameters of the urethral sphincter are below normal, there is a prolapse of the anterior and posterior walls of the vagina, as well as the uterus to the vaginal ring [5].

Among all types of urinary incontinence in women, stress incontinence (urinary incontinence during stress) accounts for about 50-80%, urgency incontinence – 10-20%, mixed incontinence – 15-30%, and all other types – up to 5%. Diagnosis and treatment of various forms of urinary incontinence remains one of the main problems of urogynecology.

Today, there is no surgery that can provide 100 percent success in surgical correction of stress urinary incontinence in women. This is due to the complex anatomical structure of the lower urinary tract of a woman who is exposed to traumatic (childbirth, surgery on the anterior vaginal wall, etc.), physical, psychological and hormonal influences throughout her life, as well as to the multicomponent mechanism of regulation of the function of the vesicourethral segment in normal and pathological conditions, including urinary retention. The mechanism of urinary retention in women under stress is a complex and multifactorial system in which each anatomical element contributes to its successful functioning [6]. Various techniques, both conservative and surgical, are used to combat stress urinary incontinence. However, only surgery can cope with serious manifestations of the disease. The «gold standard» in surgical urogynecology is the TVT-O or TVT Obturator operation. This operation is the safest compared to other techniques and can be used in the treatment of stress incontinence [7].

The above and the importance of this problem prompted us to describe a clinical case of stress urinary incontinence in a woman.

SURGICAL INTERVENTION

A synthetic loop urethropexy (TVT-O operation) was performed using the Gynecare TVT Obturator System Tension-free Support for Incontinence (ETHICON, inc. Johnson & Johnson Company, USA). The complex treatment included antibacterial, antithrombotic and infusion therapy.

CASE STUDY

A 53-year-old woman turned to the UMPB UMD Department of Gynecology with complaints of urinary incontinence during coughing, sneezing, laughing, and physical exertion. She considers herself sick for 7-8 years, when she first noticed symptoms during physical activity. For the last year, she has been experiencing urinary discharge with any abdominal wall tension.

Family and allergic history is unremarkable. Occupational history is burdened by constant physical labor at factories.

Obstetric and gynecological history – 4 pregnancies, 3 natural births, 1 spontaneous abortion at 8-9 weeks. The delivery was complicated by cervical and vaginal tears. Menstrual function: menarche since the age of 15, the cycle was regular, menstruation was moderate, not painful. Currently, she has been in menopause for 3 years. Previous surgeries: appendectomy in childhood.

During the objective examination of the patient, the general condition was considered satisfactory. The patient has a regular body structure. Increased BMI. The skin and mucous membranes are pale pink in color. Lymph nodes are not palpable. The pharynx is clean, the tongue is not coated. The thyroid gland is not enlarged. The mammary glands are soft, not painful. Symptoms of peritoneal irritation are negative. At the Uzhhorod City Maternity Hospital of the Uzhhorod City Council, the gynecological department, in order to diagnose stress urinary incontinence, the following was done assessment of complaints, patient's medical history, pelvic ultrasound, vaginal examination with determination of the «coughing impulse» symptom, voiding test (Valsalva), cystometry, urethrocystometry assessment of the residual urine volume after urination, assessment of the frequency and volume of urine output, general and bacteriological urinalysis, clinical and laboratory tests (complete blood count, coagulogram, biochemical blood test), consultation with a therapist, neurologist.

Gynecological status: The external genitalia are properly developed. The introitus vagina is free. The cervix is cylindrical, the external os is closed, atresia of the os. There is an insufficiency of the urethral sphincter, it is gaping. The uterus is not enlarged, not painful to palpation, movable. Appendages on both sides are unremarkable. Parameters are free, vaults are deep. Vaginal discharge is mucous. On the gynecological chair, urine leakage on exertion was detected, cough test and Valsalva test were positive.

At the stage of preoperative preparation, clinical and laboratory examinations were performed, and the patient was consulted by other specialists, namely: a general practitioner, anesthesiologist, and neurologist. Examination by a therapist: Ischemic heart disease. Cardiac insufficiency I. Condition after ischemic stroke (2008). Adipositas of the second stage. Conclusion of the neurologist: neurological causes of urinary incontinence were excluded, no acute neurological disease was detected.

Normal results of general and bacteriological urinalysis and neurological examination, the presence of anatomical pelvic support disorders and urinary leakage during exertion, positive cough test and Valsalva test, normal cystometry and urethrocytometry, normal residual urine volume, normal bladder capacity and sensitivity, absence of involuntary detrusor contractions allow to make a diagnosis of stress urinary incontinence.

Admission to the operation has been obtained. The patient was familiarized with the scope of the operation and informed consent was obtained. Surgical treatment was performed as planned. A synthetic loop urethropexy (TVT-O operation) was performed using the Gynecare TVT Obturator System Tension-free Support for Incontinence (ETHICON, inc. Johnson & Johnson Company, USA). The complex treatment included antibacterial, antithrombotic and infusion therapy.

In aseptic conditions, under spinal anesthesia, the puncture points of the suburethral sling were marked 1 cm above the urethra and at the intersection of the inguinal fold and the transverse line. We install a Foley catheter. In the

projection of the urethra, 1 cm below the external sphincter, make a vertical incision 1.5-2 cm long. We take the edges of the wound on the Alice clamp and pull them aside. Next, we hydroprepare the vaginal walls in the direction of the descending branch of the pubic bone at an angle of 45° on both sides. After that, we separate the tissues with a sharp and blunt method, also at an angle of 45° until you feel the touch of the pubic bone. The procedure is repeated on both sides. In the formed tunnels, to protect the bladder, we alternately place a grooved probe along which, using a deshan-like conductor, we pass a mesh implant through the septum and enter the skin at the intersection of the direct projection of the clitoris and the iliac crease. This manipulation is performed on both sides. We place a clamp between the urethra and the strip, on which the implant is fixed to determine the degree of tension. We cut off the ends of the implant above the skin. The vaginal mucosa is sutured with vicryl sutures. Separate knotted vicryl sutures are placed on the skin in the area of the incisions. Gauze tampon was inserted into the vagina. The total blood loss was 100 ml. The urine through the catheter was light and clear.

After the operation, the patient received ceftriaxone 2.0 + 0.9% NaCl 200.0 IV No. 5, pentoxifylline 5.0 + 0.9% NaCl 200.0 IV No. 3, infulgan 100.0 IV No. 3, asparkam 10.0 + 5% glucose 200.0 IV No. 3, dexalgin 2.0 IV No. 4, analgin 2.0 + dimedrol 1.0 IV No. 3, unorm 5.0 + 0.9% NaCl 200.0 IV No. 3, flenox 0.4 p.c. No. 3, eufilin 2.4% 10.0 + 0.9% NaCl 200.0 IV No. 2.

Data of the patient's laboratory examination: HBC – hemoglobin – 130 g/l, erythrocytes – 4.82 x 1012/l, leukocytes – 7.20 x 109/l, platelet count – 252 x 109/л. CSF – light yellow, transparent, erythrocytes – 2-3 in the field of view, leukocytes – 3-4 in the field of view.

The early and late postoperative periods were uneventful. The gauze tampon was removed the next day after the surgery, slightly soaked with blood. The vaginal mucosa was treated with Ginodek gel No. 7 after the operation. The patient was discharged from the hospital on the 7th day in a satisfactory condition under the supervision of the district gynecologist.

The effectiveness of the result of surgical treatment was evaluated taking into account subjective and objective criteria for the restoration of anatomical parameters and functional parameters, as well as the patient's quality of life during dynamic follow-up for 2 years. We noted the high efficiency of surgical treatment of stress urinary incontinence using synthetic material. The woman is satisfied with the result of the operation and the improvement in quality of life, no relapse has been observed.

DISCUSSION

According to various authors, patients with stress urinary incontinence should undergo a comprehensive examination to clearly determine the type of incontinence and choose surgical treatment. The examination should include the following components: careful collection of complaints and anamnesis, detailed objective examination, general and bacteriological urinalysis, assessment of residual urine volume after urination, assessment of urinary frequency and volume of urine output, and urodynamic tests. The introduction of modern methods of combined urodynamic examination into medical practice makes it possible to comprehensively assess the urinary function, determine the cause and type of disorders, and determine the prospects for treatment [8-11].

During the objective examination, a general physical examination, neurological screening, with special attention to the lower extremities and perineum, and urogynecological examination are performed. Healthy 40-year-old women with moderate symptoms of urinary incontinence who lead an active lifestyle require different treatment approaches than 80-year-old patients with dementia and constant urinary leakage. Older patients have decreased physiological reserves and numerous pathological processes and may require only medical treatment. Neurological examination is indicated due to the possibility of numerous neurological causes of urinary incontinence. The presence of a cough reflex indicates the intactness of the spinal cord. The deep tendon reflexes, anal reflex, pelvic floor muscle reflexes, and contractility of the bulbocavernosus muscle are checked [4, 10, 11].

The goal of treating stress urinary incontinence is to provide support for the pelvic organs and restore the anatomical position of the urethrovesical junction. Surgical treatment is the most optimal way to correct it. The choice of surgery method is determined by the type of incontinence, primary or secondary procedure, and the degree of concomitant pelvic relaxation [12, 13].

In the world clinical practice, the installation of a synthetic suburethral sling is the most effective and safe surgical method of treating stress urinary incontinence. Its effectiveness is 80-95% [14,15]. The most commonly used surgical procedures for the treatment of age-related urinary incontinence in women are surgical operations with the use of synthetic tape – TVT and TVT-O. It is installed in place of damaged or weakened ligaments, maintaining the urethra in the correct position. The procedures are very similar. The difference lies in the location of the incisions through which the tapes are inserted. During TVT plastic surgery, the tape is passed through the paraurethral canals, and its ends are brought to the abdominal wall. During the TVT-O operation, the tape is passed through the locking holes located inside the pelvic bones.

The TVT-O technique was developed by the French doctor E. Delorm in 2001 as an alternative to the TVT operation. The main reason why the surgeon decided to improve the existing method was that it was associated with a high risk of damage to the intestines and bladder. The analysis of literature data comparing TVT and transobturator tape urethropexy (TOT) techniques showed that the TOT technique requires less time, the postoperative period is shorter and more comfortable, and there are fewer postoperative complications. Anatomical studies have shown that the transobturator sling technique is safe in terms of damage to the main pelvic vessels (occluding artery and vein) and bladder with proper perforation, since the latter does not penetrate the pelvic cavity but passes

under the sphincter muscle. The perforators in the outside-in technique are located much further from the occluding vessels than in the inside-out technique. However, when performing an operation using the outside-in technique, it is necessary to perform a much larger dissection of the paraurethral space for finger control of the perforator into the vaginal wound [13,16].

C.M. Gomes et al. (2017) conducted a study of the literature on complications of synthetic suburethral slings, including transobturator slings. The authors noted that bleeding during transobturator suburethral sling placement occurred in -02% of -cases, bladder damage – in 015%-, urethral damage – in 0.-12.-5%, urethral erosion – in 0.-030.8%, intestinal damage – in 0%, vaginal erosion – in -010.-9%, urinary tract infection – in 7.413%-, inguinal pain – in -09.-4%, *de novo* -detrusor hyperactivity – in 015.-6%, urethral obstruction – in 3.011.-0%, and urinary retention – in 2.711.-0% of patients [17].

In connection with the occurrence of pain in the inguinal area (thigh), the formation of inflammatory infiltrates and abscesses of the thigh (labia) after the installation of transobturator slings, scientists began to look for options to reduce (avoid) these complications. One of the options was to reduce the length of the polypropylene tape and avoid its placement on the thigh. In 2009, Johnson & Johnson introduced the Gynecare TVT Abbrevo set for practical use for performing transobturator sling using the inside-out technique. This is a modification of the previous Gynecare TVT-obturator system, in which the mesh is much shorter (by 38%), has a length of 12 cm and is fixed in the pelvic muscles to avoid inflammation and abscesses of the thigh [7].

CONCLUSIONS

The basis for the correct determination of stress urinary incontinence is the history taking and physical examination, followed by confirmation of the diagnosis by using urodynamic tests.

The most universal operation for the correction of stress urinary incontinence is the TVT-O sling operation.

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CONFLICT OF INTEREST
The Authors declare no conflict of interest

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