

Suburethral sling in the treatment of anatomical type of stress urinary incontinence in women

S. P. Darenkov^{1,2}, A. A. Proskokov², M. D. Pavlyuk²

1. N. I. Pirogov Russian National Research Medical University, Department of Urology of Medical Faculty, Moscow (Head of the Department – Prof. S. P. Darenkov);

2. Clinical Hospital of the Presidential Administration of the Russian Federation, Moscow (Head of the Hospital – E. R. Yashina)

Stress urinary incontinence (SUI) is one of the most common diseases among women. The main treatment of it is a surgical intervention. Recently sling operations with a suburethrally set synthetic (prolene) loop have become widely spread. In the study the authors used a prolene suburethral sling in 23 women with SUI. The main characteristic of this tape was lightness. It made possible to eliminate SUI symptoms and provide good urodynamic results in 95,7% of patients. Thus the operative technique with suburethral prolene sling is an effective method in treatment of anatomic type of SUI in women.

Key words: stress urinary incontinence, suburethral prolene sling

Stress urinary incontinence or urinary incontinence due to the tension of the abdominal muscles is defined as a state of involuntary urine leakage from the external opening of the urethra at the higher tension of the abdominal muscles, without simultaneous contraction of the detrusor urinae muscle, causing both social and hygienic problems [1]. SUI in women is a common problem, encountered both in outpatient and clinical practice. It is estimated that about 15-20% of patients in urogynaecological departments is treated due to this condition. SUI in women is one of the ten most common diseases in women and, according to data resulting from different studies, more than 46% of women living in Europe and America suffer from stress urinary incontinence [2]. It was found that the symptoms of SUI have highly negative impact on the quality of life, including social, physical, psychological and sexual aspects. Currently, there is no doubt that the primary treatment method of SUI in women is a surgery [3]. At the end of the previous century so-called sling operations (from English sling – loop) were performed to treat this condition. The essence of this method is the use of tapes (slings) made of different materials, which are placed under the urethra neck, and output to the front wall of the abdomen. At the beginning for this purpose surgeons used autologous material such as skin, tendons of the abdominal muscles, of the vagina wall, and others. Currently, this type of surgery is called a traditional sling. In 1996, the clinical practice started using the technique of tension-free synthetic loop (tension-free vaginal tape – TVT), which involves placing a synthetic sling made of prolene in the central

part of the urethra. The above described method led to the creation of a whole class of operations, which is called the urethral tape suspension technique (sling) [4]. In 2001, E. Delorme et al. proposed the technique of placing the tape over the obturator foramen (transobturator tape – TOT) for fixing a tension-free synthetic tape, justifying that there was need to reduce the number of cases of bladder injury, which occurred in more than 7% of the operations using TVT [5]. In a published study in 2010 R. Angioli et al. indicated that during the five year observation, the effectiveness of TVT was 71.4%, and TOT – 72.9% [6]. There is no information available on the frequency of complications after the surgical treatment of stress urinary incontinence, which is associated with an insufficient number of standardised methods to assess the research results. However, it is known that after an open Burch colposuspension and surgeries using the TVT and TOT methods in approximately 15% of patients stress incontinence is still present. There are also not rare cases of difficulties in urination or recurrence of the imperative urination problem [7-9].

The aim of our study was to evaluate the results of the application of the new prolene sling in the urethra suspension technique to treat stress urinary incontinence in women.

Patients and methods

After comprehensive clinical-laboratory and instrumental studies there were 23 women with primary anatomical stress urinary incontinence at the age from 32 to 76 years (average age - 56.7 years) directed for the surgical treatment using the prolene sling in the urethra suspension technique. The average duration of disease was 8.2 years (from 1 to 18 years). Preoperatively all the patients underwent the following tests: medical history indicating the length of the incontinence problems, physical examination with indicating bodyweight, urinalysis, urine cultures, a one-hour pad test, voiding diary, cough test with a full bladder to cystometric capacity (but not more than 400 ml), Q-tip test, and renal and bladder ultrasonography with determining the residual urine volume, complex urodynamic study (uroflowmetry, urethral profilometry, bladder filling and emptying cystometry determining the intra-abdominal pressure at the point of urine loss and stress-profile).

The urodynamic study was performed according to the recommendations of the International Continence Society (ICS). An objective indicator of a positive result of the operations is considered a negative pad test result (urine loss at a level not more than 1 g of urine within one hour) and no urination while coughing at a full bladder. In the cases where patients with stress urinary incontinence capacity is not more than 50% of the capacity before the operation, the result of the treatment is assessed as an improvement. Subjective efficacy of the surgical treatment was assessed on the basis of patients' statements, declaring urinary continence or incontinence during physical activities: a positive result – no stress urinary incontinence, negative – further occurrence of the disease. The

objective and subjective results of the treatment were assessed in the early postoperative period after removal of the catheter, and 6 months after the surgery.

The sling characteristics and the method of surgical treatment

The suburethral tape DALLOP NM is a prolene monofilament inelastic tape (implant) of a width of 1.0 cm and a length of 45 cm with large pores. For its implantation reusable trocars are used. The surgical method of placing a regulated suburethral sling through the obturator foramen is not significantly different from a routine TOT method. The trocars are introduced from the outside to the inside. It is worth mentioning that the implant is modified to enable its placing from the suprapubic approach where trocars are inserted into the vagina from suprapubic area. At a distance of about 1 cm from the external opening of the urethra an incision is made of the front vaginal wall at a length of 1.5-2 cm. At an angle of about 45° from the middle line horizontally paraurethral canals are formed up to the lower branch of the pubic bone. The trocars are introduced from the outside to the inside through the lance-shaped skin slit in the obturator foramen area. The prolene tape is introduced in the opposite direction, placing it under the urethra without tensioning. The vaginal incision is sewn over the tape. The ends of the tape are led out through the obturator foramina and cut off. Urine is drained by means of a Foley catheter no. 16 according to Charriere scale. Next day after the operation, the catheter is removed after former filling of the bladder with a sterile solution up to two thirds of its cystometric capacity. Then after 30-60 minutes, a cough test is performed in a supine and sitting position. The urination quality is assessed on the basis of uroflowmetry results and residual urine volume.

Results and discussion

According to the results of pre-operative tests, all the women were objectively diagnosed with urine leakage from the external opening of the urethra at increased intra-abdominal pressure (cough, pressure) without simultaneous contraction of the detrusor muscle of the bladder. At this the maximum urethral closure pressure in all patients was greater than 30 cm of water gauge (from 37 to 74), intra-abdominal pressure at the point of urine leakage exceeded 60 cm of water gauge (from 64 to 136), the Q-tip test results were more than 30°. All these results point to urethral hypermobility. In view of the above, all the 23 women had anatomical stress incontinence and therefore they had the prolene sling implanted. In all the cases the surgery was performed under extrameningeal anaesthesia. The average surgery length was 34 minutes (from 28 to 55), the average blood loss during the surgery - 52 ml (from 0 to 150), the average length of hospital stay - 3.5 days (from 1 to 7). During the operation there were no complications associated with the sling insertion. All the patients' tests were evaluated on the day following of the surgery, immediately after removing the catheter. According to the subjective and objective result evaluation, there was a complete lack of stress urinary incontinence in

18 out of 23 (78.3%) women who underwent the surgery, improved condition in 4 (17.4%), and in 1 (4.3%) patient SUI remained at a light level. All the 23 women with stress urinary incontinence treated with the urethral tape suspension, were long-term observed from 6 to 36 months (average follow-up period - 14 months). Based on the data from the objective study, no recurrences of SUI were reported in the later postoperative period.

Summary

Based on the foregoing, it can be concluded that the suburethral sling implantation using the urethral DALLOP NM tape suspension technique is a minimally invasive surgery, without any specific complications and contraindications, which proved to be effective in 95.7% of the women suffering from anatomical urinary incontinence at stress or effort. Our data show that the operational correction of urinary incontinence in women using the prolene suburethral sling may be a good choice for the treatment of this condition.

Literature

1. Abrams P., Cardozo L., Fall M. et al. The standardization of terminology in lower urinary tract function // *Neurol. Urodyn.* 2002. V.21. P.167–178.
2. Botlero R., Urquhart D.M., Davis S.R., Bell R.J. Prevalence and incidence of urinary incontinence in women: review of the literature and investigation of methodological issues // *Int. J. Urol.* 2008. V.15. P.230–234.
3. Serati M., Salvatore S., Uccella S. et al. Surgical treatment for female stress urinary incontinence: what is the gold-standard procedure? // *Int. Urogynecol. J.* 2009. V.20. P.619–621.
4. Ulmsten U., Henriksson L., Johnson P., Varhos G. An ambulatory surgical procedure under local anesthesia for treatment of female urinary incontinence // *Int. Urogynecol. J.* 1996. V.7. P.81–86.
5. Delorme E. Transobturator urethral suspension: miniinvasive procedure in the treatment of stress urinary incontinence in women // *Prog. Urol.* 2001. V.11. P.1306–1313.
6. Angioli R., Plotti F., Muzii L. et al. Tension-free vaginal tape versus transobturator suburethral tape: five-year follow-up results of a prospective, randomised trial // *Eur. Urol.* 2010. V.58. P.671–677.
7. Al-Badr A., Ross S., Soroka D. et al. Voiding patterns and urodynamics after a tensionfree vaginal tape procedure // *J. Obstet. Gynecol. Can.* 2003. V.25. P.725–730.
8. Mazouni C., Karsenty G., Bretelle F. et al. Urinary complications and sexual function after tension-free vaginal tape procedure // *Acta Obstet. Gynecol. Scand.* 2004. V.83. P.955–961.

9. Gateau T., Faramarzi-Roques R., Le Normand L. et al. Clinical and urodynamic repercussions after TVT procedure and how to diminish patients complaints // Eur. Urol. 2003. V.44. P.372–376.

Information about the authors:

Darenkov Sergei Petrovich, doctor of medical science,

professor, head of Department of Urology of Medical Faculty of the N.I. Pirogow Russian national medical research university; head of the NIL innovative technologies in urology of the N.I. Pirogow Russian national medical research university.

Address: 119049, Moscow, Lenin Prospekt, 10, room 12

Phone: (495) 952-4345

E-mail: darenkov@list.ru