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Results of surgical correction for cervical elongation with vaginal wall prolapse in patients of reproductive and premenopausal age

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ABSTRACT

BACKGROUND: The problem of cervical elongation is becoming increasingly important due to the rising prevalence of pelvic organ prolapse. In Russia, descent and prolapse of pelvic organs account for 39% of all gynecological pathologies.

AIM: This study aimed to compare the immediate and long-term results of surgical treatment for cervical elongation in combination with vaginal wall prolapse in patients of three clinical groups.

MATERIALS AND METHODS: A total of 105 patients aged 30 to 55 years with a combination of cervical elongation and vaginal wall prolapse of degrees I–II were followed up. The patients were divided into three clinical groups based on the implemented surgical techniques, including group 1 (*n*=36) with Moscow surgery, group 2 (*n*=35) with modification of the Manchester surgery using synthetic implants, and group 3 (*n*=34) with Manchester surgery.

The patients underwent a comprehensive clinical examination, surgical treatment, and follow-up in the early and long-term postoperative periods (1, 6, 12, 24, and 36 months). The efficacy of surgical treatment was assessed using a questionnaire. During dynamic monitoring, a gynecological examination with a Valsalva maneuver, and transperineal, and transvaginal echography were performed.

RESULTS: During the first month after the surgery, patients noted irregular dragging pains in the perineum and/or inguinal region every second. A frequent urge to urinate was reported in 16.7%, 17.1%, and 17.6% of patients in groups 1, 2, and 3, respectively. A further survey revealed that the surgical treatment results were satisfactory, as it had a positive effect on the quality of life and mood and contributed to an increase in social and sexual activity. According to the physical examination, there were no signs of prolapse recurrence and mesh-associated complications. Erosion of the anterior vaginal wall over the polypropylene endoprosthesis was detected 6 months after the surgery in 3 (8.6%) patients of group 2.

Genital prolapse recurrence was diagnosed after 12–36 months in 7 (20.6%) patients of group 3. After 36 months, degree I prolapse of the posterior (*n*=1) and anterior (*n*=1) walls of the vagina was revealed in patients of groups 1 and 2, respectively.

Keywords: cervical elongation; prolapse of the vaginal walls; Moscow surgery.

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Результаты хирургической коррекции элонгации шейки матки в сочетании с опущением стенок влагалища у пациенток репродуктивного и пременопаузального возраста

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АННОТАЦИЯ

Введение. Проблема элонгации шейки матки становится все более актуальной в связи с ростом распространённости пролапса тазовых органов. В России опущение и выпадение органов малого таза достигает 39% среди всей гинекологической патологии.

Цель исследования — сравнить ближайшие и отдалённые результаты хирургического лечения по поводу элонгации шейки матки в комбинации с опущением стенок влагалища у пациенток трёх клинических групп.

Материалы и методы. Под наблюдением находились 105 пациенток в возрасте от 30 до 55 лет с сочетанием элонгации шейки матки и опущения стенок влагалища I–II степени, которых разделили на три клинические группы в зависимости от реализованных хирургических методик: 1-я группа (*n*=36) — Московская операция; 2-я группа (*n*=35) — модификация манчестерской операции с использованием синтетических имплантатов; 3-я группа (*n*=34) — манчестерская операция.

Пациенткам провели комплексное клиническое обследование, хирургическое лечение и наблюдение в раннем и отсроченном послеоперационных периодах (1, 6, 12, 24 и 36 мес). Эффективность хирургического лечения оценивали при помощи анкетирования. В процессе динамического мониторинга осуществляли гинекологическое исследование с пробой Вальсальвы, трансперинеальную и трансвагинальную эхографию.

Результаты. В течение первого месяца после операции каждая вторая пациентка отмечала нерегулярные тянущие боли в области промежности и/или паховой области. Учащённые позывы к мочеиспусканию наблюдались у 16,7; 17,1 и 17,6% пациенток 1-й, 2-й и 3-й групп, соответственно. Дальнейшее анкетирование показало удовлетворённость результатами хирургического лечения, что положительно отразилось на качестве жизни, настроении, способствовало повышению социальной и сексуальной активности. Согласно данным объективного обследования, признаков рецидивов пролапса и mesh-ассоциированных осложнений не отмечено. Через 6 мес после операции у 3 (8,6%) пациенток 2-й группы выявлена эрозия передней стенки влагалища над полипропиленовым эндопротезом.

Рецидив генитального пролапса диагностирован через 12–36 мес у 7 (20,6%) пациенток 3-й группы. Через 36 мес у пациенток 1-й и 2-й групп выявлено опущение задней (*n*=1) и передней (*n*=1) стенок влагалища I степени.

Ключевые слова: элонгация шейки матки; опущение стенок влагалища; Московская операция.

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BACKGROUND

The incidence of pelvic organ prolapse (POP) can reach 94%, depending on the criteria for diagnosing the disease and the population sample. For example, the incidence of POP in Korea is 49.9%; in Tanzania, 64.6% of women are diagnosed with grade II–III POP, and 6.7% of patients have a severe disease. In Russia, pelvic organ ptosis and prolapse reach 39% among all gynecological pathologies [1–4].

An increase in the length (elongation) and/or overall size (elongation plus hypertrophy) of the uterine cervix is significant in the structure of descent of the pelvic organs, which is often combined with vaginal wall prolapse and entails various anatomical, topographical, functional, and trophic disorders of the pelvic organs [5].

Cervical elongation is becoming increasingly relevant because young women present in gynecological hospitals with impaired quality of life because of this pathology.

Options for cervical elongation involve isolated prolapse of the cervix, elongation of the cervix associated with vaginal wall prolapse, and increased cervical length associated with uterine prolapse. The consequence of prolonged ptosis or uterine cervix prolapse can be cicatricial deformation and hypertrophy, as well as the formation of dystrophic, dysplastic, and/or inflammatory processes (decubital ulcers, colpitis, endocervicitis with a long recurrent course, and cervical intraepithelial neoplasia) [6].

The most effective treatment for this pathology is surgery. In the 19th–21st centuries, several groups of surgical techniques were developed and introduced into clinical practice to correct pelvic organ ptosis and cervical elongation with and without vaginal wall prolapse. The classic intervention was the Manchester surgery proposed by Donald at the end of the 19th century and modified by Forthegrill in 1915, which can be performed in patients in both reproductive and perimenopausal periods. The disadvantages of Manchester surgery include the use of exclusively intrinsic tissues for fixation; complete intersection of the cardinal ligaments, which results in impairment in the natural anatomical and topographic design in the pelvis; increased traumatic nature of the surgery, which is often manifested by postoperative pain; displacement of the uterine body anteriorly; and displacement of the cervix posteriorly because of the intersection and transposition of the cardinal ligaments, which leads to an increased risk of disease relapse, with incidence varying from 3.6% to 22% [7–8].

Attempts were made to improve the Manchester surgery. For example, its modification was proposed using mesh synthetic (polypropylene) implants as a narrow tape, providing additional transobturator cervical suspension, which increased the efficiency of surgical intervention and reduced disease relapses [9]; however, this technique led to mesh-associated complications, with incidence varying from 6 to 18% [10–11].

In 2021, A.I. Ishchenko et al. improved a previously developed (2018) surgical technique for correcting cervical elongation combined with vaginal wall prolapse (Moscow surgery) [5, 12].

This study aimed to compare the immediate and long-term results of surgical treatment for cervical elongation associated with vaginal wall prolapse in three clinical groups of patients, which were formed depending on the surgical techniques implemented.

MATERIALS AND METHODS

This study was conducted between 2018 and 2022 in the gynecological departments of the University Clinical Hospital No. 4, the Treatment and Rehabilitation Center of the Ministry of Health of the Russian Federation, and the V.F. Snegirev Clinic of Obstetrics and Gynecology, which was the clinical base of the Department of Obstetrics and Gynecology No. 1 of the N.V. Sklifosovsky Institute of Clinical Medicine of the I.M. Sechenov First Moscow State Medical University.

We monitored 105 patients aged 30–55 years with cervical elongation associated with grade I–II vaginal wall prolapse. All patients underwent a comprehensive clinical examination, received surgical treatment using three different techniques, and had outpatient follow-ups in the early and delayed postoperative periods.

Three groups were formed according to the surgical technique employed. Group 1 (main) included 36 patients who underwent Moscow surgery, group 2 (comparison) consisted of 35 patients who underwent surgical correction using synthetic polypropylene implants, and group 3 (comparison) included 34 patients who underwent the Manchester surgery in 2012–2017. This group was analyzed using outpatient and inpatient clinical documentation and data from an online and telephone survey.

The study groups were formed using thematic sampling. The inclusion criteria were as follows: cervical elongation associated with grade I–II prolapse of the anterior vaginal wall in patients of reproductive and premenopausal age; consent to the proposed scope of surgery and installation of mesh titanium or polypropylene implants; voluntarily signed the informed consent form to participate in the study and medical intervention; provided consent to the study of clinical documents (outpatient cards and medical histories). The non-inclusion criteria were as follows: grade III–IV vaginal wall prolapse; complete prolapse of the uterus; current indications for hysterectomy; inflammatory diseases of the pelvic organs and/or abdominal cavity; severe extragenital diseases that do not allow adequate anesthesia; decubital ulcers of the cervix; congenital or acquired deformities of the pelvic bones and/or hip joints that do not allow surgery to be performed via a transvaginal approach.

The exclusion criteria were as follows: refusal to participate in the study, presence of malignant neoplasms in female genital organs, and pregnancy.

The patients were examined in accordance with the standards of medical care for patients with pelvic prolapse.

It included an analysis of complaints and anamnesis, physical examination, gynecological and rectal examination, instrumental examination (transvaginal and transperineal echography, colposcopy), and laboratory methods (clinical and biochemical blood tests, hemostasiogram, general urine analysis, bacterioscopic and bacteriological examination of smears from the vagina and cervical canal, and cytological examination of the ecto- and endocervix). According to indications, other research methods were also performed. Their prescription was based on individual clinical symptoms, anamnesis data, and preoperative preparation (electrocardiography, chest X-ray imaging, determination of external respiratory function, Doppler measurements of the vessels of lower extremities, etc.). Consultations with specialists (therapist, endocrinologist, pulmonologist, urologist, proctologist, etc.) were also performed.

In the analysis of anamnesis data, the nature and time of onset of clinical symptoms, stages of development of the underlying disease, characteristics of heredity, extragenital pathology, and indicators of menstrual and reproductive functions were clarified. The nature of previous gynecological diseases and surgical interventions was considered.

During the clinical examination, the external genitalia, perineum, vagina, and cervix were examined, and a gynecological examination was then performed, which is the basis for diagnosing POP.

The international Pelvic Organ Prolapse Quantification System (POP-Q) was used to determine the severity of prolapse [13].

Extended colposcopy was performed using the Carl Zeiss 17 apparatus (Germany). Transvaginal and transperineal echographic examinations were performed using a Voluson P6 device (General Electric, USA) equipped with transvaginal and convex sensors.

Group 1 (n=36) underwent surgical correction of cervical elongation associated with grade I–II vaginal wall prolapse using a newly developed technique (Moscow surgery) that included amputation of the elongated cervix with an incomplete intersection of the cardinal ligaments without their transposition, sacrospinal-transobturator cervical suspension using nonabsorbable ligatures with original anchorage, and tape-shaped mesh titanium implants (titanium silk), which have a high degree of inertness with respect to the surrounding biostructures, which determines the tolerance of the human body tissues to this type of endoprosthesis, and distinguishes the latter from their synthetic analogs [5, 14].

Group 2 (n=35) underwent the modified Manchester surgery after the amputation of the elongated cervix, bilateral transection, and transposition of the cardinal ligaments. A transobturator cervical suspension was performed using polypropylene tape-shaped implants, which were fixed to the anterolateral walls of the cervix [9].

Group 3 (n=34) underwent Manchester surgery using exclusively their tissues for strengthening and fixation.

The last stage of surgery was identical in all three groups. Each intervention was completed with colpoperineolevatoroplasty.

Outpatient follow-up was performed 1, 6, 12, 24, and 36 months after surgery. The efficiency of surgical treatment was assessed using a validated PD-QoL [prolapse (of pelvic organs), dysfunction (of pelvic floor), and quality of life] questionnaire, which included 40 questions and 9 domains regarding the symptoms of POP, their severity, and effect on the daily life of patients [15]. During dynamic observations, gynecological and rectal examinations and transvaginal and transperineal echography were performed.

Statistical processing of the research results was performed using variation statistics. To analyze quantitative characteristics, Student's t-test was used (significance level p <0.05).

RESULTS

The age of patients with cervical elongation and grade I–II vaginal wall prolapse ranged from 30 to 55 years. Moreover, 38 (36.2%) women were between 30 and 45 years old, and 67 (63.8%) patients were between 46 and 55 years old.

Analysis of complaints showed diversity, which is typical for the descent of pelvic organs. All patients noted discomfort, a foreign body sensation in the vagina or outside it, and experienced awkwardness and uneasiness when walking. Nagging and aching pain in the lower abdomen and lumbosacral region occurred in every third patient, and 44 (41.9%) patients noted discomfort and a feeling of awkwardness during sexual activity. In addition, 32 (30.5%) patients experienced frequent urges to urinate, and 13 (12.4%) complained of constipation.

A slight feeling of discomfort in the vagina was recognized for the first time approximately 14–15 years ago in 14 patients, 9–12 years ago in 36, 5–7 years ago in 30, 2–4 years ago in 20, and 1 year ago in 5. The intensity of symptoms increased with disease progression.

Family history supported the hereditary nature of the pathology identified because genital prolapse was registered in mothers in every fourth case and in maternal grandmothers in every seventh case [4].

In the study of somatic pathology, cardiovascular diseases were noted in 23.8% of the patients, chronic bronchitis in 7.6%, chronic gastritis in 11.4%, and chronic cholecystitis and cholelithiasis in 9.5%.

According to D.F. Kostiuczek et al. (2005), 84% of female patients with cervical elongation have a complex of clinical, morphological, and immunohistochemical manifestations of connective tissue dysplasia [16].

Evidence of possible congenital disorders of the connective tissue structure in the three groups can be hernias (4.8%), varicose veins of the lower extremities (28.6%), hypermobility and dislocations of joints (15.2%), arthrosis of large joints, and osteochondrosis of various parts of the spine (18.1%) [17].

Menstrual function and the time of menopause did not have any particularities. The average age at menarche was 13.4±1.8 years, and the average age at menopause was 52.4±3.7 years.

Moreover, 91 (86.7%) patients had 1–2 and 14 (13.3%) patients had 3 natural deliveries at term. Childbirth was complicated by a history of trauma to the cervix, perineum, and/or vagina in 76 (72.4%) women, which was a predisposing factor for the development of genital prolapse. A history of artificial abortions was noted in 64 (60.95%) patients, and spontaneous miscarriages were registered in 16 (15.2%).

Among gynecological diseases, 25 (23.8%) patients had a history of benign cervical diseases (polyps of the cervical canal, ectropion, and endometriosis), 6 (5.7%) had salpingoophoritis, 19 (18.1%) had polyps and endometrial hyperplasia, 12 (11.4%) had uterine fibroids, and 3 (2.9%) had benign ovarian tumors.

Six (5.7%) patients had a history of abdominal myomectomy, 3 (2.9%) had undergone laparoscopic cystadenectomy, and 19 (18.1%) had undergone 1–3 therapeutic and diagnostic interventions (hysteroscopy and separate diagnostic curettage of the endocervix and endometrium).

Several authors assessed the significance of risk factors in the development of cervical elongation ranked them in this order: (1) connective tissue dysplasia, (2) natural childbirth and birth trauma, and (3) gynecological surgeries, such as diathermocoagulation of the cervix and separate diagnostic curettage of the endocervix and endometrium [18–19].

According to the literature, cervical elongation was registered in every third woman with pelvic organ descent, and its degree increased with the progression of prolapse. Cervical elongation was most often diagnosed in patients with prolapse of the anterior vaginal wall [20].

Surgical treatment was indicated in all patients with grade II cervical elongation associated with grade I–II vaginal wall prolapse, which led to the onset of pathological clinical symptoms and deterioration in the quality of life of women.

Surgical correction is the most effective treatment for this pathology and is usually performed through a transvaginal approach. Some surgeons prefer an organ-sparing scope (Manchester surgery and its modifications), whereas others prefer a radical (hysterectomy) scope of intervention.

The young age of women and the increased risk of urinary incontinence, recurrent pelvic prolapse, sexual dysfunction, and various neuroendocrine disorders after hysterectomy determine the preference of many surgeons for organ-sparing surgery. However, congenital connective tissue dysplasia, excess body weight, failure to perform anterior colporrhaphy and colpoperineolevatoroplasty increase the risk of disease relapse. Despite this, many surgeons consider Manchester surgery to be a reasonable alternative to hysterectomy because of its organ-sparing scope, reduction in the intervention duration and blood loss, and minimization of the risk of intra- and postoperative complications [5].

Currently, polymer, often polypropylene, endoprostheses are used to suspend or strengthen biological structures and replace fascial defects, which helps increase surgical efficiency and the longevity of its anatomical and functional results. However, mesh-associated complications remain unresolved, which worsen both the immediate and long-term results of the surgery, often necessitating repeated interventions associated with partial excision or complete removal of implanted synthetic endoprostheses [9, 21]. According to a multicenter study, the total number of mesh-associated and general surgical complications during the correction of genital prolapse was 22.4% [22]. The introduction of titanium implants into surgical practice helps in reducing the number of mesh-associated complications caused by extreme biological inertia, low fusion effect, and absence of cascade reactions of the body immune system to titanium implants [5, 23].

In all three groups, surgeries were performed using spinal anesthesia. In group 1, patients underwent Moscow surgery, during which the elongated cervix was elongated with partial bilateral intersection of the cardinal ligaments without their transposition and a Timesh-ligature sacrospinal-transobturator cervical suspension (Figs. 1 and 2). Group 2 underwent modified Manchester surgery with additional transobturator cervical suspension using tape-shaped polypropylene implants. Group 3 underwent traditional Manchester surgery. The final stage of each surgical intervention was pelvic floor strengthening with intrinsic tissues (colpoperineolevatoroplasty).

The researchers analyzed the duration of the surgical intervention, amount of blood loss, and duration of hospital stay in all three groups and considered the nature of complications in the early (Table 1) and delayed (Table 2) postoperative periods.

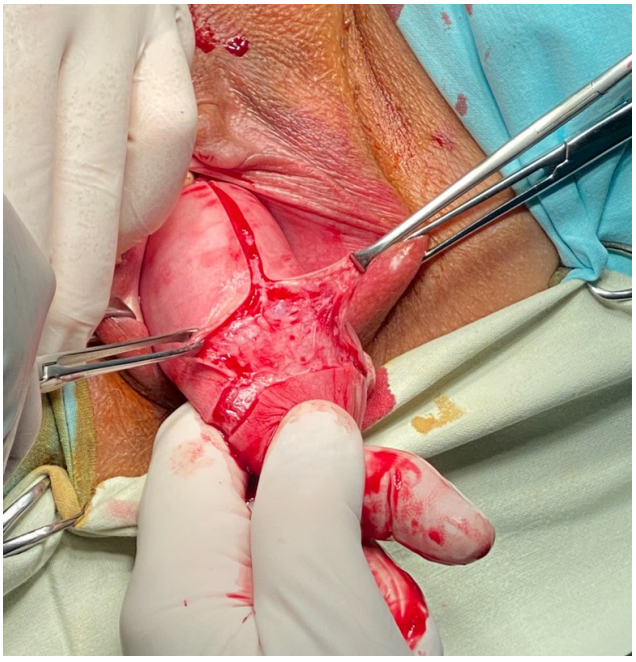

Fig. 1. Preparation for amputation of the elongated cervix.

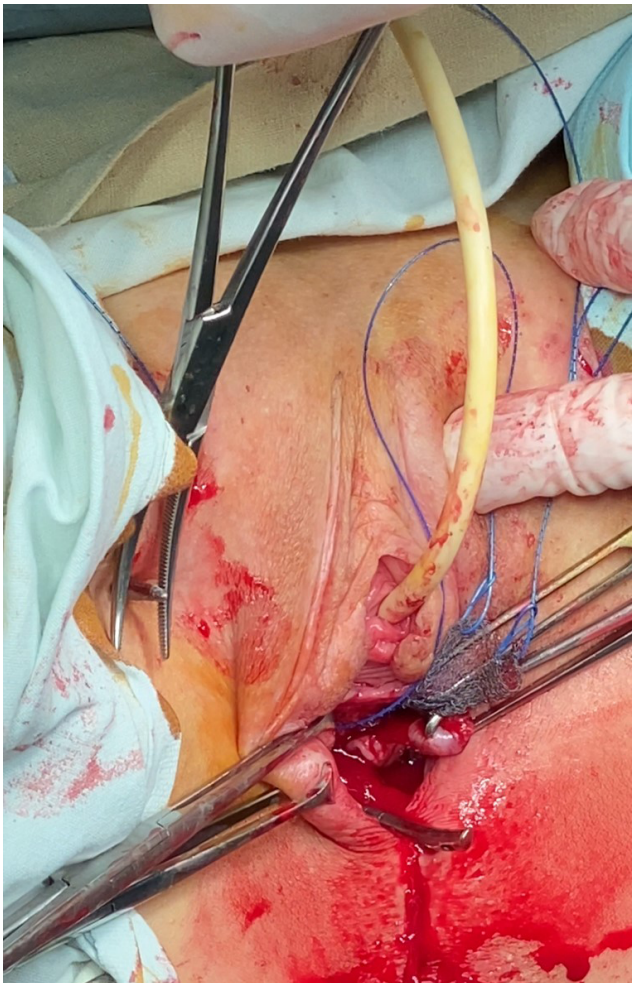

Fig. 2. Transobturator cervicosuspension using titanium implants.

The above data reveal that the Moscow surgery requires a slightly longer time than the other two surgical techniques, which is associated with the complicated surgical technique in group 1. The amount of blood loss and duration of hospital stay of the patients did not differ significantly. The incidence of small-volume hematomas (30–40 mL), which did not require surgical intervention, did not differ between the groups.

One month after surgery, nearly every second patient in the three clinical groups noted irregular nagging pain in the perineum and/or groin. Frequent urinary urgency was registered in 16.7%, 17.1%, and 17.6% of the patients in groups 1, 2, and 3, respectively.

Further questioning of the patients showed satisfaction with the results of surgical treatment, which had a positive effect on the quality of life and mood and contributed to an increase in social and sexual activity. However, case follow-up 6 months after surgery revealed that 3 (8.6%) patients in group 2 began to complain of a sanioserous discharge from the genital tract and unpleasant painful sensations during sexual intercourse. A gynecological examination revealed erosion of the anterior vaginal wall above the endoprosthesis, which required partial excision of the implant and suturing of the mucous membrane of the anterior vaginal wall in two patients and application of ointment tampons in one patient.

Recurrence of genital prolapse was diagnosed after 12–36 months in 7 (20.6%) patients in group 3. After 36 months, groups 1 and 2 were diagnosed with grade I prolapse of the posterior (*n*=1) and anterior (*n*=1) vaginal walls.

The absence of mesh-associated complications and low incidence of disease relapses during 36 months of follow-up in group 1 indicates the efficiency of the developed surgical technique (Moscow surgery) for the correction of grade II cervical elongation associated with grade I–II prolapse of the anterior vaginal wall with combined application of non-absorbable ligatures and titanium tape-shaped implants used to perform the Timesh-ligature sacrospinal-transobturator cervical suspension.

CONCLUSION

The study showed the advantages of the Moscow surgery in comparison with those of other surgical techniques for correcting cervical elongation associated with vaginal wall prolapse. Partial preservation of the fixing ligamentous apparatus (cardinal ligaments) without their transposition and amputation of the elongated cervix along with Timesh-ligature sacrospinal-transobturator cervical suspension provide long-term fixation and restoration of the natural topographic design in the pelvic cavity, which helps improve the quality of life of patients and prevent disease relapses. In turn, the use of titanium implants reduces the risk of mesh-associated complications.

ADDITIONAL INFO

Author's contribution. All authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work.

Table 1. Parameters of surgical intervention in the three groups

Parameters	Group 1 (*n*=36)	Group 2 (*n*=35)	Group 3 (*n*=34)
Surgery duration, min	92.6±32.5	88.9±21.1	78.6±20.4
Blood loss, mL	91.1±81.8	138.9±60.3	100.6±32.2
Hospital stay, bed days	6.7±2.6	6.3±1.8	7.4±1.2
Hematomas in the postoperative period, number of patients	2 (5.9%)	2 (5.7%)	2 (5.6%)

Table 2. Features of the course of early and long-term postoperative periods in the three clinical groups

Period after surgery	Number of patients, n (%)			*p*
	Group 1 (*n*=36)	Group 2 (*n*=35)	Group 3 (*n*=34)	
1 month	17 (47.2%), pain; 6 (16.7%), frequent urination	18 (51.4%), pain; 6 (17.1%), frequent urination	20 (58.8%), pain; 6 (17.6%), frequent urination	–
6 months	–	3 (8.6%), erosion of the anterior vaginal wall	–	$p < 0.05$
12 months	–	–	2 (5.9%), grade I prolapse of the anterior vaginal wall	–
24 months	–	–	2 (5.9%), grade I–II prolapse of the anterior and posterior vaginal wall	–
36 months	1 (2.7%), grade I prolapse of the posterior vaginal wall	1 (2.7%), grade I prolapse of the anterior vaginal wall	3 (8.8%), grade I–II prolapse of the anterior and posterior vaginal wall	–
Total	–	3 (8.6%), erosion of the anterior vaginal wall	–	$p < 0.05$
	1 (2.7%), grade I prolapse of the posterior vaginal wall	1 (2.9%), grade I prolapse of the anterior vaginal wall	7 (20.6%), grade I–II prolapse of the anterior and posterior vaginal wall	$p < 0.05$

Note. p is the level of reliability of differences between the indicators in the three groups.

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Competing interests. The authors declares that there are no obvious and potential conflicts of interest associated with the publication of this article.

Ethics approval. The study was carried out within the framework of V.V. Ivanova's dissertation work and its conduct was coordinated with the Local Ethics Committee of the I.M. Sechenov First Moscow State Medical University (extract from the LEC Protocol No. 05-21 dated 10/03/2021).

Consent for publication. All the patients who participated in the study signed the necessary documents on voluntary informed consent to participate in the study and the use of their medical data.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Финансирование. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Этическое утверждение. Исследование выполнялось в рамках диссертационной работы В.В. Ивановой и его проведение согласовано с локальным этическим комитетом Первого Московского государственного медицинского университета им. И.М. Сеченова (выписка из протокола ЛЭК от 10.03.2021 г. № 05-21).

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