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SURGICAL METHOD FOR PREVENTING APICAL PROLAPSE AFTER TOTAL HYSTERECTOMY IN OBESE WOMEN

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ABSTARCT:

Relevance of the topic. Genital prolapse remains a pressing problem of operative gynecology, as it is characterized by a high relapse rate of the disease after surgical treatment. This article compares 2 surgical methods for the prevention of vaginal vault after total hysterectomy in obese women.

Purpose. Development of an effective method for preventing vaginal vault prolapse by improving the surgical technique of total hysterectomy in obese women.

Materials and methods. The main group included 178 obese patients with BMI from 30 to 40, who underwent the operation of extirpation of the uterus with laparotomic access using an improved technique for strengthening the vaginal vault. The comparison group included 104 patients also with obesity, BMI from 30 to 40, with extirpation of the uterus by laparotomic access with suturing vaginal vault in traditional method.

The results of the study. The duration of the total hysterectomy operation using the advanced technology varied from 45 to 75 minutes, on average 52.5+1.5 minutes. With the traditional method, the operation of abdominal total hysterectomy lasted from 90 to 110 minutes, 98.6 ±5.6 minutes, ($p<0.05$). Thus, in the main group, it averaged 52.5+1.5 minutes, which was significantly shorter than in the comparison group - 98.6 ±5.6 minutes, ($p<0.05$).

KEYWORDS: genital prolapse, total hysterectomy, obesity.

RELEVANCE:

The failure of the pelvic floor muscles and, as a result, the prolapse of the genitals is a serious medical and socio-economic problem. It remains in the focus of attention of both gynecologists and doctors of related specialties. The disease often begins at the reproductive age and is progressive in nature. If in previous years the prolapse of the internal genitals was considered a disease mainly of the elderly, then in recent years there has been a tendency to rejuvenate women with genital prolapse and an increase in these patients in the reproductive age [4,12]. This is confirmed by the data of some authors [5,9], according to which the prevalence of genital prolapse in women under 30 years of age reaches 10.1%, in those aged 30 to 45 years – 40.2%, and in women over 50 years of age-50%.

Genital prolapse remains a pressing problem of operative gynecology, as it is characterized by a high relapse rate of the disease after surgical treatment. Up to date, according to the literature, there is a high frequency of relapses of genital prolapse (5-40%) and dissatisfaction with the functional results of operations.

One of the main problems of surgical treatment of genital prolapse remains the high frequency of recurrence of the disease, which leads to repeated surgical interventions in 30%

of cases. So, after anterior colporrhaphy recurrence rate of the disease reaches 24-31%, after posterior colporrhaphy it gets 25-35%. After vaginal hysterectomy in case of prolapse, relapse in the form of vaginal vault prolapse develops with a frequency of up to 43% [1,6,7].

According to Russian authors, from 10 to 20% of patients in gynecological hospitals are treated for genital prolapse [2, 11]. Despite the improvement in the quality of obstetric care, approximately 50% of all women who gave birth on time have genital prolapse of varying severity, and in women over 50 years of age, this pathology occurs in 57-78% of cases [1,8].

Prolapse of the internal genitals in our Republic occurs in 45% of women who have had 2-3 or more births, with creates discomfort, urinary incontinence, constipation and a decrease in libido. In connection with this, the family has problems associated with sexual dysfunction, frequent inflammatory diseases of the genitals, constipation. Consequently, there is a need for surgical correction, which is accompanied by relapses of omission and prolapse of the genitals from 2 to 10% of cases [4,13].

With the predominant prolapse of the vaginal walls, the patients note the following distress:

* Feeling of incomplete emptying the rectum or bladder;
* Frequent urgency to urinate;
* Pain in the lower back, sacrum;
* Feeling of heaviness or a foreign object in the perineum;
* Urinary incontinence when coughing, sneezing, laughing, or having sexual intercourse.

In the research, it was revealed that an increased body mass index can also be one of the causes of genital prolapse. Perhaps the fact is that excessive weight generally increases the load on the internal organs and systems and contributes to the deterioration of the overall condition of the body [3,8].

The problem of vaginal vault prolapse after extirpation of the uterus remains relevant for both gynecological surgeons and doctors of related specialties. Vaginal vault prolapse after the operation of extirpation of the uterus does not directly threaten life, but leads to functional insufficiency of various organs and systems, and a decrease in the quality of life of patients [3,4,6,11].

Currently, there is no common understanding of the pathogenetic mechanisms of genital prolapse, so it is important to clarify the unresolved issues of pathogenesis and determine the algorithm for examining women in order to early detect disorders in various parts of the pelvic floor for further choosing the tactics of surgical treatment of the identified disorders [2, 10, 10].

Surgical treatment, especially in severe cases of genital prolapse, presents significant difficulties due to the need not only to eliminate the main symptoms of the disease, but also to restore the architectonics of the pelvis, functional disorders of the pelvic organs, with a minimum number of complications.

The above data indicate how relevant is today vaginal vault prolapse due to its high frequency and a number of complications leading to a decrease in the quality of life of women and disability. The issue of prevention and correction of vaginal vault prolapse is also relevant.

The purpose of the study. Development of an effective method for preventing vaginal vault prolapse by improving the surgical technique of total hysterectomy in obese women.

Materials and methods of research. The research was carried out in the Republican Specialized Scientific and Practical Medical

Center of Obstetrics and Gynecology in the framework of the applied research project «Development of a surgical method for the prevention and treatment of vaginal spasms after total hysterectomy in obese women» (2017-2018). During the period of 5- year work in the Department of operative Gynecology of the Center, we developed an element during total hysterectomy with abdominal access to prevent vaginal vault prolapse.

The essence of the method is to apply a direct clamp simultaneously with the capture of the sacro-uterine ligaments, cardinal ligaments and vascular bundle at an angle of 45 degrees with respect to the conductive axis of the uterus body, which makes it possible to combine the stages of surgery, thereby shortening its duration, as well as reducing the volume of blood loss. The subsequent fixation of sacro-uterine, cardinal, circular ligaments with the side walls of the vagina on each side and simultaneous application of a twisted suture on the anterior and posterior walls of vaginal vault is performed with a single thread.

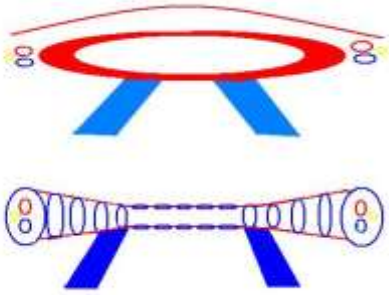

Figure 1. Improving the method of prevention of vaginal vault prolapse in total abdominal hysterectomy.

Thus, when the suture is fixed, the size of the douglas space decreases due to its stretching and lifting, which prevents the further formation of the enterocele. This method preserves the physiological horizontal axis of the vagina in relation to the musculis levatoris ani externa.

The proposed method of forming the vaginal vault excludes the possibility of accumulation of exudate in the postoperative period, due to the creation of a natural "drainage" of the paravesical and parametral spaces. Due to the strengthening the ligamentous apparatus to the vaginal vault, vaginal vault prolapse is prevented and a deep vagina is formed, which creates the possibility of normal sexual life. The parameters of the method allow achieving the set technical result-reducing the risk of early and late postoperative complications in hospitals of any level.

The main group included 178 patients with obesity, BMI from 30 to 40, who underwent the operation of extirpation of the uterus with laparotomic access using an improved technique for strengthening the vaginal vault. In 106 (39.9%) patients, the BMI ranged from 30 to 34, in the remaining 72 (60.1%) - from 35 to 40.

The comparison group included 104 patients also with obesity, BMI from 30 to 40, with extirpation of the uterus by laparotomic access with suturing vaginal vault according to the traditional method. In 45 (43.3%) patients, the BMI ranged from 30 to 34, in the remaining 59 (56.7%) - from 35 to 40.

It should be noted that the patients of both groups were comparable in age, somatic status, gynecological morbidity, all with obesity of 1-2 degrees.

RESULTS AND DISCUSSIONS:

To confirm the effectiveness of the improved method of suturing vaginal vault we analyzed the different characteristics of the course of the early postoperative period, such as duration of surgery, blood loss, numbers of maximum body temperature rise, number of days with a high body temperature, number of days in hospital after surgery, and the number

of women with inflammation of the vaginal stump and granuloma (table 1).

The duration of the total hysterectomy operation using the advanced technology varied from 45 to 75 minutes, on average of 52.5+1.5 minutes.

With the traditional method the duration of abdominal total hysterectomy operation varied from 90 to 110 minutes, 98.6 ±5.6 minutes, ($p<0.05$). Thus, in the main group, it averaged 52.5+1.5 minutes, which was significantly shorter than in the comparison group - 98.6 ±5.6 minutes, ($p<0.05$).

As can be seen from table 1 the size of the uterus according to ultrasound data and the weight of macropreparations in the compared groups were identical.

Table 1. Main characteristics in the study groups

Characteristics	The main group, n=178	The compared group, n=104
Size of the uterus, weeks	17.5±0.8	16.8±0.5
Duration of operations, min	52.5±1.5	98.6 ±5.6 *
weight of macropreparation, gr	754±38.1	768±26.1
General blood loss, ml	205.6+18.4	290.7±26.8 *

Note: * - $p<0.05$, the significance of differences between groups.

The volume of blood loss in the control group ranged from 250 to 400 ml, on average of 290.7±26.8 ml. Significantly less blood loss was registered in the main group - from 200 to 250 ml, on average 205.6±18.4 ml, ($p<0.05$).

Intraoperative complications were not observed in the main group. Only in the early postoperative period in 2 (1.1%) cases there were subaponeurotic hematomas. After carrying out antibacterial and infusion therapy, there was a recovery.

When performing a hysterectomy according to the traditional method, that is, in patients of the comparison group, the following intraoperative complications were registered: 1 (0.96%) wound of the bladder and 1 (0.96%) wound of the ureter.

It should be noted that in the proposed method of forming vaginal vault, the possibility of accumulation of exudate in the postoperative period is excluded, due to the creation of a natural "drainage" of the paravesical and parametral spaces. In this regard, in the main group, leaving the top of the vagina open a single case of inflammation of the vaginal stump was not registered. In contrast, in the early postoperative period, when performing the operation using the traditional method, every tenth patient in the control group - 11 (10.5%) was observed to have developed inflammation of the vaginal stump and two cases were diagnosed with subaponeurotic hematomas of the anterior abdominal wall. All cases required infusion, anti-inflammatory, and antibacterial therapy in addition to physical therapy.

Due to the absence of early postoperative complications, the vast majority of patients who underwent surgery according to the developed method 163 (91.6%) were in hospital after surgery for up to 5 days, on average 4.7±0.1 days. Whereas, only 67 (64.4%) of those operated with this method were in the department from 6 to 10 days, on average 8.1±2.6 days. The remaining 37 (35.6%) patients of the control group were discharged from the clinic on the 5th day after surgical treatment.

Thus, the proportion of patients in the main group who were discharged from the department on day 5 was 2.6 times higher than the proportion of patients in the control group - 91.6% versus 35.6%. Accordingly, 7.7 times fewer patients of the main group remained in the clinic after 5 days up to 8 days - 8.4% vs. 64.4%. Using the method allows reducing the duration of the patient's stay in the clinic after

surgery, significantly save both the clinic's funds, thereby increasing the turnover of the bed, and the patient's finances.

In order to study the effectiveness of the developed method for preventing and correcting vaginal vault prolapse by improving the surgical technique of total hysterectomy in obese women, we also studied the cytokine status in patients before and after surgery on days 1 and 5. The main group included 178 patients who underwent a hysterectomy operation using an improved technique for strengthening the vaginal vault. The compared group included 104 patients who underwent extirpation of the uterus with suturing vaginal vault according to the traditional method.

As our studies have shown (Table.2), in the first day after the surgical intervention in patients of both the main group and the control group, the content of all studied cytokines in the blood plasma increases.

Table 2 Cytokine status of women on the first day of the postoperative period

Charact eristic	The first group before operation, (n= 35)	The main group, (n=25) The first day after operation	The compared group, (n=10) The first day after operation
IFN-γ	8.21±0.25	11.28±0. 66*	15.77±0.58*, **
TNF-α	5.82 ± 0.27	11.68±0. 39*	15.44±0.71*,**
IL-4	6.32±0.27	11.26±0. 53*	15.79±0.59*,**
IL-6	5.34±0.16	11.41±0. 72*	16.6±0.7*,**

* - p <0.05 when compared between groups before surgery and on the first day after surgery

** - p <0.05 when compared between the main group and the control group

So, there is a high content of peripheral blood IFN-γ in the main group and is 11,28±0,66 PG/ml vs of 8.21±0,25 ng/ml before surgery, in comparison with its level in the first postoperative day was also significantly higher than before surgery is of 15.77±0, 58пг/ml (p<0.05).

A similar picture is observed in the content of IL-4, which is in the main group 11, 26±0, 53пг/ml (p < 0.05) in the compared group of 15.79±0,59 PG/ml (p<0.05) against 6,32±0,27 PG/ml before surgery.

The concentration of TNF-α in peripheral blood was significantly higher in both groups compared with the rate before the surgery and is 11, 68±0, 39пг/ml in the main group and 15.44±0,71 PG/ml in the compared group against 6,32±0,27 PG/ml before surgery and p<0, 05.

A similar pattern is observed in the content of IL-6 - 11, 41±0, 72пг/ml of 16.6±0,7 PG/ml vs 5,34±0,16 ng/ml, respectively (p <0.05).

A comparative profile of INF-γ when performing surgical interventions using traditional and advanced methods is shown in Fig.2.

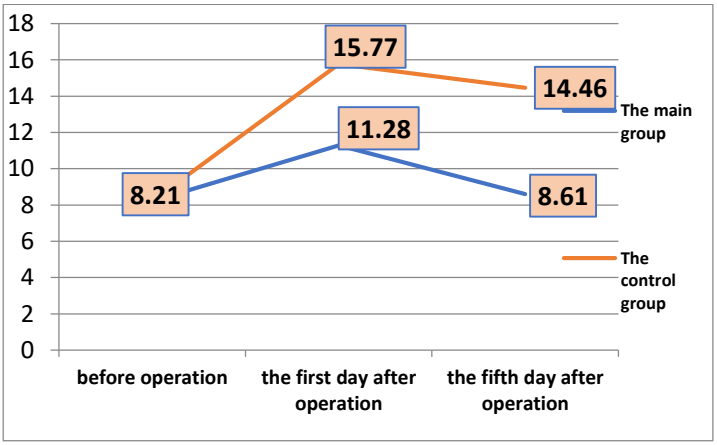

Figure 2. The level of INF-γ in the blood serum during various surgical interventions (pg / ml)

*P<0.05 when compared between the main group and the control group

**P<0.05 when comparing indicators on the first and fifth days after surgery

With surgical treatment using the improved technique of strengthening the vaginal vault, the level of INF-γ is normalized on the 5th day after surgery in women and is 8.61±0.54 pg / ml, p<0.05, approaching the indicator before surgery-8.21+0.25 pg / ml. When compared with the data on the first day after surgery, there was a significant decrease in INF-γ compared to 11.28±0.66 pg / ml at p<0.05. Observing the dynamics of the content of INF-γ in women of the control group, it

follows that its level remains high on the 5th day after the operation and is-14.46±0.79 pg / ml, which is significantly higher than before the operation, p< 0.05.

A comparative analysis of the content of TNF-α in peripheral blood showed (Fig. 3) that in the main group there was a decrease in this indicator to 8.09±0.3 pg/ml compared to the data on the 1 day after surgery – 11.68±0.39 pg/ml (p<0.05) and remains quite high when compared with the data before surgery – 5.82±0.27 pg/ml, p <0.05.

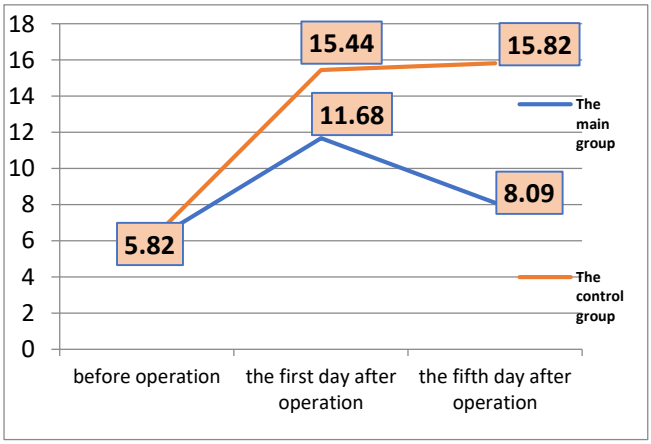

Figure 3. The level of TNF-a in the blood serum during various surgical interventions (pg / ml).
*P<0.05 when compared between the main group and the control group
**P<0.05 when comparing the indicators on the first and fifth days after surgery

Whereas in the compared group, with the traditional method of suturing the vaginal vault on the fifth day after surgery, it remains significantly high in comparison with the data before surgery and is 15.82±0.57 pg/ml versus 5.82±0.27 pg/ml before surgery, p<0.05.

The dynamics of the amount of IL-4 in peripheral blood is shown in Fig.4. There was a significant decrease in its level on the 5th day after surgery among patients of the main group to 8,004± 0.53 pg / ml versus 11.26±0.53 pg / ml observed on the first day after surgery, p<0.05.

The dynamics of the IL-4 content in the blood of women of the compared group with the operation of uterine extirpation by the traditional method is presented as follows : the level of IL-4 is 13.17±0.57 pg / ml, which is significantly higher than the indicator before the operation-6.32±0.27 pg/ml, p<0.05 and significantly lower than the indicators observed on the first day after the operation-15.79±0.59 pg / ml, p<0.05.

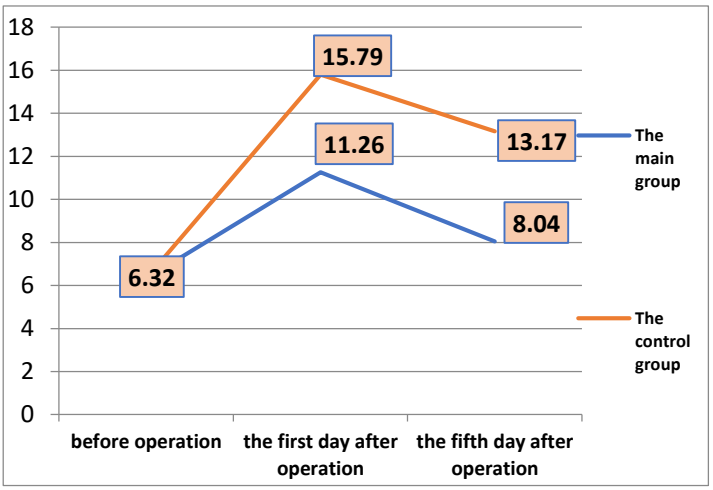

Figure 4. The level of IL-4 in the blood serum during various surgical interventions (pg / ml).
*P<0.05 when compared between the main group and the control group
**P<0.05 when comparing the indicators on the first and fifth days after surgery

Figure 5 shows the dynamics of IL-6 content depending on the tactics of strengthening and suturing vaginal vault. In the blood of women in the compared group with the operation of uterine extirpation by the traditional method, the level of IL-6 on the 5th day after the operation is 14.7±0.63 pg / ml, which is significantly higher than before the operation - 5.34±0.16 pg/ml, p<0.05 and lower than the level observed on the first day after the operation – 16.6±0.7 pg / ml, p<0.05. While in the main group, there is a decrease in this indicator to the level before the operation. So, in the main group, its indicator is 9.12±0.63 pg / ml compared to the indicator before the operation of 5.34±0.16, p<0.05. It should be noted that this studied indicator is significantly

lower than the indicator observed on the first day after surgery – 11.41±0.72 pg / ml, p< 0.05.

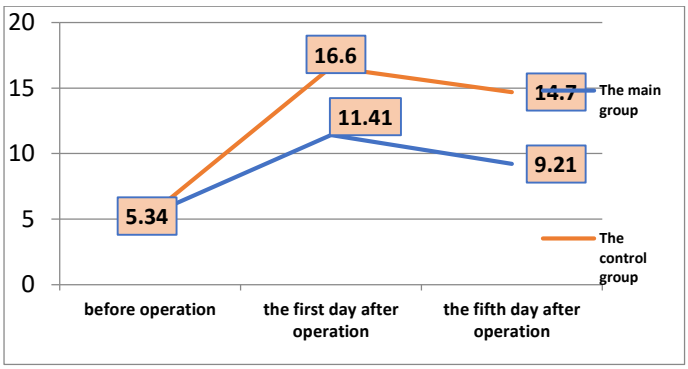

Figure 5.The level of IL-6 in the blood serum during various surgical interventions (pg / ml).
*P<0.05 when compared between the main group and the control group
**P<0.05 when comparing indicators on the first and fifth days after surgery

Thus, the analysis of the cytokine profile of obese patients who underwent uterine extirpation surgery shows that the method of performing the operation strongly affects the level of cytokines in the peripheral blood of women. The dynamics of inflammatory markers (cytokines) is observed at all stages of the study, which indicates the formation of a cascade of systemic inflammatory response and significant trauma by the operation.

Performing surgical intervention leads to an increase in the plasma level of interleukins, and to a greater extent when using traditional suturing vaginal vault. The relationship between the degree of increase in the level of cytokines from the applied method of strengthening and suturing vaginal vault was noted.

CONCLUSIONS:

1. A comparative study of the parameters of the operation and the postoperative period revealed that the operation according to the developed method can reduce the duration of the operation by 2 times (p<0.05); reduce the volume of blood loss by 1.5 times (p<0.05); the development of inflammation of the vaginal stump and postoperative complications by 2 times; reduce bed days by 2.6 times.
2. The use of an improved technique of extirpation of the uterus contributes to a less imbalance of proinflammatory cytokines and, accordingly, to reduce purulent-septic complications in the postoperative period.
3. Performing a hysterectomy of obese women according to the developed method, contributes to the creation of natural "drainage" and prevents vaginal vault prolapse.

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