Safonov R. A., Lazurenko V. V., Lyashchenko O. A., Afanasyev I. V.,'Garkavenko K. V., Chernyak O. L. Modern approaches to the treatment of genital prolapse in obese women. Journal of Education, Health and Sport. 2021;11(07):324-334. eISSN 2391-8306. DOI
http://dx.doi.org/10.12775/JEHS.2021.11.07.031
https://apcz.umk.pl/JEHS/article/view/JEHS.2021.11.07.031
https://zenodo.org/record/5725516

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.

Received: 25.06.2021. Revised: 12.07.2021. Accepted: 29.07.2021.

MODERN APPROACHES TO THE TREATMENT OF GENITAL PROLAPSE IN OBESE WOMEN

R. A. Safonov[1,2], V. V. Lazurenko[1], O. A. Lyashchenko[1], I. V. Afanasyev[1,2], K. V. Garkavenko[2], O. L. Chernyak[3]

[1]Kharkiv National Medical University;
[2]Kharkiv Regional Perinatal Center;
[3]V. N. Karazin Kharkiv National University

Aabstract

Introduction. The problem of female genital prolapse (GP) remains in the sportlight of gynecologists, because despite the variety of surgical methods, there are still recurrences of the disease, which are associated not only with the failure of the restored ligaments, fascia, muscles, damaged pelvic floor and perineum, but with the imperfection of the operation. The solution of this problem is especially important in the treatment of patients with extragenital pathology, in particular obesity. **The purpose:** to optimize the treatment of genital prolapse in obese patients by determining an individual approach to planning surgical treatment taking into account the degree of obesity and concomitant pathology. **Materials and methods.** We examined 65 patients of which 20 had genital prolapse and obesity (main group), 25 had genital prolapse and normal weight (comparison group), 20 women did not have gynecological diseases and extragenital pathology made up control group. To diagnose obesity and determine its degree we calculated body mass index (BMI). To determine the degree of GP its quantitative assessment was used (POP-Q; 1996). Surgical intervention included transvaginal extirpation of the uterus without appendages, anterior colporrhaphy,

colpoperineoraphy with levatoplasty, sacrospinal colpopexy. Transabdominal and laparoscopic colposacropexy in obese women were not used due to the presence of relative contraindications for laparoscopy (cardiovascular disease, respiratory pathology, adhesions, the condition after hernias' surgery). Therefore, all operations on women with GP and obesity were performed transvaginally due to the inability to perform abdominal access. In comparison group transvaginal surgery was performed. All the groups under study were representative. Before the use of polypropylene mesh "Polymesh" to minimize purulent-septic complications associated with the use of synthetic prostheses aquadissection was performed with 0.9% saline with the addition of 1 g of ceftriaxone per 200 ml. After the operation, the women used suppositories with hyaluronic acid (revitax). **Results.** The results of surgical treatment have been analyzed and the following data were obtained: recurrences in the main and in the comparison group were 4% (2 women in whom operations were performed with the use of their own tissues without mesh prosthesis). Infectious complications, dyspareunia and pelvic pain were not observed. **Conclusions.** Surgical treatment of GP in obese women by using polypropylene mesh "Polymesh" for colposacropexy after transvaginal uterine extirpation increases the effectiveness of treatment and redduces the number of recurrences. Hydropreparation of the mesh with an antibacterial agent and postoperative use of hyaluronidase intravaginally helps to reduce purulent-septic complications of surgery and improves the patients'quality of life.

Key words: genital prolapse; obesity and overweight; polypropylene mesh "Polymesh"; quality of life.

Introduction. The problem of female genital prolapse (GP) is in a spotlight of modern gynecology because despite the variety of surgical treatments, there are still recurrences of the disease, associated not only with the failure of restored ligaments, fascia, muscles, damaged pelvis bottom and perineum, and with the imperfection of the operation [1, 2]. The solution of this problem is especially important in the treatment of patients with extragenital pathology, in particular obesity.

Obesity is a chronic recurrent disease, which is characterized by excessive accumulation of adipose tissue in the body due to metabolic disorders, which is based on a positive energy balance. Obesity is often combined with severe comorbidities - diabetes, hypertension, dyslipidemia, atherosclerosis. Type 2 diabetes mellitus and hypertension in obese women are three times more common than in patients in general. Obesity is accompanied by cardiovascular insufficiency, diseases of the musculoskeletal system,

respiratory disorders, the risk of these diseases increases in proportion to the increase in body mass index (BMI). The main sign of obesity in women is the accumulation of adipose tissue more than 20-25% of body weight. The risk of developing obesity-related diseases largely depends on the characteristics of adipose tissue deposition in the body. The most unfavorable is the abdominal type of obesity, which is combined with a complex of hormonal disorders and is considered a major component of the metabolic syndrome [3].

Excess weight is one of the factors in the development of pelvic prolapse: increased intra-abdominal pressure on the background of obesity has a negative effect on the state of the ligament-fascial-muscular apparatus of the pelvis. With obesity of 2-3 degree, the effectiveness of surgical treatment significantly reduces, the high probability of recurrence and severe re-surgery complicates the rehabilitation process, worsens the patient's quality of life, and therefore it is recommended to postpone surgical treatment until weight normalization [4].

The incidence of obesity is increasing every year, especially in economically developed countries. Obese patients often suffer from diabetes mellitus (DM), which significantly impairs tissue trophism, including the genital tract [3]. Surgical treatment of GP in diabetes patients often ends in recurrence of the disease due to the inability of diabetes affected tissues to grow and recover. The problem of surgical treatment of GP in obese women is characterized by difficulties in performing surgery with laparoscopic access due to the significant thickness of subcutaneous fat, the presence of a pronounced amount of visceral fat, which complicates laparoscopic intervention and prevents manipulation with endoscopic instruments. It should also be noted that the overweight in combination with Trendelenburg's position with pneumoperitoneum is an additional factor for respiratory and cardiovascular systems complications [4].

Thus, surgical treatment of patients with GP and obesity patients has not only medical but also social significance. The development and improvement of GP surgical treatment in obese women remains an urgent problem of modern gynecology.

The purpose: to optimize the treatment of genital prolapse in obese patients, determine an individual approach to planning surgical treatment taking into account the degree of obesity and concomitant pathology.

Materials and methods. 65 patients have been examined. 20 had genital prolapse and obesity and formed main group, 25 had genital prolapse and normal weight, and were included in comparison group, 20 without gynecological diseases and extragenital pathology formed control group. The study was conducted at the Department of Operative Gynecology

with Minimally Invasive Technologies of the Kharkiv Regional Perinatal Center (Ukraine), which is the clinical base of the Kharkiv National Medical University. The age of patients, place of residence, working conditions, medical history, degree of genital prolapse, previously used treatment methods, presence of extragenital pathology, nature and degree of obesity were taken into account.

To diagnose obesity and its degree the body mass index (BMI) was determined. BMI was calculated as the ratio of body weight (in kg) to the square of height (in m^2). BMI value within 18.5-24.9 kg / m^2 was considered as normal body weight. To determine the distribution of fat in the body the ratio of waist circumference (WT) and hip circumference (HC) was measured. Obesity was considered abdominal if the WC / HC rate exceeded 0.85. WC was measured in a standing position between the lower edge of the thorax and the crest of the iliac bone along the mid-inguinal line, HC was easured in the widest area at the level of the great spit. WC more than 88 cm testifies to high risk of concomitant diseases, increased WC is a sign of higher risk of complications even with normal BMI data. It was determined when obesity was primary, alimentary-constitutional, and when - secondary, endocrine-metabolic (hypothyroid). According to the degree of obesity was divided as follows: 1 degree - (+ 10-29%), 2 degree - (+ 30-49%), 3 degree - (+ 50-99%), 4 degree - more than 100%. By BMI indicator of 25-29.9 corresponded to overweight; indicator 30-34.9 – corresponded to 1 degree; 35-39.9 – 2 degree; and indicator 40 and more corresponded to the 3rd degree of obesity. During its course a stable and progressive types were determined. By type of adipose tissue deposition abdominal (android, central), gynoid (buttock-femoral), mixed formes were differentiated.

To determine the degree of GP a system of its quantitative assessment POP-Q (1996) was used. Ultrasound examination included transvaginal and transperineal ultrasound to assess the condition of the uterus, appendages, perineum, pelvic floor. To detect pathological changes of the internal genitals ("Voluson 10E GE Healthcare") Doppler examination of blood flow to the vessels of the pelvic organs was performed. To determine the state of the perineum and adjacent organs levator test, Q-tip test and Bonney test were used.

Clinical and biochemical blood test, urine, coagulogram were performed, electrolytes, total cholesterol, lipids, hormonal parameters, leptin were determined. A physician, cardiologist, endocrinologist consultations were conducted. To exclude a malignant process Pipel biopsy was performed and hysteroscopy if necessary.

All the subjects gave informed consent to participate in the examination and processing of their personal data (Order of the Ministry of Health of Ukraine dated January

21, 2016 N 29), as well as in compliance with moral and ethical principles in accordance with the main provisions of the World Medical Association Declaration of Helsinki (1994, 2000, 2008) and the positive decision of the Commission on Bioethics of the Kharkiv National Medical University.

The results were processed using parametric statistics methods with the program "Statistica 6".

Results and discussion. The age of patients in the main group varied from 52 to 67 y. o. (mean 60.5 ± 7.5), in the comparison group the patients age ranged 51-82 y.o. (mean 64.6 ± 9.2) in the control group it varied from 48 to 59 y. o. (mean 55.3 ± 4.8). GP is characteristic of women with a mean age of 62.4 ± 8.1 years, but obese women were several years younger. 75% of the main group women and 92% of the comparison group women were rural dwellers. In the control group their share was 85%. The latter may be explated by the specifics of the Regional Clinical Hospital. Almost 90% of women in the main group and the comparison group did not work due to their pensionable age. Birth rate was almost the same in all groups and was 2.3 ± 0.7 (all through the natural birth canal).

Different forms of alimentary form obesity predominated (100%) in the main group, mainly it was of the 2 degree (n = 13 or 65%), stable form was registered in 16 women (80%), abdominal type - in 19 (95%). BMI in the main group was 36.4 ± 3.2 (P <0.05), in the comparison group - 24.5 ± 1.7, in the control one it was 23.9 ± 1.4.

Among the extragenital pathology in addition to obesity in the main group there were metabolic cardiomyopathy, dyslipidemia (3/15%), coronary heart disease (6/30%), varicose veins of the lower extremities (14/70%), coxarthrosis (1/5%), spondyloarthritis (2/10%), gonarthrosis (2/10%), psoriasis (1/5%), chronic pyelonephritis (1/5%), hypertension (13/65%), type 2 diabetes mellitus (5/25 %), the adhesions of the abdominal cavity (9/45%), chronic gastritis (2/10%), chronic cholecystitis (3/15%), cyst of the right kidney (1/5%), nodular goiter (5/25%) , chronic bronchitis (1/5%), scleroderma (1/5%).

As seen from the survey results, varicose veins of the lower extremities (70%), hypertension (65%), abdominal ligation (45%), type 2 diabetes mellitus (25%), nodular goiter (25%) were the most common pathologies (Table 1).

In the group of comparison the following results were obtained: hypertension (16/64%), coronary heart disease (12/48%), osteoarthritis (1/4%), chronic pyelonephritis (2/8%), chronic bronchitis (1/4%), connective tissue of the abdominal cavity (4/16%), varicose veins of the lower extremities (6/24%), chronic cholecystitis (1/4%), psoriasis (1/4%), chronic gastritis (2/8%), chronic pancreatitis (2/8%) (Table 1).

Table 1. Extragenital pathology in women with genital prolapsis

Exstragenital pathology	Main group, n=20		group of comparison, n=25	
	n	%	n	%
Obesity	20	100	-	-
Dyslipidemia	3	15	-	-
Varicose veins of the lower extremities	14	70	6	24
Gastrointestinal diseases:				
adhesions of the abdomen	9	45	4	16
- chronic gastritis	2	10	2	8
- chronic cholecystitis	3			
chronic pancreatitis	-	-	2	8
Endocrine diseases:				
-nodular goiter	5	25	-	-
- type 2 diabetes mellitus	5	25	-	-
Diseases of the musculoskeletal system:				
-coxarthrosis	1	5	-	-
spondyloarthrosis	2	10	-	-
gonarthrosis	2	10	-	-
-osteoarthrosis	-	-	1	4
Diseases of the cardiovascular system:				
- arterial hypertension	13	65	16	64
- coronary heart disease	6	30	12	48
- metabolic cardiomyopathy	3	15	-	-
Diseases of the urinary system:				
- chronic pyelonephritis	1	5	2	8
- urinary incontinence	3	15	-	-
-cyst of the right kidney	1	5	3	12
-acute urinary retention	3	15	-	-
Skin diseases				
- psoriasis	1	5	1	4
- scleroderma	1	5	-	-
Diseases of the respiratory system				
-chronic bronchitis	1	5	1	4

Thus, hypertension (64%), coronary heart disease (48%), varicose veins of the lower extremities (24%) and the connective process of the abdominal cavity (16%) are the most common disorders in the comparison group women with GP.

In the control group, extragenital pathology occurred in 3 (15%) of women and was represented mainly by chronic gastritis (1/5%) and fibrocystic mastopathy (2/10%).

Variants of GP in women of the main group are presented in Table 2. They include elongation and scarring of the cervix (2/10%), lowering of the anterior wall of the vagina - cystocele (9/45%), lowering of the posterior wall of the vagina - rectocele (8/40%), incomplete loss of internal genitals (9/45%), acute urinary retention (3/15%), urinary incontinence (3/15%), urethrocele (2/10%), vaginal prolapse (1/5%), complete prolapse of internal genitals (4/20%), old postpartum perineal rupture (1/5%). Thus, in obese women incomplete loss of internal genitals (45%), cystocele (45%), rectocele (40%), complete loss of internal genitals (20%), acute urinary retention (15%), incontinence urine (15%) occur most often.

In GP women of comparison group the structure of the pathology under study was as follows: incomplete prolapse of the internal genitals (11/44%), lowering of the anterior wall of the vagina - cystocele (18/72%), lowering of the posterior wall of the vagina - rectocele (12/48%), complete loss of internal genitals organs (13/52%), urinary incontinence (3/12%), old postpartum perineal rupture (1/4%). Thus, incomplete prolapse of internal genitals (44%), cystocele (73%), rectocele (48%), complete prolapse of internal genitals (52%) with dysfunction of adjacent organs were most common in comparison group women with GP.

Table 2. Variants of genital prolapse among the patients under examination

GP type	Main group, n=20		Group of comparison, n=25	
	n	%	n	%
Incomplete prolapse of internal genitals	9	45	11	44
Complete prolapse of internal genitals	4	20	13	52
Cystocele	9	45	18	72
Rectocele	8	40	12	48
Urinary incontinence	3	15	3	12
Old postpartum perineal rupture	1	5	1	4
Acute urinary retention	3	15	-	12
Urethrocele	3	15	-	12
Elongation and scarring of the cervix	2	10	-	-

The complaints of the main group and the comparison group patients were identical: discomfort associated with vaginal entry, "wind flapping" during intercourse, symptoms of stress urinary incontinence which varied in the amount of urine lost from minor to permanent leakage. Patients also noted a feeling of a foreign body in the vagina, discomfort in a sitting

position, difficulty in emptying the bladder and rectum, signs of cystitis, acute urinary retention, trophic ulcers on the mucous surface of the vagina, especially when the fallen genitals have not been adjusted.

GP stages by POP-Q were determined after gynecological examination: the cervix was normal or elongated, the leading point of prolapse was > +1 (lowering at a distance below 1 cm from the hymenal ring), the apical point was localized less than - 6 cm from the introitus [2]. 1-2 stages of GP were excluded from our study due to the conservative treatment prescription, patients with GP of 3-4 stagesderwent surgical treatment.

The treatment plan took into account the patient's wishes and needs, the benefits of using synthetic materials, the need to remove the uterus, access and scope of surgery, the choice of adequate anesthesia.

Surgical intervention included transvaginal extirpation of the uterus without appendages, anterior colporrhaphy, colpoperineoraphy with levatoplasty, sacrospinal colpopexy. Transabdominal or laparoscopic colposacropexy in obese women was not used due to the presence of relative contraindications for laparoscopy (cardiovascular disease, respiratory pathology, the presence of adhesions, the condition after surgical treatment of hernias). Therefore, all operations on GP and obesity women were performed transvaginally due to the inability to perform abdominal access, and in the comparison group women transvaginal surgeries were performed.

Eight (40%) patients underwent extirpation of the uterus without appendages through the vagina, unilateral sacrospinal colpopexy, anterior colporrhaphy, colpoperineoraphy with levatoplasty; 12 (60%) women underwent extirpation of the uterus without appendages through the vagina, sacrospinal colpopexy on the left using meshes "Polymesh", anterior colporrhaphy, colpoperineoraphy with levatoroplasty. It should be noted that before using the Polymesh mesh, in order to minimize the purulent-septic complications associated with the use of synthetic prostheses, aquadissection was performed with 0.9% saline with the addition of 1 g of ceftriaxone per 200 ml.

The comparison group included women with transvaginal intervention for better comparability of treatment outcomes. Six (24%) patients underwent extirpation of the uterus without appendages through the vagina, anterior colporrhaphy, colpoperineoraphy with levatoplasty, 12 (48%) women underwent extirpation of the uterus without appendages through the vagina, sacrospinal colpopexy unilateral, anterior colporrhaphy, colpoperineoraphy with levatoplasty, another 7 (28%) patients underwent extirpation of the

uterus without appendages through the vagina, sacrospinal colpopexy on the left using the grid "Polymesh", anterior colporrhaphy, colpoperineoraphy with levatoplasty (Table 3).

Table 3. Types of surgery in the women under examination

Type of surgery	Main group, n=20		Group of comparison, n =25	
	n	%	n	%
Extirpation of uterus without appendages through the vagina, anterior colporrhaphy, colpoperineoraphy with levatoplasty			6	24
extirpation of the uterus without appendages through the vagina, sacrospinal colpopexy unilateral, anterior colporrhaphy, colpoperineoraphy with levatoplasty	8	40	12	48
extirpation of the uterus without appendages through the vagina, sacrospinal colpopexy on the left using the mesh "Polymesh", anterior colporrhaphy, colpoperineoraphy with levatoplasty	12	60	7	28

As it seen from the table, obese womwn underwent maily transvaginal uterine extirpation with unilateral sacrospinal colpopexy using a synthetic Polymesh mesh prosthesis [5].

The uterine extirpation was due to both prevention of recurrence of the disease, due to a more reliable effect of the prosthesis compared to sacrospinal colpopexy, and prevention of endometrial malignancy in obese women, in whom this process is very high due to estrogen [6]. In the comparison group sacrospinal colpopexy (48%) predominated; the use of the mesh "Polymesh" and plastic correction with own tissues were relatively the same.

Specific complications associated with the mesh prosthesis use were not registered;

At plastic correction with own tissues there were two (4%) complications. The data obtained coinside with the data of literature [7, 8].

Synthetic mesh "Polymesh" is obtained by weaving synthetic polypropylene threads and resorbable synthetic threads.

They are used to strengthen tissues and long-term stabilization of fascial structures, they are highly effective, have a small number of recurrences, so they are used in repeated interventions to prevent recurrence of the disease, especially cystocele and rectocele. Polyglycaprolactone or polyglycolic acid fibers are used to give the implant stiffness, which facilitates its manipulation during surgery. After resorption of synthetic fibers, the volume of

foreign material stored in the body is reduced by 60%. Therefore, the main advantages of partially resorbable meshes are the reduction of the mesh mass, large pore size and greater distance between the fibers, which contributes to the formation of more elastic apical support, rather than a rigid "scar plate" [7].

Specific complications associated with the installation of a mesh prosthesis are due to the body's response to a foreign body and include postoperative wound healing, the development of purulent-septic complications or the formation of scar tissue, which leads to reduced tissue elasticity. In addition, tissue hydrodissection was performed with saline with the addition of an antibacterial agent, and after surgery, women used suppositories with hyaluronic acid (revitax) [9].

Analysis of surgical treatment results showed that there were 4% of recurrences in the main and in the comparison groups. In 2 women the operations were performed with the use of their own tissues without a mesh prosthesis; in the same time infectious complications, dyspareunia and pelvic pain were not observed.

Thus, the use of Polymesh polypropylene mesh in obese women has shown its effectiveness especially due to preoperative antibacterial treatment and postoperative use of revitax. This may be recommended for use in plastic surgery to prevent recurrence and complications.

Conclusions. Surgical treatment of genital prolapse in obese women by using polypropylene mesh "Polymesh" for sacrospinal colpopexy after transvaginal extirpation of the uterus increases the effectiveness of treatment and reduces the number of recurrences. Hydropreparation of tissues with an antibacterial agent and postoperative use of hyaluronidase intravaginally helps to reduce purulent-septic complications of surgery and improves the patients' quality of life.

References:

1. Fleischer K, Thiagamoorthy G. Pelvic organ prolapse management. Post Reproductive Health. 2020;26(2):79-85.

2. Surgery for women with pelvic organ prolapse with or without stress urinary incontinence /Kaven Baessler, Corina Christmann-Scmid, Christipher Maher. 19 augeust 2018 Cochrane Database /httpc://doi.org/ 10.1002/ 14651858. CD013108

3. Kozak HI, Marushchak MI Prevalence of alimentary obesity and factors contributing to its development. Nursing 2013; 3: 27-29 [in Ukrainian].

4. Lee UJ, Kerkhof MH, Van Leijsen SA, Heesakkers JP. Obesity and pelvic organ prolapse. Curr Opin Urol 2017;27(5):428-434.

5. Shkarupa DD, Kubin ND, Popov EN And, Shapovalova EA, Kovalev GV. Anterior-apical prosthetic reconstruction of the pelvic floor by vaginal access with the use of ultralight mesh implant 2 years of observation. Journal of Obstetrics and Gynecology. 2018; 67 (3): 55-63 [in Russian].

6. Gromyko NL Experience in the use of mesh prostheses in the correction of pelvic prolapse. Reproductive health. Eastern Europe = Reproductive health. Eastern Europe: an international scientific and practical journal. 2017; 7 (3): 437-439. [in Russian].

7. Chughtal B, Mao J, Buck J, Raplan S, Sedrakyan A. Use and risks of surgical mesh for pelvic organ prolapse surgery in women in New York state: population based cohort study. BMJ. 2015; 350: h2685. Epub 2015 Jun 2.

8. Davidson ERW , Thomas TN, Lampert EL, Paraiso MFR, Ferrando CA. Route of hysterectomy during minimally invasive sacrocolpopexy does not affect postoperative outcomes. International Urogynecology Journal. 2019; 30(4): 649-655.

9. Safonov RA, Lazurenko VV, Chernyak OL, Lyashchenko OA, Ovcharenko OB. Prevention of recurrence of genital prolapse in elderly women after surgery. Reproductive endocrinology. 2020; 4 (54): 95-98 [in Ukrainian].