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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**MODERN TREATMENT ASPECTS OF UTERINE MYOMAS
IN WOMEN OF REPRODUCTIVE AGE**

Speciality: 3215.01 – Obstetrics and gynecology

Field of science: Medicine

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GENERAL REVIEW OF THE WORK

Relevance and development of the topic. The problem of uterine myoma is one of the leading issues in sphere of obstetrics and gynecology, and this fact is primarily connected with the high frequency of the disease - its frequency is 10-29% among gynecological patients. Besides it, the uterine fibroids are found in one in three patients at the age of 40^{1,2}.

Taking into consideration the fact that the myoma is multifactorial and it's pathophysiology, requirement for non-surgical treatment of uterine myoma increased during the recent years. The conservative treatment based on the hormonal-dependent and pathogenetic nature of myoma. Possible conservative treatment methods for uterine myoma often are either not qualitative, or are completely ineffective. Therefore, implementation of surgical treatment becomes necessary. Increasing of the size of the nodule in the background of pregnancy is more likely seen among women planning a pregnancy, what makes radical treatment of uterine myoma more advisable.

Currently, an examination method alternative to myomectomy is uterine arterial embolization^{3,4}. After embolization of the uterine arteries, decrease in the size of the uterus and myomatous nodules and normalization of menstrual function is observed. Menorrhagia is eliminated at the moment of implementation of embolization, menstrual blood loss is reduced for 3-4 times. After 2-4 months, the volume of myoma decreased in 90% of patients. In the year of observation, the volume of the uterus and myomatous nodules

¹Стрижаков, А.Н. Доброкачественные заболевания матки / Стрижаков А.Н., Давыдов А.И., Пашков В.М. [и др.]. – Москва: ГЭОТАР; 2014. – 312 р.

²Sparic, R. Cesarean myomectomy in modern obstetrics: more light and fewer shadows / R.Sparic, S. Kadija, A. Stefanovic [et al.] // J. Obstet. Gynaecol. Res., – 2017. 43 (5), – p. 798-804. PMID 28168805

³Зиганишин, А.М., Насырова, С.Ф., Кулавский, Е.В. Хирургические аспекты лечения миомы матки // Современные проблемы науки и образования, – 2015. № 6, – с. 234.

⁴Шаповалова, А.И. Лейомиома матки и репродукция // Журнал акушерства и женских болезней, – 2019. Т. 68, – № 1, – с. 93-101.

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decreased by 2.5 and 3 times⁵.

There are numerous studies in the local and foreign literature about the problem of reconstructive surgery in patients with uterine myoma. The analysis of these studies showed that the main purpose of the operations is to preserve the uterus, to protect or restore reproductive and menstrual functions. However, so far this problem remains unresolved, and there are conflicting views in the literature on many fundamental issues.

M. Metwally and co-authors⁶ (2016) reviewed the Cochrane database to determine the effectiveness of myomectomy in improving fertility in patients with uterine myoma and to compare the effectiveness of different surgical approaches in rehabilitation process. The authors conclude that currently there is no convincing evidence based on the results of randomized controlled trials to assess the role of myomectomy in increasing fertility. As for the surgical approach to myomectomy, modern data based on the results of two randomized controlled trials show that there is no significant difference between laparoscopic and laparotomy myomectomy in terms of the effectiveness associated with subsequent pregnancies. At the same time, due to the small number of conducted studies, this situation should be considered with a certain precautionary measure⁷.

As the result of studies for assessment of condition of the fetoplacental system in women with uterine scars after myomectomy scientists have concluded that high frequency (41.2%) of early pregnancy disorders is specific for pregnancy after myomectomy and requires early prophylactic appointment of drugs for preservation of pregnancy; the risk of miscarriage is significantly increased in

⁵Yang, Y. Ultrasound-guided percutaneous microwave ablation for adenomyosis: efficacy of treatment and effect on ovarian function / Y.Yang, J.Zhang, Z-Y.Han [et al.] // Scientific Reports, – 2015. May; 5. – 5, – p. 10034.
doi: 10.1038/srep10034.

⁶Metwally, M., Cheong, Y.C., Horne, A.W. Surgical treatment of fibroids for subfertility // Cochrane Database Syst. Rev., – 2012. Nov; 14. – 11, – CD003857.
doi: 10.1002/14651858.CD003857.pub3

⁷Donnez, J., Dolmans, M.-M. Uterine fibroid management: from the present to the future // Hum. Reprod. Update, – 2016. Nov. 22 (6), – p. 665-686.
doi: 10.1093/humupd/dmw023

patients with implanted ovum in the projection of the uterine scar (63,3%), after myomectomy performed on multiple (43.6%) and large (greater than 5 cm) nodules (41.9%) of the uterus, after removal of interstitial and submucosal nodes (50%), as well as after surgery with opening of the uterine cavity (62.5%)^{8,9}.

Undoubtedly, the main purpose of the surgery operation is to preserve the generative function after myomectomy. According to various authors, the frequency of pregnancy after myomectomy is 27.1-73%. Quite variable results confirms that there is no single algorithm for conducting pregnancy before and after myomectomy surgery. Accordingly, the pathogenesis of reproductive system disorders during uterine fibroids and its postoperative recovery is a matter of constant study. Conservative myomectomy is more appropriate to restore reproductive and menstrual function, but there are currently a number of inconsistencies in the guidelines for surgical techniques.

Thus, taking into consideration the fact that the studies on a comprehensive individual approach to the maintainance of patients planning a pregnancy after myomectomy is fragmentary and there is a lack of algorithms and schemes of treatment tactics in the pregravidity period and at different stages of pregnancy the given scientific research work is very important and necessary.

Object of research work. Women of reproductive age who have had a myomectomy.

The purpose of research work: Optimization of surgical treatment of uterine fibroids in order to reduce obstetric complications and perinatal pathologies in women of reproductive age.

Methods of research work. Women's medical histories were studied. The general clinical, laboratory, instrumental examination

⁸Sangha, R. Myomectomy to conserve fertility: seven-year follow-up / R.Sangha, R.Strickler, M.Dahlman [et al.]// J. Obstet. Gynaecol. Can., – 2015. Jan. – 37 (1), – p. 46-51. doi: 10.1016/s1701-2163(15)30362-5

⁹Гудебская, В.А. Клиническая эффективность робот-ассистированной лапароскопической миомэктомии // Альманах клинической медицины, – 2016. № 44 (2), – с. 242-248. doi:10.18786/2072-0505-2016-44-2-242-248

methods were used, also an examination card and a questionnaire were prepared for each patient.

Objectives of research work:

1. To study the consequences of laparotomy myomectomy with additional peritonization by means of the free end of the large fat of the sewing area;
2. To determine the informativeness of clinical features and sonographic signs of pregnancy course and scar quality after myomectomy;
3. To assess the advantages and disadvantages of different birth methods for mother and fetus in women with post myomectomy scars in uterine;
4. To conduct a comparative analysis of the results of childbirth for the newborn depending on both the postpartum period and the operation performed with the modified technique.

The main provisions submitted to the defense:

1. Women with uterine scars after myomectomy are at high risk for developing miscarriages and fetoplacental insufficiency.
2. To diagnose disorders of the fetoplacental system after myomectomy and monitor the effectiveness of treatment dynamic dopplerometric examination of maternal-fetal blood circulation is a highly informative diagnostic method. Timely detection of such defects allows to eliminate perinatal losses.
3. In women with uterine scars natural childbirth is possible after a modified myomectomy.
4. In newborns born by women with uterine scars adaptive disorders in the early neonatal period are possible. One of the ways of reducing the incidence of perinatal pathologies is making the time of birth is closer to the physiological time of birth in these women.

Scientific novelty of research work:

1. In pregnant women with uterine scars after myomectomy the frequency of risk factors such as premature birth, chronic placental insufficiency (CPI), intrauterine growth retardation has been identified according the results of complex clinical, ultrasound and dopplerometric diagnostics.

2. Dynamic dopplerometric examinations of blood flow in the mother-twin-fetal system were performed among pregnant women with uterine scars after myomectomy, the nature and sequence of hemodynamic disturbances were determined.

3. Prognostic value of early and persistent detection of hemodynamic disorders in the uterine-placental-fetal system was determined for prediction of scar quality in uterine.

4. In pregnant women with uterine scars possibilities of early diagnosis and prevention of complications of termination of pregnancy by mother and fetus have been determined.

Practical significance of research work: Based on the conducted studies, possible causes of poor scar formation in the uterus after myomectomy were identified. It has been shown that the course of pregnancy after myomectomy is directly related to the quality of the formed scar. The risk of miscarriage is higher among women with uterine scars. Requirement for early diagnosis of hemodynamic assessment of the maternal-fetal system for the timely correction of detected abnormalities and prognosis of scarring in uterine has been identified. In addition, in these pregnancies, it is possible to assess whether the delivery was completed naturally or surgically by monitoring the condition of both the scar and the mother and fetus at the same time as choosing the end date.

Approbation of research work. The main provisions of the dissertation were presented at the conference "The 27th World Congress on Controversies in Obstetrics, Gynecology and Infertility" (Paris, 2019).

The materials of work was approved at a meeting of the Department of III Surgical diseases, I and II Departments of Obstetrics and Gynecology of Azerbaijan Medical University (AMU) (03.07.2018, protocol No. 01), at the scientific seminar of the Dissertation Council ED 2.06 at the AMU (02.04.2021, protocol No. 05).

Application of results of the scientific research work. Achieved results have been applied in education process of the Department of III Surgical diseases, I and II Departments of Obstetrics and Gynecology of Azerbaijan Medical University, clinical work of

Educational Surgery Clinic of AMU, Gynecological departments of Central Hospital Of Oil Workers, Maternity Center of Nakhchivan AR, "Real ST Center", "Baku Medical Plaza" clinics.

Title of the institution where the scientific research work was conducted: Department of III Surgical diseases, I and II Departments of Obstetrics and Gynecology of Azerbaijan Medical University, Gynecological departments of Central Hospital Of Oil Workers and the Maternity Center of Nakhchivan AR, "Real ST Center", "Baku Medical Plaza" clinics.

Publications. 10 scientific works on the topic of the dissertation were published. 7 of them are articles, 3 theses, including 2 articles and 1 theses published abroad.

Structure and volume of the dissertation. The dissertation is written on 162 computer pages (228850 symbols) and consists of chapters "Introduction" (5,5 pages, 10801 symbols), "Literature review" (20 pages, 40157 symbols), "Materials and methods" (7 pages, 13079 symbols), two chapters reflecting the results of personal research (55 pages, 78531 symbols), "Conclusion" (37 pages, 77068 symbols), "Findings" (1,5 pages, 2551 symbols), "Practical recommendadtions" (1 pages, 1348 symbols) and "List of literature" (30 pages). 41 tables and 9 charts and 1 figure have been included to the dissertation work.

The list of literature includes 255 sources (13 in Azerbaijani, 118 in Russian and 124 in English).

MATERIAL AND METHODS OF THE RESEARCH WORK

In order to study the frequency of myomectomy, indications for surgery, intra- and postoperative complications¹¹⁹ medical histories of pasients underwent surgery in the Central Hospital Of Oil Workers and Department of Gynaecology of the Maternity Center of Nakhchivan AR, "Real ST Center", "Baku Medical Plaza" clinics were analyzed during 2008-2014 years. We have conducted a comprehensive examination of 96 women who underwent myomectomy for assessment of the course of the postoperative period, the characteristics of the healing process in the scar area in

uterus. All examined women were divided into 2 groups: the first group included 54 patients who underwent hysteromentopexy (additional peritonization of the suture area with the free end of a large fat), and the second group included 42 patients who did not undergo peritonization of the suture area in uterus.

Examination methods. The following examination methods have been used for conducting of the scientific research work:

- General clinical examination;
- Clinical and laboratory examination;
- Dopplerometry of the uterine scar with ultrasound (US) of pelvic organs after myomectomy;
- Hysteroscopy;
- For each patient, we developed a specially designed examination card and questionnaire.

The general clinical examination was performed according to the generally accepted scheme. A special attention was paid to obstetric and gynecological anamnesis: age of menarche, onset of sexual life, features of menstrual and sexual function, determination of the menstrual cycle and the nature of its violation, the time after surgery, the course of surgery and the postoperative period and the use of contraception, postoperative sexual life, recovery of sexual function, gynecological diseases and previous gynecological operations.

During the gynecological examination, the features of the development of the external genitalia, alopecia, the condition of the vulva and uterine mucosa, the size, condition, consistency, motility and derivatives of the uterus were assessed.

Exographic examination. For assessment the condition of the small pelvic organs before treatment, as well as to dynamically assess the effectiveness of treatment the Ultrasound examination (USM) by Sono Scape SSI 8000 (China) using real-time transabdominal and transvaginal sector transmitters with acoustic vibration frequency of 5 MHz has been used. All patients underwent transabdominal and transvaginal examination.

Depending on the nature of the suspected pathology, exographic examination in women of reproductive age was performed at

different phases of the menstrual cycle, as well as in the early proliferative phase (days 4-8) when they are suspected of hyperplastic processes of the endometrium.

Dopplerographic examination. Dopplerographic examination of blood vessels was performed for assessment of blood circulation. Dopplerographic examination of blood circulation was conducted using 3.5 MHz transmitter (sector transmitter), by operating the exoscope in "duplex-highpulse" mode, by ultrasound machine.

Data of V.N.Demidov and B.I.Zykin were used as normative parameters during US examination¹⁰.

Comparison of the obtained results was conducted according data of Ye.V.Fyodorova conducted with average values of circulatory parameters for fertile women¹¹.

Myomectomy imlementation methods. Access to the abdominal cavity mainly was performed through Pfannenstil cross section on transverse groin. Lower secondary incision was made only if the size of the fibroid is too large (> from 20 weeks of pregnancy), or along an old scar that has formed after a previous surgical intervention. After opening the abdomen small pelvic organs were examined and the surgical condition was assessed. Surgery was performed in the uterus in the projection of the largest node, perpendicular to the axis of the uterus, close to the center of the uterine body - in the area with the least vascularization by determining the number, size and location of myomatous nodules visually and by palpating.

We have implemented enucleation of myomatous nodules we performed in a dull and sharp ways. Knot enucleation was conducted by bluntly separating the "capsule" by cutting the fibrous spaces after the uterine wall is cut. Taking into consideration that that the uterine wall of the nodule "capsule" element is a hypertrophied muscle structure, we did not cut it. The construction of myometrium was

¹⁰Демидов, В.Н., Зыкин Б.И. Ультразвуковая диагностика в гинекологии. – Москва: Медицина, – 1990. – 224 с. (с. 38-50).

¹¹Федорова Е.В., Липман А.Д. Применение цветового доплеровского картирования и доплерометрии в гинекологии. – Москва: Видар-М, – 2002. – 104 с. (с. 22-28, 60-70).

performed with separate sutures along a row. Double-row sutures were placed when the uterine cavity was opened or when large defects of the myometrium were joined. Additionally some patients underwent peritonitis of the scar in childhood with high fat in order to improve the healing process of uterine scars, the prevention of adhesions with intestinal loops and better hemostasis. During hysteromentopexy we sewed the free side of the fat to the scar after myomectomy, with several free ends of the ligature retained after the wound sutured in uterus. Synthetic suture material (vicryl, PGA), which gradually melts and disappears, is used for single-strand knots.

Statistical processing of the archived results. During the statistical processing of the set of variation series for all parameters the value of an average account (M-Mean), mean square inclination ($a=Std. Dev.$) and standard error ($t=Std. Error$) was calculated. The accuracy of the differences between the indicators was assessed using the Student's t-test in the case of normal distribution of indicators. During, a statistical difference between the independent samples the comparison of quantitative characteristics was determined by means of non-parametric Mann-Whitney U-criterion, the White T-criterion. χ^2 and Fisher's exact criteria were used to determine the statistical difference between the quality characteristics of the groups.

The difference between the indicators was considered statistically significant when the significance level was at least $p<0.05$. The statistical significance of the differences was accepted on at least two criteria.

RESULTS OF THE RESEARCH AND THEIR DISCUSSION

As it was mentioned above, medical cards of 119 women have been analyzed during the study, the age of these women was between 23-36 years, the average age was $30,3\pm 4,8$. According to data of medical cards the biggest group was consisted of 47 women aged between 29-36 years with myoma, 17 of them were aged between 26-28 years, 20 women - 34-36 years.

Special attention was paid to the study of the menstrual cycle. The

mean age at which menarche occurred was 13.3 ± 1.36 , fluctuating between 9-18. Starting of menstruation till 10 years was seen in 3 (2,5%) women. The late menarche was recorded at the same quantity of women. In almost all girls - 91.6%, menarche was established within 6 months, in 6 (5.0%) - within 1-2 years. Menstruation remained irregular until the moment of surgery in 4 (3,4%) women. The duration of menstruation varied between 2-10 days, was 5.1 ± 1.37 days on average. In patients 18 (15,1%) the duration of menstruation was recorded as more than 7 days. An average duration of menstrual cycle was $28,22 \pm 2,4$ days (from 2 to 24 days). In 105 (88,2%) women menstruation was regular at the time of surgery. In most women (59,7%) blood loss during menstruation was moderate, only in 47 (39,5%) women hypermenorrhea was seen.

During the anamnestic investigation it became clear that 51 (42,9%) of examined women didn't use contraceptives or used ineffective methods (interrupted sexual intercourse or calendar method). 27 (22,3%) women used condoms. Hormonal drugs, including combined oral agents have been episodically used by 56 (47,1%) women (mainly for therapeutic purposes). Only 23 (19,3%) used these medications for contraceptive purpose. Another 19 (16,0%) women used intrauterine contraception (IUC) for protection from unwanted pregnancy. IUC was removed at the surgery processes. A part of them was removed because of menorrhagia, in some, IUC was also removed in preoperative preparation for individual diagnostic pruritus or aspiration from the uterine cavity.

When extragenital pathologies were studied, it was found that 60 (50,4%) women suffered from somatic diseases, 59 (49,6%) women felt healthy.

In 20 (16,8%) women ovarian cysts were found. In 16 (13,4%) women hyperplastic processes of the endometrium, in 15 (12,6%) women endometriosis of various localizations were observed, what indicates that there are certain common links in the pathogenesis of uterine fibroids and benign diseases of the uterus and ovaries.

Destructive treatment of the cervix was performed at the time of surgery in 41 (34,4%) women, and therapeutic-diagnostic pruritus of the uterine cavity and cervical canal was performed in 29 (24,4%)

women. Open surgery on small pelvic organs (laparotomy) was performed in 13 (10,9%) women. Indications for surgical treatment were ovarian pathology, ectopic pregnancy, caesarean section and myomectomy. Besides gynecological interventions different surgical operations also affect the process of adhesion in the small pelvis. Appendectomies performed in 18 (15,1%) patients are especially important from this point of view.

At the time of the operation, most women were able to perform their reproductive functions. Thus, 82 (68.9%) women had a history of pregnancy. The number of births (n = 65, 54.6%) was slightly higher than the number of spontaneous abortions. In addition, 19 miscarriages occurred in the 18th week of pregnancy. This is probably due to hyperestrogenism in patients with uterine fibroids.

The fact that the average weight of infertility in the structure of gynecological diseases is significantly higher – 25(21,0%) women - is a particularly noteworthy issue. Besides it, the number of secondary infertility was relatively high. However, half of the women with secondary infertility (7 out of 14) gave birth.

Thus, myomas were not the main cause of infertility in most women, they suffered from infertility long before fibroids for various reasons.

The size of the nodes fluctuated over a wide range. The majority of women (40 people) had a fibroid size of 4.0-4.9 cm (chart 1).

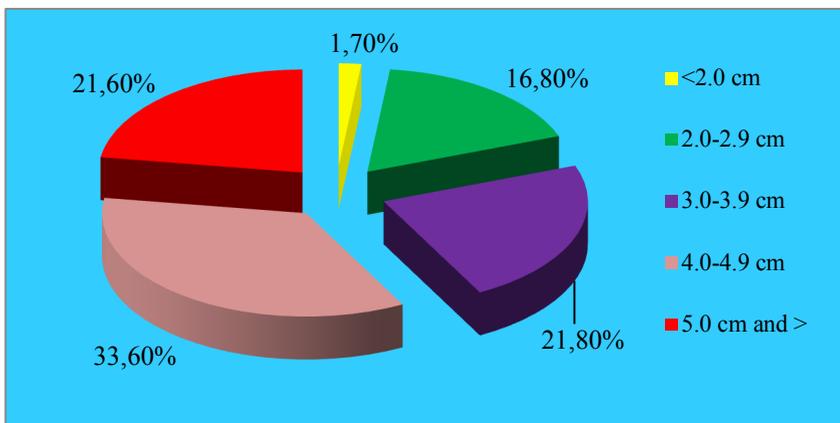


Chart 1. Dimensions of uterine myomas

In most of women - person (33,60), sizes of myomas were 4,0 - 5.0 cm. In 21,8 % of all cases this figure was 5,0-12,0 cm. In some

cases it was less than 4,0 cm.

After analysis of gynecological pathology after myomectomy special attention was paid to detection of relapses of the disease. During 5 years we have detected 14 (15,05%) cases of uterus myoma aftersurgical treatment. Most relapses (10 out of 14) occurred 1-2 years after surgery. There were no relation between size of removed nodules and reasons of their re-formation.

As it is known, myomas are often accompanied by other benign processes of uterine and uterine growth. Thus, hyperplastic processes of the endometrium were recorded in 8 (8.3%) patients and did not differ statistically until myomectomy. Most often, this pathology was observed during from 1 to 2 years (6 out of 8) after surgery. Hysteroscopy was performed in all cases. In 6 patients, the condition of the scar after myomectomy was assessed by opening the uterine cavity during the procedure. In all cases, endometrial hyperplasia was confirmed histologically. Later, progestogen drugs were prescribed for 3-12 months. Ovarian cysts were registered in 6 patients. Ovarian cysts occurred in 1 person in the first year, in 2 cases in the second year, and in 3 cases after 4 years. After anti-inflammatory and hormonal treatment, 5 women had normal ovarian structure under ultrasound control. In this case, laparoscopy was performed and the ovaries were resected within healthy tissues. According to the results of histological examination, the cyst was follicular. In addition, intraoperatively, the process of adhesion to the intestinal loop in the scar area in childhood was found, which caused a number of technical difficulties in the operation.

Analysis of women's reproductive and somatic health status after myomectomy revealed a high incidence of extragenital, gynecological, infectious and inflammatory diseases, indicating a weakening of immunological and nonspecific resistance, which subsequently had a significant impact on the course of pregnancy and childbirth for both mother and fetus. A comparative analysis of pregnancy characteristics of patients in clinical groups revealed legitimate differences.

According to the pregnancy protocol, All patients with miscarriage risk have taken progesterone.

Shortening of the cervix revealed during ultrasound screening of the first trimester (11-12 weeks of pregnancy), was present in 12 (22.2%) of pregnant women in group I and 26 (61.9%) of pregnant women in group II, which is very high in comparison.

The risk of miscarriage in the second trimester remains high - 35.2% and 64.3%. Iron deficiency anemia is often diagnosed during the analysis of hematological parameters.

Peripheral edema was found without statistically significant differences between the examined pregnant women in both groups: 12 (22.2%) and 16 (38.1%). Chronic placental insufficiency is characteristic for women in both groups throughout pregnancy.

It is known that in CPI, two forms of disorder appear immediately; malnutrition and respiratory failure. In this regard, the main directions for the prevention of CPI are the measures aimed at improving uterine-fetal blood circulation, normalization of gas exchange in the maternal-fetal system, the restoration of metabolic disorders.

In case of CPI a set of therapeutic and prophylactic measures contains first of all application of adrenomimetics, antiplatelet agents, etc.

The mean duration of childbirth and the duration of dehydration did not differ in either group. Premature rupture of the membranes in group I occurred in 8 pregnant women (14.8%), and in group II in 10 pregnancies (23.8%). The duration of the dry period was much longer in the second group than in the first group - 8.1 ± 0.3 and 2.6 ± 0.7 hours, respectively. Also, in the second group, almost all women - 5 (11.9%) patients underwent episiotomy due to the exacerbation of chronic hypoxia of the fetus and the risk of rupture of the gap. No rapid or sudden childbirths were observed in the analyzed groups.

The childbirth anomalies were very common in both groups. Initial weak childbirth was observed in 19 (35.1%) and 22 (52.3%) patients. Secondary birth defects were less common because the prolonged delivery resulted in a Caesarean section. Disorganization of labor activity was observed in 3 (5.5%) and 6 (14.2%) cases.

The following fact also should be noted that as the time spent after

myomectomy shorter, the risk of miscarriage and complications such as premature birth is as greater. During the analysis of the course of the gestation period, it was determined that numerous complications of pregnancy occurred in pregnant women of groups I and II. In order to assess the impact on the course and outcome of labor, the characteristics of termination of pregnancy and the time of birth were analyzed.

In both groups where myomectomy was conducted there was a tendency to increase the frequency of premature births with the physiological course of hestasis. There were no rapid and sudden births in the analyzed groups.

Diagnosis of premature separation of a normally located placenta was detected in 1 (2,1%) woman from I group and 3 (10,3%) women from II group. Delayed delivery, respectively was 5 (10,6%) and 2 (6,9%). In 45 out of 47 (90%) pregnant women in group I there was the advent childbirth, in 2 (4%) cases - pelvic childbirth was observed. In II group these indicators were 19 (63,3%) and 4 (13,3%) (table 1).

Table 1

Structure of childbirth

Complications	Clinical groups				p
	Group I n=47		Group II n=29		
	abs.	%	abs.	%	
Physiological childbirth	26	55,3 ± 7,25	6	20,7 ± 7,52	< 0,01
Caesarean section	21	44,7 ± 7,25	23	79,3 ± 7,52	< 0,01
Urgent	4	8,5 ± 4,07	2	6,9 ± 4,71	> 0,05
Planned	17	36,2 ± 7,01	21	72,4 ± 8,3	< 0,001

The instructions for caesarean section were often in favor of both the mother and the fetus. The most common obstetric pathologies indicated by surgical delivery were weakness of labor, hypoxia of the fetus, and useless scars in the uterus.

No postoperative complications were found in any of the women.

An important indicator of the health of newborns is information about their physical development. All children were born alive, and stillbirths and early neonatal deaths were not reported in the comparable groups of pregnant women.

A characteristic marker of favorable intrauterine development of the fetus is the weight of newborns. Anthropometric examination revealed a significant difference between the values of newborn height, head circumference and thoracic circumference in the studied groups ($p > 0,05$). When assessing the condition of infants at birth, it was found that the share of infants born in satisfactory condition with an score of 8 points and above on the Apgar scale also prevailed in group I - 24 (51.1%) and 11 (37.9%). 16 children (34.0%) in group I (7-5 points) and 12 (41.4%) in group II were born with mild asphyxia.

Intrauterine growth retardation syndrome (IGRS) has also been developed in newborns of group II. The frequency of occurrence of I degree IGRS was 8 (19%) newborns in the I group and II level IGRS was seen in 8 (14,8%) newborns and was consistent with the I degree (chart 2).

A comparative analysis of perinatal pathology showed a high incidence in the II group of examined women. Respiratory disorders syndrome occurred in 5 (10.6%) newborns in group I and 6 (20.7%) in group II.

Nəzarət qrupunda bütün uşaqlar doğum evindən qənaətbəxş All children from the control group were discharged from the maternity hospital in satisfactory condition. 5 (9.3%) infants in group I and 7 (16.7%) infants in group II were transferred to another department to continue treatment.

Thus, the percentage of births with intrauterine growth retardation after myomectomy in pregnant women without appropriate preventive measures is high, which requires their subsequent inpatient care¹².

¹²*Həsənov, Y.M.* Qadınlarda miomektomiyadan sonra hamiləliyin qedişati xüsusiyyətləri, doğuş və doğuşdan sonrakı dövr // – Bakı: Azərbaycan Təbabətinin Müasir Nailiyyətləri, – 2015. № 3, – s. 92-96.

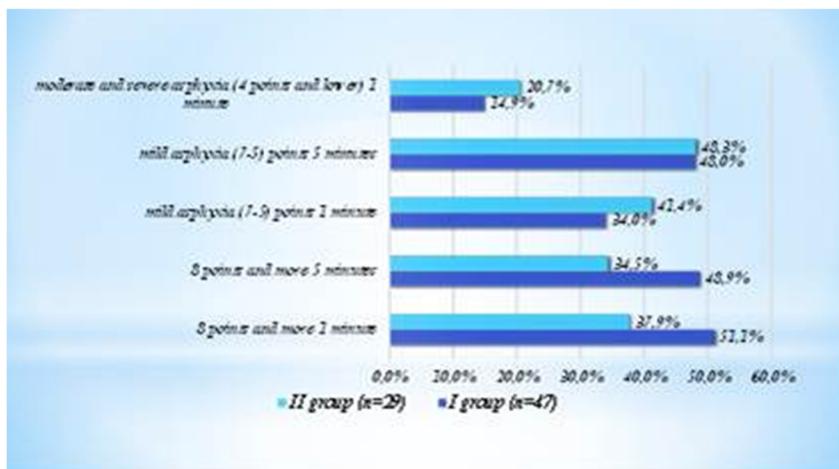


Chart 2. Assessment of newborns according to Apgar scale

According to R.A. Grannum and co-authors (1979) certain differences were found between the examined groups by studying the exographic picture of the structural changes of placenta. This is manifested in the irregularity of the substance of the placental parenchyma with the presence of irregularly shaped, irregularly wavy exogenous zones with depressions in the chorial layer and the formation of exogenous areas in the basal layer. Placental thickness in women from group I was $2,4 \pm 0,05$ cm, from group II $2,7 \pm 0,02$ cm ($p < 0,001$). Non-physiological localization of the placenta is typical for both groups. Both groups are characterized by low placentation in most cases (17 (36.2%) and 16 (55.2%)), and front location of placenta in 1 (2.1%) and 5 (17.2%) pregnant women in both groups was characteristic.

As for the ultrasound structure of the placenta, almost all women in both groups had a I-II degree of maturity of the placenta.

Studying hemodynamics in the “Mother-placenta-fetus” system, different degrees of disorders have been identified in all women. Indicators of hemodynamics in fetoplacental system vessels primarily affect placental blood flow when there is a scar in the uterus. This is probably due to morphological changes in the vessels of the uterus. Uterine-placenta-fetus blood flow disorders were found

in all women in both groups. The differences in the groups were obtained according to the degree of IA (compensated form of deficiency, the disorders are limited to uterine-double blood flow) – such women in the main group, were significantly less than in the comparison group: respectively 3 ($4.9\pm 2.8\%$) and 11 ($15.3\pm 4.3\%$). Differences were also observed in the II degree indicator (onset of decompensation, both uterine-fetal and fetal-circulatory disorders) - 11 (23.4%) and 8 (27.6%) pregnant women in both groups. Indicators such as pulse index were significantly higher in women from group I than in women from group II: UAd- 0.79 ± 0 respectively against the values of 0.68 ± 0.02 , 0.67 ± 0.03 and 1.54 ± 0.02 . 01, UAs - 0.79 ± 0.01 and UA - 1.62 ± 0.03 ($p<0.001$). There were also significant differences between the groups in the systolic-diastolic ratio in the uterine vessels and umbilical arteries. Thus, in UAd it is 2.79 ± 0.04 in group I, and 2.27 ± 0.03 ($p<0.001$) in group II; in UAs respectively - 2.29 ± 0.01 and 1.91 ± 0.03 ($p<0.001$); in the umbilical artery - 2.63 ± 0.01 and 2.57 ± 0.02 ($p<0.05$). As for the resistance index, only significant differences were found in the right uterine artery. In group I, the index was higher than in group II - 0.77 ± 0.02 and 0.67 ± 0.03 ($p<0.05$). No significant differences were found in the left uterine artery and umbilical artery resistance groups¹³.

Disorders of biparietal size of the head (BHS) and growth of the average diameter of the abdomen (AD) was more noticeable compared to the growth retardation of the femur in pregnant women from group II. According to V.N.Demidov (2004) when comparing values of BHS, AD, thigh length (TL) with allowable variability limits, intrauterine growth retardation of fetus was detected in 9 ($30,0\pm 2,5$)% pregnant women, also, in most cases, retardation was moderate, i.e. resignation from development of TL, AD, BHS indicators was no more than 2 weeks from gestation. In most fetuses (6 ($20\pm 2,2$ %) intrauterine growth retardation was asymmetric. In one case, malnutrition was noted with biometric parameters lagging far

¹³Hasanov, Y.M. Exographic evaluation of the fetoplacental system in women with uterine scars after myomectomy // – Baku: Modern Achievements of Azerbaijani Medicine, – 2019. № 2, – s. 96-99.

behind the required gestational parameters (3 weeks).

At 32-34 weeks of gestation, no significant differences in fetometric parameters were found in the groups, despite the presence of grade I IGRS in individual women (table 2).

Table 2

**Indicators of hemodynamics
of the uterine-placenta-fetus complex**

Indicators of hemodynamics of the uterine-placenta-fetus complex	Arteries	Women groups (M±m)		p
		Group I n=47	Group II n=29	
Pulse index (PI)	UAd	0,79±0,01	0,68±0,02	<0,001
	UAs	0,79±0,01	0,67±0,03	<0,001
	GA	0,62±0,03	1,54±0,02	<0,001
Resistance index (RI)	UAd	0,77±0,02	0,67±0,03	<0,01
	UAs	0,75±0,01	0,69±0,04	>0,05
	GA	0,71±0,02	0,64±0,03	>0,05
Systolo-diastolic ratio (SDR)	UAd	2,79±0,04	2,27±0,03	<0,001
	UAs	2,29±0,01	1,91±0,03	<0,001
	GA	2,63±0,01	2,57±0,02	<0,01

Note: p₁₋₂ – is an indication of significant differences in pregnant women in the compared groups.

In women at 35-36 weeks of gestation, fetal developmental delay was more significant and was consistent with grade 1-2 IGRS according to general criteria. An asymmetric type of grade 2-3 IGRS has been reported in women up to 37 weeks of gestation. The obtained parameters of fetometry were 3 weeks behind the parameters corresponding to the normal period of pregnancy. It should be noted that these disorders were more noticeable in pregnant women of group II.

We applied cardiotocography (CTG) method for assessment of the degree of intrauterine hypoxia of the fetus. Monitoring was almost continuous - both at the time of admission and during treatment. 27

(57.4%) in group I and 12 (41.4%) pregnant women in group II had signs of intrauterine hypoxia: basal rhythm was changed between 100-110 or 150-170 beats\minute, heart rhythm was monotonous (with a basal rhythm amplitude of 5-10 beats / min) or vice versa - more than 25 beats / min during an examination period of more than 40 minutes. At the KTG sporadic deselerations were noted, accelerations were almost non-existent.

Immediate termination of birth was required in other women (11 (23.4%) and 9 (31%)), as the CTG picture showed severe intrauterine abnormalities of the fetus.

Indicators of general blood analysis in the postpartum period were studied. General blood tests were monitored on days 1 and 3. It is established that when analyzing blood counts on the first day of the postpartum period, we noted that the level of hemoglobin and erythrocytes in the blood was comparable between patients of the first and second groups ($p<0.05$), which was explained by an increase in blood loss during surgery.

The incidence of anemia in the postpartum period increases in examined women. Thus, mild anemia is observed 3 times more in the first group and 2 times more in the second group.

It was found that the amount of leukocytes was within the norm. No significant differences were found between the first and second groups ($p>0,05$).

Lymphocyte levels were normal in the first and second groups ($p<0,05$). Other biochemical parameters of the blood did not differ significantly between groups ($p>0,05$).

When studying the timing of restoration of the structure of the myometrium in the area of the scar in the uterus, no significant differences were found between the groups. However, depending on the location, size and number of cut nodes, a certain pattern was found during the restoration of the myometrium structure.

Analysis of the results of laparotomy myomectomy with additional peritonization by means of the free end of the large fat of the sewing area showed that the myometrium was recovered 1 month after removal of subserous nodules in 40.0% (39.0% in group II), in 13.2% after 1 month after removal of interstitial nodes (10.0% in

group II). After 12 months, these indicators in both cases were 100%. After removal of submucous nodes, the myometrium recovered after 12 months in 44.0% of cases (38.0% in group II)¹⁴.

Thus, the results of the current study showed that Dopplerometric diagnosis of disorders of the fetoplacental system after myomectomy and monitoring the effectiveness of treatment allows to eliminate perinatal losses. It has also been shown that women with uterine scars can have a natural birth after a modified myomectomy.

FINDINGS

1. Analysis of the results of laparotomy myomectomy with additional peritonization by means of the free end of the large fat of the sewing area showed that the myometrium was recovered in 40.0% of cases after 1 month of removal of subserosal nodules, and in 13.2% of cases after 1 month of removal of interstitial nodules. After 12 months, these indicators were 100% in both cases. After removal of submucosal nodules, the myometrium was recovered after 12 months in 44.0% of cases [4, 7].
2. Myomectomy is the most common invasive procedure, allowing the restoration of reproductive function in 81.2% of women with uterine fibroids. Due to the high frequency of miscarriages and premature births during pregnancy after myomectomy (81%) and chronic placenta deficiency (69%), it requires early appointment of prophylactic drugs aimed at maintaining pregnancy [3, 4].
3. It is established that dopplerometric examination of the velocity curve of blood flow in the uterine artery is a highly informative method for women with uterine scars after myomectomy. Severe degree of circulatory disorders in the uterine artery - III degree was observed in 53,2% cases, II

¹⁴*Həsənov, Y.M.* Konservativ miomektomiya zamanı peritonizasiyanın müxtəlif növlərinin tətbiqinin müqayisəli təhlili və onların qadın reproduktiv funksiyasına təsiri / Əməkdar elm xadimi, professor Naziyə Musa qızı Şəmsəddinskayanın 90-illik yubileyinə həsr olunmuş konfrans, – Bakı, – 2016. – s. 149-151.

- degree - in 27,6% cases, and It is most common in pregnant women with scar localization after myomectomy [1, 10].
4. The course of childbirth is usually accompanied by early rupture of the membranes (37.9%), anomalies in childbirth (10.3%), hypotonic bleeding (13,8%). The childbirth methods should be detected individually. Among the most common births, the optimal method of delivery for women with scarp in uterus is natural childbirth in women with low obstetric and perinatal risk, and planned caesarean section in women with high obstetric and perinatal risk [6].
 5. All children (100%) during the study were born alive and in comparable groups of pregnant women there were no cases of stillbirth and early perinatal mortality. Anthropometric examination revealed significant differences in length, head circumference and chest circumference of newborns in the study groups ($p < 0.05$): in group I, children born in a satisfactory condition according to the Apgar scale prevailed - 51.1% and 37.9%, respectively. Light asphyxia was noted in 34.0% and 41.4%, respectively. IUGR I degree was found in 14.8% of patients in group I, IUGR I and II degree in group II - 19% and 16.7%, respectively. Respiratory distress syndrome occurred in 10.6% of patients in group I and 20.7% in patients in group II [4].

PRACTICAL RECOMMENDATIONS

1. For optimization of surgical treatment tactics it is advisable to conduct a comprehensive preoperative examination of patients with non-invasive fibroids, combined with dopplerometry, which allows to predict the rate of fibroid growth, the likelihood of destructive changes in the nodules, as well as to assess the morphological features of the tumor structure.
2. In patients with uterine myomas using of a short (3-month) course of treatment with QnRH agonists or gestrinone as the second stage of organ protective treatment allows you to increase the likelihood of pregnancy and reduce the number of

- relapses after surgery.
3. Dynamic ultrasound monitoring in the postoperative period allows to assess the degree of recovery of myometrium in the scar area and it is very important for determining the method of continuation and termination of pregnancy.
 4. These are the indications for surgical childbirth for women with scars in uterus after myomectomy: scar in the uterus after myomectomy surgery, which results in the rupture of large fibroid nodules with large interstitial components and the opening of the uterine cavity. Placement of the scar on the posterior wall of the uterus and placement of placenta on the postoperative scar.

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LIST OF ABBREVIATIONS

BSH	– biparietal size of the fetal head
CPI	– chronic placental insufficiency
IUGR	– intrauterine growth retardation
KTG	– cardiotocography
UA	– umbilical arteries
AD	– the average diameter of the abdomen
PI	– pulse index
RI	– resistance index
SDR	– systolo-diastolic ratio
UAd	– right uterine artery
UAs	– left uterine artery

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