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Myomectomy or conservative management of uterine fibroids: effects on reproductive potential

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AIM: The aim of this study was to analyze reproductive function, pregnancy and labor in women after laparoscopic myomectomy and in women with unoperated myoma.

MATERIALS AND METHODS: The main group consisted of 60 patients aged 25–46 years with a scar on the uterus who had laparoscopic myomectomy. Inclusion criteria were full-term pregnancy, uterine scar after laparoscopic myomectomy for subserosal or intramural uterine myoma (3–10 cm), and myomatous nodules (one to three). The comparison group included 30 women aged 25–46 years who were not surgically treated. Inclusion criteria were full-term pregnancy, subserosal or intramural uterine myoma (3–10 cm), and myomatous nodules (one to three). All patients in the main group underwent laparoscopic myomectomy. In all cases, the myomatous nodule was removed intracapsularly, leaving the leiomyoma pseudocapsule, which, with a deep arrangement of the transmural myomatous nodules, avoided opening the uterine cavity; myomatous nodule morcellation being used. With a deep intramural arrangement of the leiomyoma, the myometrial defect was sutured layer by layer with the application of several rows of endosutures.

RESULTS: Six months after myomectomy, the patients underwent MRI of their pelvic organs with contrast. In 95% of cases, the uterine scar had no anatomical insolvency. In assessing the anamnesis, gynecological diseases occurred two times more often in women in the main group: 22 (36.7%) patients resorted to the use of the in vitro fertilization method for pregnancy, while among the patients in the comparison group, there were only two (6.7%) of them ($\chi^2 = 12.8$; $p < 0.001$). In the main group, moderate preeclampsia and gestational diabetes mellitus were twice as common. In the main group, all patients were delivered by caesarean section, of which 83.3% were planned and 16.7% were emergency. In the comparison group, 73.3% of patients were delivered through the natural birth canal and 26.7% by caesarean section ($\chi^2 = 149$, $p < 0.0001$). The most unfavorable signs predisposing to obstetric complications and operative delivery were the presence of multiple nodules (OR = 5.96 (1.09–32.72), $p < 0.05$), the location of the nodule or scar in the uterine bottom (OR = 2.52 (1.00–6.33), $p < 0.05$), and their combination with IVF (OR = 9.09 (2.42–34.07), $p < 0.01$).

CONCLUSIONS: In 95% of women, the scar on the uterus after myomectomy was consistent, but all these pregnant women were delivered by cesarean section, mainly for combined indications. However, they carried out the pregnancy safely, with a good outcome for the fetus. In women with uterine myoma and its conservative management, there was a lower rate of aggravated gynecological history and obstetric complications, and 73.3% of them were delivered through the natural birth canal. Despite the increased risk of caesarean section, the presence of uterine fibroids, even of a large size (more than 4 cm), should not be considered as a contraindication to vaginal delivery.

Keywords: uterine fibroids; myomectomy; pregnancy; delivery.

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Миомэктомия или консервативное ведение миомы матки: влияние на репродуктивный потенциал

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Цель — провести анализ репродуктивной функции, течения беременности и родов у женщин после лапароскопической миомэктомии и у женщин с неоперированной миомой.

Материалы и методы. Основную группу составили 60 пациенток с рубцом на матке, у которых была выполнена миомэктомия лапароскопическим доступом. Критерии включения: возраст — 25–46 лет, доношенный срок беременности, рубец на матке после лапароскопической миомэктомии по поводу субсерозной или интрамуральной миомы матки размером от 3 до 10 см, количество миоматозных узлов от одного до трех. В группу сравнения вошли 30 женщин в возрасте 25–46 лет, не подвергавшихся хирургическому лечению, с субсерозной или интрамуральной миомой матки размером от 3 до 10 см, количеством миоматозных узлов от одного до трех, с доношенным сроком беременности. Всем пациенткам основной группы выполнена миомэктомия с применением лапароскопического доступа. Во всех случаях миоматозный узел удаляли интракапсулярно с оставлением псевдокапсулы лейомиомы, что при глубоком расположении трансмуральных миоматозных узлов позволяло избежать вскрытия полости матки; осуществляли морцелляцию миоматозного узла. При глубоком интрамуральном расположении лейомиомы дефект миометрия ушивали послойно с наложением нескольких рядов эндошовов.

Результаты. Через 6 мес. после миомэктомии пациенткам выполнена магнитно-резонансная томография органов малого таза с контрастированием. В 95 % случаев рубец на матке был анатомически состоятелен. При оценке анамнеза отмечено, что гинекологические заболевания встречались в два раза чаще у женщин в основной группе: 22 (36,7 %) пациентки для наступления беременности прибегли к использованию вспомогательных репродуктивных технологий, в то время как среди пациенток группы сравнения таких было только две — 6,7 % ($\chi^2 = 12,8$; $p < 0,001$). В основной группе в два раза чаще встречались умеренная преэклампсия и гестационный сахарный диабет. В основной группе все пациентки были родоразрешены операцией кесарева сечения, из них 83,3 % в плановом порядке и 16,7 % экстренно. В группе сравнения родоразрешены через естественные родовые пути 73,3 % пациенток, операцией кесарева сечения — 26,7 % ($\chi^2 = 149$; $p < 0,0001$). Наиболее неблагоприятными признаками, predisposing к развитию акушерских осложнений и оперативному родоразрешению, явились множественные узлы [ОШ 5,96 (1,09–32,72); $p < 0,05$], расположение узла или рубца в дне матки [ОШ 2,52 (1,00–6,33); $p < 0,05$], их сочетание с экстракорпоральным оплодотворением [ОШ 9,09 (2,42–34,07); $p < 0,01$].

Заключение. У 95 % женщин рубец на матке после миомэктомии был состоятельным, но все эти беременные были родоразрешены оперативным путем, преимущественно по сочетанным показаниям. Тем не менее они благополучно выносили беременность, с хорошим исходом для плода. У женщин с миомой матки и ее консервативным ведением отмечалась более низкая частота отягощенного гинекологического анамнеза и акушерских осложнений, и 73,3 % из них были родоразрешены через естественные родовые пути. Несмотря на увеличение риска кесарева сечения, миому матки даже большого размера (более 4 см) не следует рассматривать как противопоказание к родам естественным путем.

Ключевые слова: миома матки; миомэктомия; беременность; родоразрешение.

Как цитировать:

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BACKGROUND

Myomectomy, in the pregravid period in patients of reproductive age, which is one of the most common among benign myometrial tumors, is currently the focus of Russian and international researchers. In the population, fibroids are registered in 20%–50% of women, its incidence increases with age, and according to postmortem examination, uterine fibroids are detected in 80% of female patients [1]. The incidence of fibroids reaches 70% at reproductive age, and at present, the incidence of uterine fibroids increases in young women under 30 years old, who have not implemented their reproductive function [2].

Fibroids are associated with 5%–10% of cases of female infertility [3]. The negative effect of uterine fibroids on female reproductive function can manifest itself during conception, childbearing, and delivery [4]. Thus, the problem of uterine fibroids and pregnancy is still relevant. This is also associated with the noticeable rejuvenation of patients with fibroids and with the increasingly late planning of pregnancy by modern women. The course of pregnancy, childbirth, and the postpartum period in female patients with uterine fibroids is accompanied by several complications, including myomatous nodule malnutrition, threatened, habitual, and recurrent miscarriage, placental insufficiency, and accordingly, chronic hypoxia and small-for-date fetus. Childbirth in women with uterine fibroids is often complicated by preterm amniotic fluid discharge, dystocia and uterine inertia, early postpartum hemorrhage, and uterine subinvolution. Labor ends with a cesarean section in 30%–40% of cases, 15% is accompanied by myomectomy, and 30% had supravaginal uterine amputation [5].

Today, the primary method of treating fibroids is surgery. Most of the current clinical guidelines indicate that conservative myomectomy has a positive effect on fertility and increases the probability of carrying out pregnancy and should be performed as a pregravid preparation [6]. In such cases, the determinant indication for myomectomy is often the pregnancy planning factor, rather than classical indications, such as the nodule size, its localization, and the rate of fibroid growth [7]. However, an opposite opinion is also presented and its supporters question the reasonability of myomectomy in nulliparous women, given the postoperative myometrial scar formation, which is becoming a more significant pregnancy and childbirth complication than the fibroid itself [8].

Since 2012, selective progesterone receptor modulators have been used as uterine fibroid conservative treatment, which directly affects leiomyoma, suppresses cell proliferation, and induces apoptosis, thereby decreasing the nodule size. They can be prescribed as a preoperative preparation and mono-method [9]. Ulipristal has been proven to maintain fertility in the presence of fibroids.

Concurrently, new methodological diagnostics (ultrasound, magnetic resonance imaging (MRI), etc.) and therapy approach for fibroids (agonists of gonadotropin-releasing hormones, selective progesterone receptor modulators, laparoscopic myomectomy, new minimally invasive high-tech surgical interventions, such as uterine artery embolization and focal ultrasound ablation of myomatous nodules, which preserve both the organ and its function) were developed in recent decades, as well as anti-adhesion barriers and contemporary methods to assess the state of the scar after myomectomy for a new approach to solve this problem.

In these cases, optimizing the pregravid preparation of female patients with uterine fibroids and developing alternative approaches to surgical intervention is especially important. This study analyzes the aspects of reproductive function and the course of pregnancy and childbirth in women after laparoscopic myomectomy and in women with non-operated fibroids to substantiate the choice of a differentiated approach to pregravid preparation of female patients with uterine fibroids.

MATERIALS AND METHODS

The study was approved by the ethical committee of the D.O. Ott Scientific Research Institute of Obstetrics, Gynecology, and Reproductology (protocol No. 58 dated January 31, 2017).

The main group consisted of 60 patients with a uterine scar, who underwent myomectomy by laparoscopic access in the Department of Operative Gynecology of the D.O. Ott Scientific Research Institute of Obstetrics, Gynecology, and Reproductology. Inclusion criteria were women aged 25–46 years, whose pregnancy occurred in the natural cycle or with the use of assisted reproductive technologies (ART) programs, full-term pregnancy (37–41 weeks), a uterine scar after laparoscopic myomectomy for subserous or intramural uterine fibroids ranging from 3 to 10 cm in size, with 1–3 myomatous nodules, and informed consent to conduct the study. Exclusion criteria were a history of surgical interventions for external genital endometriosis, uterine fibroids and reconstructive plastic surgery, and abdominal delivery by cesarean section, as well as the presence of adenomyosis, intramural-submucous, and submucous type of uterine fibroids. Patients with severe somatic pathology, including type 1 and 2 diabetes mellitus and blood clotting disorders were also excluded. All patients of the main group subsequently delivered by cesarean section according to the classical technique of intraperitoneal cesarean section with a transverse incision in the lower uterine segment in the maternity ward of the D.O. Ott Scientific Research Institute of Obstetrics, Gynecology, and Reproductology from 2017 to 2018.

The comparison group included 30 female patients aged 25–46 years, without a history of surgical treatment, with subserous or intramural uterine fibroids sized 3–10 cm, with 1–3 myomatous nodules, and full-term pregnancy. Pregnancy in this group occurred in the natural cycle or with the use of ART programs. The exclusion criteria were a history of surgical interventions for external genital endometriosis, uterine fibroids, reconstructive plastic surgery, abdominal delivery by cesarean section, adenomyosis, and intramural-submucous and submucous types of uterine fibroids.

All patients of the main group underwent myomectomy using a laparoscopic approach using a set of Karl Storz equipment (Germany). The surgeries were performed under endotracheal anesthesia. A standardized surgical technique was applied to perform this surgical intervention, which main task was myometrial injury minimization and subsequent full-fledged postoperative uterine scar formation. A solution of epinephrine and methylethylgobrevine was used for hydropreparation. The specified surgical approach minimizes intraoperative blood loss. Mechanical hydrodissection of the intact myometrium from the capsule of the myomatous nodule was also performed, which further facilitated the fibroids enucleation. The intramural localization of fibroids had an incision in a size that would not present any particular difficulties in enucleating the nodule through it. Ultrasonic energy was used, namely an Ultracision harmonic scalpel (ETHICON) to minimize electrosurgical and thermal myometrial trauma. Bipolar coagulation and transection of large vessels that feed the nodule were performed. In all cases, the myomatous nodule was intracapsularly removed, leaving the leiomyoma pseudocapsule, which avoided opening the uterine cavity with the deep transmural myomatous nodules location. For quick, effective, and safe myomatous nodule removal from the abdominal cavity, its morcellation was performed. Synthetic absorbable material was used. With a deep intramural leiomyoma, the myometrial defect was sutured layer by layer with the imposition of several rows of endo-sutures to prevent hematoma formations in the bed area of the removed myomatous nodule. Chromium hydrotubation was performed to prevent the development of adhesions and tuboperitoneal infertility. Anti-adhesion barriers InterceedR (regenerated cellulose oxide) were used.

MRI of the pelvic organs with contrast was performed on all patients at 6–12 months after laparoscopic myomectomy.

Statistical analysis of the obtained data was performed using Microsoft Excel 2017 (Microsoft Corporation, USA) and STATISTICA.10 (Statsoft Inc., Tulsa, USA). Descriptive statistics methods included an arithmetic mean and error assessment, as well as the frequency of occurrence

of attributes with discrete values. Differences in the values of quantitative indicators between the groups were assessed using the Student's *t*-test. The indicators measured on the nominal scale were compared using Pearson's chi-squared test (χ^2) and Yates' correction for small samples. The a posteriori Bonferroni method was used for multiple comparisons. Correlation analysis was performed using Spearman's rank correlation assessment.

RESULTS AND DISCUSSION

The obstetric-gynecological and somatic anamnesis, the peculiarities of the course and nature of pregnancy and childbirth complications in pregnant women with a uterine scar after conservative myomectomy and in pregnant women with uterine fibroids, without a history of surgical treatment, have been studied.

The average indicators of age and body mass index (BMI) were assessed to determine the homogeneity of the examined groups of patients. The average age of female patients in all groups varied from 25 to 46 years and did not significantly differ (33.7 ± 4.3 years in the main group and 32.0 ± 5.1 years in the comparison group). The average BMI of the examined women in all groups varied from 18.6 to 32 kg/m² and also did not significantly differ between the groups (27.7 ± 4.7 kg/m² in the main group and 26.3 ± 5.3 kg/m² in the comparison group). Thus, both groups did not significantly differ in age and BMI, which suggests that these factors did not significantly affect the study results.

The study of the obstetric-gynecological history aspects revealed that the groups significantly differed in the degree of their burden. Gynecological diseases were noted in 80% of women in the main group and 40% in the comparison group patients, that is, in the comparison group, they were 2 times less common. The summary data of the gynecological history burden are presented in Table 1.

The data presented in Table 1 show that indicators, such as the frequency of polyps and endometrial hyperplasia, have no significant difference between the groups. Significant differences were found in the frequency of cervical ectopia, which was more common in the group of women without treatment for uterine fibroids compared with the main group (70% and 40%, respectively), and a tendency toward a higher frequency of induced abortions was also noted, of which the indicator in the comparison group (46.7%) was higher than that in the main group (31.7%). Women without surgical can be assumed to have importance for higher fertility. The more frequent incidence of cervical ectopia in the comparison group women was associated with a higher frequency of induced abortions in them. One of the causes of ectopia is induced abortion, which complication is genital tract

Table 1. Obstetric and gynecological history in patients of the examined groups

Anamnesis index	Groups				χ^2	p
	main (n = 60)		comparison (n = 30)			
	n	%	n	%		
Abortions	19	31.7	14	46.7	1.39	0.2
Spontaneous miscarriage	26	43.3	6	20	5.49	0.02
Ectopic pregnancy	3	5	–	–	0.59	0.4
Cervical ectopia	24	40	21	70	4.78	0.03
Endometrial polyp (surgical treatment)	6	10	4	13.3	0.02	>0.5
Endometrial hyperplasia	3	5	1	3.3		>0.5

Table 2. Extragenital diseases in examined patients

Pathology	Groups				χ^2	p
	main (n = 60)		comparison (n = 30)			
	n	%	n	%		
Cardiovascular system diseases	13	22	8	27	0.09	>0.5
Gastrointestinal tract diseases	16	27	4	13	1.98	0.2
Urinary system diseases	11	18	17	57	11.3	<0.001
Endocrine system diseases	40	67	19	63	0	>0.5

infections [10]. Ectopic pregnancy was registered in 3 out of 60 cases in the main group and absent in the comparison group, thus further research and a larger volume of material are required for conclusions. Cases of spontaneous miscarriage were 2 times more often in the main group than that in the comparison group, namely in 43.3% of cases versus 20% ($\chi^2 = 5.49$, $p = 0.02$). Spontaneous miscarriage can further negatively affect the reparative processes of the myometrium.

The assessment of somatic diseases of the examined female patients is presented in Table 2. The examined patients often had diseases of the cardiovascular, urinary, and endocrine systems and gastrointestinal tract. However, no significant differences were found in the incidence of these diseases between the study groups, except urinary system diseases, in which incidence in the comparison group was 3 times higher than in the control group ($p < 0.001$). Probably, a prolonged increased volume of the uterus (due to myomatous nodules) adversely affects the urodynamics of the urinary tract. However, all these diseases were neither indications nor contraindications for a cesarean section.

The study of the uterine scar localization after myomectomy in the main group and myomatous nodules in the comparison group (Fig. 1) revealed that myomatous nodules were localized along the uterine posterior and anterior walls with approximately equal incidence. In the main group, more often, but not significantly, the nodules were located along the anterior

wall. In the comparison group, myomatous nodules were significantly located more often ($\chi^2 = 4.31$; $p = 0.03$) in the uterine fundus area.

Multiple myomatous nodules were more common in the main group (30% of cases), whereas they were noted in 13.3% ($\chi^2 = 3.21$; $p = 0.06$) of cases in the comparison group. This is due to more extensive disorders of the uterine smooth muscle structures in female patients of the main group due to endometritis, metritis, induced abortion complications, and prolonged intrauterine device usage. Even minor myometrial fiber damage causes myomatous nodule formations [3].

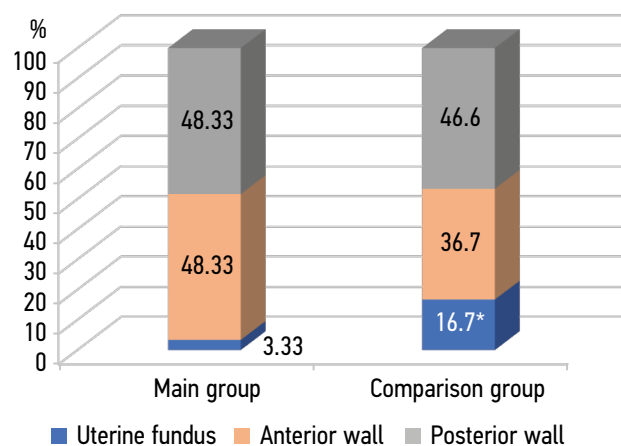
**Fig. 1.** Localization of myomatous nodules. * $p = 0.03$ compared with the main group

Table 3. Results of the MRI of the pelvic organs after laparoscopic myomectomy

Characteristic	Value
Thickness of the myometrium in the area of scar changes, mm	10.9 ± 0.92
Thickness of the intact myometrium, mm	17.0 ± 0.72
Difference between intact myometrium thickness and scar thickness, mm	4.7 ± 0.23
Uneven accumulation of contrast in the area of scar changes, <i>n</i> (%)	24 (40%)
Uterine volume, cm ³	78.3 ± 1.3

All patients from the main group underwent a pelvic examination using dynamic contrast-enhanced MRI 6 months after surgical treatment. Concurrently, the thickness of the myometrium in the area of cicatricial changes, the thickness of the intact myometrium of the uterine wall, where the myomatous nodule was removed, and the volume of the uterus were assessed to assess the myometrial state in the scar area. Results are presented in Table 3.

In 95% of cases, the thickness of the myometrium in the area of cicatricial changes and the thickness of the intact myometrium of the uterine wall, where the removed myomatous nodule was located, were anatomically consistent. No signs of failure were also noted in the thickness measurement of the uterine scar and the thickness of the myometrium of the intact uterine wall, where the myomectomy was performed. Thus, the thickness of the uterine scar after myomectomy using the laparoscopic approach was not <0.3 cm. However, in 5% of cases, the studied values corresponded to the indicators of inconsistency. Thus, the myometrium segment thickness in the scar area was <0.2 cm. Special attention should be paid to the 40% of cases with an uneven contrast accumulation by the myometrium in the area of cicatricial changes. Six months after surgery, the average uterine volume according to MRI data was 78.3 cm³.

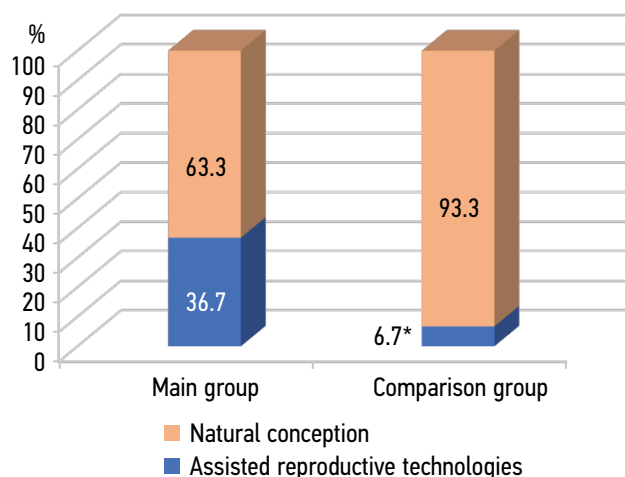


Fig. 2. Frequency of natural conception and conception with the use of assisted reproductive technologies in female patients of the study group. * $p < 0.001$ compared with the main group

The elucidation of the fertility status of patients of reproductive age in the comparison and main group was of particular interest. Therefore, the frequency of natural pregnancy or with the use of ART was studied (Fig. 2), which revealed that 22 (36.7%) patients of the main group resorted to ART methods, whereas 2 (6.7%) in the comparison group ($\chi^2 = 12.8$; $p < 0.001$). Therefore, an undoubtedly negative effect of the consequences of surgery was found on a woman's fertile status.

Analysis of the course of pregnancy, childbirth, and postoperative period

The incidence analysis of pregnancy complications (Table 4) assessed the incidence and severity of preeclampsia as the most hazardous complication for the mother and the fetus. Moderate preeclampsia was 2 times more common in the study group. The incidence of severe preeclampsia in the study group did not significantly differ. The frequency analysis of gestational diabetes mellitus found that the main group had almost 2 times higher and amounted to 41.7%, which was characterized by a high incidence of moderate preeclampsia, whereas 26.7%, in the comparison group; however, the statistical analysis did not reveal a significant difference between these groups ($p = 0.2$). Concurrently, the high incidence of gestational diabetes mellitus in female patients of both groups compared to the general population, which is 7%–10% [11], is noteworthy, which makes us pay attention to the possible relationship between uterine fibroids and the development of gestational diabetes mellitus.

The incidence assessment of chronic placental insufficiency did not reveal significant differences between the groups. The placental morphology analysis, which was performed in the department of morbid anatomy of the D.O. Ott Scientific Research Institute of Obstetrics, Gynecology, and Reproductology, revealed that the weight, size, shape, and histological aspects of the placenta of patients in the main and comparison group corresponded to the gestational age. Concurrently, a moderate degree

Table 4. Incidence of obstetric complications in the study group

Indicator	Groups		χ^2	p
	main (n = 60), %	comparison (n = 30), %		
Severe preeclampsia	(1) 1.7	(3) 10.0	2.22	0.09
Moderate preeclampsia	(27) 45.0	(6) 20.0	6.37	<0.01
Gestational diabetes mellitus	(25) 41.66	(8) 26.66	1.78	0.2
Chronic placental insufficiency	(13) 21.66	(6) 20.0	0.01	>0.5

Table 5. Indications for cesarean section in patients with uterine scar after myomectomy

	Indication	(n) %
Elective cesarean section	Scar failure	(3) 5
	Combined indications — together with a scar	
	IVF ICSI	(15) 25
	Fetal growth retardation, diabetic fetopathy, fetal breech presentation, and tight cord entanglement around the fetal neck	(13) 21.7
	Moderate to severe preeclampsia without birth canal maturity	(17) 28.3
	Non-scar related	
	Cicatricial deformity of the cervix	(1) 1.7
Emergency cesarean section	Placenta previa	1.7
	Premature rupture of membranes without birth canal maturity or with threatening fetal hypoxia	(5) 8.3
	Abnormality of labor and threatening fetal hypoxia	(3) 5
	The clinical discrepancy between the size of the fetal head and the mother's pelvis	(2) 3.3

Note. IVF: in vitro fertilization; ICSI: intracytoplasmic sperm injection.

of involutive-dystrophic changes, circulatory disorders, and compensatory-adaptive reactions was noted in both groups. In rare cases, inflammatory changes in the placenta were noted in the comparison group. All this indicates the absence of fibromatous process effects on the morphofunctional characteristics of the placenta in both groups.

All patients in the main group delivered by cesarean section, including 83.3% (50 pregnant women) in a planned manner and 16.7% urgent, with 8.3% and 8.3% of patients before the onset of labor and during labor, respectively. The structure of indications for cesarean section in female patients of the main group is presented in Table 5.

Table 5 demonstrates that, in the overwhelming majority of cases (75%), the main group delivered by elective caesarian section for combined indications associated with obstetric complications; the scar (its failure) condition was the reason for the surgical delivery in 5% of cases. The main indication for elective cesarean section in female patients with uterine scar after myomectomy was preeclampsia, both severe and moderate, without therapy response. As for cesarean section delivery, conception using in vitro fertilization (25%) exceeded to some extent the general population

value in the Russian Federation (17.9%) and was lower than that indicated by other authors (33.7%) [12]. Planned vaginal delivery in 10 (16.7%) patients also had surgical delivery. This is consistent with the opinion that even scars, which can be regarded as consistent according to anatomical and morphological criteria, may turn out to be functionally defective during labor [13].

The delivery complication analysis in female patients with uterine fibroids (comparison group) assessed the incidence of preterm and early amniotic fluid discharge, uterine contractility abnormalities, and fetal distress. The data obtained in the study of the nature and outcome of childbirth in patients with fibroids did not differ from those in the population, as abnormalities of uterine contractility were detected in 10% of female patients and preterm amniotic fluid discharge was recorded in 7 (23.3%) patients. An exception was fetal hypoxia during childbirth, which occurred in 6 puerperas (20%), which exceeded the population indicator (7%–10%) [14] by more than 2 times and required an urgent surgical delivery. Possible causes of this labor complication include both gestational diabetes mellitus and fibroids. Thus, 22 patients (73.3%) in the comparison group had a vaginal delivery and 8 (26.7%) had cesarean section

Table 6. Influence of the characteristics of fibroid or scar after myomectomy and related characteristics on the course of pregnancy and childbirth of patients in the two study groups

Risk factor	Odds ratio	Confidence interval 95%		p
		min	max	
Uterine posterior wall	1.14	0.48	2.70	>0.05
Uterine anterior wall	1.49	0.62	3.56	>0.05
Uterine fundus	5.96	1.09	32.72	<0.05
Uterine multiple fibroids	2.52	1.00	6.33	<0.05
PID — 1.08	1.08	0.52	2.24	>0.05
IVF — 9.09	9.09	2.42	34.07	<0.01

Note. PID: pelvic inflammatory disease; IVF: in vitro fertilization.

delivery. The comparison of groups after myomectomy, in addition to fetal distress, revealed a combined indication for urgent surgical delivery in 1 case (3.3%) as preterm amniotic fluid discharge without birth canal maturity. One patient had an elective cesarean section due to the low nodule location (3.3%). Thus, patients with non-operated fibroids have a much higher chance of giving birth through the vaginal birth canal ($\chi^2 = 149$, $p < 0.0001$).

The indicators of the state of newborns in the main and comparison groups were of interest. No significant differences were found in indicators, such as length, weight, and Apgar score. In both groups, the Apgar score was at least 8 points. This indicates that the state of the reproductive system of female patients with laparoscopic myomectomy history and women delivered without fibroid treatment, does not prevent conception, bearing, and childbirth under the conditions of timely and qualified assistance by obstetricians and gynecologists. Concurrently, our data indicate a higher risk of complications in female patients with a history of myomectomy, including preeclampsia, gestational diabetes mellitus, decreased fertility, and, as a result, surgical delivery.

Finally, discriminant analysis of the risk of developing obstetric complications based on the clinical signs of fibroids and scar after myomectomy was performed, of which the most significant are presented in Table 6. The table indicates that the most unfavorable signs predisposing to the development of obstetric complications and surgical delivery are multiple nodules, nodules or scars in the uterine fundus, and their combination with in vitro fertilization.

CONCLUSION

In 95% of female patients, uterine scar after myomectomy was consistent, but all had surgical delivery, mainly for combined indications. Nevertheless, they

safely carried the pregnancy, with a good fetal outcome. In female patients with uterine fibroids and its conservative management, a lower incidence of aggravated gynecological history and obstetric complications was noted, wherein 73.3% had a vaginal delivery. Despite the increased risk of cesarean section, the presence of even large uterine fibroids (over 4 cm) should not be considered a contraindication to vaginal delivery. This will reduce the frequency of surgical delivery, which primarily adversely affects the subsequent implementation of reproductive function and the general health of women in the long term. Conservative treatment should be used if the patient plans to maintain fertility and does not have an absolute indication for myomectomy. The contraindications to surgery should also be noted. Thus, a differentiated approach is required to address the issue of radical or conservative management of patients with uterine fibroids, especially in primiparas, due to which the incidence of surgical-related obstetric complications are reduced and full-fledged reproductive function are maintained.

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