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Laparoscopic myomectomy in women with redroductive intentions (Literature review)

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Uterine fibroids are the most common benign tumors of the female genital tract and are associated with numerous clinical problems. Laparoscopic myomectomy is an absolute altermative to standard open surgical technique with comparable long-term results. Due to the wide use and improvement of operational techniques with laparoscopic access, the pressing issue is possibility of its use in women, who have leiomyomas of the uterus and reproductive intentions.
The attitude to the quality of endoscopic suturing of the uterus after the enucliation of the knot and capability of suture during the next pregnancy is controversial. The technical aspects of suture of uterine incisions and also experience and skill of a surgeon during myomectomy deserves special attention. Uterine ruptures during the pregnancy and delivery are connected with violation of suture techniques – one-row uterine suture is compared with layering, and it's extremely important for the full recreation of uterine-wall integrity after the removal of leiomyoma; wide use of electrocoagulation, which can lead to burns of myometrium with the further worsening of tissue regeneration.Given the need for an individual approach to each patient with uterine fibroids and reproductive intentions, surgical technique, access, choice of energy and suture are determined by each surgeon depending on the size, localization of uterine fibroids and clinical course to obtain the most effective postoperative result.
The article is dedicated to peculiarities of the laparoscopic myomectomy in women of reproductive age. Laparoscopic myomectomy, when performed by an experienced surgeon, can be considered a safe technique with good results in terms of pregnancy outcome.
Key words: *uterine fibroids, fibroid, myomectomy, laparoscopy, surgical technique.*

Лапароскопічна консервативна міомектомія у пацієнток із репродуктивними намірами (Огляд літератури)

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Міома матки – найпоширеніша доброякісна пухлина жіночої репродуктивної системи, яка пов'язана з багатьма клінічними проблемами. Лапароскопічна міомектомія – абсолютна альтернатива стандартній відкритій хірургії із зіставними віддаленими результатами. У зв'язку з широким використанням та вдосконаленням оперативних технік з лапароскопічним доступом сьогодні гостро стоїть питання можливості його застосування у жінок, які мають лейоміому матки та репродуктивні наміри.
Неоднозначним є відношення до якості накладання ендоскопічного шва на матку після енуклеації вузла та спроможності шва під час наступної вагітності. На особливу увагу заслуговують як технічні аспекти ушивання розрізу на матці, так і досвід та навички хірурга при проведенні міомектомії. Розриви матки під час вагітності та пологів, за даними різних літературних джерел, пов'язані, як правило, саме з порушенням техніки ушивання дефекту маткової стінки – однорядний шов на матці порівняно з пошаровим ушиванням, що вкрай необхідно для повноцінного відновлення цілісності стінки матки після видалення лейоміоми; широке застосування електрокоагуляції, висока енергія якої може призвести до опіку міометрія з подальшим погіршенням процесів регенерації тканин. Ураховуючи необхідність індивідуального підходу до кожної пацієнтки з міомою матки та репродуктивними намірами, хірургічну техніку, доступ, вибір енергій та шовного матеріалу визначає кожний хірург залежно від розміру, локалізації міоми матки та клінічного перебігу для отримання найбільш ефективного післяопераційного результату.
Стаття присвячена огляду літератури щодо особливостей проведення лапароскопічної міомектомії у жінок репродуктивного віку. Лапароскопічну міомектомію, яку виконує досвідчений хірург, можна розглядати як безпечну процедуру з хорошими результатами наступних вагітностей.
Ключові слова: *міома матки, фіброїд, міомектомія, лапароскопія, хірургічна техніка.*

Лапароскопическая консервативная миомэктомия у пациенток с репродуктивными намерениями (Обзор литературы)

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Миома матки – самая распространенная доброкачественная опухоль женской репродуктивной системы, которая связана со многими клиническими проблемами. Лапароскопическая миомэктомия – абсолютная альтернатива стандартной открытой хирургии с сопоставимыми отдаленными результатами. В связи с широким использованием и улучшением оперативных техник с лапароскопическим доступом сегодня остро стоит вопрос возможности его применения у женщин с миомой матки и репродуктивными намерениями.
Неоднозначным является отношение к качеству наложенного эндоскопического шва на матку после энуклеации узла и состоятельности шва во время последующей беременности. Особенного внимания заслуживают как технические аспекты ушивания дефекта маточной стенки, так и опыт и навыки хирурга при проведении миомэктомии. Разрывы матки во время беременности и родов, по данным литературных источников, связаны, как правило, именно с нарушением техники ушивания дефекта маточной стенки – однорядный шов на матке по сравнению с послойным ушиванием, что необходимо для полноценного возобновления целостности стенки матки после удаления миомы; частое использование электрокоагуляции, высокая энергия которой может привести к ожогу миометрия з последующим нарушением процессов регенерации тканей. Учитывая необходимость индивидуального подхода к каждой пациентке с миомой матки и репродуктивными планами, хирургическую технику, доступ, выбор энергий и шовного материала определяет каждый хирург в зависимости от размера, локализации миомы матки и клинического течения для получения более эффективного послеоперационного результата.
Статья посвящена обзору литературы относительно особенностей проведения лапароскопической миомэктомии у женщин репродуктивного возраста. Лапароскопическую миомэктомию, которую выполняет опытный хирург, можно рассматривать как безопасную процедуру с хорошими результатами последующих беременностей.
Ключевые слова: *миома матки, фиброид, миомэктомия, лапароскопия, хирургическая техника.*

Due to the wide use and improvement of operational techniques with laparoscopic access, the pressing issue is possibility of its use in women, who have leiomyomas of the uterus and redroductive intentions [1, 2]. The attitude to the quality of endoscopic suturing of the uterus after the enucliation of the knot and capability of suture during the next pregnancy is controversial [2, 3, 4]. The technical aspects of suture of uterine incisions and also experience and skill of a surgeon deserves special attention [2, 5]. Significant advantages of laparoscopy are also important due to absence of incision of anterior abdominal wall, a less pronounced pain syndrome, blood loss reduction, a shorter period of recovery and hospital stay. However, laparoscopic myomectomy requires more time for sugery, training and special equipment [3, 4, 5, 6, 7]. Laparoscopic removal of large size fibroids from specific areas has a high intra-operaive risk including possible convertion to laparotomy [3, 4, 8, 9, 10, 11]. Uterine ruptures during the pregnancy and delivery are connected with violation of suture techniques — one-row uterine suture is compared with layering, and it's extremely important for the full recreation of uterine-wall integrity after the removal of leiomyoma; wide use of electrocoagulation, which can lead to burns of myometrium with the further worsening of tissue regeneration [2, 3, 8, 9, 10].However, this should not be a systematic contraindication to the attempt of vaginal birth in women with scar on the uterus after myomectomy [3, 8, 12]. Indirect MRI-based evidence indicates complete recovery of myometrium after caesarean section within 6 months, the required time between myomectomy and subsequent pregnancy with optimal tissue repair [3, 13]. All patients undergoing laparoscopic myomectomy should be informed of the risks of conversion laparotomy in about 8% of surgical procedures [3, 5, 8, 9, 10, 11].

Alternative treatments for uterine fibroids in patients with reproductive intentions

1. Focused Energy Delivery Systems:

1) thermolysis, cryomyolysis: laparoscopic thermal coagulation or cryodestruction of myomatous nodes [5, 11, 13, 14]. It should be noted that only one uterine fibroids can be treated in one procedure. However, safety / efficiency of the procedure isn't fully researched, there are following medical complictations: fever, need for blood transfusion, conversion hysterectomy [3, 5, 8, 9, 14];
2) MR-guided focused ultrasound – limited use in women with uterine fibroids in patients with reproductive intentions.; need for MRI, long-term intervention (from minutes to few hours) [3, 11, 13];
3) Radiofrequency myolysis is the new way of laparoscopic myolysis, which includes delivery of radio frequency energy to myoma under ultrasonic control [3, 11].

2. Laparoscopic-assisted myomectomy: if the size of the uterus allows, it can be removed through a mini-laparotomy incision to complete the suture; in some cases, it is possible to further palpate smaller intramural nodes and remove them to reduce recurrence of leiomyoma and improve obstetric outcome [3, 8, 9, 15].

3.Hand-assisted laparoscopy.

4. Robotic assisted laparoscopy – only one study indicated that this treatment is associated with more blood loss than standard laparoscopic myomectomy [3, 5].

5. Ultraminilaparotomy: suturing of the uterus is performed through a 25 mm trocar incision, where the morcellator is inserted. This intervention is recommended for minimally invasive treatment of large myomas (cases of effective treatment of leiomyoma larger than 14 cm are described) [8].

6. Traditional minilaparotomy is usually performed through a 3–6 cm incision [3, 8, 10].

Indications for laparoscopic myomectomy

Most surgeons have their own criteria for laparoscopic myomectomy [5].

1. The presence of 1–3 intramural or subserous myomatous nodes up to 10 cm in diameter. They are also determined by the surgeon experience.
2. The presence of a node more than 15 cm or not more than 3 myomatous nodes of 5 cm [9].
3. The presence of 1–3 intramural or subserous myomatous nodes less than 8 cm in diameter [11].

Criteria for myomectomy for infertile patients (American College of Obstetricians and Gynecologists)

Indications: uterine fibroids in patients as a possible factor in infertility or recurrent miscarriage.

Confirmation of indications:

1) large uterine fibroids or specific localization is a possible factor in infertility;
2) there are no other causes of infertility or recurrent miscarriage.

Myomectomy criteria for patients who wish to maintain the uterus (American College of Obstetricians and Gynecologists)

Indications: uterine fibroids in patients who wish to maintain the uterus.

Confirmation of indications:

1) asymptomatic uterine fibroids of such size that it can be palpated transabdominally; patient has problems;
2) uterine fibroids, which is a possible cause of uterine bleeding (profuse bleeding with congestion or duration of more than 8 days; anemia due to acute or chronic blood loss) [7].

Preoperative preparation for conservative myomectomy

1. Instrumental examination. Careful preoperative examination of patients with uterine fibroids using ultrasound and, if necessary, MRI deserves special attention [3, 7]. This helps to clearly determine the number, size, localization of myomatous nodes, their relation to the uterine cavity and to the vessels [5, 16].

2. Use of medicines.

1) Gonadotropin-releasing hormone agonists (GnRHa), compared to placebo and in the absence of treatment, have advantages in improving preoperative hemoglobin and hematocrit levels, reducing postoperative complications and hospital stay [5, 8]. With the use of GnRHa before myomectomy, there was a decrease in intraoperative blood loss [8]. It is worth remembering the side effects of treatment with GnRHa in the form of pronounced hypoestrogenic effect, reduction of bone mineral density, recovery of the size of the node in 2–3 months after treatment. GnRHa may cause softening of the myomatous node (development of degenerative changes), complicating dissection with prolonged laparoscopic intervention and increasing the risk of conversion laparotomy [3, 5, 6, 8, 9, 17].
2) Ulipristal acetate is a selective progesterone receptor modulator. This drug can be used as a preoperative preparation in women of reproductive age with uterine fibroids and moderate or severe clinical manifestations up to 3 months. The perfect use and effect of the drug is still being studied [3, 8].

3. Correction of anemia.

Correction of anemia in patients with uterine fibroids, considering possible intraoperative complications such as bleeding (use of selective progesterone receptor modulators, GnRHa analogues in preoperative preparation) is equally important [3, 8, 14, 16].

Anesthesia

Endotracheal anesthesia is classically used for analgesia.

Port locations for laparoscopic myomectomy are traditional

First in umbilical area for optics, second and third in inguinal areas for various instruments. However, in case of unusual or difficult cases, the location of the ports may be altered or an additional port may be installed for the convenience of the surgeon and to improve access to uterine fibroids (for example, in the middle line 2/3 of the navel to the womb) [2].There are enthusiasts who advocate single-port

laparoscopy, but there is no evidence base for its benefits for laparoscopic myomectomy [2, 5].

A uterine manipulator is used to improve exposure. Initial abdominal examination (revision) is a visual inspection of the area under the first trocar to eliminate iatrogenic damage, then a clockwise examination of the abdominal cavity, determine the pathological formation, severity of adhesions. Revision allows to solve the fundamentally important issues for conservative myomectomy intraoperatively: number, size, localization of fibromyomas and their relationship between themselves and vessels or adjacent organs, anatomical structures [7, 14].

Stages of conservative myomectomy

Incision of tissues and removal of a myomatous node.
2. Carrying out suturing of the formed defect of the uterine wall.
3. Provision of stable hemostasis.
4. Removal of the myomatous node from abdominal cavity [4,6,7,17].

To improve the quality of surgical treatment by laparoscopy, patients with uterine leiomyoma and reproductive intentions use a number of techniques:

1. The use of techniques that reduce blood loss during surgery.
2. Use of a certain kind of energy.
3. Surgical techniques for suturing the uterus using different types of suture material [6, 8, 18].

Ways to reduce blood loss in myomectomy

Myomectomy has traditionally been considered as surgery, which leads to a high risk of intraoperative blood loss. This is due to increased blood supply to the uterine fibroids [8]. It is worth saying that the fibroid itself has little vascularization, but the surrounding myometrium contains an extensive network of blood vessels. In this case, mechanical obstruction of the venous drainage of the myometrium and endometrium with occlusion and dilation of the venous plexuses occurs under the influence of myoma. Enucleation of intramural fibroids from a pseudocapsule may result in the risk of bleeding from adjacent blood vessels. 'Dead Space', which is formed as a result of the enucleation of fibroid, is a potential place for hematoma [17].

The following methods are available to reduce blood loss in myomectomy:

1) preoperative use of drugs;
2) occlusion of blood flow in vessels;
3) chemical hemostasis;
4) Surgical techniques of directorate [14, 17].

Physical occlusion of blood flow in vessels

1. Use of tourniquets. Taylor et al. (2005) returned to the use of turnstiles for occlusion of each ovary and uterine arteries [19]. However, the use of the method is limited by the size of the fibroid, especially for uterine vessels [17, 20]. Literature sources have reported that the use of pericervical tourniquets significantly reduces blood loss during myomectomy and the need for blood transfusions [3, 19].

2. Ligation, uterine artery clipping; temporary occlusion of the internal iliac arteries, which results in cessation of blood flow in the uterine arteries and myometrial perfusion processes. Thee processes provide a significant reduction in intraoperative blood loss and helps to clearly define the boundaries of the myomatous node [11, 19, 20, 21]. However, these surgical procedures should be performed by an experienced surgeon, since there is always a risk of injury to the vessels [3, 17, 20]. Laparoscopic ligation of the uterine arteries has potential advantages over UAE - avoiding non-selective embolization; less postoperative pain. In the writings on the subject described cases of temporary paralysis of the obstructive nerve. Also described is a new procedure - temporary occlusion of the uterine vessels using transvaginal Doppler-controlled clamping without laparoscopic access [20, 21].

3. Uterine embolization before myomectomy (UAE, in particular selective embolization). The use of UAE before myomectomy may be particularly useful in women with large myomas when expecting massive blood loss or bleeding risk comparable to the risk of conversion hysterectomy [5, 13, 19, 22]. A number of authors consider uterine fibroids treatment with UAE only for women who do not plan pregnancy [11, 19]. UAE in conservative myomectomy for women wishing to retain fertility, according to various sources, has the following effect on reproductive potential – non-selective embolization can lead to ovarian embolization, leading to decreased ovarian reserve; reduction of adequate blood supply to the endometrium with subsequent impaired implantation [5, 13, 22, 23].

Indications for UAE – symptomatic LM (hemorrhagic, pain); isthmus localization of uterine fibroids; submucosal uterine fibroids; centripetal growth of the uterine node; asymptomatic LM size greater than 14 weeks of pregnancy; by number – 5 or more knots with a diameter of more than 3 cm; relapse of LM after treatment; not bearing and infertility (with multiple uterine fibroids, ineffectiveness of previous treatment, at high risk during conservative myomectomy); as a stage of preoperative preparation [7, 19, 22]. Contraindications to the UAE: infectious diseases of pelvic organs, suspected leiomyosarcoma; subserous node on a thin leg [5, 7, 22].

Chemical hemostatics

1. Vasopersin (a hormone that can lead to vascular spasm and reduction of myometrium; reduces both blood loss and the need to use electrocoagulation - preserving the surrounding myometrium) [3, 5]. There have been several reports of cardiovascular collapse after intramiometric injection, which requires the correct dilution and communication with the anesthesiologist [3]. In one of the studies, diluted vasopressin (20 units in 100 ml of saline solution) introduced into the uterine incision has an effect that can be compared with mechanical vascular occlusion - Penrose drain, turnstile) [3, 5, 8, 9].
2. Bupivacaine 50 ml 0.25% + 0.5 ml (1mg / ml) epinephrine – reduction of intraoperative blood loss, total surgery time, myoma enucleation time [3, 8]. There are works that used hydropreparation of the myometrium in the projection of the incision of the uterus, which used a solution of adrenaline and methergrebrev (400 ml of saline, 1 mm 0.1% adrenaline hydrochloride, 0.2 mg of methylergobervine). However, vasoconstrictors also have a downside, in particular – it is difficult to visualize bleeding vessels, which can be a threat of late blood loss and hematoma in the projection of the suture [8].
3. Tranexamic acid (antifibrinolytic action, plasminogen inhibitor) [3].
4. Misoprostol (prostaglandin E1 analogue) is used intravaginally (Celik and Sapmaz 400 mg are used once). It reduces the blood flow in the uterine arteries and increases the contractile capacity of the myometrium, which provides a significant reduction in perioperative, intraoperative blood loss and blood transfusion levels [3, 8].
5. Oxytocin intravenously: data indicating the effectiveness of the drug in reducing intraoperative blood loss; according to other sources, no significant difference was found between oxytocin use with and without laparoscopic myomectomy [3, 6].

Kind of energy

Impaired tissue repair processes after coagulation use adversely affect the ability of the scar on the uterus at subsequent pregnancy [4, 6, 7]. Today, with conservative myomectomy, ultrasonic scalpel is preferred, its effect is due to the effect of cavitation; the formation of high-amplitude ultrasonic vibrations leads to rupture of membranes without thermal tissue damage and charring [5, 6, 7, 14]. Also, when using an ultrasonic scalpel, unlike laser and electricity, a strip is not formed on the site of coagulation that can be reinforced and lead to vessels with the subsequent occurrence of bleeding; no perifocal vascular reaction; less pronounced pain syndrome in the postoperative period. This method is safe because electric current through the woman's body does not pass [5, 6, 8].

Monopolar coagulation is not used in conservative myomectomy, since it has a damaging effect on the edges of the wound. Bipolar coagulation through technological features does not allow a linear cut, which is extremely necessary for conservative myomectomy; provides good point hemostasis [4, 6, 7, 8, 9, 10].

Surgical dissection techniques

The incision of the serous membrane of the uterus is determined by the size, number and localization of leiomyomas and their proximity to the uterine vessels and fallopian tubes. To reduce the risk of joint formation, the authors indicate the choice of a single, anterior, median vertical incision to remove as many leiomyomas without opening the uterine cavity [8]. At deep arrangement of transmural myomatous nodes it is possible to leave a pseudocapsule of a leiomyoma that allows not to open a uterine cavity. At this stage, according to some authors, it is possible to enter 5 units of oxytocin intravenously to reduce the uterus and «birth» of other nodes, which facilitates their excretion [8, 17]. Traditional vertical incision is used to reduce the risk of uterine lengthening and damage to the fallopian tubes, ligaments, and vessels. A horizontal incision is recommended to prevent the section of vessels going transversely to minimize blood loss [8]. In addition, by closing the incision of the uterine wall, the placement of vertical sutures perpendicular to the blood vessels also contributes to hemostasis [7, 8, 17].

During a dissection, leiomyoma is captured by a hook, using a traction appropriate to the size of the site. You can use laparoscopic ball forceps with traction and contraction to maximize atraumatic atrial node myometrium. The selection of fibroids is mainly blunt with the use of atraumatic clamp or laparoscopic scissors [6, 8]. With tight fusion of the leiomyoma capsule and myometrium, it is necessary to dissect the tissues with the help of ultrasonic energy in the cutting mode, which will minimally injure the adjacent myometrium [7, 8, 14]. After isolation of the myomatous node, it is necessary to be sure that there are no gaping vessels in the area of his bed, which can bleed significantly and lead to hematoma. For hemostasis it is necessary to apply bipolar coagulation in the mode of coagulation or suturing of blood vessels. It should be remembered that excess coagulation can lead to the disruption of the postoperative scar on the uterus during pregnancy [8]. During conservative myomectomy, all visible nodes should be removed. It is advisable not to open the uterine cavity, but if it happens, it should be sutured with intermittent extramural sutures using Vicryl 2-0 [4, 6, 17].

Closing. During the conservative myomectomy, special attention is paid to suture material. The physicochemical properties of the suture affect the reaction of the surrounding tissues [10].

Options for suture with conservative myomectomy

1. Wicker coating material (Vicryl, Vicryl Rapide ,Vicryl Plus (polyglactin).
2. Monofilaments (Monocryl (polygecapron), PDS (polydioxanone).
3. Self-locking suture material – unidirectional, bidirectional thread (polydioxanone with notches) [6, 10, 18].

Stages of overlay seams for the uterus:

1. Conclusion of the first starting seam.
2. Production of myometry suture.
3. Production of fixation of the last final seam [6]. During the extraction of myometrial defect, separate muscle-muscle endosches using a method of extracorporeal tying nodes using a pusher. However, a number of surgeons choose the technique of intracorporeal tying nodes [14]. For this purpose, a synthetic material that resolves (Vicryl+ 2-0 and/or Monocryl+ 2-0). In order to prevent the formation of hematoma in the area of the myomatous node, an extraction of myometry defect is carried out layer with the overlap of several sutures [5, 6, 8, 9]. Adequate closure of the dead space is necessary to reduce the risk of local hematoma. For this purpose, a discontinuous figure-of-eight suture can be used (Vicryl 1/0) [4, 6, 8, 10, 17].

PGA – suture material: the main feature of the application of this suture material is the need to hold with the assistant of each lengthened stitch with an atraumatic laparoscopic clamp closer to the tissues in tension, in order to avoid the dissolution of previously applied sutures. The starting suture with fixation of four multi-directional nodes: double direct, single feedback and again single straight. This is necessary to ensure adequate stretching of the thread, dense fastening of the thread in the tissue of the uterus without the risk of further dissolution of the seam. When the thread is carried out through myometrium, it is necessary to leave a sufficient thread. At the end of the suture of myometrium thread is brought to the first inject and binds to the previously left free end of the thread with four nodes. The first row: musculoskeletal – it is necessary to grasp the bed of the node to avoid the formation of cavities, where hematoma can be formed. This would counteract the formation of a complete scar. The second row: serous-muscular – constant retention of the thread tension to avoid its dissolution and formation of a full-fledged seam, which ensures the completeness of healing of the defect of the uterine wall [6, 18].

With the seizure of the bottom of the bed – the thread extends to the loop and the needle runs through the loop – the primary fixation of the suture. Subsequent suturing is performed intracorporally (as with PGA). First, the musculoskeletal series is superimposed, and then surgeons superimpose the serous muscle. The notches on the thread provide anchoring it into the uterine tissue, which eliminates the possibility of its dissolution. After all the seams are applied, the thread is cut into the warp as there is no need for tying the knot. Evacuation of myomatous node from abdominal cavity [6, 18].

Myomatous node can be removed from abdominal cavity in several ways transvaginal (colpotomy), transabdominally (through the port after incision of myoma into several parts; possible removal of myoma through postoperative scar; in particular after appendectomy; morcellation) [4, 5, 8, 14].

Morcellation may be accompanied by complications such as vascular injury or injury to organs when using the moving blade. It is especially important to remember that the molding can lead to the dissemination of pieces of uterine myoma with the formation of levomoomomatosis or a more dangerous complication – dissemination of random leimoosarcoma [3, 4]. This can be avoided using a special container, where the myomatous node is placed with subsequent molding inside [5, 8, 9, 10]. Also described is partial methylation of the myomatous node, which is bound to the uterine wall, with extremely important to visualize the end of the micolator within the mioma [8].

Sometimes the size of the node requires a mini laparotomy or colpotomy for removing it from the abdominal cavity. In the event of removing multiple myomatous nodes, colpotomy significantly reduces the duration of surgical intervention [3, 8].

Anti-adhesive agents

Myomectomy is a surgery, which is accompanied by an increased risk of joint formation. The risk factors for spike formation are determined by the length of the incision of the uterine wall, the number of removed nodes and their largest size, the location of the incision along the posterior uterine wall, the number of nodes on the uterine wall, the duration of surgery [4, 17]. It is very important to adhere to the surgical technique for myomectomy, namely – careful treatment of tissues, careful hemostasis, removal of foreign bodies. Reducing the duration of pneumoperitoneum also reduces the formation of pneumonia.

Special attention is paid to sewing technique. The incision is located in the area of the bottom or front wall of the uterus, which has a lower risk of adhesion than the posterior wall [8, 9, 17].

Among the anti-adhesive barriers for laparoscopic myomectomy, the use of agents based on oxidized cellulose (Interceed) is described. Interceed loses its effectiveness in the presence of blood or excess peritoneal fluid. In the absence of reliable hemostasis, Core-Tech (polytetrafluoroethylene barrier) is preferred. Barriers based on sodium hyaluronate and carboxymethylcellulose showed no significant results in

reducing the formation of postoperative joints [8]. The evidence base with practical guidelines for the use of anti-adhesive barriers is absent [3, 8, 9, 11, 17].

Complications after conservative myomectomy

1) early complications – intraoperative bleeding, traumatic lesions of the vessels and pelvic organs:

- when penetrating into the abdominal cavity;
- when leaching myomatous node from his bed and suturing the defect of the uterus;
- during morcellation of the myomatous node with dissemination of myoma tissue [4];
- imperfect hemostasis,
- burns, violation of the integrity of the intestine, bladder, ureter with atypical localization of nodes and disorders of normal anatomy of the pelvic organs, including the uterus [4, 8, 9, 10].

2) late complications: pain syndrome, purulent-septic complications, uterine scar failure with the formation of niches, uterine ruptures during pregnancy and childbirth, miscarriage [4, 5].

CONCLUSIONS

Myomectomy is a widespread method of surgical treatment of patients with uterine fibroids, which enables the elimination of benign tumor and allows the uterus to be preserved for reproductive function. Given the need for an individual approach to each patient with uterine fibroids and reproductive intentions, surgical technique, access, choice of energy and suture are determined by each surgeon depending on the size, localization of uterine fibroids and clinical course to obtain the most effective postoperative result.

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