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A New Surgical Management of Multiple Uterine Fibroids

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Abstract

Known methods of surgical treatment of multiple uterine fibroids with an intramural location of nodes result in the formation of several scars in the body of the uterus, which then often complicate the reproductive function of operated women. This is very sad for surgeons, but especially sad for young women, since such treatment outcomes sometimes do not leave them with hope for future pregnancy. In this study we will demonstrate a new surgical technique for multiple uterine fibroids with the formation of a one scar in the lower segment of the uterus by laparotomic access. The result of the analysis of scientific and patent literature is shown, new technical solutions in the invented surgical technique for the treatment of multiple uterine fibroids are indicated, and a patent for this invention is indicated. The main results of the prospective observation of a patient who was subjected to a new technique of surgical management for multiple uterine fibroids are indicated. Prospective postoperative observation has shown the possibility of forming the physiological structure of the walls and uterine cavity. High efficiency of the method makes its use in clinical practice promising.

Keywords: Abdominal myomectomy; Nodes fibroids; Surgical treatment infertility

Abbreviations

FDA : The U.S. Food and Drug Administration

Introduction

The surgical technique for treating multiple uterine fibroids is still not fully developed, because the complexity of this problem is associated with a high risk of inaccurate diagnosis and the possible presence of uterine sarcoma [1]. Women who have uterine fibroids that require removal are traditionally referred by doctors for laparoscopic hysterectomy or myomectomy, because endoscopic surgery has a lot of advantages over traditional open abdominal surgery, for example: a shorter postoperative recovery period, reduced risk of postoperative infection, etc. Many of these

laparoscopic operations are performed with the use of powerful morcellation [2].

From now on, the FDA restricts their use in this type of surgery, because morcellation (crushing pieces of tissue into fragments) can lead to the unpredictable spread of cancerous tissues (such as uterine sarcoma) to other parts of the body, which ultimately can "significantly worsen the patient's prognosis," said FDA representative William Maisel, MD, MPH during a press conference on April 17, 2014. Thus the FDA continues to recommend limiting the use of laparoscopic power morcellation to certain appropriately selected women undergoing myomectomy or hysterectomy [3].

Consequently, the importance of traditional abdominal myomectomy performed with the help of laparotomy increases again. However, this method of surgical treatment of multiple uterine fibroids is highly traumatic due to the many incisions of the

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uterus body and the subsequent large number of scars on it [4-6].

The aim of the study was to develop a modern method of surgical treatment of multiple uterine fibroids, performed with laparotomic access to it, which ends with the formation of only one scar on the uterus and will to preserve the reproductive function of women in the future.

Materials and Methods

We have studied the scientific and patent literature by accessing databases PubMed, Medline, Cochrane Systematic Review, E-Library, Yandex EAPATIS, Espacenet, PatSearch, USPTO until 16.07.2020. The following keywords were used in the research: uterine myoma, node fibroids, uterine morcellation, carcinoma, laparoscopy, abdominal myomectomy, scar on uterus, reproductive function, infertility. In addition, we also used the literature lists for selected articles to find more data on the websites of scientific societies specializing in obstetrics and gynecology.

Results

It was found out that the standard surgical management for the treatment of multiple uterine fibroids includes the following stages. To access the myomatous nodes under general anesthesia, a vertical or horizontal incision of the anterior abdominal wall is made, followed by a layer-by-layer dissection and parting of the tissues. Then the uterus is removed from the abdominal cavity to the outside for a good visualization of the nodes. After this, the serous membrane (visceral leaf of the peritoneum) is dissected and bluntly exfoliated, the first selected myomatous node is isolated, it is gently exfoliated and removed. After this, the released bed of the tumor is tightly sutured with surgical sutures. And so each tumor is removed one by one. After removing the last tumor, the abdominal cavity is drained, the quality of hemostasis is monitored, and then all layers of the abdominal wall are sutured in layers [7,8].

It is no secret that the disadvantage of the known method is multiple incisions of the serous membrane and myometrium, performed by surgeons directly over each node of the fibroid. This surgical technique turns the uterus into an organ with many stitched wounds, violates the architectonics of the entire myometrium, the state of the uterus, leads to peritonitis, infertility and rupture of the uterus during pregnancy and childbirth in the future.

To eliminate these shortcomings, we have developed an original method of surgical management of uterine fibroids, which ends with a single scar in the projection of the lower segment of the uterus. The lower segment of the uterus was chosen by us for the incision not by chance. It is in this place that the incision of the uterus is made during Cesarean section.

By Caesarean section the uterus is exposed, cut with a sharp surgical instrument, the incision increases to the right and left to 10-12 cm and after the operation, the uterus is sutured in layers, self-dissolving suture material (vicryl, dextron, etc.) is used, the abdominal cavity is washed, waiting for the moment of contraction of the uterus and after it becomes dense, the incisions of the anterior abdominal wall are sutured in layers. After that, the vagina and the lower part of the uterus are examined, blood clots are removed from them, and washed with a sterile isotonic solution of 0.9% sodium chloride [9].

Our research work led to the creation of an invention called "Method for surgical treatment of multiple hysteromyoma" (RU Patent 2692669. 25.06.2019) [10]. The essence of our invention is as follows. First, before laparotomy, a thorough sonographic, visual and tactile examination of the lower segment of the uterus is performed in order to select a section of the myometrium with a minimum number and size of the diameter of blood vessels. The fact is that the choice of such a section of the myometrium will allow you to create a surgical incision with minimal bleeding. If the fibroids are located in the area of the planned incision of the uterus, the surgeon uses the fingers of both hands to pull out the fibroids from the myometrium during the surgical incision of the uterus.

After incision of the uterus with a scalpel, the surgeon palm and fingers of the working hand strongly presses hard on the bottom of the uterus in the direction of the incision made, and this still further increases the size of the incision. In addition, the surgeon uses the fingers of his other hand to further increase the size of the incision. In this case, the surgeon makes sure that the uterus can come out of the incision completely with the inner surface out. Under visual and tactile control of eversion of the uterus is carried out together with placed in it by the nodes of the fibroids. After that, the node fibroids are enucleated in turn without incision of the uterus and removed through the inner surface of the uterus, not through the outer one. After removing the last node, fibroids achieve a reliable hemostasis. Then the surgeon presses the uterus with the thumbs of both hands in the direction of the incision in it and simultaneously opens the incision edges with the other fingers. Thus, the surgeon turns the uterus back and returns the uterus to its original state through this incision.

The peculiarity of the invented surgical method is that it was first proposed to use the fingers of both hands of the surgeon to peel and remove the node fibroids through the incision formed, if it is located in the area of the incision of the uterus, as well as for bloodless expansion of the surgical incision of the uterus to the optimal length and width. This increases efficiency, safety, accuracy and speed, as it eliminates massive uterine bleeding, mechanical crushing of the myometrium and shortens the period of anesthesia and surgical treatment.

The subsequent pressure of the palm and fingers of the working hand on the bottom of the uterus and the crumpling of the uterus inside its cavity in the direction of the incision made, ensures that the uterus is squeezed out through the resulting incision in the inverted form, namely-the inside side out. This provides visibility of the entire inner surface of the uterus, allows you to assess the condition of this surface and remove the nodes fibroids from the uterine wall through perforations of the inner layer.

Simultaneous expansion and extension of the incision with the fingers of the other hand until the uterus exits it and the complete inversion of the inner surface of the uterus ensures safe inversion of the uterus. In addition, the use of fingers eliminates mechanical crushing of tissues, provides timely information to the surgeon about the state of elasticity and contractility of the uterus in real time. In particular, the use of the surgeon's fingers extends the information about the state of all the walls of the uterus, including those parts of the uterus that are not visible to the surgeon's eye due to poor light, complete darkness, or because they are covered with blood.

Inverting the uterus, performed under visual and tactile control together with the fibroids located in it, exfoliating and removing them through the inner surface of the uterus in turn, improves the quality of surgical treatment, since it ensures the safety of the serous membrane and the outer layer of the myometrium.

Here is an example of the results of surgical treatment of a young married woman A. at the age of 33 years, who does not have children of her own. During the examination, the diagnosis was made: «Multiple uterine fibroids. Severe post-hemorrhagic anemia». For the application of the invented method, open surgical access to the uterus was used, performed using conventional technology under general inhalation anesthesia. Then the uterus was brought out through an incision in the anterior abdominal wall. Prior to the incision of the uterus, sonographic, visual and tactile examination of the structure of the lower uterine segment was performed using generally accepted technologies. At the same time, an area in the lower uterine segment was selected on the anterior wall of the uterus in the projection of the largest the nodes fibroids with a minimum number and diameter of blood vessels.

In this area, a median longitudinal incision was made along the anterior wall of the uterus in the projection of the largest the nodes fibroids. During the incision of the uterine wall, the surgeon with the fingers of both hands pulled out of the myometrium and removed 3 nodes of fibroids that were in the area of the uterine incision through the incision. Then, with the palm and fingers of the right hand, the surgeon was pressed on the bottom of the uterus and squeezed it inside its cavity in the direction of the incision made. At the same time, the doctor increased the size of the incision of the uterus with the fingers of the left hand until the exit from it and the complete inversion of the inner surface of the uterus. In this case, the uterus was inverted under visual and tactile control of the uterus along with the fibroids located in it.

The nodes fibroids were removed from the myometrium through the inner surface of the uterus in turn. A total of 20 myomatous nodules with a spherical shape with a diameter of 8 to 80 mm were removed. Hemostasis in the place of exfoliated nodes occurred independently and did not require surgical intervention.

Then, after achieving hemostasis at the sites of nodes enucleation, the surgeon with the thumbs of both hands pressed hard on the bottom of the uterus in the direction of the incision in it and simultaneously parted the edges of the incision with the other fingers of hands. This allowed him to successfully return the inverted uterus to its original state. After that, the anterior abdominal wall was sutured and the vagina was washed. The surgical treatment lasted 90 minutes.

The postoperative period was uneventful. The patient was discharged from the hospital home for 7 days. Her menstrual cycle was restored in 5 weeks. The first menstruation took place with a pain syndrome, stopped by non-steroidal anti-inflammatory drugs. Subsequent menstruation was regular, painless, moderate. Ultrasound control performed 4 months after surgical treatment showed that the uterus body is defined in the usual position with the following dimensions: 57-40-49 mm. In this case, the uterine cavity is formed, the endometrium has a thickness of 9 mm, corresponds to the phase of the cycle. The patient is planning to realize reproductive function and is undergoing pre-gravidar training.

Conclusion

Thus, a new method of surgical treatment of multiple uterine fibroids has been developed. A new surgical management of multiple uterine fibroids increases the safety of the structure of the uterine wall and preserves the reproductive function of the uterus. A positive clinical result is achieved due to the following innovations: identifying a site in the lower uterine segment with a minimum number of blood vessels and with a minimum of their size, performing a bloodless incision of the uterus in this area, turning the uterus through the resulting incision with its inner surface outwards, real-time visual and tactile assessment of the state of the uterus and its surface, control of tumors enucleation from the inner surface of the uterus with the preservation of the integrity of the myometrium and serous membrane over the places of their localization, and finally return of the uterus to its original state after the removal of the last node of fibroids.

As a result, the new method reduces the duration of anesthesia and surgical intervention, eliminates the presence of a large number of surgical incisions of the serous membrane and myometrium, reduces the number of surgical sutures, blood spots, inflammatory exudate and adhesions in the sites of enucleation of nodes in the middle and upper segments of the uterus.

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