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Laparoscopic myomectomy in the treatment of large myomas – unnecessary risk or effective method?

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Abstract

Introduction:

Uterine myomas are the most common benign tumors of the uterus. Most of the myomas are asymptomatic and do not require medical intervention, however if they do, a surgical approach is still the mainstay of the therapy. Myomectomy is one of the surgical methods of removing myomas for those who want to preserve fertility. Nowadays, surgical techniques are improved and less invasive methods like laparoscopic myomectomy (LM) were developed. However, the safety and the efficacy of LM is well documented in the case of average size fibroids. Laparoscopic approach in larger uterine tumors (diameter >10 cm) can be controversial and can create a challenge due to possible difficulties.

Purpose:

Evaluation of effectiveness, technical challenges and complications of LM in treatment of large myomas.

Materials and methods:

We performed search of Pubmed, Springer Link and ResearchGate databases.

Results:

Systematic analyses qualified for this review suggested that despite many possible complications and difficulties, a method can be applied successfully by an experienced specialist. However, LM in large myomas treatment is still rare and data on this subject is still limited.

Conclusions:

Laparoscopic myomectomy can be an alternative method in the treatment of large fibroids. Laparoscopic surgery of large myomas LM can be challenging and the effectiveness of a such treatment depends on the surgeon's skills. The method is also useful in women who consider pregnancy.

Key words: laparoscopic; myomectomy; myoma; tumor

Introduction:

Uterine myomas (fibromas, leiomyomas) are benign tumors that arise from the myometrium. They are composed of smooth muscle tissue and affect about 25 to 30 % women in the reproductive age¹. The precise cause of uterine fibroids is unknown, but some risk factors were identified and include genetic predispositions, obesity, environmental factors, diet and race.

A crucial process in the diagnostics for uterine myomas is bimanual pelvic examination, ultrasonography and MRI (magnetic resonance imaging).² MRI when available is also preferred for planning a surgical approach. Most cases are asymptomatic, however symptoms depend on their size, degenerative changes and location³. Tumors are commonly multiple, though they can grow anywhere the most frequent location is myometrium. They can reach >10 cm, however most of the myomas are smaller and do not require intervention. A myoma is considered as large when its diameter exceeds 10 cm.

It is believed that treatment is indicated only when fibroids cause symptoms for example painful menstruation, menometrorrhagia, serious hemorrhage, infertility or repeated miscarriages⁴. Management of fibromas is based on pharmacotherapy, surgery or a combination of these approaches. Patients with anemia or large and multiple fibroids can be treated prior to the surgery with gonadotropin-releasing hormone analogs or ulipristal acetate. Such regimen effectively reduces tumor size and facilitates surgical procedure⁵. One has to remember that current treatment relies mostly on surgical methods, however a therapy must be individualized. An approach depends on the myomas' location, number and size and willingness of the patient to retain fertility.

It is said that hysterectomy is the most effective method of symptomatic fibroids management but clearly it is not a first choice for women of the reproductive age who want to preserve fertility. Therefore, an alternative method of treatment in this group of patients is myomectomy. It can be done by either laparotomy, minilaparotomy, hysteroscopy or laparoscopy or a combination of above mentioned ways.

The strict criteria for laparoscopic treatment do not exist but the size, location of myoma have to be taken into consideration. It is possible to differentiate 3 types of myomas, according to their location - subserosal (protruding outside the uterus), intramural (in the myometrium) and submucosal (projecting into the uterine cavity). Laparoscopic approach is employed in patients with subserosal or intramural fibroids with diameter less than 10 cm and their number not exceeding 5⁶. Generally, contraindications for LM include suspected malignancy and excessive size of a myoma⁷. For submucosal or numerous fibroids, hysteroscopic myomectomy is recommended⁸. Leiomyomas can be treated also with a non-surgical and non-pharmacological approach like embolization of the uterine arteries. This method enables to achieve reduction of tumor volume and effectively alleviates symptoms. Procedure is indicated in woman who do not wish to be treated surgically but is not free of serious complications.

Purpose

Evaluation of feasibility, effectiveness and safety of LM in the treatment of large myomas.

Materials and methods

We performed research of Pubmed, Springer Link and ResearchGate databases. Studies analyzing methods of myomas' treatment were analyzed.

Results

There are many advantages of laparoscopic myomectomy as compared to the classic myomectomy done by laparotomy. The main advantage is shorter hospitalization, less postoperative pain and reduced incidence of the risk of adhesions⁹. LM is indicated for small or medium size fibroids¹⁰ not exceeding 10 cm in diameter.

As it was mentioned, LM is considered as a challenging method especially in the cases of large myomas' removal. Difficulties include long duration of the surgery, risk of intraoperative bleeding and possible conversion to laparotomy.¹¹ Meticulous presurgical imaging is necessary to detect any uterine malignancy. Unfortunately, currently there is no reliable method to differentiate benign from malignant leiomyomas (leiomyosarcomas or endometrial stromal sarcomas)¹². Neither USG nor MRI does not predict tumor's malignancy, if there are no metastases or infiltrations. The assessment of angiogenesis by Doppler velocimetry technique seems to be helpful in diagnosing endometrial malignancy. Also a rapid postmenopausal growth can be a symptom of malignancy¹³. A complex assessment of clinical data and imaging is crucial in order to plan the treatment. Power morcellation can create a risk of neoplasm dissemination and of course is strictly contraindicated when a malignancy is suspected. However, the incidence of leiomyosarcomas is rare studies showed that only about 0.25% of women who undergo surgery for fibroids can have a leiomyosarcoma¹⁴. Next disadvantage of LM in large tumors is obliteration of vision due to the size of the myoma. Also, excessive bleeding should be taken into consideration, as the amount of bleeding during surgery for myomas larger than 10 cm increases.¹⁵

In some studies¹⁶, a GnRH therapy before LM was administered in order to reduce size of the fibroma and volume of intraoperative blood loss. However, the procedure is of unproven efficacy. What is more a degeneration of the fibroma can occur that added technical difficulties to the laparoscopic procedure.

The data concerning laparoscopic myomectomy in large fibroids is limited. The first prospective study was performed by Sinha R et al. and involved 51 women with at least one myoma of a large size. The study concluded that LM can be safely used alternatively to laparotomy in large myomas treatment¹⁷. Another study [1] suggested that LM has many advantages as a surgical method of treating fibroids. Aksoy et al. presented case report of patients with 17 cm myoma¹⁸. Tumor was removed successfully without any harm to the patient's endometrium. There is also a description of a successful LM in 34-year old woman's with 18 cm myoma¹⁹. Finally, a research done by Hyo Jin Yoon et al.²⁰ assessed the effectiveness of laparoscopy for large myomas. Fifty one patients were analyzed and study proved that procedure is feasible, there was no conversion to laparotomy and all of the fibromas were removed successfully. The largest diameter of the fibroma was 15.2 cm. Seven patients required postoperative transfusion.

It is suggested that LM is an option not only for women, who want to retain their fertility but also for those, who are infertile because of the distortion of endometrial cavity by a myoma. LM enhances the postsurgical pregnancy rate²¹, which is comparable to the rate achieved with laparotomy²².

LM increases life quality and sexual functions when compared to laparotomy due to less trauma and postsurgical pain²³. It was found that patients can return to work quicker if they undergo laparoscopic or robotic myomectomy, comparing to those who had laparotomy²⁴. However it is suggested that favorable effects of LM could be short-term. The recurrence rate of fibroids is 15% and hysterectomy will be required for about 10% of women within 5 to 10 years after laparoscopic myomectomy²⁵. Thus, a potentially successful approach can influence life quality and cause sexual impairment in the long term, however more investigations are needed. LM has positive impact on pregnancy outcomes and can be safely used in women,

who want to retain fertility and become pregnant . Studies showed that pregnancy rate is exceeding 60%^{26, 27}. Laparoscopic myomectomy is linked to the increased risk of uterine rupture. However, the risk seems to be relatively small, the overall incidence was 0.07%²⁸ as compared to 0.012% for those without any previous uterine scar.

There is no one recommended mode of delivery after myomectomy therefore there is a need for more randomized studies. In some studies, it is advised that vaginal delivery can be achieved after LM if performed according to protocol of vaginal birth after cesarean section²⁹. Contrary to the above, ACOG recommended a cesarean section after myomectomy The procedure should be performed in 38 week of pregnancy³⁰.

Discussion

The management of myomas relies mostly on the surgical techniques, both classic and minimally invasive. Although LM is more feasible in myomas of smaller size (up to 10 cm), literature suggests that this method can be successfully used in the treatment of larger myomas. LM for large tumors is widely considered as a challenging method. The potential complications of this methods includes excessive bleeding, prolonged surgery, conversion to laparotomy, injuries to urinary or digestive tracts. Articles published from 1993 to 2013 reported 55 complications related to the use of power morcellator. They included large bowel, kidney, the bladder injuries, injuries of the diaphragm and major vessel. Six death occurred³¹. Overall, the frequency of injuries to the organs caused by power morcellator was assessed as (0.12%)³². Undoubtedly, LM has many advantages when compared to laparotomy. They include less pain and faster postsurgical recovery³³. However, because of the possible complications, the treatment options of large myomas are not standardized and the patient's approach could be complex.

When uterus preservation is demanded LM allows to retain fertility. Other advantages of LM involve faster recovery, shorter hospitalization, less pain and decreased risk of postsurgical adhesions. Data concerning use of LM in the removal of large myomas is limited but safety and efficacy of the method seems to be proven.

Conclusions

Removal of the large myomas by laparoscopy is still regarded as a surgical and technical challenge. The LM removal of a large tumor can be recommended only following balanced assessment of all of possible risks and technical difficulties. The main factors behind surgical success are the experience and skills of the surgeon.

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