

SPECIFIC FEATURES IN THE TREATMENT OF UTERINE FIBROIDS: SURGERY VS. UTERINE ARTERY EMBOLIZATION

Oana-Maria BODEAN¹
Dragos DAVITOIU²
Octavian MUNTEANU³
Elvira BRATILA⁴
Costin BERCEANU⁵
Monica CIRSTOIU⁶

ABSTRACT:

UTERINE LEIOMYOMAS OR "UTERINE FIBROIDS" ARE THE MOST COMMON BENIGN UTERINE TUMORS IN WOMEN OF REPRODUCTIVE AGE. USUALLY, THEY DEVELOP AS MULTIPLE SMALL TUMORS OR AS LARGE MASSES WITH DIFFERENT LOCATIONS RELATED TO THE LINING OF THE UTERUS. THE PATIENT HAS EITHER NO SYMPTOMS FOR A LONG PERIOD, OR SHE REPORTS HEAVY MENSTRUAL BLEEDING, PELVIC DISCOMFORT OR FERTILITY ISSUES. THERE IS A WIDE NUMBER OF TREATMENT OPTIONS, WHICH MUST BE ADAPTED TO EACH CASE, BUT THE MOST COMMON SOLUTION FOR LARGE SYMPTOMATIC TUMORS IS SURGERY. A NEWER ALTERNATIVE TO HISTERECTOMY OR MIOMECTOMY IS UTERINE ARTERY EMBOLIZATION. EACH OF THESE OPTIONS IS SUITED FOR A CERTAIN TYPE OF PATIENT, ACCORDING TO A SERIES OF CRITERIA. THESE PROCEDURES HAVE THEIR RISKS AND BENEFITS, BUT THE PATIENT IS CONCERNED BY SUCH ASPECTS AS: PAIN LEVEL, HOSPITALIZATION PERIOD AND RECOVERY. THE FOLLOWING ARTICLE PRESENTS SPECIFIC ASPECTS ON THIS TOPIC ACCORDING TO OUR EXPERIENCE WITH UTERINE FIBROID TREATMENT IN THE UNIVERSITY EMERGENCY HOSPITAL BUCHAREST.

KEYWORDS: UTERINE FIBROIDS, HYSTERECTOMY, PAIN, EMBOLIZATION

¹ Department of Obstetrics and Gynecology, University Emergency Hospital Bucharest, Romania

² Department of General Surgery, University Emergency Hospital Bucharest, Romania

³ Department of Obstetrics and Gynecology, University Emergency Hospital Bucharest, Romania
(Corresponding author: octav_munteanu@yahoo.com)

⁴ Department of Obstetrics and Gynecology, "Sfantul Ioan" Emergency Hospital, Bucharest, Romania

⁵ Department of Obstetrics and Gynecology, University of Medicine and Pharmacy Craiova, Craiova, Romania

⁶ Department of Obstetrics and Gynecology, University Emergency Hospital Bucharest, Romania

INTRODUCTION

Uterine fibroids, also called “myoma”, “leiomyoma”, “fibro-leiomyoma” are the most common benign tumors of the female genital tract. According to statistics, their incidence is 25% or even 80%, as shown by recent studies using ultrasound examination and histologic tests.

The tumors originate from the myometrium and are found in different locations, being classified according to their location and direction of growth:

- Intramural (growing within the uterine walls)
- Subserosal (originate from the myocytes near the uterine serosa and growing outward)
- Pedunculated (attached to the uterine wall by a pedicle)
- Submucous (growing near the endometrium, bulging into the endometrial cavity)
- Cervical (developing in the cervix)
- Rare locations: ovarian, fallopian, in the broad ligament, vaginal, vulvar.^{1,2}

Myomas are hormone-sensitive tumors, mainly estrogens augment their growth and therefore these tumors increase in size in women of reproductive age, during pregnancy or during hormonal therapy and decrease after birth or at menopause.

Most women with uterine fibroids are asymptomatic. However, some patients experience heavy menstrual or inter-menstrual bleeding, dysmenorrhea, pelvic pressure, infertility; the larger the tumor, the most frequent the symptoms.

Treatment options for uterine leiomyomas are chosen according to criteria related to: size of the tumor, location of tumor, related symptoms, patient’s age, and patient’s desire for procreation and preservation of fertility.

Treatment alternatives include:

- Expectation (small non symptomatic fibroids can be kept under surveillance by regular ultrasound examinations)
- Drug treatment (in order to release symptoms such as: pain, heavy bleeding, anemia, or to reduce tumor size). The therapy is either non-hormonal (non-steroidal anti-inflammatory drugs) or hormonal- androgens, gonadotropin releasing hormone agonists (GnRH agonists), GnRH antagonists, combined oral contraceptives (COCs), antiprogestins (Mifepristone), levonorgestrel releasing intrauterine system.
- Surgical management: includes hysterectomy and myomectomy of different techniques.
- Uterine artery embolization: an alternative to surgery in women who do not desire radical interventions, women who have contraindications for surgical intervention or in order to shrink large tumors prior to surgery in certain cases.^{3,4}

The patient whose condition cannot be managed by drug therapy is usually informed and advised to choose a more aggressive solution, such as surgery or uterine artery embolization. Both options raise questions about risks, benefits, complications, hospitalization days, recovery and follow-up.

Hysterectomy is a major surgical intervention that can be performed either by abdominal approach, vaginal approach or laparoscopy. There are many techniques used to remove the uterus and/or cervix and also both or just one ovary and salpinx.⁵

Myomectomy is also a surgical intervention aimed to remove only the uterine fibroid, by making a slice-type incision on the uterus. The intervention can be performed by an abdominal approach or by laparoscopy. The uterine wall is then sutured and closed.⁶

Uterine artery embolization is a procedure of minimally invasive radiology, which implies the injection of small particles into the uterine arteries in order to obstruct the

vascularization of the fibroids. The fibroids decrease in size in the next 3 to 12 months and related symptoms are reduced.⁷

AIM OF STUDY

The aim of this article is to highlight the particular features about pain level, hospitalization days, complications and follow-up in patients treated for uterine fibroids by hysterectomy versus those treated by uterine artery embolization (UAE).

MATERIAL AND METHODS

Data was extracted from files of patients admitted and treated in the University Emergency Hospital Bucharest between 01.01.2013 and 31.12.2014. We have studied patients diagnosed with uterine fibroids in the Department of Obstetrics and Gynecology who underwent hysterectomy in the same department or in the Department of General Surgery and compared them to patients who underwent UAE for uterine fibroids in the Department of Interventional Radiology.

RESULTS AND DISCUSSIONS

The surgical management of selected cases

A number of 566 total abdominal hysterectomies for uterine fibroids was performed in our hospital from 01.01.2013-31.12.2014. We have excluded from this study the interventions performed for cervical cancer or other pathologies which required hysterectomy (genital prolapse, endometriosis, emergency hysterectomy after uterine relaxation or severe bleeding after delivery). Patients who underwent vaginal and laparoscopic hysterectomy were also excluded.

The age of the operated patients has varied between 37 and 83 years old, with a mean of 60 years old. The main symptoms that brought the patient to see a specialist were: heavy uterine bleeding in perimenopause or menopause, pelvic discomfort, pressure or pain and visible enlargement of the abdomen (the uterus).

The patients underwent clinical and para-clinical examination, Pap smear, ultrasound examination to measure the size of the mass and identify other possible masses or transformations of the fibroid. Once the diagnosis of uterine fibroid was established, according to patient's age, comorbidities and will for fertility preservation, the patients selected for hysterectomy were headed for surgery.

A total abdominal hysterectomy is a major surgical intervention, requiring total anesthesia. The uterus and cervix, sometimes even the ovaries and fallopian tubes are removed through an abdominal incision. The incision can be either horizontal (Pfannenstiel incision) or longitudinal, depending on the size of the tumor and on peculiarities of each case. Usually, a longitudinal incision offers the surgeon a better view and a wider space to perform the intervention with less risk.⁸

The main intraoperative complications of an abdominal hysterectomy are hemorrhage, injuries of nearby organs: ureters, bladder, and intestines. The most common postoperative complications are infection, hemorrhage and thromboembolic disease. The hormonal changes secondary to hysterectomy lead to early onset menopause with its broad spectrum of manifestations. According to studies in the literature, patients who underwent hysterectomy without oophorectomy entered menopause 4 to 5 years earlier than women without hysterectomy. Early onset menopause predisposes the patient to cardiac disease, osteoporosis and depression.⁹

In our group of patients who underwent hysterectomy with or without oophorectomy, we have not encountered a large number of complications. The most common postoperative

complication, such as suture infection, was treated with appropriate antibiotics. Infection prevention with an intraoperative dose of cephalosporin proved to offer good protection. Thromboembolic disease prevention was performed with the administration of low molecular weight heparin products to all patients in different doses according to their risk factors and conditions.

Immediately after surgery, the main concern for the patient is the amount of pain she feels and the possibility to move, to walk and regain the ability to perform normal tasks. Active management lowers the risk of thromboembolic incidents. Therefore, the patient is advised to get off bed the next day after surgery. The urinary catheter is usually removed 12 hours after surgery if there is no suspicion of bladder or ureteral injury. The risk for urinary infection increases with the amount of time the catheter is kept in place.

The intraperitoneal drainage tube set intraoperative to monitor intra-abdominal hemorrhage was usually removed 48 hours after surgery, giving the patient more freedom to regain full mobility.

Pain management was mandatory and was performed using different types of medication. Hysterectomy was performed under general anesthesia. Opioids, non-steroidal anti-inflammatory drugs, analgesics and antipyretic drugs were administered from day one, adjusting doses according to patients needs. Medication for protecting the gastrointestinal tract was also administered. Antibiotics were administered for at least 3 days after surgery.

Usually, the hospitalization days after an uncomplicated hysterectomy varied from 4 to 7, depending on particularities of cases. All patients have been released with a prescription to continue the anti-inflammatory and analgesic treatment for the next 5-7 days. The patients returned 10-14 days after surgery to have their stiches removed and to establish further follow-up. The next visits were performed at one month and three months after the intervention.

Uterine artery embolization of selected cases

During the same period of time (01.01.2013-31.12.2014), in the University Emergency Hospital Bucharest a total number of 300 uterine artery embolization interventions for uterine fibroids was performed. The patients age varied from 24 to 47 years old, with a mean age of 35,5.

These patients have been previously diagnosed by ultrasound examination with uterine myomas after complaining for a wide range of symptoms. They have also tried drug treatment for symptoms caused by myomas, but treatment failed for multiple times. Being mostly patients of reproductive age, they experienced recurrent heavy menstrual bleeding, anemia, dysmenorrhea, recurrent inter-menstrual bleeding, pelvic pressure, bloating, infertility or pregnancy loss. Neither hormonal nor non-hormonal treatment was efficient in the last 2 years.

All patients underwent a full clinical and para-clinical examination, Pap smear and vaginal ultrasound examination. Doppler ultrasound was performed to all patients in order to establish the vascularization of the uterine fibroids. Genital and urinary infections were treated first and patients with abnormal Pap smears continued to be investigated according to protocols.

The patients selected for uterine artery embolization were mostly females of reproductive age with symptomatic uterine fibroids of small to medium size, who wanted to preserve fertility or who refused surgery (myomectomy or hysterectomy). Another category consisted of peri-menopausal patients with contraindications for general anesthesia and surgery.

Uterine artery embolization implies the injection through a catheter placed in the brachial artery or femoral artery of small particles aimed to obstruct the vessels that supply the uterine leiomyoma.¹⁰ The procedure was performed under local anesthesia in the Invasive Radiology Department and it usually took less than one hour.

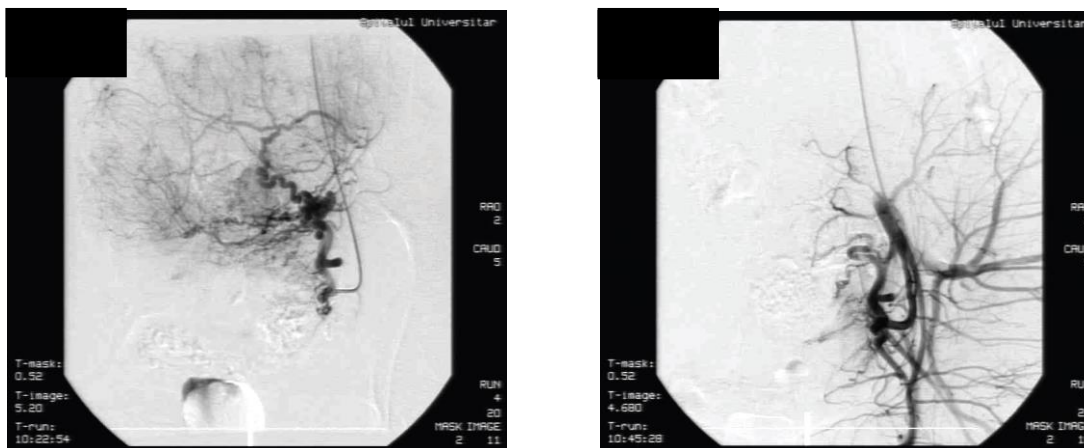


Figure 1. – Uterine artery embolization of a voluminous leiomyoma (intra-procedural aspect)

The symptoms associated to UAE appeared immediately after embolization and intensified in the first 6 hours, gradually decreasing in the next 24-48 hours.

Pain was the main symptom, usually described by the patient as mild to severe. The pain was described as colicky intermittent pain, frequently associated with nausea and vomiting. The cause of pain is considered to be ischemia of blood vessels and fibroid tissue.

Management of pain and other symptoms required the administration of anti-inflammatory drugs, analgesics and opioids given intravenously. Patients also required antiemetic medication in the first 6 hours as vomiting occurred and as pain became more intense. The best response was obtained in patients who used a patient controlled analgesia pump (PCA) with fentanyl associated with anti-inflammatory drugs taken intravenously or orally. Usually the pain decreased gradually after 24-48 hours. Persisting pain was the main reason for prolonging hospitalization. During hospitalization, patients had no restriction in moving, no intestinal or urinary tract problems and, of course, no incisions. Protection against uterine infection was made using antibiotics such as ampicillin and gentamicin or cephalosporin and metronidazole. More than 80 % of patients were released from hospital after 1-2 days after the intervention.

Recovery took less than 30 days according to patients' statements, most of them being able to restart their daily activities and jobs after less than 2 weeks of rest.

The patients were examined by ultrasound at 1 month after embolization but most effects were observed at 3 to 6 months after uterine artery embolization. Symptoms caused by fibroids, such as heavy menstrual bleeding, pelvic pressure or dysmenorrhea decreased or disappeared in the next 12 months after the intervention. Fibroid size decreased after UAE as observed at regular ultrasound examinations.

Complications of uterine artery embolization are rare, most of them being caused by infarction and necrosis of the fibroids. The most common complications are persisting pain, fever, urinary tract infections, vaginal discharge and endometritis. Rare but possibly severe complications are deep venous thrombosis, pulmonary thromboembolism, necrobiosis, persistent heavy bleeding or sepsis.^{11, 12}

Fertility is preserved in most patients who underwent UAE, but as we observed, a pregnancy can be obtained after at least 2-3 years after embolization.

Interestingly, in the same period of time (01.01.2013-31.12.2014) in the Bucharest University Emergency Hospital, only 182 myomectomies were performed. (Figure 1).

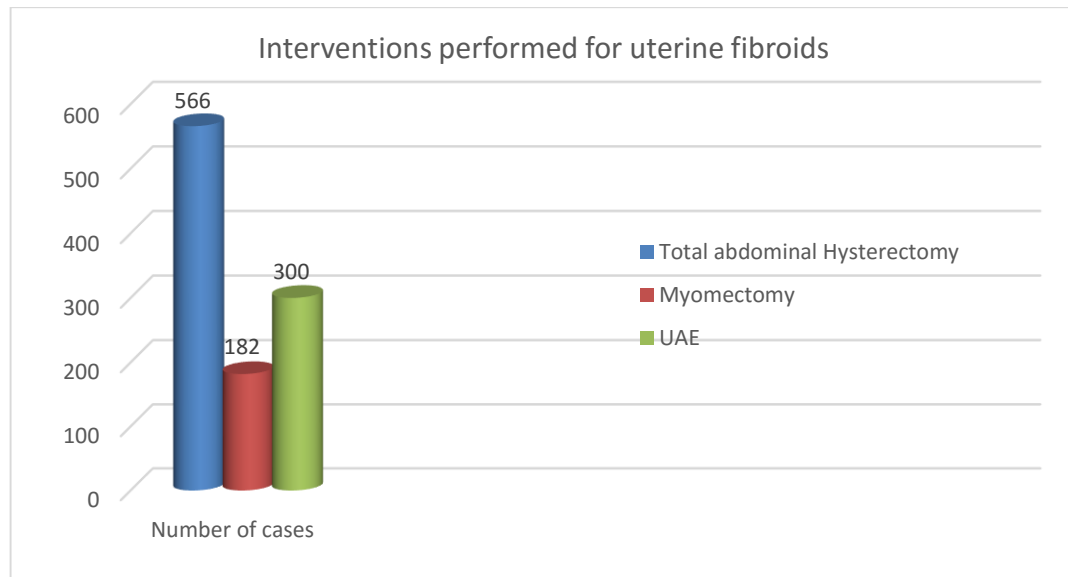


Figure 2 - Number of interventions performed for uterine fibroids

The main concern of patients who underwent myomectomy instead of UAE was the possibility of fertility problems induced by UAE. According to literature studies, women who underwent UAE have an increased risk for malpresentations, preterm birth, spontaneous abortion and ovarian insufficiency. However, further studies are required in this area.¹³⁻¹⁵

CONCLUSIONS

Women of reproductive age who are diagnosed with small to medium symptomatic uterine fibroids should be informed about the possibility of choosing UAE if medical treatment failed.

UAE procedure takes less than one hour, the pain, although intense, diminishes in 24 hours with appropriate intravenous medication or with a PCA. Complications are rare and can be prevented. The patient requires only 1 or 2 hospitalization days; it has no stitches or scars, no food intake restrictions, little limitation of activity and the possibility of going back to work after less than 10 days. Sexual activity is restricted for only one month and it has no other impediments afterwards. An important aspect in some cases is that UAE only releases symptoms without actually making the fibroid disappear. Therefore, UAE is in some cases, just a step prior to hysterectomy or myomectomy.

Hysterectomy is the best choice for perimenopausal or menopausal patients with large symptomatic uterine fibroids. Although is a major surgical intervention with important immediate and late complications, it has better outcomes than UAE for this group of patients. Pain can be reduced with proper medication, but hospitalization and recovery takes a lot longer. Early onset menopause and its hormonal manifestations secondary to hysterectomy are a specific problem to deal with in this category of patients. Physical activity, sexual activity and even psychological aspects change in a woman who underwent a hysterectomy.

July 2015

All patients must be informed about the complications and benefits of all treatment options they have for uterine fibroids.

REFERENCES

1. **Bazot M, Cortez A, Darai E, et al:** Ultrasonography compared with magnetic resonance imaging for the diagnosis of adenomyosis: correlation with histopathology. *Hum Reprod* 16:2427, 2001
2. **Cook JD, Walker CL:** Treatment strategies for uterine leiomyoma: the role of hormonal modulation. *Semin Reprod Med* 22:105, 2004
3. **Chelmow D, Aronson MP, Wosu U.** Intraoperative and postoperative complications of gynecologic surgery. In: DeCherney AH, Nathan L, Goodwin TM, Laufer N, eds. *Current Diagnosis & Treatment: Obstetrics & Gynecology*. 10th ed. New York, NY: McGraw-Hill Medical; 2007.
4. **Dandade D, Malinak LR, Wheeler JM.** Therapeutic gynecologic procedures. In: DeCherney AH, Nathan L, Goodwin TM, Laufer N, eds. *Current Diagnosis & Treatment: Obstetrics & Gynecology*. 10th ed. New York, NY: McGraw-Hill Medical; 2007.
5. **Farquhar CM, Sadler L, Harvey SA, Stewart AW.** The association of hysterectomy and menopause: a prospective cohort study. *BJOG*. 2005;112:956-962.
6. **Goodwin S.** – „Uterine artery embolization for the treatment of uterine leiomyomata embolization”, *Cardiovasc Int Rad*, 2003, 26(6):522-7.
7. **Kjerulff KH, Langenberg PW, Rhodes JC, et al.** Effectiveness of hysterectomy. *Obstet Gynecol*. 2000;95:319-326.
8. **Kempson RL, Hendrickson MR:** Smooth muscle, endometrial stromal, and mixed Müllerian tumors of the uterus. *Mod Pathol* 2000, 13(3):328–342.
9. **Klein A, Schwartz ML** - Uterine artery embolization for the treatment of uterine fibroids: an outpatient procedure. *Am J Obstetr Gynecol*, 2001; 184:1556-60.
10. **Lacy CF, Armstrong LL, Goldman MP, Lance LL.** *Drug Information Handbook*. 15th ed. Hudson, OH: Lexi-Comp Inc; 2007.
11. **Ravina JH, Aymard A, Ciraru-Vigner N si colab.** - Arterial embolization of uterine myoma: results apropos of 286 cases. *J Gynecol Obstet Biol Reprod*, 2000; 29:272-275.
12. **Rice CN, Howard CH.**- Complications of hysterectomy. *US Pharm*. 2006; 31(9):HS-16-HS-24.
13. **Spies JB, Benenati JF, Worthington-Kirsch RL, Pelage JP** – Initial Experience with Use of Tris-acryl Gelatin Microspheres for Uterine Artery Embolization for Leiomyomata. *J Vasc Interv Radiol*, 2001; 12(9):1059-1063.
14. **Voicu D, Popovici L, Davitoiu D, Cirstoiu M**-Implications of Uterine Artery Embolization for Uterine Fibromatosis. *RST Journal of Medicine*, Supplem No 3, 49-57. 2014.
15. **Yuri Kitamura M.D., Susan M. Ascher** - Imaging manifestations of complications associated with uterine artery embolization, *Radio Graphics*, 2005, 25:S119-S132.