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Conservative treatment of patients with bulky leiomyoma uterine arteries embolization vs. myomectomy

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Abstract

The pelvic tumors with the highest prevalence are uterine leiomyoma. These benign tumors are associated with symptoms like: pain, menorrhagia and menometrorrhagia. A modern method of treatment in these cases is uterine arteries embolization. This technique consists in injecting particles of polyvinyl alcohol into vessels that supply the tumorsin order to block their vascularization. This procedure is performed by femoral or brachial artery approach with a 3F micro catheter. First, a dye is injected followed by X-ray guidance. Another used method consists in surgical excision of the leiomyoma - myomectomy. We performed a retrospective descriptive study analyzing a group of 90 patients hospitalized in the University Emergency Hospital Bucharest on the Obstetrics-Gynecology ward between 01.01.2011-01.01.2015 diagnosed with bulky uterine fibroids. Two groups were formed. Group A included 45 patients who underwent uterine artery embolization. Group B consisted of 45 patients who underwent myomectomy. All patients were re-evaluated clinically and by ultrasound at 1 month, 3 months and 6 months after the procedure to assess treatment response. An extensive comparison was conducted between the two groups.
Keywords: *leiomyoma, uterine arteries embolization, myomectomy, conservative treatment*

Introduction

The most common pelvic tumors are uterine leiomyoma. Studies based on data obtained from ultrasound and histopathology indicates a 60-70% incidence among women.

Uterine leiomyoma is a benign tumor composed of smooth myometrial muscle and blood vessels. It develops from uterine cells, undifferentiated cells with maturation and proliferation capacity, on which a stimulus acts and determinates an abnormal proliferation.

The trigger is still unknown, but it has been demonstrated that high serum levels of estrogens are mandatory. This is confirmed by the high incidence in women with genital activity (i.e. it does not appear before puberty and regresses in climax). These tumors also have an accelerated growth rate throughout pregnancy[1-4].

Uterine leiomyoma can vary in size and location: sub-serous myoma, intramural or sub mucous myoma, which deforms the uterine cavity. Regardless of their position, myomas have important complications hard to neglect: menorrhagia, menometrorrhagia, pain, compression of the bladder, bowl, ureters or rectum, fallopian tube infections, infertility and miscarriages. In these conditions a treatment is necessary: hysterectomy, myomectomy, hormone therapy or uterine artery embolization. Given the high incidenceof leiomyoma in women with reproductive age who want to preserve the uterus, it is recommended that the treatment be as conservative as possible. An advantage of uterine arteries embolization is that it may be performed to symptomatic women with a contraindication for surgery (cardiovascular disease, morbid obesity, respiratory diseases)[5-8].

Uterine arteries embolization may also be performed as a way of reducing the blood loss during myomectomy. Selective blockage of blood vessels causes decreased blood supply to the fibroid nodules, leading to degeneration and regression thereof, diminished blood loss and pain. Modern uterine arteries embolization requires supra-selective catheterization and is contraindicated to patients that are allergic to iodine agents, have coagulopathy or kidney failure, had previous pelvic irradiation or are pregnant. To prevent complications arising after embolization a Pap smear, vaginal secretion and cervical culture are mandatory prior to the procedure[9-12].

Methods

We performed a retrospective descriptive study analyzing a group of 90 patients hospitalized in the UniversityEmergency Hospital of Bucharest on the

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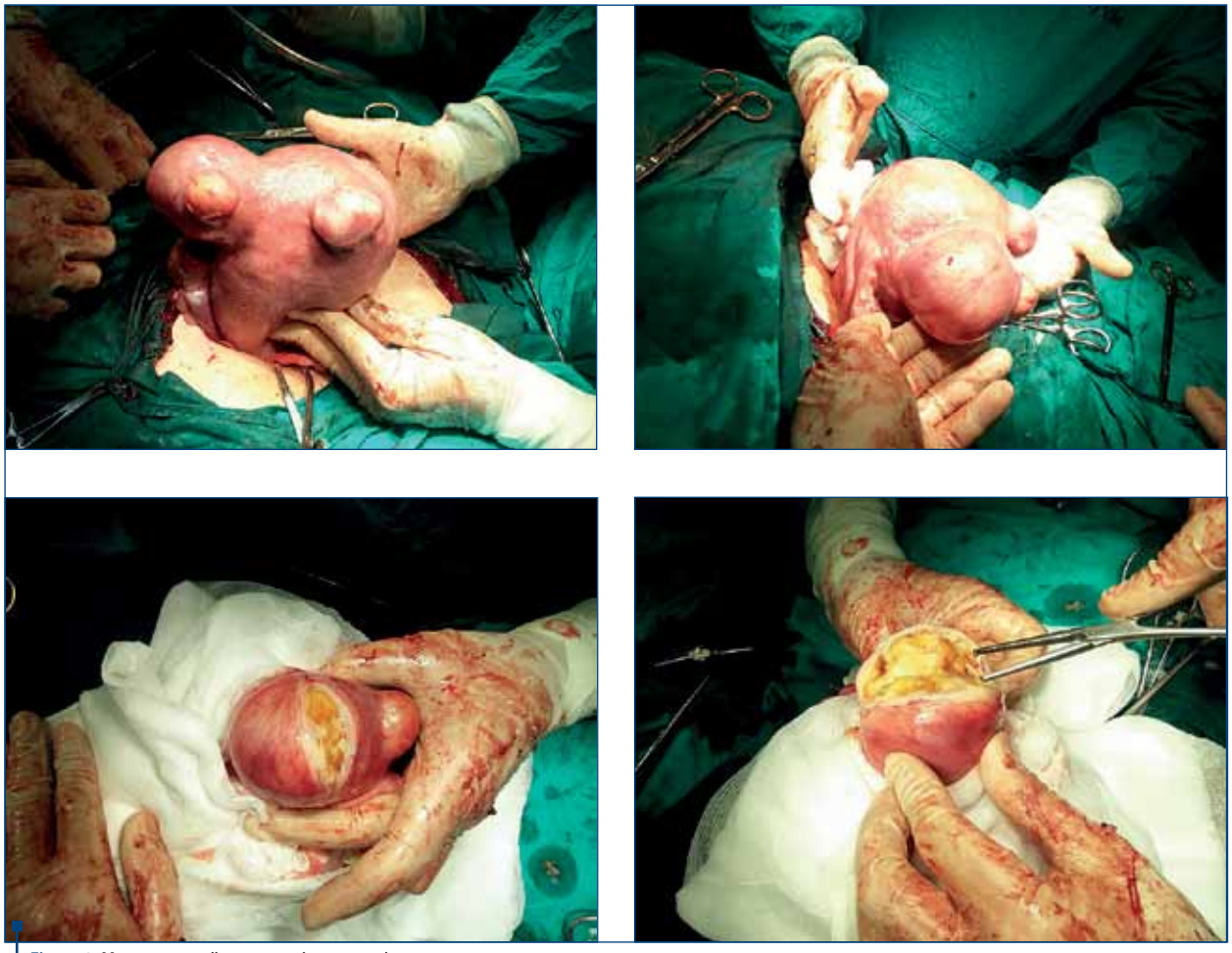


Figure 1. ***Myomectomy (intraoperative aspects)***

Obstetrics-Gynecology ward between 01.01.2011-01.01.2015 diagnosed with bulky uterine fibroids. Two groups were formed. In Group A we included 45 patients who underwent uterine artery embolization. Group B consisted of 45 patients who underwent myomectomy. All patients were re-evaluated clinically and by ultrasound at 1 month, 3 months and 6 months after the procedure to assess treatment response.

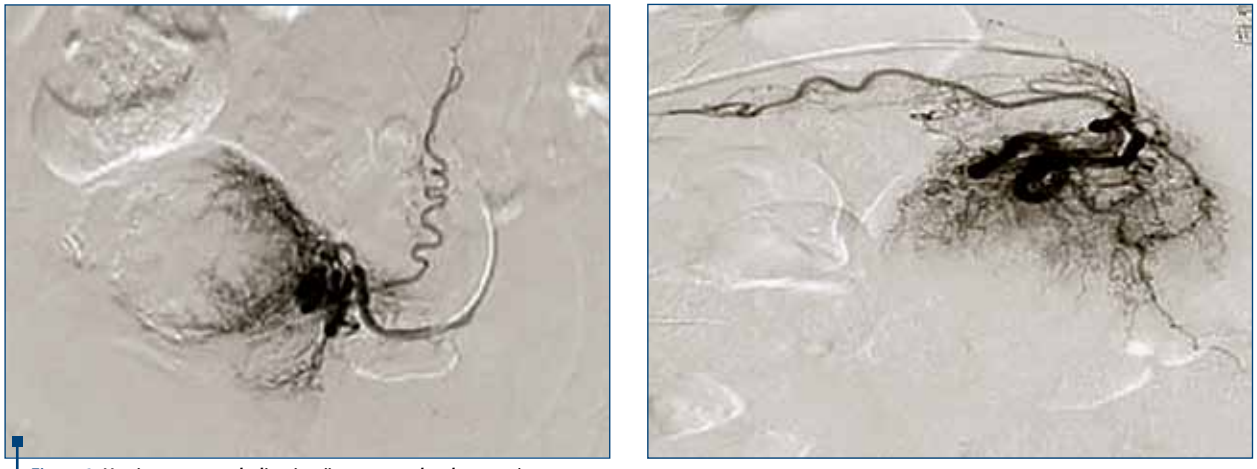


Figure 2. ***Uterine artery embolization (intra-procedural aspects)***

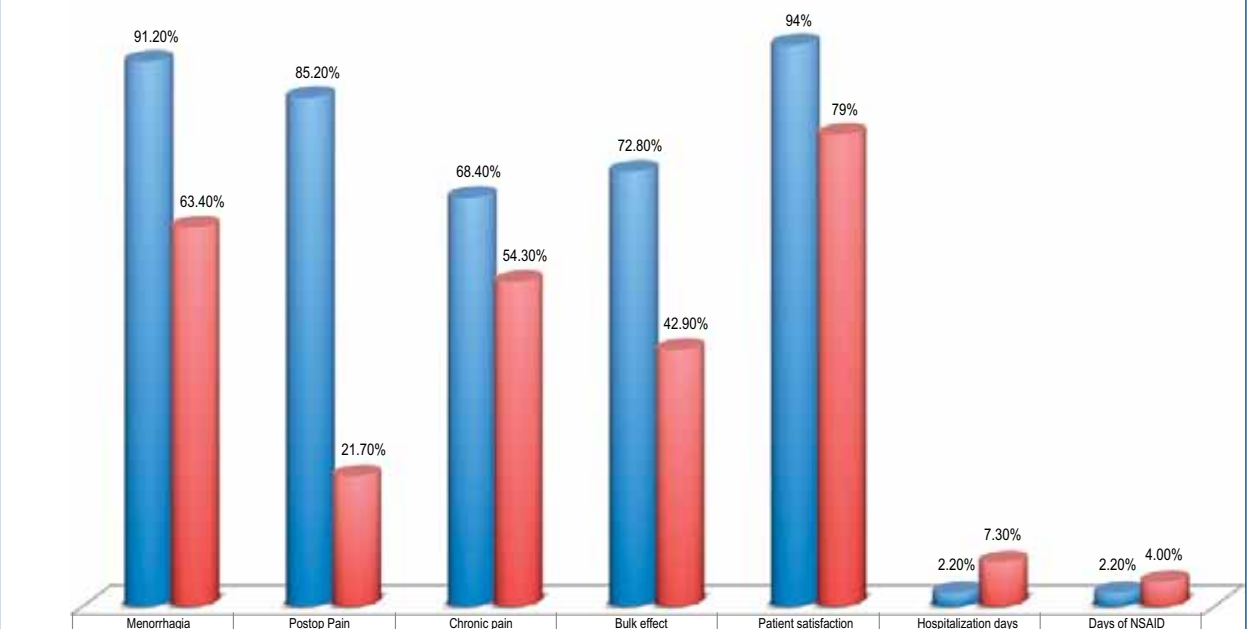
Myomectomy protocol

Myomectomy is performed through a laparotomy followed by the uterine incision at the level of the leiomyoma (see Figure 1). The uterine incision must be well planned in order to prevent complications, it can be transverse but usually a vertical incision is made directly over each myoma, in order not to intercept the arcuate arteries. After the visualization of the fibroid's capsule, the leiomyoma must be enucleated (there were described many techniques, either a blunt dissection of the nodule, or a vertical incision through the nodule separating it in two parts followed by the extraction of each, or a traction on the myometrial edges with Allis clamps). The uterine defects are then closed with sutures in layers[13-18].

Uterine arteries embolization protocol

Interventional protocol varies from center to center. Prior to the procedure we administered a painkiller/anti-inflammatory (e.g. ketoprofen, indomethacin), we sedate the patient (i.e. fentanyl and midazolam); and antibiotic prophylaxis was administered (usually a cephalosporin). The approach was currently brachial - a 5F introducer sheath is mounted at this level. Then we insert a 3F/4F/5F catheter. It is indicated the use of a 3F micro catheter followed by the administration of nitroglycerin[19,20]. Nitroglycerin has a vasodilation effect on small arteries and also avoids an arterial spasm with theinaccurate migration of particles injected in the vessel that would lead to ovarian dysfunction or even ovarian failure. When the junction of the common iliac artery with the aorta is reached while advancing the catheter, the first insertion of contrast dye is made in order to visualize the pelvic vascularization; subsequently, the process of 'imaging roadmap' is being started.

After passing through the aortic bifurcation using the "crossover" technique, the catheter is inserted into the left common iliac artery with its advancement in left internal iliac artery for the left uterine artery approach. Then the probe must be positioned as close as possible to the arterial branches that provide blood flow to the fibroid in order to inject the substance containing polyvinyl alcohol particles or gelatin sponge (Gellfoam) by x-ray guidance, until the artery is blocked. The amount of substance injected depends on the arterial caliber and also on fibroid's volume. We recommend a partial embolization by selection of vessels that feed the fibroid without stopping all of the blood flow through the uterine artery if there is just one nodule. Some operators mix the embolizing substance with 5 mg of 1% lidocaine in order to reduce pain after intervention. The procedure takes between one hour and one hour and a half. For confirming the success, after intervention an arteriogram is performed (Figure 2)[21-25].



	Menorrhagia	Postop Pain	Chronic pain	Bulk effect	Patient satisfaction	Hospitalization days	Days of NSAID
Embolization	91.20%	85.20%	68.40%	72.80%	94%	2.20%	2.20%
Myomectomy	63.40%	21.70%	54.30%	42.90%	79%	7.30%	4.00%

Figure 3. Comparison of the main symptoms and cost-efficiency (hospitalization days and days in which the patient required the use of analgesics) between the analyzed groups

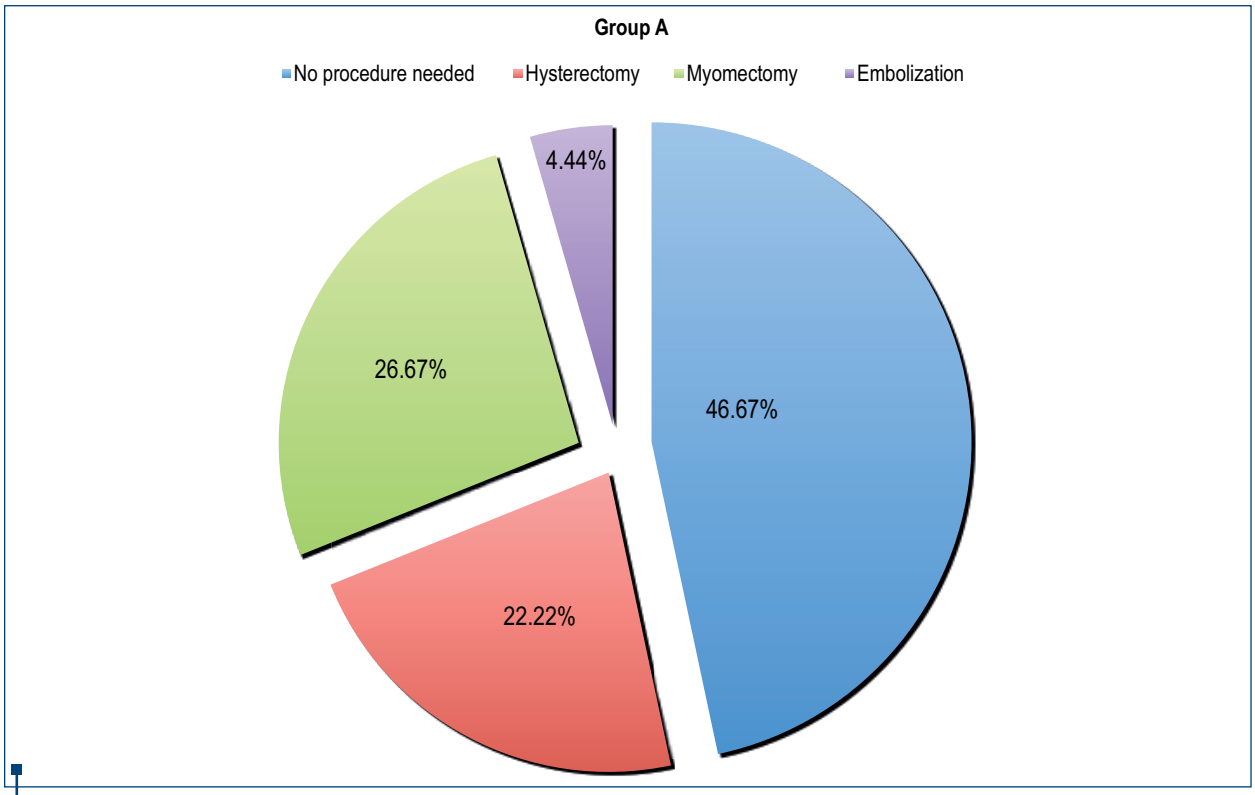


Figure 4. The distribution of patients from group A who required a second procedure – note than 50 %received a secondary method of treatment

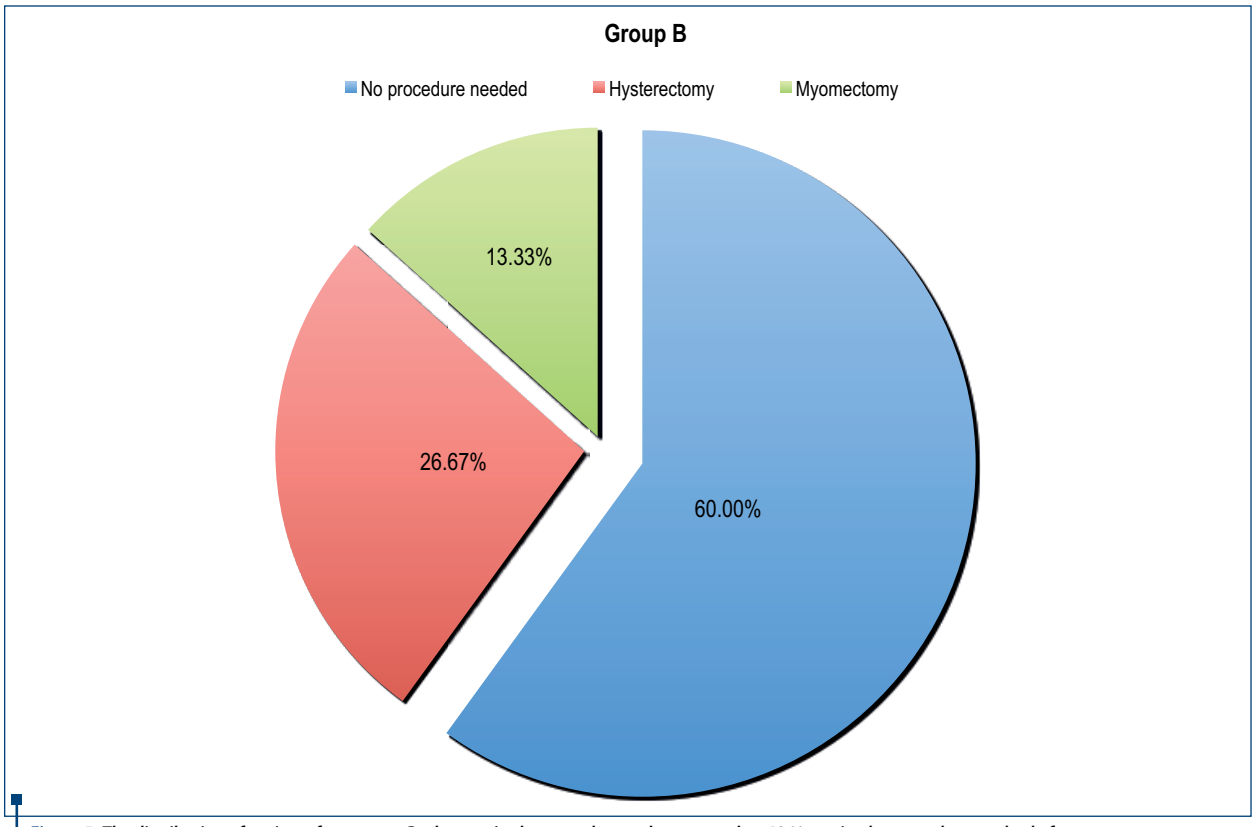


Figure 5. The distribution of patients from group B who required a second procedure - note that 40 % received a secondary method of treatment

Results

In every group we enrolled 45 women with the age between 17 to 42 in group A and 22 to 45 in group B. The average age of the patients who underwent uterine arteries embolization was 28.4 and 32.1 for the patients pertaining to group B (Figure 3).

All the patients included in the study wereevaluated after the procedure: Menorrhagia was the first symptom evaluated. About 91.2% of patients from group A (Embolization) voiced that menorrhagia decreased considerably or is even absent. Only 63.4% of patients in group B claimed the same thing.

Postoperative intense pain (first 5 days postop) was present in 85.2% of patient from group A, while only 21.7% from group B had this symptom.

Chronic pain was significantly reduced or even absent in 68.4% of patients from group A and 54.3% from group B.

Bulk effect reduced in 72.8% from group A and only 42.9% of cases from group B.

Patient satisfaction was evaluated also. About 91.2% of patients that underwent embolization were satisfied with the procedure. From the group that had surgery 79% were satisfied.

Hospitalization days were counted. Patients from group A were hospitalized for approx. 2.2 days while patients from group B needed to stay in the hospital 7 daysor more.

Days of nonsteroidal anti-inflammatory drugs (NSAIDs). The number of days that the patient needed NSAIDs was calculated and the patients from group A needed 2.2 days of painkillers while group B needed 4 days of analgesic drugs.

Some of the patients who underwent embolization-required a second procedure. About 10 of them had a hysterectomy in the following year, 12 had a myomectomy and 2 had another embolization. From the group that did myomectomy 12 needed a hysterectomy and 6 another myomectomy (Figures 4, 5 and 6).

We also evaluated the number of days after daily activity resumption was counted. As we can see in the chart below patients with embolization recovered faster.

The blood loss during the procedure was minimal (none) for the patients who underwent uterine arteries embolization and important in the group of patients who received the surgical treatment.

Discussion

Following uterine arteries embolization the vascularization of the uterus will not be affected; the blood flow was abolished only for uterine fibroids. Symptoms like menorrhagia and menometrorrhagiastop and the menstrual blood loss decreases in most cases. After involution of fibroids the remaining symptomatology (abdominal pressure, pain, andpolakiuria) will disappear. Some studies show that 2-3% of patients will eliminate vaginally small fragments of fibrous tissue; in these cases the location of the tumors is near the uterine mucosa and as a resultof necrosis it will partially detach. These women are advised to have a curettage

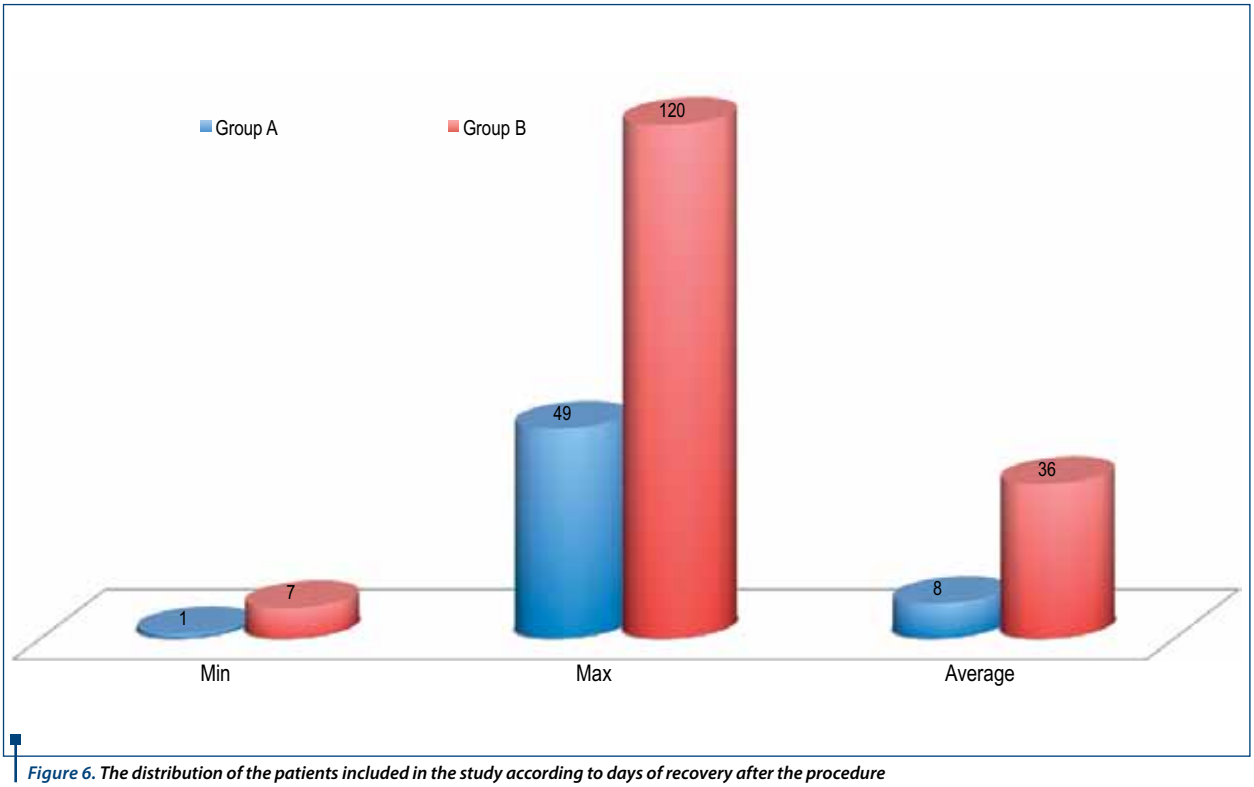


Figure 6. The distribution of the patients included in the study according to days of recovery after the procedure

procedure to prevent further bleeding or infections[26,27].

Complications after embolization are minimal, occurrence of uterine damage as a result of inadequate blood supply or infection is less than 1%; also, subsequent studies have confirmed that the X-ray dose to which the patient is exposed during the entire surgery is below the limit of radiation.

Following the procedure, an after embolization pain syndrome may appear; this is the effect of infarction and necrosis of fibroid structures due to the sudden blood supply cut. The syndrome is characterized by abdominal pain similar with cramps during menstruation; duration ranging from 1-2 hours to several days; in these cases usually the oral or rectal administration of NSAIDs is enough, or in rare cases parenteral administration is needed[28,29].

The complications of myomectomy consist in hemorrhage with possible conversion to hysterectomy, adhesion formation after surgery, fever and infection[30,31].

Some authors observed that women who undergo uterine artery embolization are more likely predisposed to further invasive treatment (surgery or repeat embolization) than those who had myomectomy. Among women who did not need such treatment, satisfaction and relief of symptoms were similar. Based on our study, we conclude that the satisfaction rate is higher if the patient is treated by uterine arteriesembolization[4].

Conclusions

Embolization is the conservative method of treatment for benign uterine tumors, indicated in symptomatic fibroid nodules, in women with reproductive age. Following selective obstruction of the fibroid vessels a relative fast involution of the nodule takes place and the symptomatology disappears; fast recovery is another advantage of this procedure.

Myomectomy is another conservative method, which implies a laparotomy. Based on our study, patients are more satisfied with the embolization and also the hospitalization and recovery days are reduced following this procedure, little complications appeared, less NSAIDs administered but the acute pain in the first 5 days after the procedure was more intense in the embolization than myomectomy. ■

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