

UTERINE ARTERY EMBOLIZATION AS A METHOD OF TREATMENT OF UTERINE FIBROIDS

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Abstract. UAE can be used to reduce the volume of myomatous nodes and reduce intraoperative blood loss in patients before hysterectomy of submucous nodes, as well as laparotomic and laparoscopic myomectomies, significantly expanding the indications for the use of endoscopic access.

Keywords: uterine fibroids; uterine artery embolization.

The use of uterine artery embolization (UAE) for the treatment of uterine fibroids began in the early 1990s in France. French gynecologist J. Ravina, when using endovascular occlusion of the uterine arteries before hysterectomies or myomectomies in patients with uterine fibroids, in order to reduce subsequent intraoperative blood loss, noted the disappearance or decrease in clinical manifestations of the disease in a significant part of patients with simultaneous reduction in the size of the uterus and fibroid nodes in 1995, a group of researchers led by J. Ravina presented the experience of using UAE for the treatment of uterine fibroids in 16 patients. Speaking about the method today, we can say that since the early 2000s, after receiving the results of UAE on large series of patients [14, 16, 24], the data of the "UAE register" (study FIBROID) [26, 22] and, finally, the results of prospective multicenter studies [9, 27] a real boom in the introduction of UAE into clinical practice has begun and continues to this day. In 2004, an industry standard on the use of UAE was published, developed jointly by several dozen leading specialists in the field of gynecology and endovascular surgery [21]. Today, all over the world, UAE has taken a strong position as an alternative method to hysterectomy in patients with uterine fibroids, i.e. most indications for radical surgical treatment are those for UAE. There are at least 300 centers in the USA alone that actively use UAE for the treatment of uterine fibroids and have significant experience. Unfortunately, their number does not exceed 10-15 in our country, which is facilitated by the absence of endovascular surgery departments in most medical institutions, as well as low awareness of specialists about the possibilities and prospects of endovascular technologies in obstetrics and gynecology. The method of endovascular occlusion of the uterine arteries itself is carried out in the conditions of X-ray surgery, which, in turn, can be either standardly equipped, stationary, or represented by a mobile installation. In gynecological practice, standard unilateral access through the right femoral artery according to the Seldinger method is the most frequent, only in 1.42% of cases a puncture of the contralateral femoral artery is required. Immediately before the UAE, all patients undergo selective angiography of the vessels of the pelvic organs, during which a step-by-step assessment of the femoral and iliac arteries is carried out. The next stage is alternate catheterization of the uterine arteries. For this purpose, the catheter is carried through the aortic bifurcation into the contralateral internal iliac artery and is lowered to the place of discharge of the uterine artery. After the catheter is installed at the mouth of the uterine artery, emboli are inserted into the lumen of the vessel under constant X-ray visual control. When signs of completion of embolization appear, embolization is similarly performed on the other side. It is

important that with UAE, the cessation of blood flow occurs only in the vessels feeding the fibroids, and does not affect the healthy myometrium in any way. After the removal of the catheter, the final stage of the operation is started - hemostasis, which consists in manual compression of the puncture site of the artery throughout 10-20 minutes, followed by applying a pressure bandage. At the moment, the problem of choosing an arterial access for performing an UAE is a solved issue, as well, in our opinion, the use of brachial access dramatically increases the duration of the intervention, as well as the time of fluoroscopy, thereby increasing the X-ray dose. In addition, using brachial access dramatically increases the risk of developing local complications at the puncture site, including brachial artery thrombosis with the development of subsequent limb ischemia. The shortest duration of the procedure is achieved precisely when using the femoral access. Thus, in our observations, when using access through the right femoral artery, the average duration of fluoroscopy was 3 minutes 10 seconds, and the total duration of intervention in 90% of observations did not exceed 15 minutes. This is possible with the use of modern catheters, for which it is not required to form a loop in the aorta with the help of the Voltman maneuver. Moreover, if it is impossible to use femoral access (for example, in patients with occlusive-stenotic lesions of the femoral and external iliac arteries), in our opinion, it would be more appropriate to use radial access. Until now, the question of the expediency of the application is debatable UAE in patients with submucosal and subserous localization of nodes, since in such situations hysteroresection or laparoscopic myomectomy is possible. Being the main proponents of endoscopic surgery and innovators on a number of issues in this area, we can say that UAE expands the possibilities of endoscopic technologies when performing organ-preserving operations and allows to preserve the uterus in those women whose endoscopic access is contraindicated. The question of transcervical myomectomy in submucous fibroids should be solved taking into account the following factors: the length of the uterus on the probe should not exceed 12 cm, and the size of the submucous node should not be more than 5 cm in diameter, while we assign a large role in the technical success to the topographic localization of myomatous nodes. Submucous nodes of type 2, exceeding 5 cm in diameter and located close to the serous lining of the uterus, significantly increase the operational risk (perforation, blood loss, a significant area of surgical trauma, anaesthetic complications, etc.) in patients with multiple uterine fibroids, having indications for hysterectomy, hysteroresection only the submucous node is inappropriate, since the treatment is incomplete. After the UAE, submucous nodes were isolated spontaneously from the uterine cavity in 35.7% (expulsion or discharge in the form of necrotic detritus). A decrease in the volume of submucous nodes by more than 50% was accompanied by their migration into the uterine cavity and the formation of the 1st or 0th types of submucous nodes, which made it possible to perform hysteroresection or mechanical myomectomy in patients with the initial size of fibroids of 12-15 cm in conditions of the lowest risk, without blood loss, with minimal traumatization of the myometrium diameter. We consider it important to emphasize that 47.6% had a trans-cervical myomectomy performed mechanically at various times after the UAE and 15.4% had optimal conditions for performing hysteroresection modeled. According to our data, interstitial nodes with a central or centripetal direction of growth cause a similar clinical picture with submucous uterine fibroids, with the development of menorrhagia and IDA. As a rule, deformation of the uterine cavity and the collapse of the contractile ability of the myometrium occurs when nodes of significant size are reached - over 6-7 cm in diameter. There are no conditions for performing hysteroresection in interstitial fibroids, and with the development of menorrhagia and anemia,

hysterectomy was the main method of treatment . In our observations, the UAE not only leveled the clinical manifestations of uterine fibroids, but in 21% there was an isolation of interstitial nodes into the uterine cavity with the formation of a submucous component, which allowed us to also perform hysteroresection in these patients. Node expulsions or myomectomy after UAE should not be considered as a complication. The decrease in the volume of nodes and their migration towards the uterine cavity should be regarded as the achieved result after the UAE. In all observations, erect myomatous nodes over 10 cm in diameter were noted. We did not perform hysterectomy in any of the examined patients, all patients underwent transcervical myomectomy against the background of complex anti- inflammatory and antibacterial therapy . Infectious complications after UAE in patients with submucous localization of nodes are not uncommon, and in our observations amounted to 2.3%. As a rule, the appearance of the pyometra was caused by a large fixation zone of the myomatous node in the myometrium and the inability to spontaneously stand out from the bed, while the myomatous node giving birth blocked the internal pharynx, which prevented the rehabilitation of the uterus. Most authors using UAE note a low percentage of infectious complications. In most studies, their frequency did not exceed one percent [13, 14, 17, 25, 28]. According to various authors, the development of endomyometritis was in 11% of patients at various times after UAE, in 2% the migration of myomatous nodes into the uterine cavity was accompanied by the development of pyoma [15, 19]. We have developed a monitoring algorithm in which the probability of infectious complications is minimized. When detecting migration of the myomatous node, it is advisable to carry out ultrasound monitoring and monitoring of the nature of vaginal discharge, and at the first signs of infection, anti-inflammatory therapy is necessary. Currently, there are a large number of publications that show that the risk of developing complications of UAE is several times lower than with other options for surgical treatment of uterine fibroids. To date , there are references in the literature devoted to UAE and combining data on more than 100,000 interventions only about 4 deaths, one way or another associated with endovascular surgery. In 2 cases, the cause of death was injection complications, in 2 others - massive pulmonary embolism [18], W. Walker et al. It is believed that these figures are 30 times lower than the mortality rate after hysterectomy (1 in 1600 operations) performed for uterine fibroids [29]. In addition, the improvement of the methodology and tactics of the use of UAE has now allowed to reduce the risk of complications to a minimum. In our studies, complications did not exceed 3.4%. It should be noted that the majority of patients who have undergone UAE develop post- embolization syndrome. Usually its severity is moderate, its most striking symptoms are pain in the lower abdomen and hyperthermia, as a rule, pass within 1-3 days. The development of postembolization syndrome is not a complication of the intervention, it should be considered similarly to the appearance of pain in the area of any postoperative wound. At the same time, the violation of the integrity of the scar occurred even before the start of regular birth activity and had an erased clinical picture; clear symptoms appeared only after the rupture became complete. In connection with the above and according to the observations, the conditions for laparoscopic myomectomy are: zero and 1st type of subserous nodes. Contraindications for performing myomectomy from this access are: type 2 of the subserous node; the size of the uterus exceeding 12 weeks of pregnancy; the presence of multiple interstitial nodes; low (cervical-isthmus) location of the myomatous node, especially coming from the posterior wall. Considering all of the above, for most patients whose subserous nodes have a pronounced interstitial component, the method of choice should be considered UAE. Of course, a contraindication to the UAE is also a uterine

sarcoma. According to Breusenko V. G., Kapranova S. A. et al., correct diagnosis of uterine sarcoma at the preoperative stage is possible if the basic principles of patient selection are observed immediately before the intervention [1, 4]. We consider it important to take into account the clinical course of the disease: rapid growth of fibroids, postmenopausal fibroids, unverified metroragia - all this is the basis for considering the issue of in-depth examination of patients and exclusion of uterine sarcoma. It should be emphasized that the presence of a pronounced concomitant extragenital pathology is not a contraindication for endovascular intervention. Integration UAE allowed us to obtain a stable therapeutic effect in 2 patients who had a myocardial infarction (2 weeks and 6 months ago, respectively), 3 with a history of stroke, 112 patients with hypertension, 89 who had a history of 4 to 8 glandular sections, 33 with diabetes mellitus of the 2nd type 1 with amyloidosis of the kidneys, 3 with a single kidney and lung, etc. At the same time, the use of UAE did not entail the aggravation of somatic disease or complications. Every tenth patient had an UAE performed for emergency indications, due to severe uterine bleeding, i.e. if there were indications for an emergency hysterectomy. Bleeding was stopped in all patients, in the absence of information about the morphological state of the endometrium and endocervix, hysteroscopy and separate diagnostic curettage of the uterine mucosa were performed in the near future after the UAE. In patients with uterine fibroids, a combination of uterine fibroids and adenomyosis, dysfunctional uterine bleeding and blood diseases (leukemia and disease Willebrand) in 98% of cases, endovascular treatment was sufficient. hemostatic effect during UAE is caused by arterial thrombosis of the ascending branches of the uterine arteries, as a result of which the main blood circulation in the uterus becomes collateral, the volume of circulating blood in the uterus decreases by 2 times - as a consequence, uterine bleeding stops immediately at the time of the procedure. This effect has also been successfully used in patients with uterine bleeding caused by oncological diseases. UAE it was performed in inoperable patients with endometrial adenocarcinoma, cervical cancer, bleeding from adenocarcinoma metastasis localized in the parametric region, after pangi- sterectomy. There is a legitimate question about the effect of UAE on ovarian function. In order to exclude the possibility of emboli entering the ovarian stroma in 1.3% of the examined patients, we consciously resorted to changing the technique of UAEscularization of the ovarian arteries proper from one or two sides when they are involved in the blood supply of the myomatous node. At the same time, the introduction of embolization particles was carried out through a microcatheter inserted through a conductive catheter into the peripheral parts of the ovarian arteries, farther than the zone of departure of the arterial branches of the ovary itself, which made it possible to avoid unintentional embolization. In conclusion, I would like to emphasize once again that UAE is an innovative technology in medicine, it is a new look at the problem of treating uterine fibroids and new hopes. The introduction of endovascular surgery into gynecological practice is an absolute breakthrough in the worldview and a new direction that needs to be mastered and implemented.

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