Case 1199

Uterine artery embolization for
erine fibroids
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Section: Interventional radiology
Imaging Technique: MR
Case Type: Clinical Cases
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Patient: 43 years, female

Clinical History:

Imaging Findings:
The patient suffered from severe menorrhagia with iron-deficiency anemia caused by a fibroid with a diameter of 6.5 cm. Ultrasonography and hysteroscopy confirmed the diagnosis of a fibroid without signs of malignancy, pedunculated submucous fibroid or endometritis. Magnetic resonance imaging (MRI) revealed a intramural fibroid in the dorsal part of the uterus. Based on these data, the patient was considered to be a good candidate for uterine artery embolization (UAE). Preprocedural measures were taken, eg: intravenous drip infusion, urine bladder catheter, 2000 mg Kefsol (Cefalozine) intravenously 30 min prior to the procedure and 10 mg Morphine intramuscular. After local anesthesia and introduction of a 5 French (Fr) sheeth in the right groin digital subtraction arteriography (DSA) was started. Contralateral internal iliac arteriography and selective DSA of the anterior division of the left internal iliac artery to analyze the uterine artery was then performed with a single 4 Fr, cobra-shaped glide-catheter (C2,Cordis) and with a hydrophilic polymer-coated 0.035 J guide wire (Terumo). The selective angiogram revealed the arcuate and centripetal vessels towards the fibroid. Because of vasospasm a co-axial micro catheter (Tracker 18, Boston Scientific) technique was applied to ensure free-flow embolization. After stable positioning the micro catheter in the uterine artery, polyvinyl alcohol particles (Contour 355-500, Boston Scientific) were injected mixed with contrast medium until stases of flow in the uterine artery. Next, the Waltman loop manoeuvre was performed to selectively catheterize the right uterine artery. The micro catheter was also used on the right side because of uterine artery vasospasm. After the successful embolization (figure 1 and 2) the patient was discharged the next day in good condition. She was given 50 mg Voltaren supp as medication for 2 weeks if necessary. Follow-up was realized with MRI at 3, 6 and 12 months after the procedure. With MRI shrinkage of the fibroid and the uterus can be appreciated (figure 3 and 4). In this case MRI shows a 70% decrease in volume of the fibroid (4.3 cm diameter) after embolization. The complaints of the patient have subsided to a great extent and a normal menses was achieved. She is very satisfied with the non-surgical approach of her problem.

Discussion:
UAE is emerging as an effective, non-surgical treatment for women with symptomatic uterine fibroids. UAE is considered to be a good alternative to hysterectomy and myomectomy. UAE is not difficult to perform, for many interventional radiologists have experience with embolization techniques in cases such as pelvic trauma, postpartum or oncologic pelvic bleedings. The radiologist should know about the arterial supply of the pelvis, the anatomy and its variations eg differences in the blood supply of fibroids or the different origins of the uterine arteries. Careful evaluation concerning indications and contraindications (eg known severe contrastreaction, pregnancy,
endometritis, pedunculated submucous/-serous fibroids, malignancy) is obligatory. Both knowledge of (micro-)
catheters and techniques as well as embolization material to be used is necessary. One may perform a single
puncture of the femoral artery only at one side in combination with the Waltman loop manoeuvre to catheterize the
uterine artery on both sides. An alternative is a bilateral approach at both groins positioning both catheters over the
top in the contralateral uterine artery. The radiologist must be aware of possible reflux or retroflow of embolization
material during the procedure. In case of persistent severe vasospasm, mostly caused by guide wire manipulation,
the micro-cathether technique must be applied to preserve free-flow in the uterine artery. Free-flow is essential to
achieve proper distal embolization with the preferential blood flow towards the fibroid (target-embolization). Without
free-flow in the artery particles are pushed or squashed into vessels, such as the uterine-ovary-shunts, leading to so
called non-target embolization of the ovaries causing premature menopause. To avoid non-target embolization it is
necessary to recognize the shunts. It is important to perform fluoroscopy repeatedly during the procedure. If a shunt
is recognized one should switch over to larger particles to prevent distal embolization through the shunt risking
ischemic damage to the ovaries. More and more interventional radiologists prefer a so-called uterine fibroid
embolization (UFE). The main technical difference between UAE and UFE is the different end-point. In UAE the end-
point is obtained when there is stasis of contrast, occlusion of the distal part of the uterine artery (“tree trunk
appearance”). The end-point in UFE is reached by disappearance of the blush of contrast created by the fibroid
vessels. This technique may be performed by using small spheres of gelatin (embospheres, Biosphere Medical),
which are easy to deliver, without clogging the catheter or clumping in the vessel. Since only one particle is required
to occlude any one vessel, the embolization may be accomplished with fewer particles. This may decrease the risk
of non-target embolization. The uterine artery, its main branches and cervical branches even so, are better
preserved (“pruned tree appearance”). There is some evidence that there may be less discomfort (eg pain) for the
patient after using this embolization technique. Close cooperation and good partnership with the attending and
referring gynaecologist is essential and the only way to success with patient satisfaction figures up to 90%. Proper
follow-up and coaching of patients is mandatory.

Differential Diagnosis List: Uterine fibroid of 6.5 cm projected in the posterior myometrium is successfully
embolized; 1 year follow-up reveals a significant decrease in volume of both the fibroid as the uterus.

Final Diagnosis: Uterine fibroid of 6.5 cm projected in the posterior myometrium is successfully embolized; 1 year
follow-up reveals a significant decrease in volume of both the fibroid as the uterus.

References:

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1999; 10:1149-1157. (PMID: 10527190)
results. JVIR 1999; 10:1159-1165. (PMID: 10527191)
Figure 1

Description: Vascularity of fibroma well visualized

Origin:
Figure 2

Description: Post embo, occlusion of uterine artery vascular bad Origin:
Figure 3

Description: Sagittal T1 weighted image pre embo

Origin:
Figure 4

Description: T2 weighted image post embo Origin: