

UTERINE FIBROID WITH CALCIFIED RIM FORMATION MIMICKING A FETAL HEAD AFTER UTERINE ARTERY EMBOLIZATION

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Uterine fibroid is the most common tumor in women. Medical treatments for fibroid-related symptoms usually offer only temporary improvement and the symptoms progress within a few months after the medical treatment. Therefore, effective treatment for fibroids has mainly been myomectomy or hysterectomy. Uterine artery embolization (UAE) has been reported to be an effective alternative surgical therapy for uterine fibroids [1]. Many reports show a short-term reduction in fibroid and uterine size, as well as clinical improvement in bulk-related symptoms and reduction in menstrual bleeding [2].

Many different types of degeneration have been identified in fibroids. Hyalinization is the most common type. Calcification occurs in hyalinized tissue in about 4% of fibroids [3]. Calcification is usually dense and amorphous. On a radiograph, this pattern of calcification almost confirms the diagnosis of fibroids. We report a uterine fibroid-forming calcification after UAE, which presented an image like that of a fetal head.

A 38-year-old woman, gravida 0, presented with a symptomatic uterine fibroid causing increased urinary frequency. Her menstrual amount was normal and hemoglobin level was 12.8 g/dL. Regarding fertility, she requested to undergo conservative treatment with replacement of surgical eradication with UAE. Trans-abdominal ultrasound showed one fibroid 6.6 × 5.7 cm in size on the posterior uterine corpus and another one 2.2 × 1.5 cm in size on the anterior uterine corpus (Figure 1). Five days before UAE, abdominal magnetic resonance imaging (MRI) confirmed a well-defined intramural fibroid measuring 6.5 cm in diameter on



Figure 1. Ultrasonography before uterine artery embolization. There are two fibroids, 6.6 × 5.7 cm and 2.2 × 1.5 cm in size, and no calcification in the fibroids.

the posterior uterine wall with slight hypervascularity and another two intramural fibroids that were 3 and 2 cm in size, respectively. Bilateral UAE combined with an injection of 400–600 μm polyvinyl alcohol (PVA) particles was performed and there were no procedure-related complications. Six months after UAE, the MRI demonstrated a retroverted uterus shrunk from 9.2 × 7.5 × 7.5 cm to 7.8 × 6 × 6 cm with a dominant posterior corpus fibroid 5.2 cm in diameter and another two small fibroids on the anterior wall. The patient also felt an obvious improvement in the urinary frequency. One year later, an ultrasound examination showed an obvious calcified rim surrounding the dominant uterine fibroid, 5.6 × 5.3 cm in diameter, especially at the anterior aspect (Figure 2). Plain abdominal kidney/ureter/bladder (KUB) X-ray showed a radio-opaque structure mimicking a fetal head in the pelvis (Figure 3). The patient has had regular follow-up at the clinic and there has been no progression in the fibroid size or related symptoms.

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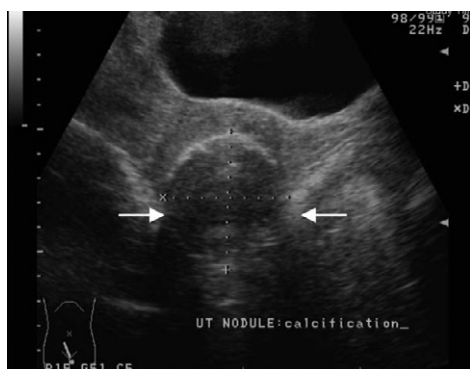


Figure 2. A calcified fibroid 12 months after uterine artery embolization. The hyperechoic rim on the posterior border of the fibroid is masked by acoustic shadow (arrows).

UAE has been used during the last two decades in a variety of clinical settings, including postpartum hemorrhage, catastrophic bleeding after cesarean delivery, and bleeding following gynecological surgery [4]. Ravina [5] first used arterial embolization to treat fibroids in 1991 and published his first series in 1995. The change in the fibroid after UAE has been discussed in many reports. Degeneration is the major presentation of uterine fibroids after UAE and necrosis can be seen on histological study. Histopathological features are classified as hyaline necrosis, coagulative tumor cell necrosis, and acute suppurative necrosis. Hyaline necrosis is typically found in benign smooth muscle tumors that have undergone infarction [6]. Overall, fibroids appear to decrease in echogenicity and, in general, become hypoechoic after embolization due to degeneration [7].

Calcification after natural fibroid evolution can often be seen within the fibroid and presents as an amorphous pattern. The pattern of dystrophic calcification found in fibroids after UAE is similar to the calcification after natural degeneration of fibroids. Colgan et al found dystrophic calcification of infarcted fibroids in 6 out of 18 cases [6]. A calcified rim in an infarcted fibroid does not seem to be the result of dystrophic calcification.

It is believed that the calcified rim is caused by a peripheral inflammatory reaction to deposited PVA particles. PVA particles can aggregate together and occlude small arteries after injection. The PVA aggregates are most often deposited around the periphery of the fibroid [9]. Pathological studies of resected human fibroids after embolization suggest that this development is the result of aggregation of PVA particles in peripheral fibroid arteries. Early perivascular inflammation can be seen related to the PVA deposits and calcification has been observed after 12 months [8]. A series of ultrasound follow-ups after UAE are compatible with the finding in our patient regarding calcification of the



Figure 3. An intact calcified rim in the pelvis mimicking a fetal head (arrows).

fibroid detected 12 months after UAE. However, hyperechogenicity on transabdominal ultrasound was not shown because of an acoustic shadowing effect (Figure 2). The ultrasound finding and phenomenon of a disrupted echogenic rim on the posterior aspect of the fibroid is also attributed to the calcified changes in the fibroid. An intact radio-opaque image mimicking a fetal head was found on KUB (Figure 3).

Calcified rims in the abdomen are not a rare finding in radiography. The rim-like appearance can be described as a wall of calcification surrounding a hollow structure, as in a renal cyst, gallbladder, diverticulum, and visceral aneurysm. Other differential diagnoses include fecal material and the wall of an abscess or hematoma. The calcification of fibroids is usually dense and amorphous. A calcified rim is not a common image finding with fibroids. A rarely observed pattern similar to a calcified rim after UAE is the calcification of fibroids with red degeneration. This type of calcification appears to represent vein thrombosis from past red degeneration [3]. Patients with calcified rims of red degeneration typically experience acute abdominal symptoms during early pregnancies. A history review can discriminate it from calcification after UAE.

The main advantages of UAE are the minimally invasive approach, low risk of procedure-related complications, and possibility for the patients to preserve their reproductive potential [10]. The prognosis after UAE is dependant on the shrinkage of the fibroid, complications after UAE, and the recurrence of fibroids. Observation of calcification of fibroids after UAE shows there is not a greater fibroid volume reduction in those with a complete calcified rim. However, further volume

reduction has been seen in fibroids with incomplete calcification. The calcified fibroids do not increase in size even after hormone replacement therapy for more than 6 months [8]. It seems that the complete calcified rim could point to the end stage of the fibroids. Indeed, the size of the fibroid in this patient was about 5.2–5.6 cm for 5 years and no further size reduction was noted after appearance of the calcified rim. More data are needed to correlate the association of a calcified rim and the change in fibroid size after UAE.

In conclusion, we report a possible change in a fibroid after UAE. There are several causes for calcified rims in the abdomen and some of them are related to acute abdomen. This provides a differential diagnosis of a calcified rim in the abdomen. In the follow-up of patients after UAE, the presence of a complete calcified rim suggests the low possibility of progression of the fibroid in the future, even if the fibroid is under the stimulation of estrogen.

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