
Uterine artery embolization for symptomatic myoma can cause pyomyoma, acute renal failure, and ischemic heart disease: a case report

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Summary

In this paper, I present a case of pyomyoma, acute renal failure, and ischemic heart disease that occurred as a complication of uterine artery embolization for uterine myoma with massive vaginal bleeding. The findings in this case suggest that although uterine artery embolization is generally safe, it may occasionally cause serious acute complications.

Key words: Uterine artery embolization; Uterine myoma; Pyomyoma, acute renal failure; Ischemic heart disease

Introduction

Uterine myomas are the most common gynecologic benign tumors affecting women of reproductive age worldwide. Often, myomas may be asymptomatic or cause only mild to moderate symptoms; in such cases, they may be left untreated. However, if they cause massive or prolonged vaginal bleeding, lower abdominal pain, pelvic pressure, dysmenorrhea, dyspareunia, or increased urinary frequency, medical or surgical treatment may be necessary. The surgical approaches employed in the management of myomas are myomectomy or hysterectomy. Both procedures require induction of general anesthesia, which may be contraindicated in patients with severe underlying diseases and are associated with need for reoperation and possibility of complications, such as bleeding and postoperative adhesion. Furthermore, most patients prefer less expensive and minimally aggressive treatment approaches not requiring hospitalization. Efforts in developing such methods led to the introduction of uterine artery embolization [1].

Uterine artery embolization is a minimally invasive, transcatheter radiologic intervention to block a vessel by particles, with a high success rate of 85-95% [2-3]. The procedure is widely used for the management of postpartum hemorrhage and symptomatic uterine leiomyoma. The most common complications of the procedure are self-resolving fever, while rare complications include ischemic events such as skin necrosis, bladder wall necrosis, muscle necrosis, reflux of emboli into lower limbs vessel, nerve damage, and uterine infarction [3, 4]. Infectious complications include endometritis, pelvic inflammatory disease, tubo-ovarian abscess, and pyomyoma [5]. Pyomyoma re-

sults from infarction and infection of a leiomyoma and is an extremely rare complication of uterine artery embolization, and only a few cases have been reported [6]. Pyomyoma is a life-threatening condition, and of 14 cases reported in a recent case series, the mortality rate was found to be 21% [7]. It can also cause ischemic conditions like uterine necrosis, rectal necrosis, nerve injury, acute renal failure, and infectious conditions like endometritis, pelvic inflammatory disease, tubo-ovarian abscess, and pyomyoma [5]. This paper presents a rare case of acute renal failure, ischemic heart disease, and pyomyoma occurring in a patient with a unilateral kidney who underwent uterine artery embolization.

Case Report

A 51-year-old woman (gravida 4, para 2) was referred to the present tertiary center for the management of unresponsive pulmonary edema and acute renal failure. Two weeks before, she visited the local hospital with massive vaginal bleeding and dizziness. History taking revealed that 25 years ago, she had undergone right nephrectomy after a traffic accident, but had no other health concerns. Initial laboratory tests yielded the following results: serum hemoglobin level, 6.1 g/dL; platelet count, 72,000/uL; serum creatinine level, 1.8 mg/dL was checked. A computed tomography (CT) scan revealed that the uterus was enlarged to the size greater than a fetal head with myoma. Because the patient had only a single kidney and a poor general condition, uterine artery embolization was recommended rather than hysterectomy. Embolization of both uterine arteries was performed via the right femoral artery by using gelfoam particles. Omnipaque was used as the contrast medium. However, within a few hours of the procedure, the patient's urine output reduced considerably, and serum creatinine level increased to 3.1 mg/dL. The patient experienced severe nausea, vomiting, and general weakness. Acute renal failure was diagnosed and hemodialysis was per-

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Figure 1. — Pelvis CT scan shows multiple air pockets in the uterus, indicating myoma necrosis.



Figure 2. — Gross specimen of resected uterus: myometrium shows myometrial abscess with infarction and pyomyoma; endometrium shows chronic ulcer with abscess formation.

formed three times a week; however, the patient's condition did not improve, and the patient's serum creatinine level increased to 10.6 mg/dL. The patient's dyspnea had aggravated, and electrocardiography showed T-wave abnormality.

On admission to the present hospital, the patient's vital signs were stable, but she had chest discomfort and palpitation. The findings of two dimensional echocardiography were highly suggestive of ischemic heart disease and a ^{99}Tcm -methoxyisobutylisonitrile (MIBI) study showed evidence of a right non-transmural myocardial infarct. The patient responded well to the medical treatment administered, and showed symptomatic improvement. However, five days later, the patient developed new symptoms of fever and feverishness and foul, pus-like, bloody vaginal discharge. Broad-spectrum antibiotics were administered and imaging tests were conducted to determine the anatomic cause. Pelvis CT showed multiple air pockets in the uterus, indicating necrosis of the myoma (Figure 1). Although sufficient intravenous antibiotics were administered, the patient's symptoms persisted and levels of inflammatory markers remained elevated.

Therefore, total abdominal hysterectomy and left salpingo-oophorectomy (LSO) were performed 40 days after uterine artery

embolization. Surgical examination revealed that the uterus was enlarged (size greater than a fetal head), with multiple firm masses that were determined to be myomas and severe bowel adhesion. The bowel adhesions were released by the colorectal surgeon. The findings of histologic examination were consistent with myometrial abscess with infarction and pyomyoma (Figure 2).

Microbial culture studies of the pus from the abscess revealed the presence of *Enterococcus faecalis*. Six days after the operation, the patient was discharged without any further complications and recovered completely without need for hemodialysis or heart procedures.

Discussion

The present patient developed uterine pyomyoma two weeks later after uterine artery embolization, with symptoms of foul, purulent vaginal discharge, vaginal bleeding, lower abdominal pain, feverishness, and elevations in the serum levels of C-reactive protein and inflammatory markers. Pyomyoma can be a life-threatening condition and may necessitate surgical treatment and hysterectomy if the patient does not respond to medical therapy with broad-spectrum antibiotics. Gelfoam is used for uterine artery embolization. Gelfoam, a water-insoluble hemostatic material is widely used as a biodegradable, intravascular embolic agent that is absorbable and arteries occluded with gelfoam can be recanalized within several weeks [8]. After gelfoam embolization, uterine necrosis with infection rarely occurs [9]. Furthermore, the diameter of the occluded artery was an important factor of uterine necrosis [10, 11]

The present author performed a literature search for articles pertaining to acute renal failure after uterine artery embolization and retrieved one case [12]. In the current case, the patient's initial serum creatinine level at the first hospital was 1.8 mg/dL, indicating only mild impairment of renal function. The functioning of the remaining kidney may have been compromised by the compression the ureter by the large leiomyoma. Another possibility is that the hypotension caused by the acute massive vaginal bleeding may have led to decreased renal perfusion, resulting in mild abnormalities of the renal function test. Some hours after uterine artery embolization, the patient had reduction in urinary volume, and developed uremic symptoms such as nausea, vomiting, and general weakness. These symptoms were caused by hypoperfusion of the patient's dysfunctional single kidney by renal toxic agents, non-steroidal anti-inflammatory drugs (NSAIDs) [12, 13], and contrast media [14]. NSAIDs cause a decrease in the serum levels of prostaglandin and regulate vasodilatation at renal glomerulus. Acute kidney injury by NSAIDs is caused by an impairment of renal blood flow by inhibiting the renal compensatory mechanism of prostaglandin. Additionally, NSAIDs cause interstitial nephritis characterized by an immunologic reaction, resulting in renal impairment. Contrast nephropathy is an acute decrease in renal function after the use of intravenous contrast media. The use of contrast has

been associated with renal tubular cell toxicity and renal medullary ischemia [14]. The risk factors affecting contrast nephropathy are pre-existing renal impairment, decrease in effective arterial volume due to hypovolemia or congestive heart failure, and concurrent use of nephrotoxic agents such as NSAIDs. These risk factors were observed in the present patient.

The present patient developed dyspnea, chest discomfort, and palpitation two weeks after uterine artery embolization, and electrocardiography and two-dimensional echocardiography showed signs of possible ischemic heart disease. Fortunately, the patient responded well to conservative treatment, thereby precluding further invasive procedures. In this case, the author believes that ischemic heart disease may have been caused by acute hypovolemia and hemodynamic instability due to massive vaginal bleeding, and during the period of hospitalization, the patient's general condition was poor, which may have further worsened the heart disease.

Thus, the findings in this case shed new light into the possible complications of uterine artery embolization. Therefore, patients undergoing uterine artery embolization should be thoroughly evaluated to rule out the possibility of complications such as acute renal failure, ischemic heart disease, and pyomyoma.

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