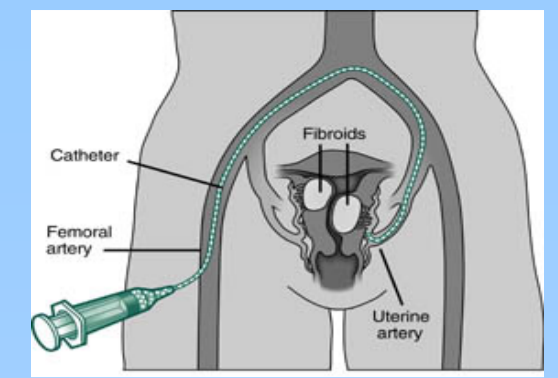


Myometrial air infiltration following postpartum Uterine Artery Embolization: Interpretation of CT and ultrasound images in the acute post-procedure period

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Introduction

Uterine Artery Embolization is being increasingly utilized to treat postpartum hemorrhage. Little is known regarding normal imaging findings in the post-embolization postpartum uterus. We present a case of atony related postpartum hemorrhage successfully controlled by arterial embolization, which was complicated by post-embolization fevers and imaging findings of air infiltration throughout the myometrium.

Case Report

A 42-year-old woman, gravida 3 para 2002, presented in labor at term. The patient's labor proceeded without complication, for a spontaneous vaginal delivery. The initial estimated blood loss was 400 mL, but for several hours after delivery the patient experienced episodic uterine atony with hemorrhage totaling an estimated additional 2000 mL. No vaginal or cervical lacerations were visualized, however, a 6cm submucosal fibroid was palpable. Treatment included pitocin IV, cytotec 600 mcg per rectum, and several doses of carboprost tromethamine 0.25 mg IM. A Bakri balloon was placed in the uterus and inflated with 400 mL of saline. The patient also was transfused 4 units packed red blood cells.

After 850 mL further blood loss, accompanied by hypotension to 80/60, Uterine Artery Embolization was performed using the right common femoral artery approach. Pelvic arteriography demonstrated enlarged, tortuous uterine arteries supplying the postpartum, hypervascular uterus. Selective arteriography of the left uterine artery showed no active extravasation of contrast to suggest hemorrhage, which is the typical finding in postpartum hemorrhage cases. A 3 French microcatheter was used to perform embolization bilaterally using gelfoam suspension (gelfoam mixed with iodinated contrast) until arterial stasis was achieved. Post-embolization arteriography showed flow in the proximal uterine arteries, but static flow into the distal uterine artery branches.

Post-embolization, the patient had no further vaginal bleeding. She remained hemodynamically stable, but began having fevers as high as 39.7°C (103.5°F). She was started on broad spectrum antibiotics for suspected endometritis, but post-embolization uterine necrosis was also considered. On postpartum day #4, a CT scan and pelvic ultrasound showed an enlarged uterus with a submucosal fibroid, and air tracking into the myometrium (Figures 1 and 2). The imaging findings were worrisome due to concern for uterine necrosis or a gas forming infection. With limited data on normal imaging of the uterus following embolization for postpartum hemorrhage, the findings were difficult to clinically interpret.

Given the patient's overall good clinical condition, expectant management with continued antibiotic therapy was followed. Her fevers resolved by postpartum day #6, and she was discharged home. Her recovery thereafter was uneventful until two months later when she presented complaining of persistent cramping. Her cervix was dilated due to the 6 cm submucosal fibroid, now necrotic, attempting to pass. In the operating room, the necrotic fibroid was easily removed vaginally. She had no further complications.

Images

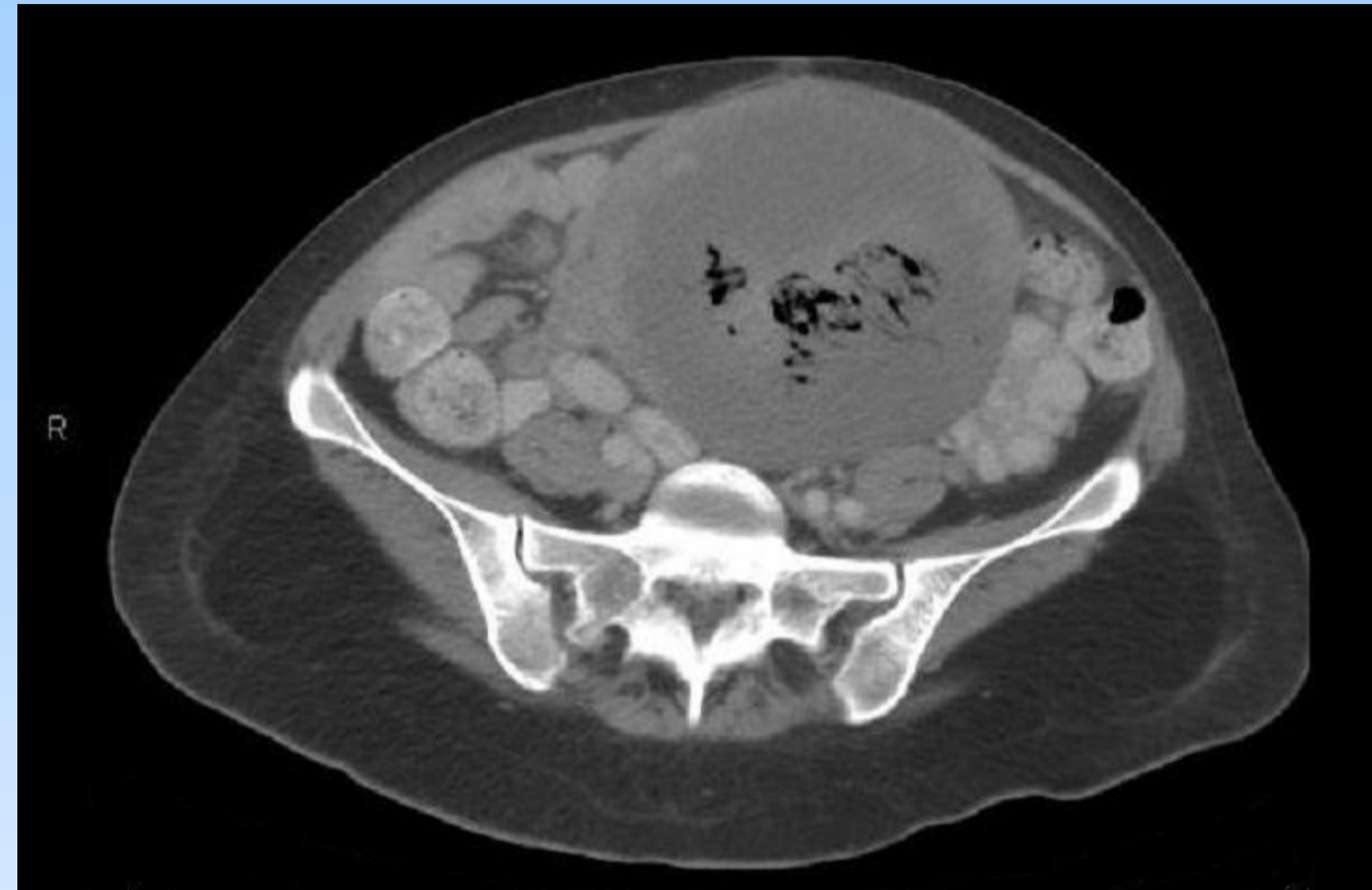


Figure 1. CT scan showing air infiltrating myometrium following postpartum embolization



Figure 2. Ultrasound showing air infiltrating myometrium following postpartum embolization

Discussion

Since its first reported usage in 1979, arterial embolization for the control of refractory postpartum hemorrhage has become an increasingly utilized option [1]. Originally used as a final attempt at hemostasis following hypogastric artery ligation or hysterectomy, Uterine Artery Embolization instead has the ability in many cases to avoid laparotomy and preserve the uterus. Most women regain normal menstruation following embolization, and future pregnancy is possible [2-4]. While these case series have demonstrated a success rate exceeding 85% for the control of obstetrical hemorrhage, embolization is not without potential complications. Ischemia and necrosis have been reported, including that of the uterus itself [5], and of other surrounding structures such as bladder wall [6], and vascular compromise of the buttocks [7] and lower extremities [8].

It is important to be able to distinguish post-procedure complications from the normal course. Post-Embolization Syndrome, thought to be due to cytokine release, associated with the non-pregnant Uterine Fibroid Embolization (UFE), may also occur following postpartum Uterine Artery Embolization (UAE), causing abdominal pain, fever, leukocytosis, and nausea and vomiting, with onset 1-5 days following the procedure, typically lasting 2-7 days [9]. Clinical judgment must be used to differentiate benign Post-Embolization Syndrome from life threatening uterine necrosis or an infectious process.

Conclusion

The findings of air permeating through the myometrium on ultrasound and CT scan, while initially considered very worrisome, did not represent uterine necrosis or an infectious process. Although air introduced into the arteries during embolization is limited, this is not an uncommon occurrence, with air trapped in the gelfoam suspension routinely introduced. These images provide a useful information about the puerperal uterus as it may appear four days after Uterine Artery Embolization. Similar patients may be conservatively managed if clinically stable otherwise.

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