Ruptured traumatic ovarian artery pseudoaneurysm in a pregnant patient

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A woman at 36 weeks’ gestation was involved in a motor vehicle crash. She required emergency delivery of a healthy infant by cesarean section. She received anticoagulation, despite a splenic injury, for a possible inferior vena cava clot. She re-presented with new retroperitoneal hemorrhage around the juxtarenal aorta. A computed tomography scan suggested a vague contrast blush anterior to the aorta. Arteriography disclosed a right ovarian artery pseudoaneurysm, which was treated with microcoil embolization. The patient has subsequently recovered fully. In major trauma in pregnant patients, ovarian artery pathology needs to be considered in the differential diagnosis of post-traumatic hemorrhage. (J Vasc Surg Cases 2015;1:36-8.)

Traumatic injuries in pregnant women present a unique set of problems. Many physiologic changes occur in pregnancy, including hypertrophy of uterine and ovarian arteries and veins to accommodate the growing fetus. Obviously, there are also two lives to consider with major trauma in a gravid woman. The priority is to save the mother’s life first, and hope to salvage the fetus if possible. Indicators of increased risk of adverse outcome with trauma in pregnancy include abdominal trauma and third-trimester trauma, both of which were present in the patient we present here.

Ovarian artery aneurysm or pseudoaneurysm has very rarely been described. It is associated with the mid-to-distal artery in most cases and usually in postoperative hysterectomy patients or postpartum patients, although spontaneous rupture has been described. Traumatic disruption of the ovarian artery has only been reported once previously, which was treated surgically. Rupture at the origin of the ovarian artery with endovascular treatment has not been previously described. Consent was obtained from the patient to publish this case report.

CASE REPORT

A 36-year-old gravida 5 para 4 woman at 36 weeks’ gestation was the restrained driver in a high-speed motor vehicle crash. Her vehicle was initially struck on the driver’s side by a driver who ran a stop sign. The patient’s car then continued forward and struck a light pole. Before the car burst into flame, the patient was extricated by a passerby. Her airbag had deployed. The patient did not lose consciousness and had not been drinking alcohol. She was hypotensive en route to the hospital but stabilized with fluid resuscitation.

Fetal monitoring upon arrival to the trauma center disclosed fetal distress. She was taken for emergency cesarean section and delivered a live female infant with Apgar scores of 6 and 10. No active intraperitoneal hemorrhage was seen, so the uterus and abdomen were closed. The patient then had a computed tomography (CT) scan of the abdomen and pelvis disclosing a grade 3 splenic injury and what was felt to indicate possible clot in the inferior vena cava. In retrospect, this was likely flow artifact from the enlarged ovarian vein entering the inferior vena cava. A Celect (Cook Medical, Bloomington, Ind) inferior vena cava filter was placed, and a decision was made to heparinize the patient despite the splenic injury.

She remained hemodynamically stable with stable serial hematocrits. The patient was transitioned to Lovenox...
(Sanofi-Aventis, Bridgewater, NJ), and warfarin was prescribed. She was allowed to go home on post-trauma day 3. Her infant was healthy and also discharged to home.

The patient came to the emergency department 2 days later with hypotension and new midabdominal pain. A repeat CT scan with contrast disclosed a new retroperitoneal hematoma around the infrarenal aorta. A vague contrast blush was seen just anterior to the aorta, below the renal arteries (Fig 1). This was felt to represent an aortic pseudoaneurysm. The patient was stabilized and taken urgently for arteriography.

An initial flush aortogram disclosed contrast anterior to the aorta, just below the renal arteries, without active extravasation and eventual disappearance. In an attempt to locate the abnormal vessel, select imaging of the left renal artery, superior mesenteric artery, and left internal iliac artery showed no abnormalities. We then searched the area of the abnormality with a select catheter and cannulated what turned out to be the origin of the left ovarian artery with a pseudoaneurysm and some maintained distal flow (Fig 2).

We used the Progreat Coaxial Microcatheter system (Terumo Medical Corp, Somerset, NJ) to cannulate the more distal ovarian artery. Through the microcatheter, we placed a Miracle Bro 0.14-inch wire (Asahi Intecc USA, Santa Ana, Calif). Imaging now showed the pseudoaneurysm just distal to the wall of aorta. We replaced the microcatheter and placed three microcoils from distal to proximal and packed into the pseudoaneurysm cavity. Final imaging showed no flow into the ovarian artery or the pseudoaneurysm and no coil extension into the aorta (Fig 3).

The patient stabilized nicely, but did require a 2-U transfusion of packed red blood cells. The trauma team felt strongly that anticoagulation should be resumed, and this was done on postprocedural day 2. Her splenic injury did not bleed and remained stable. She was ultimately discharged home on Lovenox and transitioned to warfarin. A follow-up CT scan at 1 month after injury showed a healing splenic injury and a resolving retroperitoneal hematoma. The patient was tolerating a regular diet and had a healthy infant. Anticoagulation was stopped 1 month later. The result of an inferior vena cavagram was normal, and the inferior vena cava filter was successfully retrieved. She continues to do well, with no apparent ill effects of the trauma except for improving low back pain and a healing left elbow fracture.

**DISCUSSION**

The anatomy of the ovarian arteries is quite variable. In most patients, a pair of ovarian arteries arises from the anterolateral infrarenal aorta. The usual site of origin is the level of L2, as seen in our patient; however, the ovarian arteries can originate from L1 to L4. Up to 20% of ovarian arteries can originate from the renal arteries. Rarely, they branch from the adrenal, lumbar, or internal iliac arteries. The artery then usually takes a tortuous course anterior to the
ureter, supplies the ovary, and anastomoses with the uterine arteries.15

Studies of women undergoing uterine fibroid embolization have shown some fibroids with a significant arterial supply from the ovarian arteries. In such patients, treatment of the uterine arteries and ignoring the ovarian arteries results in an 8% rate of failure of the treatment of the fibroid.15

The ovarian arteries in our patient were likely hypertrophied to allow additional flow to the uterine arteries to support the gravid uterus and fetus. The patient sustained lateral and anterior forces to the aorta during the automobile crash, and either or both forces may have contributed to the partial avulsion of the right ovarian artery. Anticoagulation then allowed significant delayed bleeding. The natural history of this pseudoaneurysm if the patient were not anticoagulated is not known. Because there is significant pelvic collateralization, sacrifice of the ovarian artery should have no long-term sequelae. In retrospect, the patient likely did not have thrombus in the inferior vena cava but only flow artifact from inflow from a dilated ovarian vein. The cavagram done at the time of inferior vena cava filter insertion did not show evident clot. Despite this, the trauma surgeon felt strongly that anticoagulation was necessary. Obviously, this might have facilitated the retroperitoneal bleed.

Paulus et al14 reported the delayed post-traumatic rupture of the ovarian artery in a 66-year-old woman after trauma. The bleeding was delayed 9 days post-trauma and treated surgically, with a good result. Spontaneous rupture of ovarian artery aneurysms has been described in several case reports.2,3,5,7,8,11 Bilateral staged endovascular repair in one patient was described. The initial aneurysm was ruptured, with the contralateral treated electively at a staged procedure. Both were treated with endovascular techniques.2 Postpartum rupture and posthysterectomy rupture has also been described. Treatment has been surgical and with coil or particle embolization. A case such as ours, with endovascular treatment of a traumatic ovarian artery pseudoaneurysm at the origin of the vessel, has not been previously described.

CONCLUSIONS

Trauma causing ovarian artery pseudoaneurysm is exceedingly rare. Still, this should be in the differential diagnosis of bleeding with major trauma in pregnant women.

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