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Preoperative Magnetic Resonance Imaging and Antepartum Myomectomy of a Giant Pedunculated Leiomyoma

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BACKGROUND: Antepartum myomectomy is reserved for severe pain and prevention of fetal complications. Magnetic resonance imaging has been useful in nonpregnant women for preoperative management and patient counseling.

CASE: A primigravida was admitted at 12 weeks of gestation in severe acute abdominal pain with a large abdominal mass, confirmed by magnetic resonance imaging to be a pedunculated 30×27×19–cm uterine leiomyoma. An uncomplicated abdominal myomectomy was performed, incorporating a flat cup vacuum device to mobilize the mass without disturbing the gravid uterus. The patient later had an uncomplicated term vaginal delivery and healthy newborn.

CONCLUSION: Magnetic resonance imaging and a flat cup vacuum device were helpful in preoperative planning and performing an uncomplicated abdominal myomectomy during pregnancy, respectively.
(Obstet Gynecol 2008;111:577–9)

The true prevalence of uterine leiomyomata in pregnancy is unknown. However, they have been detected by ultrasonography in 2.7% of pregnancies after 24 weeks of gestation.[1] Uterine leiomyomata are associated with pregnancy-related maternal and fetal complications, including miscarriage, threatened preterm labor, preterm delivery, placental abruption, placenta previa, obstructed labor, cesarean delivery, breech presentation, malposition, and severe postpartum hemorrhage.[1,2] Massive uterine leiomyomata may be associated with fetal growth restriction and fetal compression syndromes.[3] Magnetic resonance imaging (MRI) is often used to complement or clarify equivocal ultrasonography in the evaluation of pelvic masses. In addition, MRI is superior to ultrasonography in defining spatial relationships and characterizing the embedment of uterine leiomyomata in nonpregnant women.[4] Therefore, MRI has been described as an important tool in preoperative planning for cases in which mapping of uterine leiomyomata is paramount. We describe a case in which MRI aided in the diagnosis and preoperative strategy for a patient who underwent an antepartum myomectomy of a giant pedunculated leiomyoma at 12 weeks of gestation.

CASE

A 22-year-old gravida 1, para 0 woman presented to an outlying emergency department at 7 weeks of gestation with abdominal discomfort and an abdominal mass palpable to just below the xiphoid process. She reported that her abdomen started increasing in girth several months before pregnancy. A giant uterine leiomyoma was suspected by the maternal–fetal medicine consultant, who planned a second-trimester MRI given concern for preterm delivery or severe fetal compression syndrome. Expectant management with oral analgesics (5 mg/325 mg oxycodone/acetaminophen tablets) was recommended until 12.0 weeks of gestation, at which time she was admitted with severe intractable acute abdominal pain. Examination revealed a firm, severely tender abdominal mass unchanged in size. Magnetic resonance imaging confirmed the diagnosis of a 30×27×19–cm giant pedunculated leiomyoma. T1- and T2-weighted images without contrast clearly demonstrated the leiomyoma arising from the right fundus by a 3-cm stalk (Fig. 1). Multiple areas of cystic degeneration within the leiomyoma were appreciated by MRI and felt to be the cause of the patient's symptoms. No ascites or hydronephrosis was noted. Because of the patient's severe pain, failed expectant management, and concern regarding the prognosis of the pregnancy, the patient underwent an uncomplicated abdominal

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Fig. 1. T2-weighted magnetic resonance sagittal image demonstrating a giant leiomyoma *(asterisk)* undergoing cystic degeneration and connected to the gravid uterus *(open arrow)* by a 3-cm stalk *(solid arrow)*.
Alanis. Antepartum Myomectomy. Obstet Gynecol 2008.

myomectomy procedure at 12.1 weeks of gestation via a midline, vertical incision. A Kiwi manual vacuum system (Clinical Innovations, Murray, UT) was used to mobilize the mass out of the peritoneal cavity while minimizing disturbance of the gravid uterus (Fig. 2). A giant, pedunculated 7.95-kg leiomyoma was noted to be vascularized by several saprophytic vessels from the omentum and bladder (Fig. 3). The stalk was cross-clamped near its base and over-sewn with a baseball stitch. The myometrium was not incised. Cefazolin 1 gram intraveneuously was used preoperatively. No perioperative tocolytic therapy was employed. The patient was discharged home on postoperative day 3, and the remainder of her pregnancy proceeded unremarkably. At 38 weeks of gestation the patient went into spontaneous labor followed by a vaginal delivery of a 2,330-gram male neonate. Both the infant and mother were discharged home on postpartum day 2. The patient was diagnosed with preeclampsia on postpartum day 7, which resolved without sequelae.

COMMENT

Antepartum myomectomy has been discouraged in the past over fears of bleeding and pregnancy-related complications. However, Mollica et al[5] demonstrated that antepartum myomectomy reduced the rate of miscarriage and cesarean hysterectomy in women with recurrent severe pain, large or rapidly-growing leiomyoma, or leiomyomata, which distorted the placental site. Retrospective and observational series document the safety and low risk of antepartum myomectomy in well-selected patients.[6,7] The most common and important reason for antepartum myomectomy is severe abdominal pain that is not amendable to conservative medical management. Angtuaco et al[8] reported on the efficacy of MRI in the pregnant patient with an acute abdomen for differentiating degenerating uterine leiomyomata from ovarian torsion, which can be especially difficult in cases with a large pedunculated leiomyoma. Transabdominal ultrasonography could not contribute to the diagnosis in

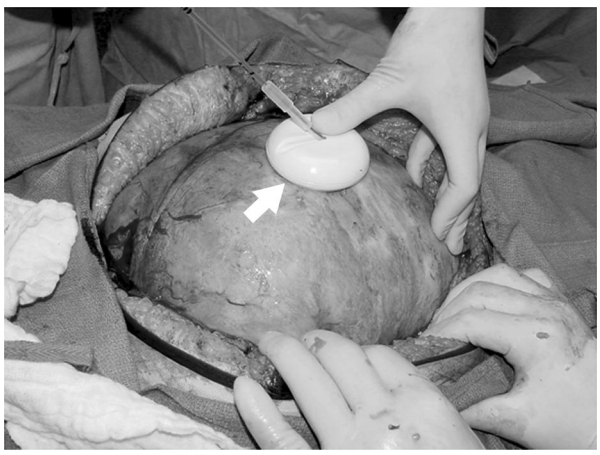

Fig. 2. A manual vacuum cup *(arrow)* is applied to the anterior surface of the leiomyoma to enable its mobilization while minimizing disturbance of the pregnant uterus.
Alanis. Antepartum Myomectomy. Obstet Gynecol 2008.

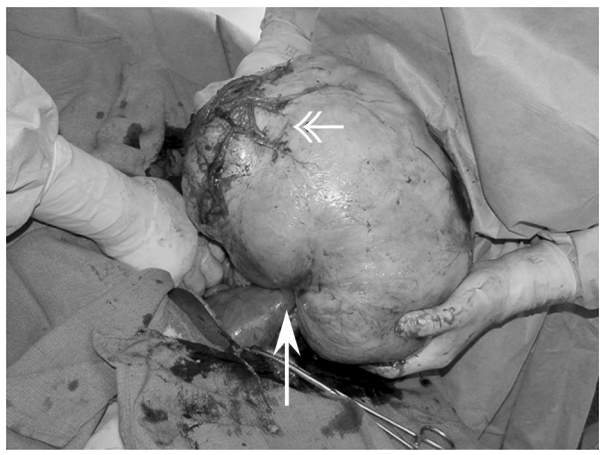

Fig. 3. Saprophytic vessels *(double-headed arrow)* to the omentum and bladder have been divided, and the narrow stalk can be seen at the base of the leiomyoma where it is connected to the uterus *(single-headed arrow)*.
Alanis. Antepartum Myomectomy. Obstet Gynecol 2008.

our patient, because the density and size of the leiomyoma rendered the ultrasound image non-interpretable. The decision to operate was made after MRI confirmed the diagnosis and described the pedunculated nature of the 30-cm leiomyoma nearly 8 kg in weight. The weight of the newborn was small for gestational age. This may have been influenced by several mechanisms, including constitutional factors, maternal smoking, or preeclampsia, although this was not clinically evident until postpartum day 7. Magnetic resonance imaging provides essential topographic information and helps exclude other pathology, making antepartum myomectomy a good option in pregnant patients with large or painful uterine leiomyomata that do not respond to conservative medical management.

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Computed Tomography–Based Radiation Therapy of Ovarian Remnants for Symptomatic Persistent Endometriosis

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BACKGROUND: Endometriosis, a major cause of pelvic pain in women, is driven by estrogen. Ovarian remnant irradiation may alleviate pelvic pain by eliminating estrogen production in appropriately selected women with endometriosis.

CASE: Three patients with endometriosis causing incapacitating pelvic pain received 3D-imaging–based external beam radiation to doses of 1,500 to 2,100 cGy. All had pre-irradiation premenopausal follicle stimulating hormone levels and imaging evidence of ovarian remnants. None were candidates for further medical or surgical interventions. By 3 months after radiation, follicle stimulating hormone levels reached postmenopausal levels in all three patients, with complete resolution of the severe pelvic pain.

CONCLUSION: Radiation therapy effectively induced menopause and relieved refractory pain from endometriosis. Careful selection of patients is necessary, given the potential for an increased long-term risk of radiation-related complications.

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Endometriosis is the presence of ectopic endometrial glands and stroma outside the endometrial cavity. The prevalence of endometriosis is up to 22% in asymptomatic women.[1] Approximately 80% of women undergoing laparoscopy for chronic pelvic pain carry a diagnosis of endometriosis, and it is the third most common cause of gynecologic hospitalizations.[2,3]

The pain caused by endometriosis may be multifactorial in causation; reduction in estrogen levels by medical or surgical suppression has been previously reported to relieve the pain. A long-standing precedent exists for administering 16 to 20 Gy of radiation directed to the ovaries to induce menopause in premenopausal women with breast cancer.[4] Ovarian ablation by radiation has been historically reported in the treatment of endometriosis under rare circumstances when medical and surgical interventions have failed to palliate pain. However, the use of three dimensional (3D) imaging for simulation to target the

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