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Case Report

Diagnosis of abnormally invasive posterior placentation: the role of MR imaging

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ABSTRACT

Abnormally invasive placentation is becoming more common with a recent increase in cesarean sections and maternal age, among other risk factors. Ultrasonography is the first line-imaging, but it can be difficult to diagnose when limiting factors are present. Failure to recognize this serious placental abnormality precludes us from making the appropriate plan for the delivery and consequently can lead to fatal results. In this report, we present a case in which magnetic resonance imaging was used to diagnose posterior placenta increta missed by multiple sonographic examinations in a patient with previous myomectomies, and we also include a review of the literature on this topic. It is our conclusion that magnetic resonance imaging is superior to sonography to diagnose abnormally invasive placentation in cases of posterior placenta previa and high pretesting probability.

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Introduction

Abnormally invasive placentation (AIP) has had a recent rise because of the increased rate of multiple risk factors including advanced maternal age, previous cesarean section, multiparity, myometrial scarring from prior uterine surgery, and placenta previa. AIP occurs when the placenta has an abnormal attachment to the uterus, invades into the myometrium, or invades through the uterus to attach to nearby organs. Any disruption in the decidua of the uterus increases the risk of AIP. With a maternal mortality as high as

7% reported in cases with AIP [1], it is critical to make an accurate and early diagnosis that allows us to take the appropriate measures approaching the delivery. For many years, ultrasound has been the first imaging modality used in the assessment of AIP. However, it is limited by several factors including the patient's body habitus, a posteriorly located placenta, and the skills of the ultrasound operator. These limitations are practically eliminated by magnetic resonance imaging (MRI), which is emerging as an accurate diagnostic test of AIP. The following case and review of the literature discuss the role that MRI plays in the diagnosis of AIP,

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specifically in pregnancies with posterior placenta and risk factors for AIP.

Case report

The patient was a 37-year-old G2P0A1 obese woman (body mass index 41.4 kg/m²) presenting for an initial prenatal visit with a singleton intrauterine pregnancy at 9^{0/7} weeks gestation conceived by in-vitro fertilization. Her past obstetric history was significant for a twin pregnancy loss at 14 weeks managed by a dilation and curettage procedure. Her surgical history was remarkable for 2 prior myomectomies in the posterior uterine wall.

Her pregnancy course was complicated by multiple episodes of vaginal bleeding. The first episode occurred at 12^{4/7} weeks of gestation that resolved spontaneously. She was admitted to the hospital at 19^{1/7} weeks because of a new episode of vaginal bleeding. During this period, she had 2 abdominal and transvaginal ultrasound examinations at 16 and 19 weeks of gestation that showed a posterior placenta previa without evidence of accreta.

She experienced another episode of heavy vaginal bleeding at 20^{5/7} weeks requiring transfusion of 2 units of blood. An abdominal-pelvic MRI was then obtained to further assess the possibility of AIP. The MRI revealed a complete placenta previa with the placenta located posteriorly and inferiorly within the uterus (Fig. 1). The placenta was heterogeneous inferiorly and posteriorly in the lower uterine segment. Abnormal low signal intensity bands were identified on T2-weighted images within the posterior uterus near the site of the patient's myomectomy (Fig. 2). In addition, prominent periuterine vasculature was identified about the lower uterine segment, appearing as

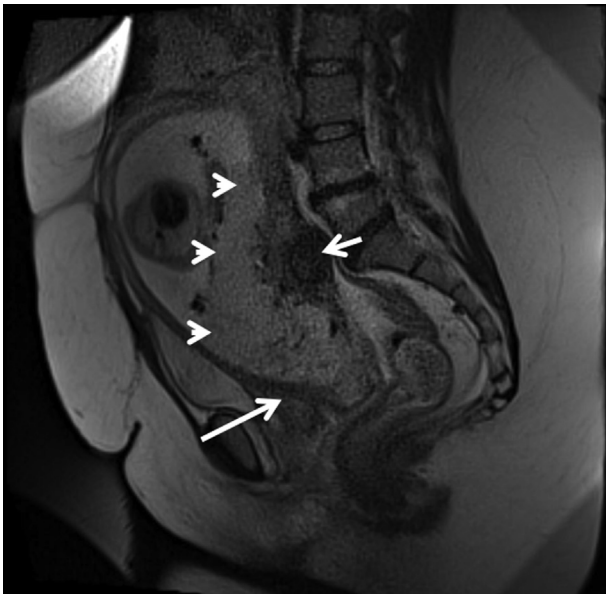


Fig. 1 – Half-Fourier acquisition single-shot turbo spin-echo (HASTE) magnetic resonance imaging (MRI). Sagittal section depicting the posteriorly located placenta (arrow heads) covering the internal os of the cervical canal (long arrow) as well as the posterior myomectomy site (short arrow).

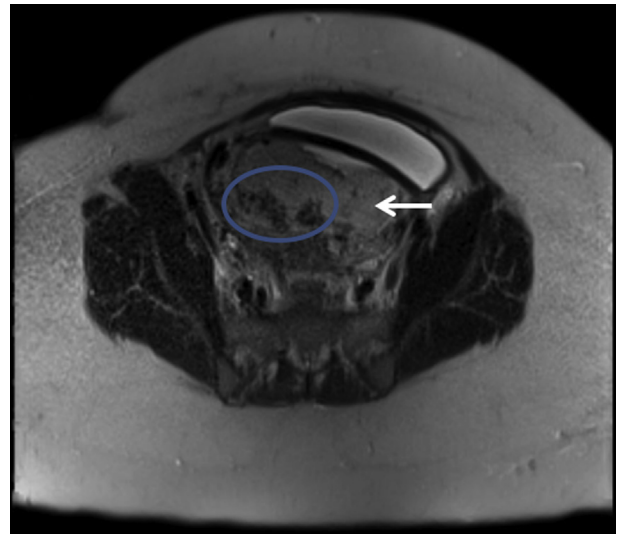


Fig. 2 – T2-weighted axial MRI. This image depicts dark T2 bands (circled) posteriorly in the placenta (arrow).

tubular high signal intensity structures on TrueFISP sequences (Fig. 3). No frank transmural extension of placenta or placental vascularity was identified. The constellation of findings was highly suggestive of placenta accreta or increta. The placenta located cephalad to the myomectomy site demonstrated normal signal intensity with a normal underlying myometrial interface. The site of prior myomectomy was well delineated at MRI, appearing as a 3.5 cm well-defined area of low T2 signal intensity within the posterior lower uterine segment (Fig. 4). A T1-weighted image also demonstrated small retroplacental hematomas superior to the myomectomy site. Interestingly, another transvaginal ultrasound performed at 24 weeks still could not identify any signs of AIP (Fig. 5).

Her next episode of significant active vaginal bleeding occurred at 25 weeks that continuously progressed and delivery by cesarean section was then indicated. Her surgery was performed by a multidisciplinary team including a gynecologist oncologist, a maternal-fetal medicine specialist, and a general gynecologist. The preparation included 2 large peripheral IV lines, one central IV line, and blood products were in the room for immediate transfusion. Intraoperatively, a gravid uterus was identified with significant levorotation because of posterior adhesive disease involving the sigmoid colon. The sigmoid colon was noted to be densely adherent to the posterior aspect of the uterus and the posterior cul-de-sac was obliterated. The adnexa were densely adherent to the surrounding tissue bilaterally. In addition, the bladder was adherent to the anterior surface of the uterus to the level of the round ligaments bilaterally. The infant was delivered through a high transverse hysterotomy. The placenta was not removed given the high index of suspicion for AIP, and she underwent a total abdominal hysterectomy and extensive lysis of adhesions. She received multiple units of blood products intraoperatively. Her postoperative course was complicated by ileus and one febrile episode. She was discharged home on postoperative day 5 in a satisfactory clinical condition.

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