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CASE REPORT PEER REVIEWED | OPEN ACCESS

MRI and placenta accreta: Keys for its interpretation in images, regarding a case

Francisca Aliaga, Fernanda del Campo, Rolando Cocio, Giancarlo Schiappacasse, Sebastián Blanco, Yumay Pires

ABSTRACT

Introduction: Placenta accreta spectrum (PAS) refers to the abnormal adherence of the placental trophoblast to the uterine myometrium. Several conditions are associated with its development. Ultrasound is the imaging modality of choice for antenatal diagnosis. In cases of doubt, magnetic resonance (MR) plays a leading role, due to its high performance, and contributes to surgical planning. The final diagnosis is made in the surgery, with subsequent confirmation by pathology. The objective of this article is to present a case of placenta increta, focused on the imaging findings in magnetic resonance imaging (MRI).

Case Report: We present a case of a 35-year-old woman with a history of 2 previous cesarean sections and chronic hypertension, who presented a 23-week pregnancy with obstetric ultrasound showing placenta accreta. An MRI was performed, and it showed signs of placenta accreta, with no evidence of transmural extension to adjacent organs. At 34 weeks, a cesarean section and hysterectomy were performed, with no evidence of bladder invasion.

Conclusion: The diagnosis of PAS is made antenatal with ultrasound, but MRI has been used in some cases, with some characteristic features that every radiologist should know.

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INTRODUCTION

Placenta accreta spectrum (PAS) disorders represent abnormal implantation of placental components into the uterine myometrium and remain the leading cause of peripartum hysterectomy in Western countries. The main risk factors of PAS correspond to conditions that are associated with scars or lesions of the uterine wall [1].

Ultrasound is the method of choice for antenatal diagnosis, due to its wide availability; however, it is affected by amniotic fluid, intestinal gas, and the position of the placenta. In cases of diagnostic doubt or characterization of the involvement, magnetic resonance (MR) plays a leading role, due to its high resolution and little involvement of the aforementioned factors. Magnetic resonance makes it possible to define more precisely the involvement of adjacent organs in case of suspected placenta percreta, and thus contributes to surgical planning [1–5].

The precise diagnosis is made in the surgical act due to the impossibility of separating the placenta from the uterus, with subsequent pathological confirmation.

The objective of this article is to present a case of placenta increta, focused on the imaging findings in MRI.

CASE REPORT

We report a case of a 35-year-old female patient with a history of 2 previous cesarean sections and chronic hypertension, who presented a 23-week pregnancy with obstetric ultrasound showing a totally occlusive anterior placenta, with some placental lacunae, thinning of the perivesical myometrium, and loss of a clear zone, consistent with placenta accreta (Figure 1). At 27 weeks of pregnancy, she consulted for heavy metrorrhagia, without pain. She was hospitalized for observation and fetal maturation. It was decided to complete the study with MRI to evaluate possible interconsultation with urology. Magnetic resonance imaging showed uterine bulge, with an hourglass shape, anterior and low insertion placenta, determining occlusion of the internal cervical os, as well as low-signal bands on T2WI and some aberrant vascular structures especially at its anterior–inferior edge, as well as some lobulation, findings that suggest accreta, with no signs of transmural extension to adjacent organs (Figures 2–5).

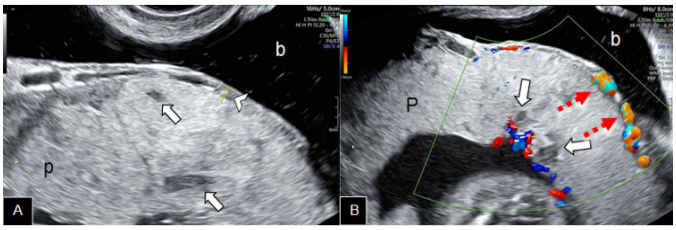

Figure 1: (A, B) Obstetric ultrasound images, in gray scale (A) and color Doppler (B). Placental lacunae (arrows), thinning of the prevesical myometrium demarcated with yellow crosses (arrowhead in A) are observed. Also vascular structures are depicted in direct relation to the bladder wall (dashed red arrows in B). p: placenta; b: bladder.

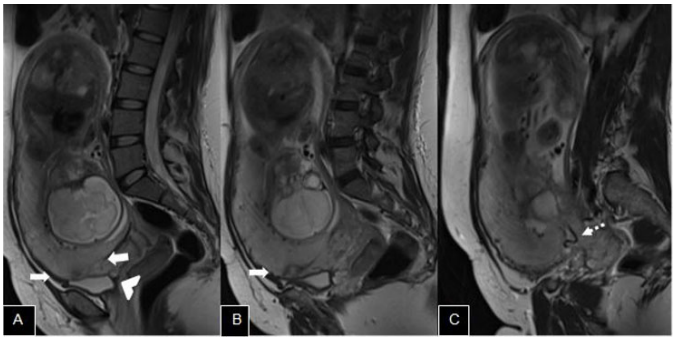

Figure 2: (A and B) Sagittal T2 WI images show hypointense bands at the uteroplacental interface (arrows), in addition to loss of continuity of the hypointense line that represents the myometrium and with placental prominence that imprints on the bladder (arrowhead). (C) Parasagittal section demonstrating contiguous hypointense vascular structures (dashed arrow).

At 34 weeks, the fetal heart rate dropped, with sustained bradycardia, so she was transferred to the ward. A cesarean section and hysterectomy were performed, where uterine rupture was evidenced with 700 cc of hemoperitoneum. There was no evidence of bladder invasion. The surgical specimen was sent for pathological examination. The uterus, partially opened at the anterior wall, showed a placental disc firmly attached to the lower uterine segment that was thinned and deeply occupied by placental tissue (Figure 6).

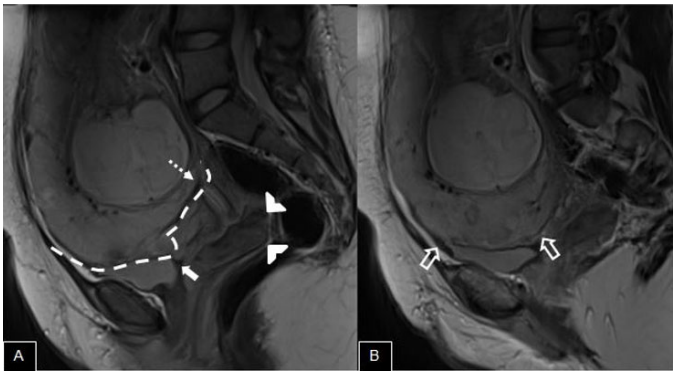

Figure 3: (A and B). T2 WI images show irregularity of the edges of the inferior aspect of the uterus with profile protrusion demarcated with the white dashed line in A, imprinting the posterior aspect of the bladder (arrow in A), partial occlusive placenta (dashed arrow), blood content of the vaginal fundus (arrowheads) and hypointense bands in the most caudal aspect of the uterus (empty arrows in B).

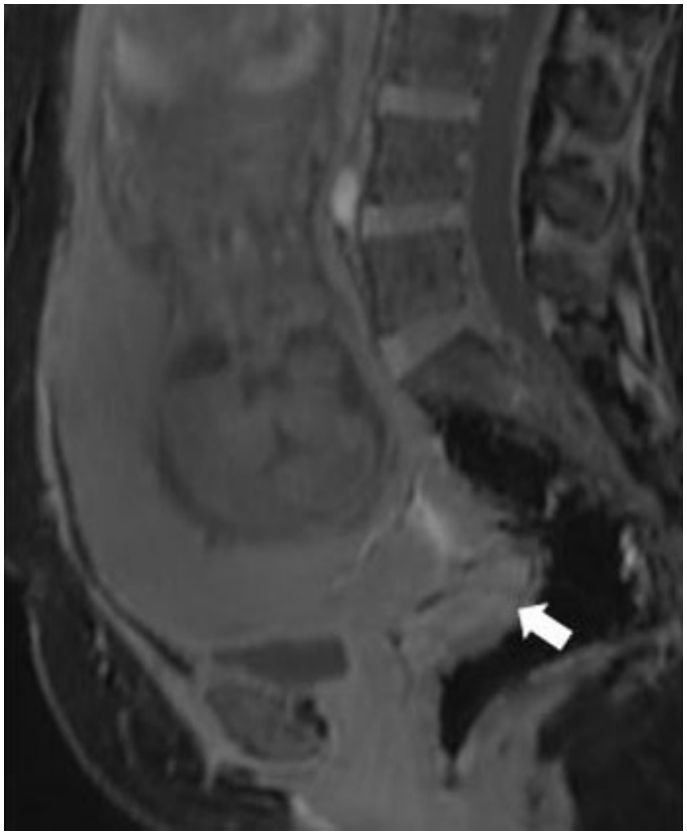

Figure 4: Sagittal T1 WI fat saturation images. It shows hyperintense content in the posterior vaginal fornix consistent with blood origin (arrow).

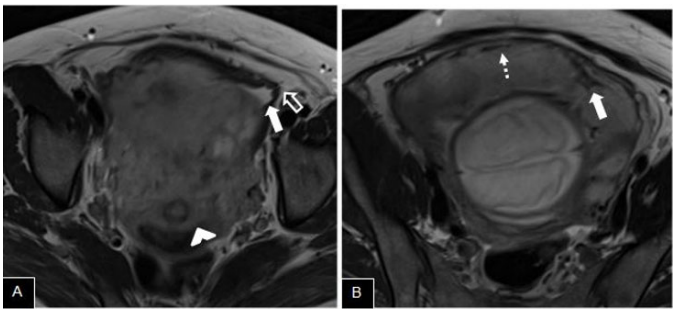

Figure 5: (A and B) Axial T2 WI images (A) show proximity of the placenta to the internal cervical os (arrowhead), in addition to loss of cleavage plane with the superior bladder wall, demonstrated with direct relation of the placental plane with the bladder lumen (arrow) (empty arrow), also (B) show hypointense bands (dashed arrow) and prominence of vascular structures (arrow).

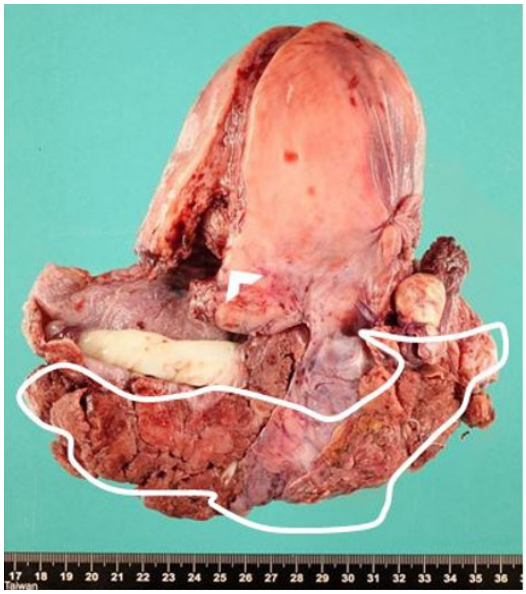

Figure 6: Gross findings in histerectomy and bilateral salpingo-oophorectomy specimen longitudinally opened at the anterior wall with placental disc (white area) attached to the lower uterine segment with thinned myometrium (white arrowhead).

DISCUSSION

The imaging study of PAS is essential for proper diagnosis and management, with ultrasound being the modality of choice due to its wide availability. In a systematic review that included 54 studies, the sensitivity of 2D ultrasound of the third trimester was 87% and the specificity 86%, demonstrating its high value. It can show numerous placental lacunae, loss of the retroplacental clear zone, thinning of the myometrium, and extraplacental extension [5].

However, in certain cases, it is necessary to complement the study with an MRI, especially when there are diagnostic doubts or for surgical planning, like in this case. In this context, the optimal evaluation is at 28–32 weeks of pregnancy, after this period it is difficult to evaluate the placenta due to prominence of cotyledons and myometrial thinning [2, 4]. Several recent meta-analyses show an overall MRI sensitivity of 86.5–94.4% and a specificity of 96–98.8% in predicting the depth of placental invasion [2].

Recently, the Society for Abdominal Radiology (SAR) and the European Society for Urogenital Radiology (ESUR) issued a joint consensus statement for MRI of placenta accreta spectrum disorders, calling for recommendations to establish a uniform technique, a lexicon to describe the findings, and a structured report [3]. They described seven MRI features of PAS disorders that include intraplacental T2-dark bands, which is the more sensitive feature for the diagnosis of PAS disorders [3], placental or uterine bulge, myometrial thinning, bladder wall interruption, focal exophytic mass, loss of T2-hypointense retroplacental line, and abnormal vascularization of the placental bed.

These predictive signs of PAS disorders must be interpreted appropriately because some of them can be observed in patients with advanced pregnancies, such as myometrial thinning. This is why, as previously mentioned, it is important to perform the MRI at the appropriate stage of pregnancy, to avoid misinterpretations.

Accurate evaluation of MRI allows to reduce the morbidity and mortality of patients, helping clinicians to decide the best surgical management, be it performing a hysterectomy or a more conservative surgical management.

CONCLUSION

The diagnosis of PAS has increased in recent times, mainly in the West, due in part to the increase in the number of cesarean sections and older maternal age, which has led to an increase in the number of peripartum hysterectomies. Ultrasound is the first imaging modality to be performed due to its high availability, low cost, and good performance in antenatal diagnosis; however, MRI is the choice in selected cases of patients in whom ultrasound evaluation is limited or for surgical planning, having high sensitivity and specificity in the diagnosis of placenta accreta, mainly in the evaluation of extramural involvement, with some characteristic features that we should be capable to recognize.

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Author Contributions

Francisca Aliaga – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Fernanda del Campo – Design of the work, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Rolando Cocio – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Sebastián Blanco – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Yumay Pires – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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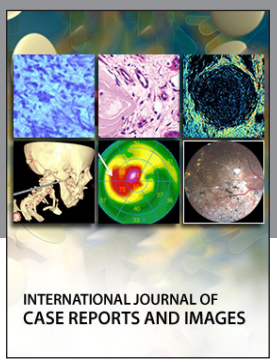
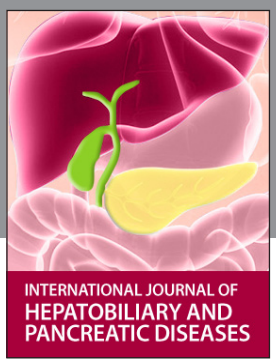
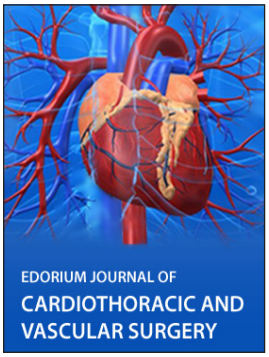
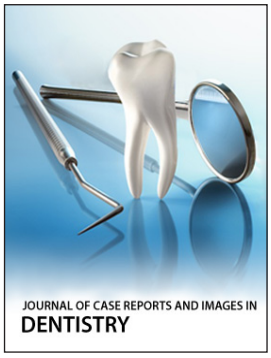
Authors declare no conflict of interest.

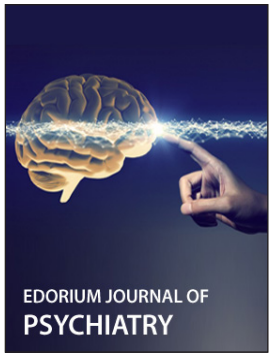
Data Availability
All relevant data are within the paper and its Supporting Information files.

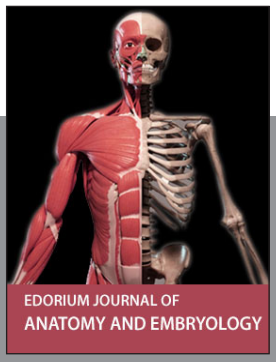


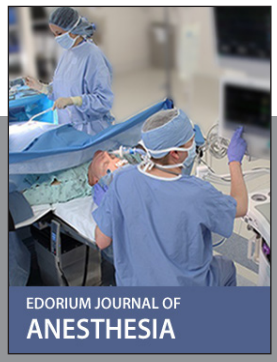












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