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ORIGINAL ARTICLE

# PICTORIAL ESSAY: MAIN RADIOLOGICAL SIGNS IN ULTRASONOGRAPHY AND MAGNETIC RESONANCE OF PLACENTARY ACRETISM

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## ABSTRACT

*OBJECTIVE: To describe and demonstrate the main radiological signs on ultrasound (US) and magnetic resonance imaging (MRI) in the diagnosis of placental accretism. CASUISTICS AND METHODS: Retrospective study carried out at Femme Laboratory of some pregnant women referred with clinical suspicion of placental accretism or who underwent routine US referrals from medical offices in greater São Paulo. Gestational age ranged from 24 to 37 weeks. Patients with suspected accretism were followed up through contact with the obstetrician and we identified the outcome that occurred. The examinations were performed using the equipment of US Toshiba and Voluson GE and the MRIs in Aera Siemens, acquired HASTE, TURBO FISP sequences, in the axial, sagittal and coronal planes and Gradiente echo (GE) in the best plane of acquisition of the placenta and the most common cases. Elucidative data were selected. The analysis of the images was performed by experienced doctors in fetal medicine and 1 radiologist with 18 years of experience in the diagnosis of accretism. RESULTS: The main signs found at US were: retroplacental hypoechoic gaps, increased vascularization of the myometrial wall, loss of boundaries between the placenta and the myometrium. MRI included thinning of the myometrial wall, heterogeneity of the placental signal, discontinuity of the myometrial wall, and hyposignal bands on the myometrial wall. FINAL CONSIDERATIONS AND CONCLUSION: US and MRI are useful in identifying placental accretism. It is essential that ultrasonographers and radiologists know and identify the main signs suggestive of accretism, as well as assess its extent for the delivery be safer.*

*KEYWORD: ULTRASOUND, ACCRETISM, MAGNETIC RESONANCE*

## INTRODUCTION

Ultrasonography is the first imaging modality in obstetrics as it is a safe and available method. A second method that can be performed without ionizing radiation, with better spatial resolution and multiplanar sections, is Magnetic Resonance Imaging (MRI) [1]. MRI uses electromagnetic radiation and generates detailed images with high tissue contrast.

Magnetic resonance imaging until 2002 was avoided in the first trimester and the use of contrast abolished during pregnancy [1] Today, MRI can be used at any gestational stage according to the maternal-fetal indication and the contrast can be used in pre-selected cases [1, 2, 3].

Placental accretism consists of abnormal placental adherence to the uterine wall. The histopathological basis consists of the absence or disorder of the basal decidua, which is the deepest layer of the endometrium. Abnormal placental adherence including the placenta accreta, increta or percreta is a frequent cause of postnatal hemorrhage [1,2,3,4]. The invasion of the chorionic villus in the myometrium increases the risk of bleeding, increasing the chances of blood transfusions or even hysterectomy, which directly affects the increase in morbidity and mortality[1].

The prevalence of accretism has increased significantly in the last fifty years, being found in recent works from [1]: 250 to 1: 93000 births. The placenta previa is the most frequent cause of placental accretism. The increase in the frequency of accretism correlates with the increase in the number of cesareans, multiparity, myomectomies and embolization of fibroids[1].

The extent of placental invasion is often not known until labor. This is due to the lack of definition in the literature of the best method of prenatal diagnosis of placental accretism, including the radiological signs and definitive maternal blood markers, and the lack of preparation of professionals to research this comorbidity.

Adequate detection of placental accretism and the extent of myometrial invasion would allow adequate planning of the delivery route, operative risk and safety measures under these conditions. This would result in reduced morbidity and a multidisciplinary approach to a potentially dramatic situation.

Ultrasonography (US), Doppler and MRI have been

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used as modalities in the diagnosis of placental accretism, but US is still the most accessible modality [1,2,3].

There are ultrasound criteria established for the diagnosis of placenta accreta and have been used with relative success. There are criteria for MRI, however they are constantly changing and updating [2,4].

There is already evidence in literature that MRI has an important role in helping to detect and complement the assessment of the extent of accretion and placental percretism [4,5].

## OBJECTIVE

To describe and demonstrate the main radiological signs on ultrasound (US) and magnetic resonance imaging (MRI) in the diagnosis of placental accretism.

## CASUISTICS AND METHODS

Retrospective study carried out at Femme Laboratory of some pregnant women referred with clinical suspicion of placental accretism or who came for routine US referrals from medical offices in greater São Paulo. Gestational age ranged from 24 to 37 weeks. Patients with suspected accretism were followed up through contact with the obstetrician and we identified the outcome that occurred. The examinations were carried out using the equipment of US Toshiba and Voluson GE and the MRIs in Aera Siemens, acquired HASTE, TURBO FISP sequences, in the axial, sagittal and coronal planes and Gradiente echo (GE) in the best plane of acquisition of the placenta. The analysis of the images was performed by experienced doctors in fetal medicine and 1 radiologist with 18 years of experience in the diagnosis of accretism.

## RESULTS

THE DIAGNOSIS OF PLACENTARY ACCRETISM:

Placental accretionism is the abnormal adherence of the placenta to the wall of the uterus, being classified as accreta, percrete and increta according to the depth of invasion. Initially, this evaluation is performed by the US, which demonstrates retroplacental vascular gaps, loss of retroplacental hypoechoic pattern of and anomalous vessels exceeding the limit of the placenta. An US with B-mode scale and color doppler analysis presents a sensitivity of about 70% and specificity of about 96% in this assessment in literature [4- 15]. MRI represents an innocuous method in pregnancy and allows an exact assessment of the depth and extent of placental accretism, with a sensitivity of 99% and specificity of 86%, so it has an important impact on the adopted obstetric approach [4,8, 16-18, 20-29].

The main signs highlighted in the literature are: the thin myometrial thickness, the hypersignal of the placental transmural extension in the T2-weighted sequences and the hyposignal bands and exophytic masses [16,17, 19, 20-29].

In this study we will demonstrate the main signs seen in pregnant women monitored at our service.

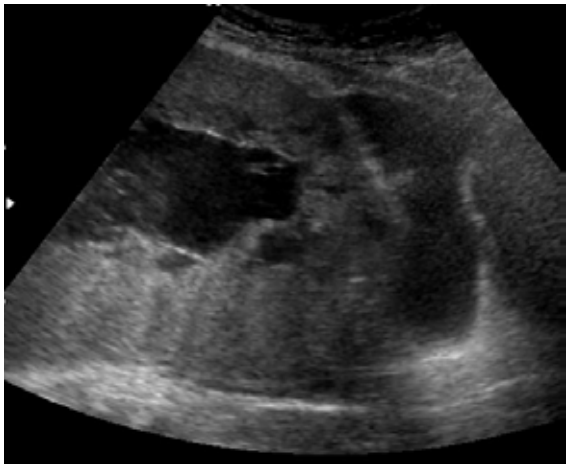

**Figure 1: 27-week pregnant woman with low total center placenta insertion and loss of retroplacental hypoechoic myometrium pattern.**

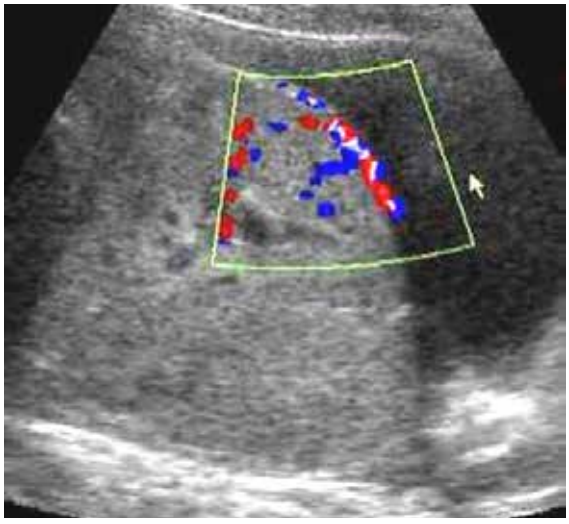

**Figure 2: A 31-week pregnant woman with a placenta of low insertion in the total center and tortuous vessels invading the myometrium.**

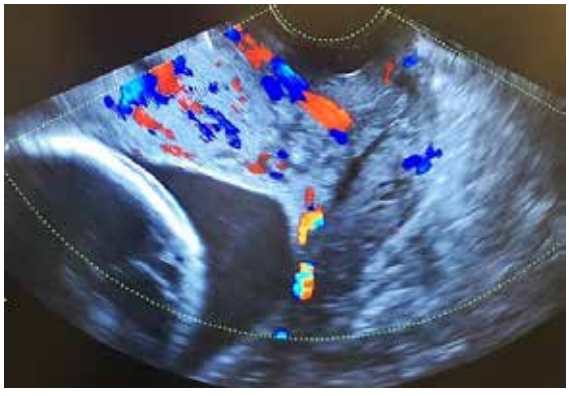

**Figure 3: 33-week pregnant woman with low marginal insertion placenta and tortuous vessels invading the myometrium and irregular vascular gaps affecting mainly the cervix and isthmus.**

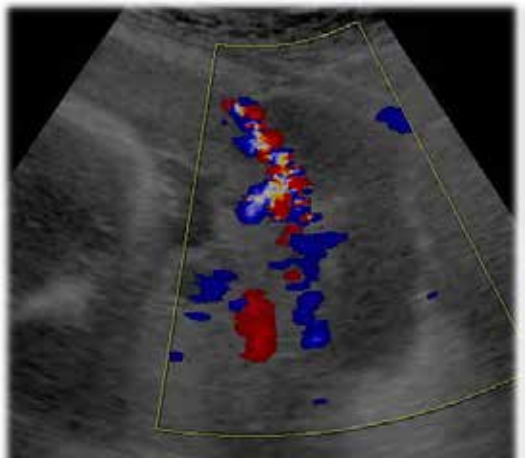

**Figure 4: 34-week pregnant woman with low insertion placenta at the center and tortuous vessels invading the myometrium and irregular vascular gaps, mainly affecting the cervix, bladder and isthmus.**

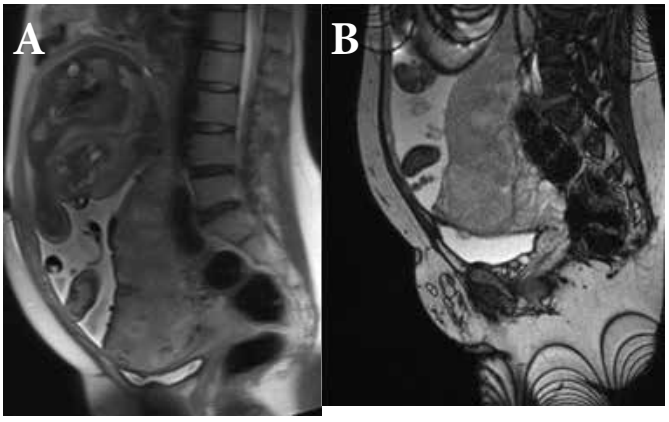


**Figure 5: 32-week pregnant woman and diagnosis of percretism, in the sequences HASTE and TURBO FISP (a, b) shows transmural hypersignal of the placenta, thinning of the myometrial wall, focus of exophytic mass on the bladder wall and posterior myometrial wall.**

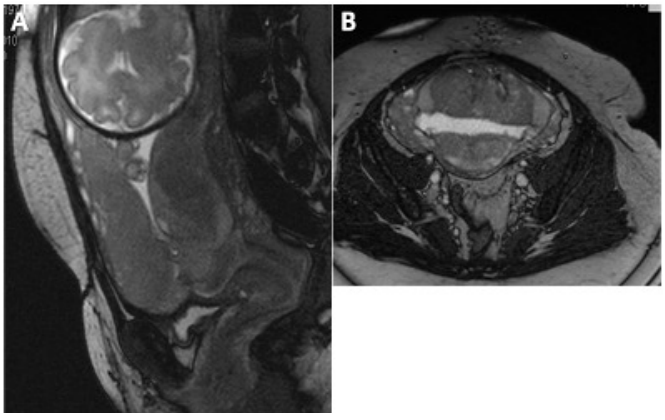


**Figure 6: 34-week pregnant woman and diagnosis of accretism in the HASTE and TURBO FISP sequences (a,b) shows transmural hypersignal of the placenta, thinning of the myometrial wall and hyposignal bands in the placenta in the isthmic and cesarean scar region.**

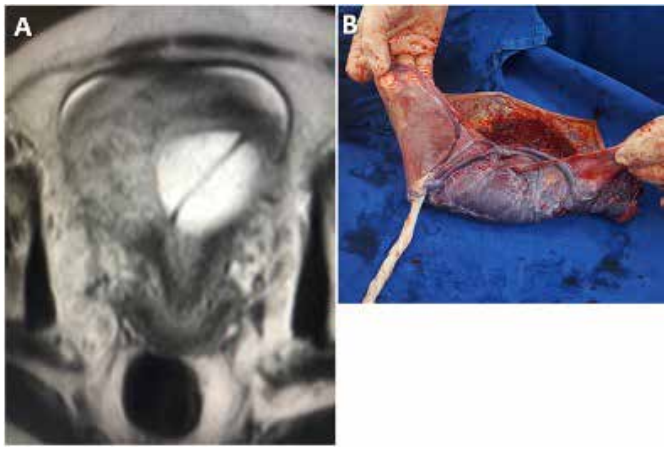


**Figure 7: 36-week pregnant woman and diagnosis of vasa previa in the HASTE sequence (a, b) an anomalous vessel adjacent to the internal orifice is evident and the anatomical specimen demonstrates vasa previa.**

## CONCLUSION

US and MRI are useful in identifying placental accretism. It is essential that ultrasonographers and radiologists know and identify the main signs suggestive of accretism, as well as assess its extent for a safer delivery schedule.

The prenatal diagnosis of the placenta accreta has improved recently, with the combination of diagnostic techniques. This will allow a real benefit for high-risk populations, with the reduction of mortality, since the prevalence of accretism has increased significantly in the last fifty years.

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