

EP15.33

Performance of Ultrasound in the Antenatal Diagnosis of Placenta Percreta

Sana Ghades^{1 2}, Amani Guezguez^{1 2}, Chaima Selmi^{1 2},Amira Ouinissi^{1 2}, Rania Boukadida^{1 2}, Yasmine Chamli^{1 2}, Soukeina Mansour^{1 2}, Anas Ouertani^{1 2}, Yasmine Ben Ali^{1 2}

1. Faculty of medicine Ibn El Jazzar, Sousse, Tunisia.
2. Department of Gynecology and Obstetrics, Division of Obstetrics and Feto-maternal Medicine, Hospital's IbnEl Jazzar, Kairouan, Tunisia.

Introduction

Placenta accreta spectrum (PAS) represents a severe obstetric complication in which the placenta abnormally invades the uterine wall, with placenta percreta being the most advanced form. Its incidence has increased worldwide, largely due to the rising number of cesarean deliveries, and it is associated with significant maternal morbidity and mortality. Early and accurate prenatal diagnosis is therefore essential to guide delivery planning and reduce complications. Ultrasound, particularly greyscale combined with colour Doppler, remains the primary imaging tool for detecting PAS, though its diagnostic performance requires further evaluation.

Objective

To evaluate the accuracy of greyscale ultrasound (US) and colour Doppler detecting placenta percreta.

Methods

This retrospective study, from January 1, 2016, to December 31, 2021, was conducted on women diagnosed with placenta previa or low-lying placenta involving the anterior uterine wall and associated with PAS as identified by the US. Transabdominal and transvaginal greyscale US was performed on admission and compared to histopathological examination after cesarean hysterectomy.

Results

Obstetric ultrasound was performed in order to assess the signs of placental accreta. It was carried out prior to delivery in all eight patients (100%). The sonographic findings varied across cases (Table I). Specifically:

- **Intraplacental lacunae** were identified in six patients (75%). In all cases, the lacunae were numerous, with some appearing large and irregular (stage 3). This sign was predictive of accreta (AUC = 0.504) with a sensitivity of 75% and a specificity of 74.3%. (Figure 1)
- **Absence or disruption of the hypoechoic retroplacental zone** was observed in three patients (37.5%). This finding was predictive of accreta (AUC = 0.488) with a sensitivity of 37.5% and a specificity of 60%.
- **Interruption of the hyperechoic interface between the uterine serosa and the bladder** was found in three patients (37.5%). This sign was predictive of accreta (AUC = 0.502) with a sensitivity of 37.5% and a specificity of 62.9%. (Figure 3)
- **Thinning of the myometrium adjacent to the bladder** was observed in one patient (12.5%). This feature was predictive of accreta (AUC = 0.305) with a sensitivity of 12.9% and a specificity of 48.6%.
- Doppler ultrasound was performed in all cases. The most frequent Doppler findings were:
 - **Visualization of vessels invading the bladder** (25% of cases), predictive of accreta (AUC = 0.690) with a sensitivity of 66.7% and a specificity of 71.4%.
 - **Flow within lacunae** (37.5% of cases), predictive of accreta (AUC = 0.714) with a sensitivity of 100% and a specificity of 57.1%. (Figure 4)
 - **Abnormal vascularization extending toward the bladder** (12.5% of cases), predictive of accreta (AUC = 0.524) with a sensitivity of 33.3% and a specificity of 71.4%. (Figure 2)
 - **Marked hypervascularization at the uterus–bladder interface** (25% of cases), predictive of accreta (AUC = 0.405) with a sensitivity of 66.7% and a specificity of 14.3%.

For patients with placenta percreta, the presence of three or more sonographic signs was identified in three cases (37.5%). (Table II)

Table III presents the diagnostic performance of different sonographic signs in the prenatal detection of placenta percreta.

Conclusion

Regarding the performance of ultrasound in the prenatal diagnosis of placenta percreta the following findings were observed:

- ✓ The presence of **intraplacental lacunae with Doppler flow** and **the visualization of vessels invading the bladder** demonstrated **good sensitivity and specificity**, with a **predictive accuracy for accreta approaching 70%**.
- ✓ **The combination of multiple sonographic signs improved the precision of prenatal diagnosis**, with a strong predictive value when more than two signs were present (AUC = 0.621).
- ✓ **Obstetric ultrasound with Doppler imaging showed good overall performance in the prenatal diagnosis of placenta percreta.**

Table I: Sonographic features in patients with placenta percreta

Sonographic Feature	N	%
Sign 1: Intraplacental lacunae	6	75
• Stage 0	0	0
• Stage 1	0	0
• Stage 2	0	0
• Stage 3	6	75
Sign 2: Absence or interruption of the hypoechoic retroplacental zone	3	37.5
Sign 3: Interruption of the hyperechoic interface between the uterine serosa and bladder	3	37.5
Sign 4: Thinning of the myometrium adjacent to the bladder	1	12.5
Sign 5: Doppler vascularization		
• Visualization of vessels invading the bladder	2	25
• Flow within lacunae	3	37.5
• Abnormal vascularization extending toward the bladder	1	12.5
• Hypervascularization at the uterus–bladder interface	2	25

Table II: Distribution of sonographic features for patients with placenta percreta

Number of signs	N	%
≥ 1 sign	6	75
≥ 2 signs	4	50
≥ 3 signs	3	37.5

Table III: Diagnostic performance of sonographic signs in placenta percreta

Sonographic sign	Sensitivity (%)	Specificity (%)	AUC
Intraplacental lacunae	75	74.3	0.504
Absence or interruption of the hypoechoic retroplacental zone	37.5	60	0.488
Interruption of the hyperechoic interface between uterine serosa and bladder	37.5	62.9	0.502
Thinning of the myometrium adjacent to the bladder	12.5	48.6	0.305
Visualization of vessels invading the bladder	66.7	71.4	0.690
Flow within lacunae	100	57.1	0.714
Abnormal vascularization extending toward the bladder	33.3	71.4	0.524
Hypervascularization at the uterus–bladder interface (Figure 19)	66.7	14.3	0.405

Combination of multiple signs

Combination of signs	Sensitivity (%)	Specificity (%)	AUC
≥ 1 sign	25.0	82.9	0.539
≥ 2 signs	50.0	74.3	0.621
≥ 3 signs	62.5	37.1	0.498