Identification of arterial pulse waves by color doppler flow within the bladder wall interface predicts placenta percreta: A case series

Krunal Patel, Davlyn Luke, Jesus Alvarez-Perez, Manuel Alvarez, Abdulla Al-Khan
Maternal Fetal Medicine, Hackensack University Medical Center, Hackensack, NJ, USA

Introduction
In this prospective case series, the objective was to investigate the role of selective doppler studies in predicting severe forms of abnormally invasive placentation (AIP), specifically percreta. Ten women with suspected percreta were evaluated at our center for AIP between 2015 to 2017. We routinely assess for the five sonographic markers in AIP cases: the size and number of placental lacunae, loss of hypoechoic zone, myometrial thinning at the uteroplacental/bladder interface, non-linear bladder wall with hypervascularity.

Method
In an effort to better predict placental percreta, we tried to identify arterial pulse waves in the area of neovascularization between the uterine serosa and bladder using color Doppler. Resistance indices (RI) and pulsatility indices (PI) were measured. Additionally, cystoscopy was used preoperatively (at time of delivery) to confirm the presence of abnormal vasculature and pulsatile vessels in the bladder wall.

Results
In all 10 cases, arterial waveforms were identified with color Dopplers. Nine of the ten cases exhibited bladder-wall vessel pulsatility during cystoscopy and all 10 cases were confirmed percreta histopathologically. The median RI of arterial waveforms located at the bladder wall was 0.42 and range of 0.25-0.51. Median PI was 0.56 with a range of 0.29-0.82. These findings of confirmed abnormal arterial vascularity between the uterus and bladder prior to surgery provided additional information to the surgical team.

Conclusion
We believe that presence of arterial wave forms on doppler studies at this interface can provide valuable information for a more accurate prenatal diagnosis of percreta. Future case control studies would further validate its predictive values for severe forms of AIP.