OP19.01. Magnetic resonance imaging of placenta accreta spectrum (PAS): Radiomics analysis correlates to surgical and pathological outcome

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Purpose
To investigate textural analyses as the radiomics with MRI of the placenta in predicting the PAS requiring cesarean hysterectomy in a high-risk population.

Methods
T2W, DWI and ADC images (1.5T) of 62 women with prior cesarean delivery referred for MRI because of sonographic PAS suspicion were retrospectively analysed. 13 Haralick texture features were calculated from placental ROIs generated based on definitions of areas of placenta in proximity to and remote from previous surgical incision sites (visible on T1W). Univariate logistic regression models were used to test the association between the primary outcome (hysterectomy vs. no hysterectomy) and the texture features.

Results
Of 62 pregnancies at risk for PAS, 40 required cesarean hysterectomy (65%), with excellent agreement between need for hysterectomy and pathology confirmation [κ = 0.82 (0.62,1)]. Of 13 Haralick variables within each of 3 imaging acquisition groups, significant differences (p<0.05) were seen in 22 of 39 parameters comparing placental ROIs in proximity to incision scar(s) to those ROI’s remote from scar(s).

Conclusion
We identified several textural features on placental MR images in the region of the prior uterine scar that differentiated pregnancies requiring cesarean hysterectomy based on clinical suspicion of PAS from those that did not. This quantitative objective assessment of PAS severity may prove to be better than current qualitative and subjective standards.