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Pannus sign on ultrasound and magnetic resonance imaging predicts placenta percreta and is associated with high estimated blood loss

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Objective: Antenatal identification of the placenta accreta spectrum (PAS) has been estimated to be approximately 50% in multicenter and population based data, with sensitivity and specificity far lower than that reported from referral center cohorts. Easily obtained, objective markers are key to improving antenatal detection. We noted that in many PAS cases, the placenta bulges over the cervical os, like an abdominal pannus over a belt. The depth of the “pannus” can be measured on ultrasound (US) and magnetic resonance imaging (MRI). We predicted that a positive sign can differentiate between percreta and increta/accreta.

Study Design: Retrospective chart review of a database of patients with PAS from Jan 2012-Jun 2019. Demographic and clinical data were abstracted.” for US and MRI images were reviewed and measurements recorded by trained researchers blinded to clinical data. The pannus sign was measured in sagittal plane (Figure). The pannus measurement (PM) drawn parallel to the cervical canal from the most caudal placental point to the IOL is the “pannus,” when positive, measured in mm. Negative (-) values indicate placenta cephalad to and positive (+) values were at or more caudal to the IOL. Sensitivity, specificity, PPV and NPV were calculated using the Chi-squared test.

Results: Of 164 women who had pathology proven PAS, 131 had adequate images, of which 120 had US, 54 had MRI and 43 had both. One with fundal PAS was excluded. 90 women had a (+) value, and 30 a (–) value on US. MR agreed with US in all but 4 cases (91%, mean difference 7.4mm.) The sensitivity and specificity were: 82.7% [95% CI, 72.5-89.6%] & 37.7% [95% CI, 25.1-77.5%] with a PPV of 68.9 and NPV of 57%. The PM was associated with

Conclusion: A positive pannus sign is senstitive for percreta, but not specific; cases of parametrial or high invasion will not be detected using this sign. There is excellent agreement between US and MRI measurements and it was easily obtained when the cervical canal could be seen. Studies of reproducibility and use with other markers of PAS are needed.

Figure 1. Measurement of the pannus sign. Panel A, ultrasound; Panel B, MRI. The outline of the placenta is shown in fine white dash. Note the similarity in shape to the abdominal pannus on MRI. The cervical canal is identified (heavy dashed line). A line is drawn perpendicular to the cervical canal to identify the internal os line (IOL, thin solid). A line parallel to the cervical canal is then measured in mm from the lowermost edge of placenta to the IOL (heavy solid). The pannus measurement is positive, as the placental edge is caudal to the IOL.