Contribution of 3D power Doppler and HD flow to the antenatal diagnosis of morbidly adherent placenta

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Objective
With the advent of improved ultrasonography technology, HD (high-definition) flow refers to a recently introduced combination of color and power Doppler by adding the information of flow direction to the advantage of power Doppler. We aim to evaluate the performance of three dimensional power Doppler and HD flow techniques in the antenatal ultrasonographic diagnosis of the morbidly adherent placenta.

Methods
Two patients with ultrasonographic findings suspicious for placenta accrete were referred for further detailed colour Doppler evaluations. With 2D gray-scale transabdominal and transvaginal ultrasonography, the irregularities and echogenicity of placenta and the interface with the uterus were scanned. Using the transabdominal 3D power Doppler and 3D HD flow, we assess the hypervascularity of the uterine serosa-bladder wall interface and irregular intraplacental vascularization.

Results
By 2D gray-scale ultrasonography, we could check the location, shape, thickness and echogenicity of placenta on these two cases. Furthermore, the information of vascularity of the uterine-bladder interface could be shown on transabdominal 3D power Doppler and 3D HD flow. The diagnosis of morbidly adherent placenta can be confirmed by introducing HD flow, and it provides a bi-directional Doppler features to achieve a more sensitive vascular study and reduce overwriting. One patient diagnosed as morbidly adherent placenta (inreta) was transferred to the medical center for balloon catheterization before cesarean section. The other was diagnosed as placenta previa without morbidly adherent placenta and stayed in our hospital for cesarean section. Both had an uncomplicated delivery without the need for hysterectomy.

Conclusion
The addition of 3D-PDA could provide additional information and improve diagnostic performance. Three-dimensional high-definition flow may be useful as an adjunctive technique in refining 2D ultrasonographic information for the antenatal diagnosis or exclusion of the morbidly adherent placenta. 3D power Doppler and HD flow can contribute to decision making and help to improve patient safety.