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A novel sign of color Doppler for severe placenta accreta spectrum

Jin-Chung S
Department of Obs/Gyn, National Taiwan University Hospital, Taipei City, Taiwan

Objective

ISUOG published the consensus of ultrasound descriptors for placenta accreta spectrum (PAS). However, these ultrasound descriptors did not distinguish the extent of severity. We described a novel sign of color Doppler that could be useful to distinguish severe cases from the rest of the placenta accreta spectrum (PAS).

Methods

We retrospectively reviewed those cases of placenta praevia totalis with the suspicion of PAS during the period between Feb 2002 and Dec 2017. In these cases, both transabdominal and transvaginal ultrasound were performed using GE expert series ultrasound. A targeted scan was directed towards the flow signals between the placenta and bladder mucosa. “Rail” sign indicated two parallel flow signals of the subplacental and bladder mucosa region with interconnected bridging vessels perpendicular to them. All these patients received ultrasound examination and operation at our hospital.

Results

In this cohort, we had more than 850 cases of persistent placenta praevia. Among these 138 consecutive cases of PAS were confirmed during operation. In addition to the common ultrasound signs we disclosed “rail” sign by color Doppler in 18 out of 21 cases of placenta percreta, 32 out of 84 of placenta increta and none of the remaining cases of placenta accreta. Among these AIPs with “rail” sign, 8 received complicated subtotal hysterectomy and 42 underwent simple hysterectomy (compared to 52 hysterectomies out of 88 patients without rail sign). Bladder injury occurred in 6 patients with rail sign (compared to none in the remaining cases without rail sign).

Conclusion

“Rail” sign by color Doppler either by transabdominal or transvaginal ultrasound identifies the advanced PAS (such as placenta increta and percreta), and predicts the higher possibility for hysterectomy and bladder injury. Rail sign is a useful sign to distinguish severe PAS from mild PAS.