

## Case Studies in Obstetrical MR

### PLACENTAL PATHOLOGIES ASSOCIATED WITH STILLBIRTH - MASSIVE PERIVILLOUS FIBRINOID DEPOSITION AND PLACENTAL-FETAL THROMBOTIC VASCULOPATHY

Dear Colleague,

Welcome back to Obstetrical MR Interesting Cases.

The new case to be presented is that of massive perivillous fibrinoid deposition (MPFD) resulting in preterm delivery at 24 weeks and neonatal death. The following link is to a companion case of placental-fetal thrombotic vasculopathy resulting in stillbirth. <http://www.hvra.com/sites/default/files/MFM%20BROADCAST%204-14-10.pdf>

These two cases are important because they highlight MR's unique ability to identify significant macromorphologic placental disease - poorly imaged, if at all, on ultrasound - that are associated with severe IUGR, preterm delivery, abruption, stillbirth, and neonatal morbidity/mortality. Stillbirth is the second most common cause for obstetrical malpractice litigation.

The current case of massive perivillous fibrinoid deposition was referred to me at 22 weeks gestational age due to a prior outside ultrasound performed at 18 weeks demonstrating a heterogeneous placenta with concern for placenta accreta. The patient had a prior myomectomy. At the time of the outside 18 week ultrasound, biometry was commensurate with dates. Patient had an elevated maternal serum AFP with no causative fetal malformations identified. My fetal MR and my own hands-on ultrasound demonstrated a profoundly heterogeneous placenta at "high risk" for accreta/increta. The more specific MR and ultrasound findings will be discussed below. Uterine artery Doppler demonstrated unilateral early diastolic notching with an elevated mean resistive index of 0.66.

Two weeks after MR, the patient had a significant bleed with preterm delivery at 24 weeks with early neonatal death. Clinically, the placenta was an accreta, being difficult to remove but not requiring hysterectomy. Placental pathology demonstrated massive perivillous fibrin deposition, infarct, and hemorrhage.

The arrows in MR images 1 and 2 illustrate the extensive thick dark bands of abnormal fibrinoid deposition along the basal plate of the placenta. In the coronal plane of section, these curvilinear bands of alternating dark fibrinoid material and intervening placental parenchyma create a cerebriform appearance, similar to the convoluted surface of cerebral cortex.



Image 1

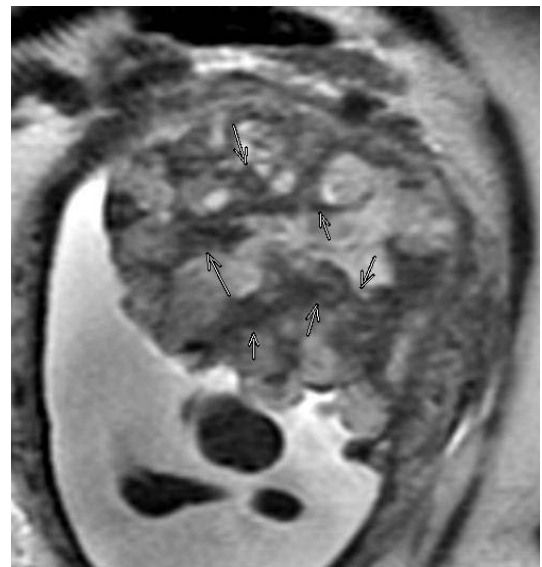


Image 2

Image 3 is a gestational age matched MR image of a normal placenta for comparison.

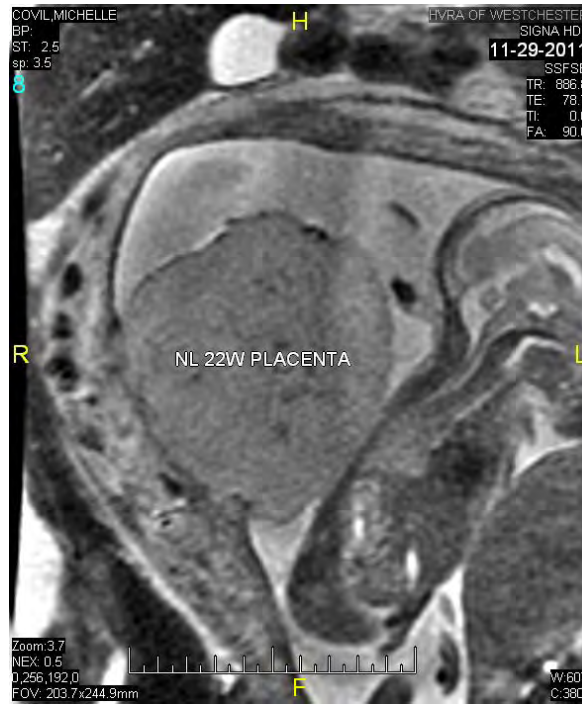


Image 3

Image 4 is a gross pathologic assessment of MPFD.

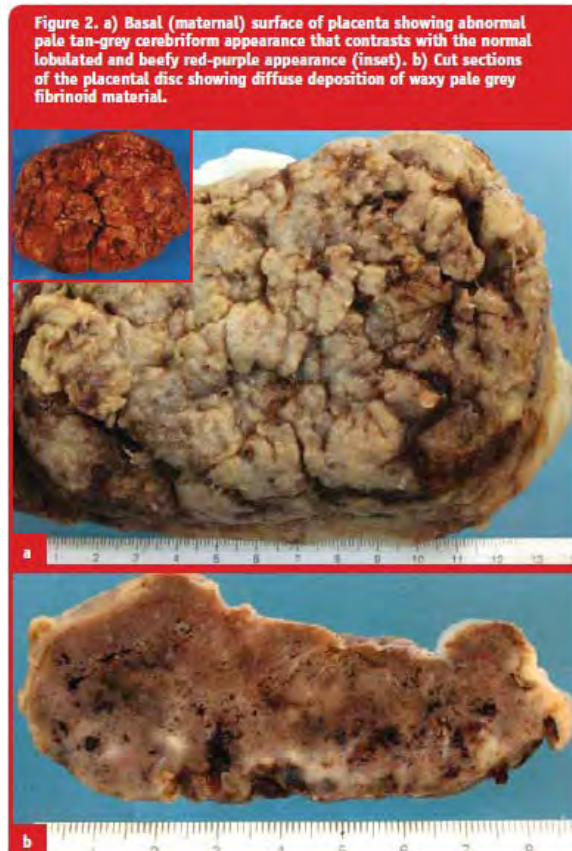


Image 4

Image 5 is ultrasound demonstration of the heterogeneous, poorly defined, hypoechoic zone of placental tissue bordering the myometrium. Please note, the dramatic improved conspicuity of pathology on MR in comparison to ultrasound.

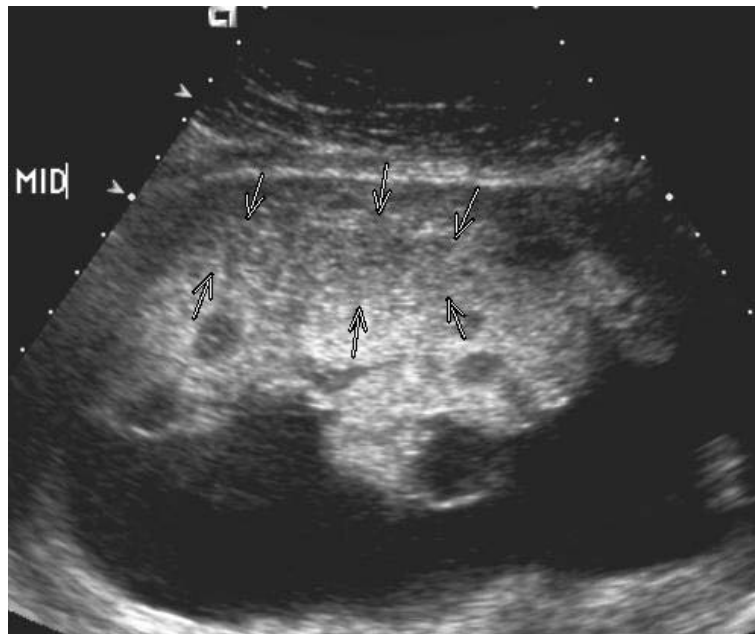


Image 5

Image 6 is color Doppler interrogation of a focal placental-myometrial zone of concern, demonstrating focally unique angioarchitecture with exceedingly high volume low resistive arterial flow with peak systolic velocity greater than 100 cm/sec.

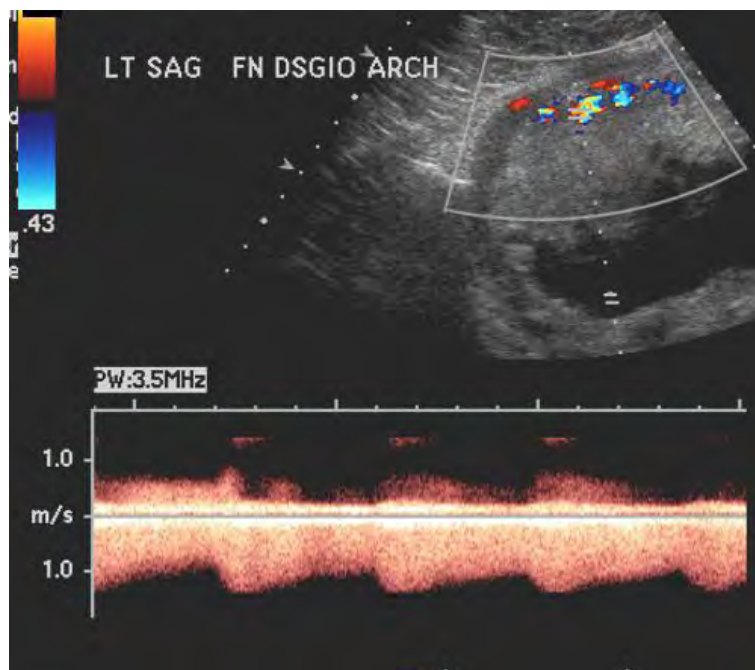


Image 6

**DISCUSSION:** Massive perivillous fibrinoid deposition is a pathologically distinctive pregnancy disorder affecting the placenta. MPFD is characterized by extensive accumulation and deposition of fibrinoid in the intervillous spaces of the placental villous parenchyma. Maternal floor infarction (MFI) is a related entity.

The pregnant patient with MPFD/MFI is typically clinically normal with fetal growth restriction or decreased fetal movements in the late second or third trimester. Elevated maternal serum AFP can be associated.

Etiology of these disorders remains unknown in the majority of cases. The condition may represent a final common pathway from a variety of chorionic villous injuries in association with stasis of the intervillous circulation.

The clinical import of these pathologies relates to association with central nervous system injury and adverse neurodevelopment outcome for the effected child and the high risk of recurrence in future pregnancies. These conditions are rare with an incidence of between approximately 0.1 and 0.5%. Stillbirth is reported to occur in a significant percentage of effected pregnancies. These conditions are also associated with IUGR and increased incidence of preterm delivery. These disorders can occur in the first and second trimester when it is associated with a recurrent miscarriage.

**SUMMARY:** This case, as well as the companion case of placental-fetal thrombotic vasculopathy demonstrates MR's unique ability to visualize high risk placental pathology, rarely demonstrated by ultrasound.

Both of these placental pathologies have significant risk for morbidity/mortality as well as recurrence in subsequent pregnancies.

Consider placental MR in the evaluation of those pregnancies for which there is a clinical desire to complete and optimize risk assessment for potentially lethal placental pathologies.

## References

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