

Dichorionic diamniotic twin pregnancy discordant for placental massive perivillous fibrin deposition and villitis of unknown etiology

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Introduction

Massive perivillous fibrin deposition (MPFD) and villitis of unknown etiology (VUE) are rare placental lesions associated with significant perinatal morbidity and mortality, including fetal growth restriction (FGR) and fetal demise, with potential recurrence in subsequent pregnancies. MPFD is closely associated with hypertension, autoimmune disease, coagulopathies, amniotic fluid infections and smoking.

Case

39-year-old, G3P1

- In vitro fertilisation (IVF), Dichorionic Diamniotic (DCDA) twin pregnancy, conceived abroad
- Selective early-onset FGR of Twin 2
- Previous first-trimester miscarriage
- Second pregnancy complicated by pre-eclampsia; delivered at 37 weeks, male infant weighing 2100 g
- No significant medical comorbidities; non-smoker

A: Placenta of predeceased Twin 2:: Representative section of placental parenchyma showing replacement of the intervillous space by dense sheets of fibrin

B & C: Placenta of surviving Twin 1

B: Focus of lymphocytic villitis with agglutinated villi showing prominent stromal infiltrate of lymphocytes

C: small chorioangioma

Investigations

Fetal investigations:

- Placental histopathology demonstrated:
 - MPFD in the placenta of the demised twin - the likely cause of fetal demise.
 - High-grade VUE in the placenta of the surviving twin.
- Chromosomal microarray analysis of the demised Twin 2 was clinically insignificant.

Maternal investigations:

- Postnatal haematological investigations revealed protein S deficiency and elevated anticardiolipin antibodies. The patient was counselled regarding high recurrence risk and advised to commence aspirin and low molecular weight heparin in future pregnancies.

Discussion

Discordant MPFD and VUE affecting separate placentas in a DCDA twin pregnancy is a rare and unusual presentation. Massive perivillous fibrin deposition is characterised by extensive fibrin deposition surrounding chorionic villi, which can impair villous blood flow and cause stromal fibrosis, reducing the functional villous surface area. This can compromise placental function and lead to FGR, preterm birth and intrauterine fetal demise, as seen in this case.

The table compares this case with previously reported twin pregnancies in which only one twin was affected by MPFD. Discordant MPFD and VUE between the two placentas suggests that fetal factors may contribute to pathology at the fetoplacental interface.

Conclusion

This unusual case of discordant MPFD and VUE in a DCDA twin pregnancy highlights the importance of placental histopathological examination and multidisciplinary assessment in determining the etiology of adverse pregnancy outcomes, informing recurrence risk and guiding management in future pregnancies.

References

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27 + 2 weeks	First Presentation at tertiary referral centre • Dichorionic twins with intrauterine death of Twin 2 • Sonographic features suggested that fetal demise was not recent
27 + 4 weeks	Follow-up ultrasound – Abnormal dopplers in Twin 1 • Increased resistance in umbilical artery Doppler studies • Lowest pulsatility index at 95th centile • Plan for close outpatient monitoring for signs of pre-eclampsia, and fetal cardiotocography (CTG)
33 + 2 weeks	Admission due to vaginal bleeding + Unexplained antepartum haemorrhage • No clear source on ultrasound • Bleeding from sac of demised twin or marginal placental abruption was considered • Admitted for close observation and fetal monitoring
34 + 4 weeks	Emergency Caesarean section (CS) due to non-reassuring CTG • Male infant, 1915 g, born in good condition • Retroplacental clot consistent with placental abruption identified behind placenta of Twin 1
Post natal	Histopathology + Postnatal counselling • Twin 1: High-grade VUE • Twin 2 MPFD

Redline et al ¹	Faye-Petersen et al ²	Feist et al ³	Gupta et al ⁴	This case
19 years old, G2P0010 Diabetes Mellitus, Mild obesity, Pre-eclampsia	24 years old G1P0 Type 2 Diabetes Mellitus GBS positive	34 years old G3P2 IVF pregnancy	30 years old G1P0 Mildly elevated BP + moderate proteinuria	39 years old G3P1 Previous pre-eclampsia, IVF pregnancy
DCDA Twins	DCDA Twins	DCDA Twins	DCDA Twins	DCDA Twins
30 + 3 weeks discordant growth. Twin A 25th centile Twin B 3rd centile	Discordant early growth, with Twin A showing poor growth and demise at 22 weeks	29 + 0 weeks Discordant growth with smaller Twin 2	33 weeks Discordant growth	27 + 2 weeks IUD of Twin 2 abnormal Dopplers in Twin 1
Elective CS for severe preeclampsia at 34 weeks	CS for Abnormal Dopplers in living Twin B at 34 + 1 weeks	Elective CS for static growth of Twin 2 at 34 weeks	Elective CS due to discordant growth at 33 weeks	Emergency CS due to non-reassuring CTG at 34 + 4 weeks
Placenta of Twin B - MPFD	Placenta of Twin A - MPFD	Placenta of Twin 2 - MPFD	Placenta of smaller twin - MPFD	Placental finding: Twin 1 - VUE Twin 2 MPFD