

Persistent Middle Cerebral Artery Reverse End-Diastolic Flow in Severe Pre-eclampsia: A Rare Case with Adverse Neonatal Outcome

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Abstract: Middle cerebral artery (MCA) Doppler assessment is an important tool in evaluating fetal well-being. Normally, the MCA demonstrates high-resistance flow, but in hypoxic states it becomes low resistance due to the brain-sparing effect. In advanced compromise, reverse end-diastolic flow (REDF) may occur, indicating severe pathology. Persistent MCA-REDF is rare and associated with poor fetal and neonatal outcomes. We report a case of persistent MCA-REDF at 30 weeks of gestation in a pregnancy complicated by severe pre-eclampsia, resulting in neonatal death despite timely intervention.

Keywords: MCA Doppler, Reverse End-Diastolic Flow, Pre-eclampsia, Fetal Hypoxia.

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I. INTRODUCTION

MCA Doppler is widely used to assess fetal hemodynamic status, particularly in cases of hypoxia, anemia, and growth restriction. It complements umbilical artery Doppler studies. In normal fetuses, MCA shows high resistance flow. In hypoxia, vasodilation leads to reduced resistance, known as the brain-sparing effect. In severe compromise, this mechanism fails, leading to increased resistance and, rarely, reverse flow.

II. CASE REPORT

A 29-year-old G2P1L1 woman at 30+3 weeks presented with headache and edema. She had severe pre-eclampsia (BP 160/100 mmHg, proteinuria). Doppler showed persistent MCA-REDF. Emergency cesarean section was performed. A 1000 g neonate was delivered, requiring intensive care. The baby developed intraventricular hemorrhage, hydrocephalus, and thrombocytopenia, and died on day 23 due to multi-organ dysfunction.

III. DISCUSSION

Persistent MCA-REDF indicates loss of cerebral autoregulation and severe fetal compromise. It is associated with high mortality. Causes include hypoxia, intracranial pathology, anemia, and placental insufficiency. In this case, pre-eclampsia likely contributed. Prompt recognition and delivery are critical.

IV. CONCLUSION

Persistent MCA-REDF is a rare and ominous finding. Early diagnosis and urgent delivery are essential to improve outcomes. Severe pre-eclampsia may be an important contributing factor.

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