ABSENCE OR REVERSAL OF END DIASTOLIC FLOW IN THE UMBILICAL ARTERY DURING OPEN FETAL SURGERY

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Introduction
• Umbilical artery (UA) Doppler ultrasound is used to assess fetal wellbeing during pregnancy
• Absence or reversal of end diastolic flow (AREDF) in the UA is associated with increased morbidity and mortality: Odds ratio for perinatal mortality of 4.0 with absent EDF, 10.6 with reversed EDF
• UA Doppler ultrasound may be an earlier marker of fetal distress compared to fetal heart rate during open fetal myelomeningocele repair

Methods
• Retrospective review of 28 patients who underwent open in utero fetal myelomeningocele repair between 2008-2013 at a US tertiary care hospital
• Intermittent UA ultrasound and fetal echocardiography intraoperatively

Results
• 21 (75%) patients had UA Doppler abnormalities: 9 (32%) reversed EDF, 9 (32%) absent EDF, 3 (11%) other
• AREDF episodes: induction of maternal general anesthesia (3 patients), uterine incision (6 patients)
• Adverse events: 1 fetal demise with absent EDF, 1 case aborted due to reversed EDF and bradycardia
• AREDF improved in 4 patients with volume infusion of warm saline into the uterus
• No difference in preoperative and intraoperative vital signs (heart rate, blood pressure)
• Patients with AREDF received significantly less colloid (441±429 mL) vs. no AREDF (1,000±707 mL, p=0.023)

Discussion
• In our review, over 50% of patients undergoing open fetal surgery had UA Doppler abnormalities
• Future prospective studies on fluid management and the use of colloid during open fetal surgery are needed
• Intraoperative UA Doppler monitoring may represent a more sensitive and direct method of fetal assessment

References
1. Lancet. 1994; 344(8938):1664-8