OBJECTIVE: To review outcomes in complicated monochorionic (MC) pregnancies undergoing selective reduction (SR) in a multicenter contemporaneous cohort.
STUDY DESIGN: Retrospective review of MC pregnancies undergoing SR at 9 NAFTNet centers from January 2010 - December 2014 was performed. Indications for SR included twin-twin transfusion syndrome (TTTS), selective fetal growth restriction (sFGR), twin reversed arterial perfusion (TRAP) sequence, and discordant anomalies. Method used, perioperative complications, obstetrical and neonatal outcomes were collected. Descriptive statistics and two paired t-test were done using STATA/IC 14.0.
RESULTS: 308 cases met criteria. Diagnostic indications for SR included discordant structural or karyotype anomaly in 67 (22%), sFGR in 67 (22%), TRAP in 92 (30%), TTTS in 81 (26%), and other in 1 (0.3%). Methods used for SR included bipolar cord coagulation (BCC) 19 (6%), BCC with cord ligation 1 (0.3%), cord ligation 1 (0.3%), laser cord coagulation 2 (0.6%), and radiofrequency ablation (RFA) 285 (93%). Technical success was reported in 98.7% (304/308). Average gestational age (GA) at the time of procedure was 19.9 weeks (14.5-26.7). Complete pregnancy outcome was available on 237 cases. Average GA at delivery was 34.2 weeks (17.9-41.6) with average birth weight of 2337.4 g (460-3969). PPROM occurred in 24.5% (58/237) and average GA at PPROM was 27.4 weeks (16.9-35.7). Co-twin demise occurred in 15.2% (36/237) at an average GA of 20.8 weeks (14.6-33.4). Overall live birth rate was 84.8% (201/237). Maternal complications (i.e. infection, hemorrhage, etc) occurred in 19.4% (46/237). Comparison of RFA and BCC outcomes are presented in the table. When reviewing outcomes by diagnosis and method of SR, there were no significant differences in outcomes comparing RFA and BCC for TTTS, sFGR or discordant anomaly. PPROM occurred in both cases of laser cord coagulation for TRAP.
CONCLUSION: RFA is the most commonly used method of SR in this contemporaneous cohort with a high technical success rate. PPROM and co-twin demise continue to be significant complications of SR procedures.

RFA and BCC Outcomes

	RFA (n=218)	BCC (n=15)	p value
GA at procedure (weeks) mean, SD	19.9 (2.3)	21.1 (1.9)	0.041
GA at procedure (median, range)	19.9 (14.5-26.7)	21.3 (17.6-23.7)	
Ga at delivery (mean, SD)	34.1 (5.5)	34.7 (4.4)	0.787
GA at delivery (median, range)	36.6 (17.9-41.6)	34.9 (24.9-40.3)	
PPROM rate	22% (48/218)	40% (6/15)	0.066
Latency from procedure to delivery (weeks)	14.2 (0.1-24.3)	13.5 (4-22.6)	0.691
GA at PPROM (mean,SD)	27.4 (5.0)	29.4 (5.5)	0.388
GA at PPROM (median, range)	28.0 (17.7-35.7)	32.8 (19.4-34.9)	
Co-twin demise rate	15.6% (34/218)	13.3% (2/15)	0.408
GA at IUFD (mean,SD)	20.7 (3.7)	22.2 (2.8)	0.581
GA at IUFD (median, range)	20.0 (14.6-33.4)	22.2 (19.4-25)	
Live birth rate	84.4% (184/218)	86.7% (13/15)	0.816
Birth weight (g) (mean,SD)	2366 (902.5)	2213 (749.7)	0.555
Maternal complication rate	17.0% (37/218)	33.3% (5/15)	0.056

181 Red cell distribution width as a novel prognostic biomarker in fetal growth restriction

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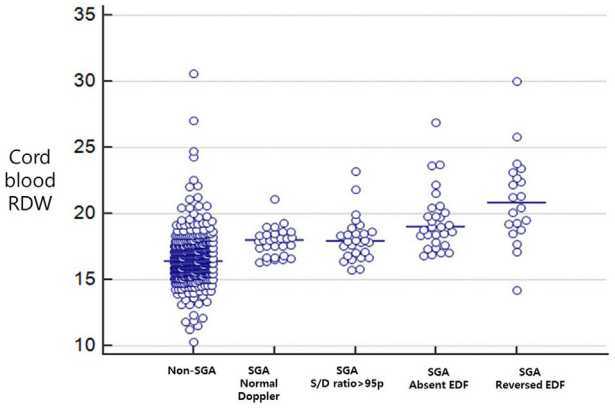
OBJECTIVE: Recent evidences suggest that red cell distribution width (RDW) can be a good prognostic marker for adverse outcomes in adult cardiovascular disease. This association has been attributed to the impaired erythropoiesis and abnormal red blood cell survival, originating from chronic hypoxic status or poor nutritional condition. Considering the pathophysiologic association between fetal growth restriction and chronic intrauterine hypoxia, which in turn can result in impaired erythropoiesis, we hypothesized that RDW could be a novel biomarker in fetal growth restriction. To address this issue, we evaluated the RDW in fetal growth restriction.
STUDY DESIGN: The study population consisted of singleton preterm neonates (24-34 weeks of gestation) born in Seoul National University Hospital. RDW in cord blood was measured at the time of delivery, and was compared between small for gestational age (SGA) neonates (birthweight $<$ 10 percentile) and non-SGA neonates (birthweight $\geq$ 10 percentile). Among SGA neonates, RDW was also examined according to the presence or absence of neonatal morbidity and/or mortality.
RESULTS: A total of 552 neonates were included in the analysis, including 115 SGA neonates and 437 non-SGA neonates. RDW of SGA neonates was significantly higher than that of non-SGA neonates (median, 18.9 in SGA neonates vs. 16.6 in non-SGA neonates, $p<0.001$). In SGA neonates, RDW increased as the umbilical arterial Doppler worsened. In addition, RDS above 90 percentile was associated with increased neonatal morbidity and/or mortality among SGA neonates, and this relationship remained statistically significant after adjustment for gestational age at delivery, birthweight, and hematologic parameters.
CONCLUSION: The RDW was higher in SGA neonates and was associated with neonatal morbidity and/or mortality among SGA neonates.

Figure. Cord blood RDW according to the presence or absence of small for gestational age (SGA) and abnormal Umbilical artery Doppler



182 Preoperative ultrasound prediction of essential landmarks for fetoscopic laser coagulation of placental vascular anastomoses

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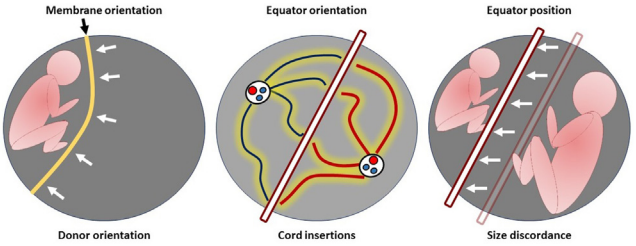
OBJECTIVE: Successful fetoscopic laser occlusion (FLOC) treatment of twin twin transfusion (TTTS) hinges on selecting a uterine entry that safely allows complete visualization of all anastomoses along the vascular equator (VE). We hypothesized that pre-operative ultrasound of the donor lie, placental cord insertions and size discordance

can predict the orientation and position of the intertwin membrane and VE (Figure) to allow successful FLOC.



STUDY DESIGN: The orientation of the key landmarks was prospectively and independently documented by 3 surgeons prior to FLOC. Following FLOC the intraoperative findings were compared to the preoperative prediction. Correct identification of basic and specific membrane, VE, VE to membrane orientation and inadvertent anterior septostomy was computed and related to case characteristics, surgeon experience and intraoperative outcome.

RESULTS: In a 3 month period 59 assessments were performed prior to 24 FLOC surgeries (10 Quintero stages 1&2, 14 stages 3&4; median gestational age 18.8 weeks (16.3-25.6); median fluid pockets 10 cm (8.1-22) and 1 cm (0-2) in recipient and donor, respectively). The maternal body mass index was 28 kg/m^2 (17.6-62.7). Basic membrane and equator orientation were correctly predicted in 52 (88.1%) and 51 (86.4%) of assessments and specific prediction was correct in 40 (66%) and 31 (52.5%), respectively. The basic relationship between the membrane and equator was correctly predicted in 45 (76.3%) of assessments but their specific relationship prediction was correct in only 19 (32.2%). There were 2 anterior septostomies of the intertwin membrane. The predicted entry provided adequate visualization of the vascular equator allowing complete equatorial dichorionization in 87.5% (n=21). Incomplete equator visualization was due to extensive anterior placenta which would not have been circumvented by a different entry site. The prediction accuracy was independent of surgeon experience, placental location, amniotic fluid volume. High body mass index (r^2 0.36, p=0.001) was the only factor that negatively impacted optimal preoperative assessment.

CONCLUSION: We present a simple ultrasound technique that allows reproducible and consistent preoperative prediction of key anatomic landmarks for successful FLOC treatment of TTTS independent of multiple potential confounders.

183 Fetal neuroprotective effects of maternal magnesium for late gestation inflammation: inhibition of apoptosis, neuronal nitric oxide synthase and nf-kb activation

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OBJECTIVE: In preterm birth, maternal magnesium sulphate (Mg) has been used as neuroprotective agent in preventing white matter brain injury. At term, chorioamnionitis and funisitis occur commonly and are associated with cerebral injury. Infection activates cell death pathways (apoptosis) and inflammatory responses through induction of caspase 3, oxidative stress and NF-kB pathways. We sought to determine if maternal Mg prevents the activation of apoptosis and inflammatory pathways in response to inflammation at late gestation.

STUDY DESIGN: Pregnant rats at 20 days of gestation (24 total: 4 groups, n=6) received injections of i.p. lipopolysaccharide (LPS; 500 ug/kg) or saline (SAL) at time 0. Dams were randomized to treatment with s.c. saline or Mg (270 mg/kg loading followed by 27 mg/kg q20 min) for 2 hours prior to and 2 hours following LPS /saline injections. Rats were sacrificed 4 hours following LPS/ saline injection. Fetal brains were collected from the 4 treatment groups (LPS/SAL, LPS/Mg, SAL/MG, SAL/SAL). We used one fetal brain from each dam, resulting in 6 brains from 6 different dams in each group. Fetal brain caspase 3 active form (af), NF-kB p65, neuronal nitric oxide synthase (phospho-nNos) and protein levels of interleukin (IL)-6, IL-10 and TNFα were determined by western blot analysis.

RESULTS: Maternal LPS (LPS/SAL) at e20 significantly ($p<0.01$) increased fetal brain caspase 3 af (0.27 $\pm$ 0.02 vs. 0.15 $\pm$ 0.06 u), NFkB p65 (0.23 $\pm$ 0.01 vs. 0.13 $\pm$ 0.01 u), and phospho-nNOS (0.22 $\pm$ 0.01 vs. 0.12 $\pm$ 0.01 u) as well as fetal brain pro-inflammatory cytokines (IL-6 0.21 $\pm$ 0.01 vs. 0.11 $\pm$ 0.01 u; TNFα 0.29 $\pm$ 0.01 vs. 0.15 $\pm$ 0.01 u) as compared to control fetuses (SAL/SAL). Maternal LPS did not alter fetal brain IL-10 levels. Mg treatment to LPS dams (LPS/Mg) significantly ($p < 0.05$) reduced fetal brain caspase 3 af (0.16 $\pm$ 0.01 u), NFkB p65 (0.11 $\pm$ 0.01 u) and phospho-Nnos (0.1 $\pm$ 0.01 u) as well as brain pro-inflammatory cytokines (IL-6 0.07 $\pm$ 0.01 u; TNFα 0.15 $\pm$ 0.01 u) to levels similar to Controls (SAL/SAL).

CONCLUSION: Maternal and/or fetal inflammation-induced fetal brain injury may be mediated via activation of inflammation, oxidative stress and apoptosis pathways. Maternal Mg may prevent inflammation-induced brain injury at term via inhibition of these putative pathways.

184 Fetal inflammatory response in the context of funisitis, but not acute histologic chorioamnionitis without funisitis, decreases with increasing gestational age

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OBJECTIVE: Recent study demonstrated that the intensity of amniotic fluid inflammatory response decreases in the setting of acute histologic chorioamnionitis(acute-HCA) with increasing gestational age(GA). However, there is no information about whether the intensity of fetal inflammatory response(FIR) in the same setting of placental inflammatory condition decreases with GA. We hypothesized that the intensity of FIR would decrease with increasing GA in the setting of funisitis, but not acute-HCA without funisitis.

STUDY DESIGN: FIR was examined in 209 singleton preterm-pregnancies(23.1< GA at delivery <36wks) with acute-HCA or funisitis and with preterm labor or preterm-PROM. Study population was divided into GA at delivery $\leq$30wks(n=61), 30-34wks(n=87), and 34-36wks(n=61). Acute-HCA was diagnosed in the presence of inflammation in chorio-decidua(CD), amnion or chorionic plate, and funisitis was defined as inflammation in umbilical cord. FIR was determined by umbilical cord plasma(UCP) CRP concentration at birth.

RESULTS: UCP CRP concentrations at birth were less intense at higher GA in patients with acute-HCA or funisitis(P<.005). Median UCP CRP concentration(ng/ml) at birth decreased in patients with funisitis (840.6,[7.6-10897.4] vs. 368.8,[4.9-5555.0] vs. 128.2,[2.2-4533.9]; P<.05), but not acute-HCA without funisitis(36.1,[1.9-7401.8] vs. 23.8,[3.0-2702.4] vs. 15.2,[3.9-1295.5]; P>.1), with increasing GA. Moreover, median UCP CRP concentration at birth