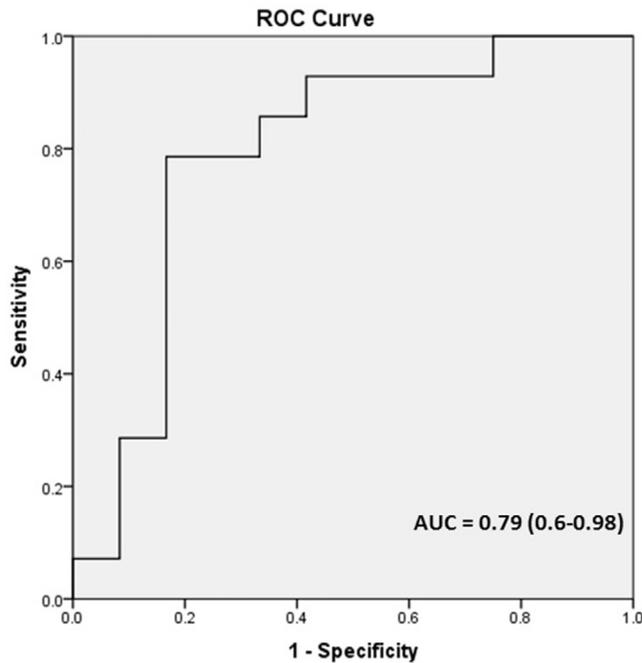


analysis identified an O/E LHR of <39% to as the best predictive cutoff for ECMO (AUC 0.79 (0.6-0.98), sensitivity 79%, specificity 83%, see Figure).



CONCLUSION: The O/E LHR expresses the relative lung size as a fixed percentage and performs better than other ultrasound parameters, including the LHR, in predicting the need for postnatal ECMO. Parents of a fetus with CDH with an O/E LHR of <39% may benefit from specialized counseling on neonatal ECMO.

217 Prenatal diagnosis of congenital diaphragmatic hernia: does laterality predict adverse perinatal outcomes?



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OBJECTIVE: To examine laterality as a predictor of adverse perinatal outcomes among fetuses with prenatally diagnosed congenital diaphragmatic hernia (CDH).

STUDY DESIGN: This is a retrospective cohort study of pregnancies with fetal CDH that were evaluated at our institution's Fetal Treatment Center from 2008 to 2016. Cases with right- versus left-sided CDH were compared. Outcomes examined included lung to head ratio (LHR), liver and stomach herniation, presence of additional anomalies, amniotic volume, hydrops, specific fetal cavity with abnormal fluid collection, intrauterine fetal demise (IUFD), gestational age (GA) at birth, birth weight, mode of delivery, use of extracorporeal membrane oxygenation (ECMO), neonatal days to discharge, and survival to discharge. Cases resulting in termination or IUFD were excluded from analyses of neonatal outcomes. Categorical variables were compared with the Fisher's exact or Chi square test as appropriate, nonparametric continuous variables were compared using Wilcoxon rank-sum, and multivariate logistic regression was used to generate adjusted odds ratios (aOR).

RESULTS: Of the 191 CDH cases identified during the study period, 157 (82%) were left-sided and 34 (18%) were right-sided. Compared

to left-sided CDH cases, those with right-sided CDH had a greater risk of liver herniation, ascites, pleural effusion, and hydrops, and demonstrated a lower median LHR (Table). In contrast, cases with left-sided CDH showed a greater risk of stomach herniation. Other perinatal outcomes did not differ by laterality (Table). For right-sided CDH, multivariate logistic regression yielded adjusted odds ratios of 3.9 (p=0.032) for liver herniation, 11.8 (p=0.001) for ascites, 9.0 (p=0.004) for pleural effusion, 14.8 (p=0.002) for hydrops, and 0.06 (p<0.001) for stomach herniation.

CONCLUSION: When compared to left-sided CDH, fetuses with right-sided CDH were more likely to have liver herniation, ascites, pleural effusion, and hydrops, and to have a lower LHR. Increased antenatal surveillance is warranted in cases of right-sided CDH to monitor for development of these outcomes.

•All continuous variables are presented as median values with ranges

Characteristics	Right-sided CDH	Left-sided CDH	p-value
LHR (range)	0.87 (0.5-3.0)	0.99 (0.3-3.0)	0.046
Liver herniation	90.6%	69.4%	0.026
Stomach herniation	12.5%	69.4%	<0.001
Polyhydramnios	31.3%	28.7%	0.769
Ascites	18.8%	1.9%	0.001
Pleuraeffusion	15.6%	1.9%	0.004
Hydrops fetalis	15.6%	1.9%	0.002
Any other anomaly	18.8%	26.8%	0.343
IUFD	3.2%	2.6%	0.999
GA at birth (weeks(range))	38.1 (29-40)	38 (30-41)	0.786
Birthweight(grams)	3200 (1300-4000)	3012 (1356-4735)	0.633
Neonatal or infant death	36%	33.6%	0.820

218 Risks of preterm premature rupture of membranes and preterm birth based on location of trocar insertion site



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OBJECTIVE: Preterm premature rupture of membranes (PPROM) and preterm birth (PTB) are known risks of invasive fetal interventions such as laser surgery for twin-twin transfusion syndrome (TTTS). The aim of this study was to assess whether the location of the trocar insertion site on the maternal abdomen was associated with PPRM and PTB. We hypothesized that the risks were higher for insertions that enter the uterus in the lower uterine segment (LUS) and in lateral entries.

STUDY DESIGN: Data were aggregated from two centers that perform percutaneous laser surgery for TTTS with identical protocols. Trocar location was prospectively documented in the operating room in centimeters (cm) vertically from the symphysis pubis and horizontally from the midline; LUS location was defined as any insertion <10 cm from the pubic symphysis on the vertical axis, and lateral location was defined as >5 cm from the midline in either direction on the horizontal axis. Patient characteristics, including trocar location (LUS y/n and Lateral y/n), were tested bivariately against 3

outcomes of interest: PPROM < 21 days, PTB < 28 weeks, and PTB < 32 weeks. For each outcome, multiple logistic models were fitted to examine the effect of trocar location, controlling for other potential risk factors. Odds ratios (OR) are reported with 95% confidence intervals.

RESULTS: 751 patients were studied. In bivariate analysis, LUS location was associated with PPROM < 21 days (18.3% vs. 8.8%, $p = 0.0355$), but not with PTB < 28 weeks (10.7% vs. 9.4%, $p=0.72$) or PTB < 32 weeks (12.2% vs. 8.2%, $p = 0.09$). Lateral location was not associated with any of the 3 outcomes. Results were confirmed with logistic regression models. Patients with LUS location were twice as likely as those with a more superior location to have PPROM < 21 days (OR = 2.17, 1.06-4.46), after controlling for placental location, Quintero stage, gestational age at procedure, preoperative vaginal bleeding, and study center.

CONCLUSION: After controlling for potential confounders, we found that trocar insertion in the LUS appeared to be associated with an increased risk of PPROM but not preterm birth. Inherent differences in the local milieu of the fetal membranes may explain these findings. Although the site of trocar insertion is often restricted by case-specific factors, it is reasonable to avoid the lower uterine segment if technically feasible.

219 Neonatal morbidity in preterm growth-restricted fetuses: does mode of delivery matter?

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OBJECTIVE: Fetal growth restriction (FGR) is associated with increased morbidity and mortality especially in preterm neonates. Cesarean rates among growth-restricted, premature fetuses are reported as high as 50%. The objective of our study was to examine neonatal outcomes in premature growth-restricted fetuses based on mode of delivery.

STUDY DESIGN: We performed a retrospective cohort study of patients with antenatally diagnosed FGR (estimated fetal weight less than 10th percentile) from 2006-2016. We included singleton, live born pregnancies delivering between 30-36 weeks' gestation. Neonates with suspected chromosomal abnormalities or anomalies were excluded. Maternal factors such as smoking, hypertension, parity, and abnormal Dopplers were examined. Neonatal outcomes included respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), 5-minute Apgar <7, neonatal death, and length of NICU stay. Mode of delivery and neonatal outcome were analyzed using Chi square. Logistic regression was used for composite neonatal morbidity. Length of NICU stay was tested using Kruskal-Wallis H test.

RESULTS: Complete data for 200 patients were available for our study. Of these, 50.3% underwent induction of labor and 49.5% underwent planned Cesarean. Ultimately 70.3% of the study population delivered by Cesarean. Composite morbidity was significantly higher in patients undergoing planned Cesarean delivery when compared to those who were induced and delivered vaginally (OR 2.73 [95% CI 1.10-6.75]). This finding remained significant after controlling for hypertension, smoking, parity, and abnormal Doppler studies. There was not an increase in composite morbidity in those patients who underwent induction but ultimately delivered by Cesarean compared

with those delivering vaginally. No neonatal deaths occurred in our study population. Neonates delivered by planned Cesarean and Cesarean after induction were found to have a longer stay in the NICU ($p < 0.001$).

CONCLUSION: Cesarean delivery is common among pregnancies complicated by FGR. Our data demonstrated a lower risk for neonatal morbidity in vaginal deliveries compared with planned Cesareans. These results are helpful for counseling patients regarding mode of delivery in growth restricted fetuses requiring preterm delivery.

Mode of Delivery	Induction/Vaginal 6 (3%)	Induction/Cesarean 7 (3.5%)	Planned Cesarean 22 (11%)	P value
RDS (n, %)	0	0	2 (1%)	0.163
IVH (n, %)	0	0	1 (0.5%)	0.599
5-minute Apgar <7 (n, %)	0	0	3 (1.5%)	0.211
NICU stay (mean, days)	12.8	15.5	24.2	<0.001

220 Neonatal morbidity is increased with the inaccurate diagnosis of fetal growth restriction

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OBJECTIVE: With the limited accuracy of fetal growth ultrasound, sonographic screening for fetal growth restriction (FGR) introduces the potential for misdiagnosis of an appropriate-for-gestational age (AGA) fetus as FGR, which may increase the likelihood of iatrogenic prematurity and associated perinatal complications. We sought to determine the frequency of misdiagnosis of FGR in newborns with AGA birth weights, and to test the hypothesis that misdiagnosis of FGR increases the likelihood of prematurity and adverse perinatal outcomes.

STUDY DESIGN: In this retrospective cohort study, the exposed cohort consisted of all singleton, liveborn, non-anomalous infants delivered at Magee-Womens Hospital from 2003-2009 that were AGA at birth, but characterized as FGR on antenatal ultrasound. For each exposed infant, we selected 9 unexposed controls whose birth weight percentile fell within 3 points of the exposed infant and were considered AGA on growth ultrasound during the same gestational week that the exposed infant was considered FGR. Consistent with institutional protocol, fetal and neonatal weights were evaluated using the growth standard published by Fenton. We compared outcomes in exposed and unexposed infants using chi-square test and logistic regression, adjusting for education, tobacco use, marital status, race, and nulliparity.

RESULTS: Out of 40,577 AGA newborns that met inclusion criteria, 10,549 (26.0%) underwent fetal growth ultrasound beyond 24 weeks. Of these, only 78 (0.7%) were misdiagnosed as FGR. AGA neonates identified as FGR on ultrasound were more likely to deliver preterm, and more likely to require NICU admission (Table). There was only 1 neonatal death in the entire study cohort, and no cases of 5 min. Apgar<4. Misdiagnosis of FGR was not associated with an increased risk of Cesarean delivery.

CONCLUSION: With use of the Fenton nomogram, the antenatal diagnosis of FGR in AGA neonates was rare, but associated with an increased likelihood of preterm delivery and NICU admission. These risks must be considered when evaluating the utility of fetal growth ultrasound or adoption of less stringent fetal growth standards.