

[06-051]

Prenatal MRI Volumetrics Predict Surgical Closure Strategy in Giant Omphalocele: A Comparison of Early Surgery and Paint-and-Wait

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Purpose

Giant omphalocele (GO) management lacks consensus between early surgery and paint-and-wait. We compared outcomes between strategies and evaluated whether prenatal MRI volumetrics can predict primary fascial closure feasibility.

Methods

Retrospective cohort study (2007–2024) of newborns with GO (sac ≥ 5 cm containing liver) at a single fetal center. Early surgery was compared to paint-and-wait. In early surgery patients with prenatal MRI (n=21), T2-weighted segmentation measured intra-abdominal volume (IAV) and eviscerated organ volume (EOV) using Visage 7. Evisceration index ($EI = EOV/[EOV+IAV] \times 100$) was correlated with closure type by ROC analysis.

Results

Forty-three infants were included (25 early surgery, 18 paint-and-wait). Mortality was comparable (8.0% vs. 11.1%; $p=1.00$). Early surgery achieved faster fascial closure (27 vs. 464 days; $p<0.01$) with lower rates of tracheostomy (4.0% vs. 33.3%; $p=0.02$) and bacteremia (0% vs. 27.8%; $p=0.01$). Primary closure patients had lower EI (16.0% vs. 37.0%; $p<0.01$) and no stomach herniation (0% vs. 68.8%; $p=0.01$). ROC analysis identified $EI \geq 26\%$ as predictive of staged closure.

Conclusions

Early surgery reduces tracheostomy and bacteremia while accelerating closure. Prenatal MRI evisceration index and stomach position accurately predict primary closure feasibility, enabling individualized counseling for GO families.

[06-052]

Prenatally Ruptured Omphalocele: Perinatal Outcomes and Prognostic Imaging Markers in a Single-Center Case Series (2012–2024)

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Objectives: To describe the perinatal outcomes, associated prenatal imaging findings, and potential prognostic markers in fetuses with prenatally diagnosed ruptured omphalocele.

Methods: Retrospective study of fetuses with prenatally diagnosed ruptured omphalocele between January 2012 and 2025. Cases with prenatal diagnosis of omphalocele sac rupture confirmed by imaging and documentation at delivery and those with postnatal records were included.

Results: 9 patients were included: All demonstrated $\geq 50\%$ liver herniation, all tested had normal chromosomal microarray results (6/6). Mean TFLV was 21.0 ± 8.7 mL, observed/expected TFLV $43.4 \pm 18.7\%$; hydrops was present in 2/9 (22%). 6/9 (66.7%) fetuses survived past delivery, 1/9 (11.1%) died at delivery, and 2/9 (22.2%) experienced intrauterine fetal demise. Of the six who survived past delivery, all neonates were admitted to the NICU and developed respiratory distress syndrome and pulmonary hypertension requiring oxygen beyond day-of-life 30. Survival to discharge occurred in 3/6 (50%) of infants who survived delivery. All survivors required tracheostomy.

Conclusions: Overall, prognosis after prenatal rupture of an omphalocele was poor in this series—66.67% experienced intrauterine or postnatal death, 33.33% survived to discharge. All survivors experienced severe but manageable pulmonary morbidity, requiring prolonged respiratory support and tracheostomy.

[06-053]

Extracorporeal Membrane Oxygenation in Neonates with Omphalocele: Outcomes and Implications for Prenatal Counseling

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Objective: To describe outcomes and temporal trends among neonates with omphalocele requiring extracorporeal membrane oxygenation (ECMO), and assess implications for prenatal counseling.

Methods: Retrospective study of neonates with omphalocele supported with ECMO using the ELSO registry (2000–2025). Demographics and outcomes were summarized and stratified by survival status. Descriptive statistics and Cox regression were used to assess mortality.

Results: A total of 88 neonates with omphalocele supported with ECMO were identified. Survival to discharge was 41%. Younger age (<28 days) and male sex were associated with survival ($p=0.048$; $p=0.047$). In multivariable Cox analysis, the presence of any ECMO complication was associated with increased mortality (HR 2.33, 95% CI 1.23–4.35, $p=0.009$). ECMO cases in neonates with omphalocele were increasingly concentrated in more recent eras, rising from 2.3% in 2007–2012 to 36% in 2013–2018 and 56% in 2019–2024 ($p=0.5$). When compared to congenital lung malformations (CLM) and congenital diaphragmatic hernia (CDH), omphalocele ECMO cases demonstrated a more pronounced increase rate over time.

Conclusions: Neonates with omphalocele requiring ECMO have high mortality, influenced by clinical factors and ECMO-related complications. Temporal patterns suggest increasing ECMO use relative to other congenital anomalies, with implications for prenatal counseling.

[06-054]

Maternal risk factors for Omphalocele

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Introduction: The etiology of Omphalocele is not fully understood and little is known on the role of maternal factors. The aim of this study was to investigate the role of maternal risk factors in the development of omphalocele.

Methods: A population-based case-control study was conducted using data from Swedish national registries between 1997 and 2016. The study included 207 mothers of children born with omphalocele (cases) and 2070 controls, matched on the children's sex and birth year. Conditional logistic regression analysis was used to estimate odds ratios (OR) with 95% confidence intervals (CI).

Results: Maternal obesity (adjusted Odds Ratio (OR) 1.82, 95% Confidence interval (CI) 1.14-2.88), IVF conception (adjusted OR 4.49, 95% CI 1.76-11.4) and nulliparity (58% of cases being firstborn) were associated with an increased risk of omphalocele. Multiparity was associated to decreased risk (adjusted OR 0.44, 95% CI 0.25-0.77).

Conclusions: Maternal obesity, IVF conception and being first born are factors associated with an increased risk of omphalocele, whereas multiparity is linked to decreased risk.

[06-055]

Validating a Rabbit Model of Complex Gastroschisis

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Background

Prenatal identification of complex gastroschisis may allow for selection of patients that would benefit from fetal interventions. Using a rabbit surgical model, we sought to induce complex gastroschisis and differentiate it from simple gastroschisis using fetal blood analyzed via mass spectrometry (MS).

Methods

Fetal rabbits underwent surgical gastroschisis creation at E24 (term=31-33 days). The fetuses were partially delivered via hysterotomies, and a segment of small bowel was delivered through a surgically created abdominal wall defect. Complex gastroschisis was induced by constricting the defect with suture. Fetuses were euthanized and necropsied at E30. Complex gastroschisis was defined as the presence of ischemic or atretic bowel with intra-abdominal bowel distension. Fetal blood obtained at necropsy was sent for MS.

Results

MS of four sham, four simple, and five complex gastroschisis fetuses identified distinct phenotypic profiles on a score plot based on unique metabolites that are undergoing further characterization.

Conclusions

We have developed a rabbit model of complex gastroschisis that is distinct from simple gastroschisis and shams by both gross findings and metabolomic signatures. These unique phenotypes may help differentiate severity of gastroschisis and thus identify patients that may benefit from fetal intervention.

[06-056]

Gestational Stage-Associated Transcriptomic Changes and Their Modulation Following Fetal Repair in an Ovine Model of Gastroschisis

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Objectives:

To characterize gestational stage-associated transcriptomic differences in intestinal tissue in gastroschisis and assess their modulation following fetal repair in a preclinical ovine model.

Methods:

This exploratory secondary analysis used intestinal samples from an established fetal lamb model of complex gastroschisis induced at 75 days of gestation (term = 145 days). Gastroschisis-induced fetuses underwent either mid-gestation harvest alone, mid-gestation fetal repair followed by term harvest, or term harvest alone. Non-operated littermates served as controls. Bulk RNA sequencing was performed on intestinal tissue obtained at harvest. Differentially expressed genes (DEGs) were assessed, followed by pathway analyses focusing on extracellular matrix (ECM), enteric nervous system (ENS), angiogenic, and inflammatory pathways.

Results:

Gastroschisis demonstrated limited transcriptional differences at mid-gestation (150 DEGs) but substantial divergence at term (2,423 DEGs) compared with non-operated littermates. ECM-related pathways were upregulated at mid-gestation and term, whereas ENS, angiogenic, and inflammatory pathways demonstrated greater divergence at term. Repaired gastroschisis demonstrated markedly fewer transcriptomic differences (29 DEGs) relative to non-operated littermates at term.

Conclusions:

Gastroschisis in the ovine model demonstrated gestational stage-associated intestinal transcriptomic differences, characterized by ECM-related changes at mid-gestation and broader neurovascular and inflammatory pathway divergence at term. Fetal repair may modulate transcriptomic divergence associated with gastroschisis.

[06-057]

Effect of Fetal Repair on Complex Bowel Features and Motility in an Ovine Gastroschisis Model

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Objectives:

To determine whether fetal repair reduces the occurrence of complex bowel features and modifies bowel motility at term in a previously established ovine model of complex gastroschisis.

Methods:

At gestational day 75 (term=145 days), gastroschisis was induced by a silicone ring-reinforced abdominal wall defect. Ten to fifteen days later, fetal repair was performed via hysterotomy with silicone ring removal, mesenteric stalk dissection, defect enlargement, bowel reduction, and closure. At term, lambs were delivered and assessed. Unrepaired term gastroschisis lambs from a prior experiment served as controls. Co-primary outcomes were (1) complex bowel features, defined as stenosis, atresia, volvulus, perforation, or necrosis, and (2) in vivo MRI-based bowel motility. Secondary outcomes included ex vivo bowel contractility and histology.

Results:

Eighteen fetuses underwent induction and repair; 13/18 (72%) survived to term. Among survivors, complex bowel features were present in 7/13 (54%) repaired lambs, lower but not significantly different from 7/7 (100%) in the historical unrepaired lambs ($p=0.052$). Bowel motility was higher in repaired lambs than in unrepaired controls. Repaired lambs showed altered enteric neuromuscular responses and thinner muscular layers.

Conclusions:

Fetal repair did not reduce the occurrence of complex bowel features but was associated with modification of bowel motility at term.

[06-058]

Evaluating the safety and effectiveness of the Vortex shunt in a fetal lamb model of lower urinary tract obstruction

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Objectives

To investigate the efficacy and safety of the Vortex shunt in the fetal lambs with lower urinary tract obstruction (LUTO).

Method

LUTO was induced in male fetal lambs at a median of 75 days (term 145 days). Fetuses were assigned to continue pregnancy until near term (LUTO, n=11) or receive ultrasound-guided Vortex shunt at a median of 96 days (Vortex, n=22). The co-twin served as a control (n=29). At 138 days, fetuses were euthanized. Safety assessed shunt dislodgement, patency, and retrievability. Efficacy was evaluated with anthropometric measurements, amniotic fluid normalization, and bladder contractility studies.

Results

All 22 Vortex shunts remained functional, properly positioned without dislodgment, and easily retrievable at the bedside after delivery. Compared with LUTO fetuses, amniotic fluid levels, lung-to-body weight ratio, bladder-to-body weight ratio, and renal pelvis diameters normalized after Vortex shunt placement. Renal histology showed normalization of the cortex-medulla ratio, glomerular maturity, and nephrogenic zone. Although bladder contractility improved after Vortex shunt placement compared with LUTO fetal lambs, the difference was not statistically significant.

Conclusion

This preclinical study confirms the Vortex shunt's safety, efficacy, and retrievability, with the shunt remaining functional during implantation. No dislodgment occurred. Hydronephrosis and renal anatomy normalized, and bladder contractility improved.

[06-059]

Sequential Abdomino-Amniotic and Vesico-Amniotic Shunting for Spontaneous Bladder Rupture Complicating LUTO with Suspected Anterior Urethral Valve: A Case Report

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Background. Fetal lower urinary tract obstruction (LUTO) in males carries a high risk of renal impairment and perinatal death. Spontaneous bladder rupture is a rare complication that transiently decompresses the urinary tract.

Case. A male fetus was referred at 21 weeks for ambiguous genitalia, subsequently characterised as hypospadias with a suspected anterior urethral valve. Bladder and kidneys were initially normal. By 26+3 weeks the bladder was moderately enlarged but judged not amenable to shunting. At 28+3 weeks a bladder “blow-out” with severe urinary ascites occurred. An abdomino-amniotic shunt was placed at 29+0 weeks, resolving the ascites and allowing bladder reformation. At 31+1 weeks, recurrent megacystis with urethral dilatation, bilateral hydronephrosis and new ureteric dilatation prompted insertion of a vesico-amniotic shunt, followed by normalisation of upper-tract dilatation. Amniotic fluid volume remained normal throughout; chromosomal microarray and whole-genome sequencing were normal. After PPROM at 34+2 weeks a 1920 g boy was delivered vaginally (Apgar 10/10). Both shunts were easily removed; postnatal imaging showed normal kidneys and renal biomarkers were normal.

Conclusion. Sequential abdomino-amniotic and vesico-amniotic shunting successfully managed fetal bladder rupture and recurrent obstruction while preserving renal function, illustrating a staged therapeutic option with good outcome in a rare presentation of LUTO.

[06-060]

Prenatal Bilateral Renal Decompression to Facilitate Vaginal Delivery in Severe Bilateral Hydronephrosis with UPJ Obstruction

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Bilateral severe fetal hydronephrosis with ureteropelvic junction obstruction represents a rare obstetric challenge when fluid accumulation substantially increases fetal abdominal dimensions. Abdominal dystocia from fetal anomaly has been reported, though no defined threshold or evidence-based guidelines exist to direct intrapartum management in this setting.

A 21-year-old G3P0202 was transferred at 33+2 weeks with PPROM and known bilateral severe hydronephrosis with UPJ obstruction and right renal displacement, identified at 28 weeks. Fetal bladder and amniotic fluid were normal. As preterm labor progressed to 4 cm dilation, fetal abdominal circumference measured 35.49 cm (>99th percentile, equivalent to 39+3 weeks), raising concern for abdominal dystocia. Ultrasound-guided bilateral percutaneous drainage aspirated 275 mL of fetal urine, reducing abdominal circumference to 31.4 cm. Vaginal delivery occurred 6 hours later without complication; Apgars 8 and 9. Left nephrostomy was successfully placed postnatally; right-sided percutaneous access was not achievable, prompting MRI which identified an 8x8x6 cm massively dilated renal pelvis displacing the right kidney across midline with overlying bowel precluding safe access. Robotic pyeloplasty is planned at 3-6 months. This case illustrates prenatal renal decompression as a feasible intrapartum strategy when severe bilateral hydronephrosis raises concern for abdominal dystocia.

[06-061]

Not Always Lethal: Contemporary Outcomes of Neonates with Congenital Bilateral Renal Agenesis

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Background:

Historically, CoBRA was fatal secondary to renal and pulmonary morbidity. However, with advances in fetal and neonatal care, survival rates may be improving. We aimed to characterize outcomes among infant survivors of CoBRA.

Methods:

Epic Cosmos was queried for neonates born 2016-2025 with renal agenesis who underwent dialysis in the NICU. We examined characteristics of survivors and non-survivors and longitudinal data on dialysis and associated procedures.

Results:

We identified 1,009 neonates with CoBRA; 7.3% survived to discharge. For non-survivors (n=935), median age at death was 1 day; 5.6% had pulmonary hypertension, 40.9% were intubated, 1.3% received ECMO and 4.1% dialysis. For survivors (n=74), median LOS was 107 days; 28.4% had pulmonary hypertension, 78.4% were intubated, <10% received ECMO, and 37.8% received a gastrostomy tube. Most (81.1%) received dialysis during their index hospitalization (median age = 7.5 days). 54 survivors had peritoneal dialysis catheter placement during their index hospitalization; 51.9% needed additional peritoneal dialysis catheter procedures. At a median follow-up of 2.7 years after discharge, there were <10 additional mortalities. 10 patients proceeded to renal transplantation at a median age of 2.77 years.

Conclusion:

While survival rates remain low for CoBRA, a subset receiving comprehensive care survive to renal transplantation.

[06-062]

Graft and Patient Survival After Kidney Transplantation in Congenital Bilateral Renal Agenesis

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Background: Advances in prenatal intervention and postnatal care have improved survival in patients with congenital bilateral renal agenesis (CoBRA). Kidney transplantation remains the gold standard treatment for end-stage renal disease (ESRD). However, transplantation outcomes in CoBRA patients remain limited. **Methods:** We conducted a retrospective review of patients with CoBRA who underwent kidney transplantation using the Epic Cosmos database. Continuous variables were reported as median and IQR; categorical variables as n (%).

Results: 81 patients with CoBRA underwent kidney transplantation from 2014–2026. Median age at listing was 10.5 years (IQR 1.5, 31.5); Median age at transplant was 22.0 years (IQR 5.0, 35.0). 89% underwent pre-transplant dialysis for a median of 34.0 months (IQR 20.5, 60.5). 76% had a prior kidney transplant. Donor type was predominantly donation after brain death (58%), with 27% receiving living donor transplants. Median hospital length of stay was 7.0 days (IQR 4.0, 10.0). Delayed graft function occurred in 19%, graft infection in 22%, and graft rejection in 36%. <10% required re-transplantation. Graft survival was 73% and patient survival was 100% at a median follow-up of 36.7 months (IQR 15.7, 59.0).

Conclusion: Kidney transplantation with CoBRA is feasible with favorable graft and patient survival.

[06-063]

Larger Fetal Ovarian Cysts are at Risk for Ovarian Loss

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Conflicts of Interest:

The authors have no conflicts of interest to disclose.

Background

Prenatally diagnosed ovarian cysts (OCs) are common, but predictors of torsion and ovarian loss remain poorly defined.

Methods

We conducted a review of fetuses with suspected OCs from 2013-2025. Patients were categorized through postnatal imaging or intraoperative findings as having two ovaries preserved (OP) or one ovary lost (OL) at the time of last follow up. Mann-Whitney U and Fischer's exact tests were used to compare groups; $p < 0.05$ was considered significant.

Results

Thirty-two maternal-fetal dyads were analyzed. Twenty-three patients (72%) had OPs and nine (28%) had OL. Six OL patients underwent surgical procedures for their ovarian cyst. No ovaries were salvaged via surgery. Compared with OP patients, OL patients had larger prenatal cysts by both maximum linear dimension (MLD) and volume ($p = 0.0017$ and $p = 0.0036$), as well as larger final prenatal volumes ($p = 0.0018$). Postnatally, OL patients continued to have larger cysts in MLD and volume ($p < 0.0001$ and $p < 0.0001$). OL patients were more likely to undergo intervention ($p < 0.0001$) and less likely to have cyst resolution on imaging ($p = 0.0010$). Three fetuses had resolution of the cyst prenatally.

Conclusions

Ovarian loss occurred in more than one-quarter of patients and was strongly associated with larger cyst size. No postnatal surgical intervention resulted in ovarian salvage.

[06-174]

Microbe-associated IL17 signalling promotes human intestinal epithelial differentiation in utero**Jerry Chan^{1,2}**¹ KK Hospital Reproductive Medicine² Duke NUS Medical School Obstetrics and Gynaecology Academic Clinical Program

In our efforts to understand fetal immune system development and its relevance to intrauterine molecular therapy, we previously identified evidence of microbes in the early gestation fetal intestine capable of inducing memory T cell responses. We extend these findings by demonstrating how microbial signals and immune cells coordinate intestinal barrier development in-utero. Spatial and single-cell profiling of human fetal organs across the second trimester identified a fetal gut-resident Th17 program marked by IL17A+RORC+ effector memory T cells associated with bacterial signals. These IL17A+ T cells localize to discrete intestinal niches enriched for 16S rRNA bacterial signal and epithelial differentiation programs, including mucin-producing barrier pathways. High-resolution spatial imaging further positioned IL17A+ T cells and bacterial signals within crypt-associated regions adjacent to LGR5+ intestinal stem cells and goblet cells. Functional validation using fetal and adult human intestinal organoids demonstrated that IL-17A/F directly modulates epithelial programs in a dose-dependent manner: lower doses promote fetal differentiation-like states, whereas higher doses induce inflammatory pathways. Together, these findings define a spatially organized IL17 immune–epithelial axis in the developing human fetal gut and support a developmental role for microbially driven IL17 signaling in coordinating epithelial differentiation and barrier maturation before birth.