



## Is early delivery beneficial in gastroschisis?



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### ABSTRACT

**Purpose:** Gastroschisis neonates have delayed time to full enteral feeds (ENT), possibly due to bowel exposure to amniotic fluid. We investigated whether delivery at <37 weeks improves neonatal outcomes of gastroschisis and impact of intra/extra-abdominal bowel dilatation (IABD/EABD).

**Methods:** A retrospective review of gastroschisis (1992–2012) linked fetal/neonatal data at 2 tertiary referral centers was performed. Primary outcomes were ENT and length of hospital stay (LOS). Data (median [range]) were analyzed using parametric/non-parametric tests, positive/negative predictive values, and regression analysis.

**Results:** Two hundred forty-six patients were included. Thirty-two were complex (atresia/necrosis/perforation/stenosis), ENT ( $p < 0.0001$ ) and LOS ( $p < 0.0001$ ) were reduced with increasing gestational age. IABD persisted to last scan in 92 patients, 68 (74%) simple (intact/uncompromised bowel), 24 (26%) complex. IABD or EABD diameter in complex patients was not significantly greater than simple gastroschisis. Combined IABD/EABD was present in 22 patients (14 simple, 8 complex). When present at <30 weeks, the positive predictive value for complex gastroschisis was 75%. Two patients with necrosis and one atresia had IABD and collapsed extra-abdominal bowel from <30 weeks.

**Conclusion:** Early delivery is associated with prolonged ENT/LOS, suggesting elective delivery at <37 weeks is not beneficial. Combined IABD/EABD or IABD/collapsed extra-abdominal bowel is suggestive of complex gastroschisis.

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Gut dysfunction is a major morbidity in infants born with gastroschisis resulting in prolonged time to reach full enteral feeds (24 days in simple gastroschisis and 47 days in complex in a recent national UK study) [1]. There have been no advances in the treatment of gut dysfunction since the advent of parenteral nutrition. Optimizing antenatal management of gastroschisis may improve neonatal outcomes. There has been much debate as to whether early delivery of gastroschisis would improve gut function and if antenatal intra-abdominal or extra-abdominal bowel dilatation could predict patients that would benefit from early delivery. However, studies to date have included small numbers and no clear consensus has been reached for either issue. Our aim is to evaluate the clinical significance of both these issues.

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### 1. Background

Nearly half of all infants with gastroschisis have type 2 intestinal failure (>28 days of parenteral nutrition) [1]. It has been hypothesized that gestational age (GA) at delivery and intra-abdominal bowel dilatation (IABD) could play a significant role in the development of pathological post-natal bowel function [2,3]. Changes in the composition of the amniotic fluid in the third trimester may lead to inflammation of the exposed bowel and gut dysfunction [4,5]. Currently, many centers electively deliver women whose fetus has gastroschisis at 37 to 38 weeks gestation due to concerns about unexpected fetal death in later gestation [6–9]. It is unclear whether delivery at less than 37 weeks and as early as 34 weeks gestation would reduce the bowel inflammation that is secondary to amniotic fluid exposure and thence improve gut function after birth. A number of studies present conflicting evidence both for [2,10–13] and against [14–16] delivery at less than 37 weeks gestation. The majority of these studies have small numbers of patients.

**Table 1**  
Presence of intra-abdominal bowel dilatation (IABD), extra-abdominal bowel dilatation (EABD) and both IABD/EABD (combined) at different stages during pregnancy by gastroschisis complexity group. Positive predictive value and negative predictive value are for complex gastroschisis.

All intra-abdominal bowel dilatation (IABD)					
Complexity group (n = total in group)	IABD at last scan Number (% of complexity group)	IABD at $\geq 30$ weeks to $\leq 34$ GA Number (% of complexity group)	IABD at $< 30$ weeks GA Number (% of complexity group)	Resolved IABD Number (% of complexity group)	Never had IABD Number (% of complexity group)
Simple n = 214	68 (32%)	47 (22%)	21 (10%)	16 (7%)	130 (61%)
Complex n = 32	24 (75%)	21 (66%)	13 (41%)	2 (6%)	6 (19%)
Positive or negative predictive value (PPV or NPV)	26% PPV	31% PPV	38% PPV	89% NPV	96% NPV
All extra-abdominal bowel dilatation (EABD)					
Complexity group (n = total in group)	EABD at last scan Number (% of complexity group)	EABD at $\geq 30$ weeks to $\leq 34$ GA Number (% of complexity group)	EABD at $< 30$ weeks GA Number (% of complexity group)	Resolved EABD Number (% of complexity group)	Never had EABD Number (% of complexity group)
Simple n = 214	46 (21%)	28 (13%)	4 (2%)	6 (3%)	162 (76%)
Complex n = 32	12 (38%)	11 (0.34%)	7 (22%)	1 (3%)	19 (59%)
Positive or negative predictive value (PPV or NPV)	21% PPV	28% PPV	64% PPV	86% NPV	90% NPV
Combined intra and extra-abdominal bowel dilatation (combined)					
Complexity group (n = total in group)	Combined at last scan Number (% of complexity group)	Combined at $\geq 30$ weeks to $\leq 34$ GA. Number (% of complexity group)	Combined at $< 30$ weeks GA Number (% of complexity group)	Resolved combined Number (% of complexity group)	Never had combined Number (% of complexity group)
Simple n = 214	14 (26%)	13 (6%)	1 (0.5%)	1 (0.5%)	200 (93%)
Complex n = 32	8 (25%)	8 (25%)	3 (9%)	1 (3%)	24 (75%)
Positive or negative predictive value (PPV or NPV)	36% PPV	38% PPV	75% PPV	50% NPV	89% NPV

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