

Prenatal Diagnosis, Neonatal Outcomes, and Management of Pregnancies Complicated by Gastroschisis

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ABSTRACT

Introduction: Gastroschisis, a congenital abdominal wall defect, causes external protrusion of intestines and organs due to incomplete wall closure near the umbilicus. Accurate prenatal diagnosis through ultrasonography requires skilled operators to detect the defect and guide management. Early identification enables perinatal care planning to minimize complications, such as organ perforation, and optimize neonatal outcomes. This case report examines the prenatal diagnosis and management of gastroschisis in a primigravida, highlighting ultrasonography's role in clinical decision-making.

Case Description: A 26-year-old primigravida at 34–35 weeks gestation was referred from Zubir Mahmud Regional Hospital with a prenatal diagnosis of gastroschisis. She reported severe abdominal pain and vaginal spotting for three weeks. Physical examination indicated stable hemodynamics, with obstetric findings including a fundal height of 26 cm, estimated fetal weight of 2015 g, left-sided fetal back, fetal heart rate of 142 beats/min, breech presentation, and no contractions. Speculum examination revealed a closed external cervical os, no dilation, negative fluxus, positive flour, protruding amniotic membranes, and a positive nitrazine test. Vaginal examination showed a posterior, soft cervix with no dilation or palpable fetal parts. The pregnancy was diagnosed with congenital gastroschisis, and a cesarean section was planned to prevent abdominal organ perforation.

Conclusion: Gastroschisis, identified at 34–35 weeks gestation, necessitates early prenatal diagnosis to prepare for appropriate perinatal care. Cesarean delivery is a preferred strategy to reduce risks of organ damage, supporting improved neonatal outcomes in affected pregnancies.

Prenatal Diagnosis, Congenital Anomaly, Gastroschisis, Pregnancy, Cesarean Section

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INTRODUCTION

Gastroschisis is a congenital abdominal wall defect characterized by herniation of the intestines and, occasionally, other abdominal organs, through a small (<2 cm) defect, typically to the right of the umbilicus, due to incomplete abdominal wall closure during embryogenesis [1]. Its etiology is not fully understood, with theories suggesting early embryonic ischemia from right omphalomesenteric artery disruption or failure of the lateral abdominal folds to fuse, leading to herniation [2,3]. Unlike omphalocele, gastroschisis is rarely associated with other anomalies, although intestinal atresia or stenosis occurs in 7–30% of cases, cardiac malformations in 8%, and rare diaphragmatic hernias have been reported [4,5]. Risk factors include young maternal age (mean age, 20 years), substance abuse, low body mass index, smoking, alcohol use, environmental teratogens, and low socioeconomic status [6]. Globally, the prevalence of gastroschisis is approximately 1 per 2000 live births, with survival rates of 90–95% with optimal management [1].

Risk factors include young maternal age (mean age, 20 years), substance abuse, low body mass index, smoking, alcohol use, environmental teratogens, and low socioeconomic status [6]. Globally, the prevalence of gastroschisis is approximately 1 per 2000 live births, with survival rates of 90–95% with optimal management [1]. In Indonesia, data are scarce, with only 37 cases reported at Sanglah Hospital between 2010 and 2012, reflecting the challenges in accessing specialized care [7]. Prenatal diagnosis via ultrasonography, feasible at 10–12 weeks of gestation with 95% specificity and 60–75% sensitivity, enables monitoring for complications such as fetal growth restriction, bowel obstruction, or polyhydramnios, supported by elevated amniotic fluid alpha-fetoprotein and acetylcholinesterase levels [8,9].

Management includes counselling on termination for nonviable fetuses, delivery post-lung maturation to limit amniotic fluid exposure, and immediate postnatal surgery [10,11]. Although caesarean delivery was historically preferred to reduce bowel trauma, recent evidence has shown no advantage over vaginal delivery, reserving caesarean delivery for obstetric indications [12]. This case study examined the prenatal diagnosis and management of gastroschisis in a primigravida, emphasizing the importance of early detection and multidisciplinary care in resource-limited settings.

CASE DESCRIPTION

A 26-year-old primigravida at 34–35 weeks of gestation was referred from Zubir Mahmud Regional Hospital. Zainoel Abidin Hospital, Banda Aceh, due to a prenatal diagnosis of gastroschisis, confirmed by ultrasonography at 6 months gestation showing intestines outside the fetal abdomen. The patient reported severe abdominal pain and vaginal spotting for three weeks, with amniotic fluid leakage noted 9 hours prior to admission. She denied mucus or blood discharge from the birth canal but reported occasional mild contractions and active fetal movement. Her last menstrual period was March 1, 2023, with an expected delivery date of December 8, 2023, which corresponded to 33 weeks and 2 days of gestation. She had three obstetrician visits and two midwifery consultations during her pregnancy. The medical history included a carious molar tooth, but no vaginal discharge was noted. The referral was necessitated by the absence of a pediatric surgeon and a neonatal intensive care unit at the referring hospital.

Table 1. Clinical Examination Findings

Parameter	Result
Vital Signs	
Blood Pressure	125/70 mmHg
Pulse Rate	89 beats/min
Respiratory Rate	19 breaths/min
Obstetric Examination	
Fundal Height (TFU)	26 cm
Leopold I	Hard, round, mobile fetal head
Leopold II	Fetal back on mother's left, hard, flat, elongated
Fetal Heart Rate (DJJ)	142 beats/min
Leopold III	Soft, non-mobile breech
Leopold IV	Presenting part above pelvic inlet, no contractions
Speculum Examination	
Cervix Appearance	Livid
External Cervical Os	Closed, no dilation
Fluxus	Negative
Flour	Positive
Amniotic Membranes	Protruding
Nitrazine Test	Positive
Vaginal Examination (Touche)	
Cervix Position	Posterior, soft
Cervical Dilation	None
Palpable Fetal Parts	None

Note: Clinical examination was conducted at Dr. Zainoel Abidin Hospital, Banda Aceh, on a 26-year-old primigravida at 34–35 weeks gestation, confirming stable hemodynamics and breech presentation with no progression of labor.



Figure 1. Ultrasound Insights: Navigating Prenatal Diagnosis and Neonatal Care in Gastroschisis Case

Table 2. Ultrasonography and Laboratory Findings

Parameter	Result
Ultrasonography	
Fetal Status	Single Live Fetus
Presentation	Breech
Fetal Heart Rate	Positive
Biparietal Diameter (BPD)	7.99 cm
Head Circumference (HC)	29.04 cm
Femur Length (FL)	5.33 cm
Estimated Fetal Weight (TBW)	1777 g
Amniotic Fluid	Severe oligohydramnios
Placenta Location	Fundus to anterior corpus
Diagnosis	Gastroschisis (intestines outside fetal abdomen), 34–35 weeks gestation
Laboratory Results	
Hemoglobin	11.3 g/dL
Hematocrit	32%
Erythrocyte Count	3.7 million/mm ³
Leukocyte Count	18,070/mm ³
Mean Corpuscular Volume (MCV)	87 fL
Mean Corpuscular Hemoglobin (MCH)	31 pg
Mean Corpuscular Hemoglobin Concentration (MCHC)	35%
Red Cell Distribution Width (RDW)	13.9%
Other Parameters	—

Ultrasonography performed at Dr. Zainoel Abidin Hospital confirmed gastroschisis and severe oligohydramnios. Laboratory results indicated no anemia but elevated leukocyte levels, suggesting possible inflammation. These findings are consistent with those obtained at 34–35 weeks’ gestation.

Initial physical examination revealed stable hemodynamics (blood pressure, 125/70 mmHg; pulse rate, 89 beats/min; respiratory rate, 19 breaths/min). Obstetric examination showed a fundal height of 26 cm, Leopold I indicating a hard, round, mobile fetal head, Leopold II confirming the fetal back on the mother’s left, fetal heart rate of 142 beats/min, Leopold III identifying a soft, non-mobile breech, and Leopold IV noting the presenting part above the pelvic inlet with no contractions. Speculum examination revealed a livid cervix,

closed external os, no dilation, negative fluxus, positive flour, protruding amniotic membranes, and a positive nitrazine test result. Vaginal examination confirmed a soft posterior cervix with no dilation or palpable fetal parts. Laboratory results indicated no anemia (hemoglobin 11.3 g/dL, hematocrit 32%, erythrocytes 3.7 million/mm³, leukocytes 18,070/mm³, MCV 87 fL, MCH 31 pg, MCHC 35%, RDW 13.9%), and other parameters were normal. Ultrasonography confirmed a single breech fetus with a biparietal diameter of 7.99 cm, head circumference of 29.04 cm, femur length of 5.33 cm, estimated fetal weight of 1777 g, severe oligohydramnios, and a placenta located at the fundus to anterior corpus, consistent with 34–35 weeks of gestation and gastroschisis (Table 2).

The diagnosis was primigravida at 33–34 weeks with a live single breech fetus, not in labor, congenital gastroschisis, and severe oligohydramnios. The patient was referred to the fetomaternal division, where lung maturation was induced with dexamethasone (6 mg every 12 h for 2 days), followed by a planned caesarean section in collaboration with a pediatric surgeon. On October 31, 2023, a caesarean delivery was performed, resulting in a female neonate weighing 1400 g with an Apgar score of 0/0, confirming gastroschisis, and a complete placenta was delivered.



Figure 2. Clinical Presentation of Gastroschisis in a Preterm Neonate with Low Birth Weight

DISCUSSION

This case involved a 26-year-old primigravida at 34–35 weeks of gestation with gastroschisis, diagnosed prenatally via ultrasonography. Zainoel Abidin Hospital, Banda Aceh, highlights critical challenges in managing this congenital abdominal wall defect, characterized by visceral herniation through a right-sided defect without a protective membrane [13]. Ultrasonography, with 95% specificity and 60–75% sensitivity, confirmed externalized intestines and severe oligohydramnios, consistent with early detection capabilities at 10–12 weeks of gestation [9].

The absence of associated anomalies, such as intestinal atresia (7–30%) or cardiac malformations (8%), aligns with typical presentations, although serial ultrasonography is vital for monitoring complications such as bowel obstruction, necrosis, or closed gastroschisis, none of which were evident in this case [14]. The patient's age aligns with the risk factor of young maternal age, although other factors, such as substance abuse, were not reported, possibly due to limited history taking in resource-constrained settings [6,7]. Prenatal diagnosis enables informed planning, which is crucial in areas with limited access to pediatric surgery and neonatal intensive care [7].

The caesarean delivery on October 31, 2023, was prompted by breech presentation and severe oligohydramnios to minimize bowel trauma and amniotic fluid exposure, which can induce peel formation and intestinal damage [12]. Recent meta-analyses have indicated no outcome benefit of caesarean delivery over vaginal delivery; however, caesarean delivery was chosen to facilitate immediate pediatric surgical intervention, which is critical for complex cases [12]. The neonate's low birth weight (1400 g) and Apgar score of 0/0 suggest prematurity and complex gastroschisis, potentially a closed defect causing ischemia, which

increases the risk of short bowel syndrome and prolonged parenteral nutrition in approximately 20% of complicated cases [13-16]. Elevated amniotic fluid inflammatory markers, such as interleukin-6 and ferritin, likely contributed to intestinal dysmotility, supporting early delivery to mitigate damage.[17] The poor neonatal outcomes may also reflect intrauterine growth restriction, as the estimated fetal weight (1777 g) was below that expected for the gestational age at delivery. [18].

Multidisciplinary management involving fetomaternal and pediatric surgical teams is essential; however, the poor outcome of the neonate underscores systemic challenges, including delayed referral due to the absence of a pediatric surgeon and neonatal intensive care at the referring hospital [7]. While gastroschisis survival exceeds 90%, complications such as intestinal atresia elevate the mortality risk by up to 20-fold, emphasizing the need for timely surgery and nutritional support [19]. This case highlights the healthcare disparities in Indonesia, where access to specialized care remains limited, potentially exacerbating adverse outcomes [7]. Future research should focus on standardizing ultrasonographic criteria for bowel dilation (7–25 mm) and explore amnioinfusion to reduce intestinal damage, particularly in resource-limited settings, to optimize the timing of delivery and neonatal outcomes [20].

CONCLUSION

This study involved a 26-year-old primigravida at 34–35 weeks of age with gastroschisis, diagnosed via ultrasonography at dr. Zainoel Abidin Hospital, Banda Aceh, highlights the role of early detection in managing this abdominal wall defect. Ultrasonography was performed at 12 weeks of guided Caesarean delivery to reduce bowel trauma. Despite a >90% survival rate, the neonate's poor outcome (1400 g, Apgar 0/0) reflects intestinal damage, risking early mortality or short bowel syndrome. Multidisciplinary care is vital; however, regional healthcare disparities in Indonesia underscore the need for improved access to neonatal care.

DECLARATIONS

None

CONSENT FOR PUBLICATION

The Authors agree to be published in the Journal of Society Medicine.

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COMPETING INTERESTS

The authors declare no conflicts of interest in this case report.

AUTHORS' CONTRIBUTIONS

All authors have made substantial contributions to the case report. R and IIM were responsible for patient management, data collection, and the initial drafting of the manuscript. All authors have reviewed and approved the final version of the manuscript, ensuring its accuracy and integrity, and are accountable for all aspects of the work.

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