Case Report

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Echogenic bowel on the second-trimester ultrasound as an indicator of jejunal atresia: a case report

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Introduction and importance: Fetal echogenic bowel (FEB) is a finding on prenatal ultrasound characterized by increased echogenicity of the fetal intestine. In this study we present a case of FEB with severe bowel dilatation identified on second-trimester ultrasound that was subsequently diagnosed with jejunal atresia postnatally.

Case presentation: A 28-year-old primigravida woman was referred to our perinatology clinic at 18 weeks/3 days gestational age for a fetal anomaly scan. The anomaly scan examination identified grade 3 fetal bowel hyperechogenicity. The results of the fetal echocardiogram and maternal serum screening for TORCH infections were normal, and the NIPT analysis showed low-risk results for chromosomal aneuploidies.

Clinical discussion: In our case, the fetal bowel diameter measured 21 mm at 29 weeks/6 days gestational age, which significantly exceeded the established clinical cut-off value for fetal bowel dilatation. This timing is crucial because if a specific problem is detected in the ultrasound that indicates an abortion of the fetus, it can only be performed legally under the 19th week of pregnancy; otherwise, termination of pregnancy is considered illegal according to the policies of this country.

Conclusion: Nowadays, ultrasonography is a non-invasive tool that facilitates the early detection of many prenatal problems. In this case, with the early detection of FEB and further investigations, we were able to safely manage the pregnancy until the 39th week of pregnancy and plan the delivery in a tertiary referral center to ensure the availability of intensive care for the baby at birth.

Keywords: case report, echogenic bowel, fetal diseases

Introduction

Fetal echogenic bowel (FEB), a soft marker of aneuploidy, is a finding on prenatal ultrasound characterized by increased echogenicity of the fetal intestine. Although FEB can be a normal finding in the third trimester reflecting the presence of meconium, in the second trimester, it can raise concerns about various fetal disorders such as aneuploidies (most commonly trisomy 21, 18, and 13), fetal growth restriction, cystic fibrosis, some gastrointestinal malformations including obstruction, atresia, perforation, and congenital infections particularly cytomegalovirus (CMV)[1,2]. The incidence of FEB is estimated between 0.2 and 1.8% of pregnancies examined in the second trimester[1], and for isolated cases of FEB in over 80–90% no etiology is identified. Furthermore, most of the cases with FEB experienced regression or disappearance at subsequent scans; however, in 27.7% of cases, FEB persisted throughout the pregnancy[3]. In D'Amico *et al*.'s study[3] among fetuses initially diagnosed with isolated FEB, anomalies of the gastrointestinal tract at birth were identified in 1.1% of cases. One of these anomalies is jejunal atresia, which is a congenital defect that results in complete obstruction of the jejunum lumen and occurs in ~0.7 per 10 000 births[4,5]. In this study, we present a case of FEB with severe bowel dilatation identified on second-trimester ultrasound that was subsequently diagnosed with jejunal atresia postnatally. This case has been reported in line with the (Surgical CAse REport) SCARE 2023 criteria[6].

HIGHLIGHTS

- A fetal echogenic bowel is a finding on prenatal ultrasound.
- The anomaly scan examination identified grade 3 fetal bowel hyperechogenicity.
- A cesarean delivery was scheduled at 39 weeks gestational age at a tertiary hospital.

Case presentation

A 28-year-old primigravida woman was referred to our perinatology clinic at 18 weeks/3 days gestational age for a fetal anomaly

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scan. Reviewing her previous medical records revealed no significant complications or health problems. The nuchal translucency (NT) ultrasound at 11 weeks/6 days gestational age revealed a retroplacental hematoma measuring 11×12 mm. The NT measurement itself was 1.65 mm, which was normal for a crown-rump length (CRL) of 52 mm (63rd percentile). No other abnormalities had been detected. Her routine first-trimester screening for fetal aneuploidy (combined test) had shown negative results for trisomy 21, 18, and 13 (PAPP-A: 2.11 multiple of median (MoM), free β-hCG: 0.9 MoM). The anomaly scan examination identified a live singleton fetus in cephalic presentation with grade 3 fetal bowel hyperechogenicity (Fig. 1) and no other fetal anomalies were detected. Besides, a fetal echocardiogram was requested to rule out cardiac anomalies, and the results were normal. Maternal serum screening for TORCH infections revealed serologic evidence of immunity to rubella and CMV. Moreover, the non-invasive prenatal testing (NIPT) analysis at 18 weeks/6 days of pregnancy showed low-risk results for chromosomal aneuploidies (fetal fractions: 12.01%). The pregnancy was followed by an ultrasound examination every 3 weeks, confirming normal fetal development and growth but persistent bowel dilation. An ultrasound examination at 29 weeks/6 days gestational age revealed significantly dilated bowel loops measuring 21.1 mm (Fig. 2). In all follow-up examinations, the state of the placenta, the amount of amniotic fluid index (AFI) and Doppler measurements were normal. A cesarean delivery was scheduled and performed at the 39th week of pregnancy at a tertiary referral center, with the mother receiving spinal anesthesia. The male newborn, weighing 3250 g and with an Apgar score of 9 out of 10 was admitted to the neonatal intensive care unit (NICU) immediately after birth. Three days after birth, the baby underwent abdominal surgery, and jejunal atresia was diagnosed during the surgery. The surgical team consisted of neonatologists and specialists in pediatric surgery. The surgeon repaired the small intestine, and the removed tissue was sent to a pathology lab for further examination. The histomorphologic and macroscopic examination confirmed the sequestrated small intestinal wall and atresia. Parenteral nutrition and serum therapy were provided from birth until after the surgery, and following the operation under the supervision of the neonatologists, the baby was gradually fed with breast milk and formula as supplementary nutrition. On postoperative day 7 the infant was discharged home with a good recovery and stable vital signs. After discharge, the mother and baby were visited in our perinatology clinic at 10 days and 2 months postpartum. Additionally, the patients were followed up via phone calls by the midwifery staff of our perinatology clinic to monitor the state of continuing breastfeeding and the presence of any warning signs.

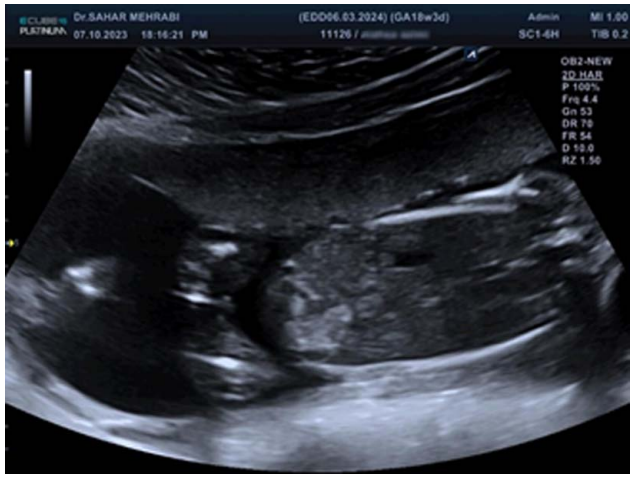

Figure 1. Echogenic bowel.

Discussion

In previous case reports and case series, gastrointestinal anomalies that have been associated with FEB include bowel or anal atresia, gastroschisis, volvulus, cloacal exstrophy, bowel duplication, biliary duct atresia, and Hirschsprung disease[2]. Notably, in one case report in 1998, FEB and fetal ascites were associated with jejunal atresia[7]. In Orgul *et al*.'s study[8], prenatal diagnosis of jejunoileal obstruction was 40%. Moreover, several studies have shown an association between gastrointestinal malforma tions and abdominal signs on ultrasonography, such as bowel dilatation[9]. The first sonographic evidence of possible small-bowel atresia is the isolated dilation of an ileal loop, showing a transverse diameter of greater than 7 mm[10]. Clinically, a fetal bowel diameter greater than 10 mm is frequently used as a cut-off value to diagnose bowel dilatation[9]. In our case, the fetal bowel diameter measured 21 mm at 29 weeks/6 days gestational age, which significantly exceeded the established clinical cut-off value for fetal bowel dilatation (Fig. 2). In our case presence of FEB and severe bowel dilatation necessitated postnatal surgery. Likewise, in the study of Laird *et al*.[11], 50% of fetuses with FEB and dilated bowel required postnatal surgical intervention. In Iran, all preg nant mothers who visit prenatal clinics or gynecologists' offices are recommended to perform an anomaly scan in the 18th week of pregnancy. This timing is crucial because if a specific problem is detected in the ultrasound that indicates an abortion of the fetus, it can only be performed legally under the 19th week of pregnancy; otherwise, termination of pregnancy is considered illegal according to the policies of this country. Therefore, it is very important for perinatologists to carefully assess the fetus and know the prognosis of abnormal findings in ultrasounds due to

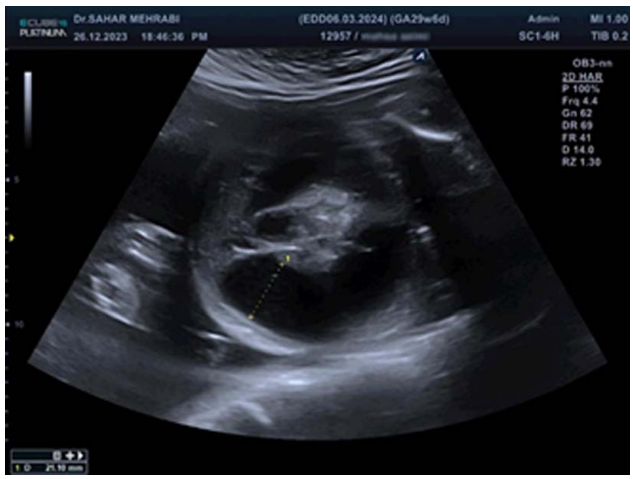

Figure 2. Bowel dilatation.

the legal restrictions and the limited time to decide whether to continue or terminate the pregnancy.

Conclusions

Nowadays, ultrasonography, as a convenient and non-invasive tool, facilitates the early detection and diagnosis of many prenatal problems and enables clinicians to make timely and precise interventions in order to improve the health outcomes of fetuses and newborns. In this case, with the early detection of FEB and further investigations, we were able to safely manage the pregnancy until the 39th week of pregnancy and plan the delivery in a level three hospital to ensure the availability of intensive care for the baby at birth. Future research can play an important role in exploring the effectiveness of ultrasonography in detecting other prenatal conditions and evaluating the outcomes of different management strategies. It could also investigate the cost-effectiveness of widespread ultrasonography screening programs and their impact on maternal and neonatal health.

Ethical approval

Given the nature of the article, a case report, no ethical approval was required.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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