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Fetal Abdominal Cyst as a Stage of Meconium Peritonitis after Fetoscopic Laser Photocoagulation

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Abstract

Fetal meconium peritonitis (FMP) is a rare form of sterile chemical peritonitis occurring in utero due to the perforation of the fetal intestine, sometimes after fetoscopic laser photocoagulation (FLP) in twin-to-twin transfusion syndrome, with the broad spectrum of prenatal ultrasound manifestations including abdominal cyst. We report a unique presentation of FMP following FLP with ascites, pseudocyst formation, and the cyst resolving probably of a fistula formation. This case report highlights unusual FMP development and gives a novel clue to antenatal diagnosis and management.

Keywords

- abdominal cyst
- meconium peritonitis
- fetoscopic laser photocoagulation
- complications
- meconium pseudocyst

Introduction

Antenatally diagnosed fetal abdominal cystic lesions present a challenge with nonobvious a diagnosis in 16%.[1] Accurate prenatal diagnosis provides an appropriate prenatal counseling with the prognosis of the needs of surgery and optimal location of delivery.[1,2]

Fetal meconium peritonitis (FMP) is a rare form of sterile chemical peritonitis that can occur in utero due to the perforation of the fetal intestine with the broad spectrum of prenatal ultrasound manifestations.[3–5]

Understanding of FMP ultrasound presentation and evolution is crucial for the management.

Case Report

A 21-year-old primigravida negative for infections and antiphospholipid syndrome was referred because of an early twin-to-twin transfusion syndrome (TTTS) in a monochorionic diamniotic twin. Fetoscopic laser photocoagulation (FLP) was performed at 18 weeks. One week later one fetus died. The second fetus had a single umbilical artery, and echocardiography and neurosonography were unremarkable.

At 22 weeks, 3 days, ultrasound demonstrated a small amount of free fluid in abdominal cavity and hyperechoic bowel (►**Fig. 1**). The patient was negative for toxoplasmosis, rubella, cytomegalovirus, herpes, and other agents (TORCH infections) and severe acute respiratory syndrome coronavirus 2.

At 28 weeks, well-defined avascular isoechoic abdominal cystic lesion 45-30-27 mm was found (►**Fig. 2**), with the connection to bowel, detected at 28 weeks, 6 days (►**Fig. 3**). The preliminary diagnosis was abdominal cyst (►**Fig. 3**).

Follow-up at 32 weeks 2 days showed a hyperechoic double contour of the lesion and diffuse low-level internal echoes (►**Fig. 4**).

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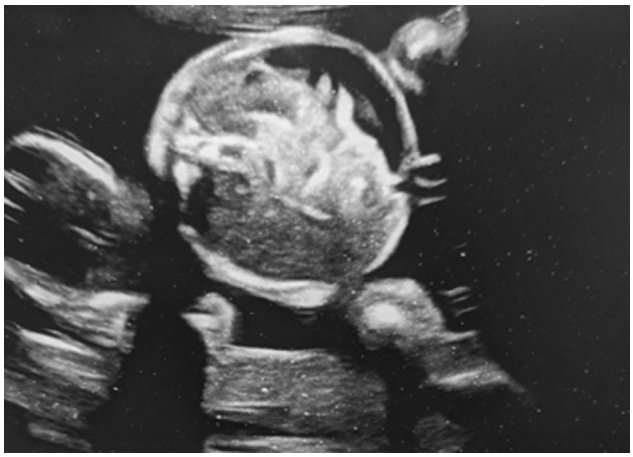

Fig. 1 Small amount of free fluid in fetal abdominal cavity and hyperechoic bowel.

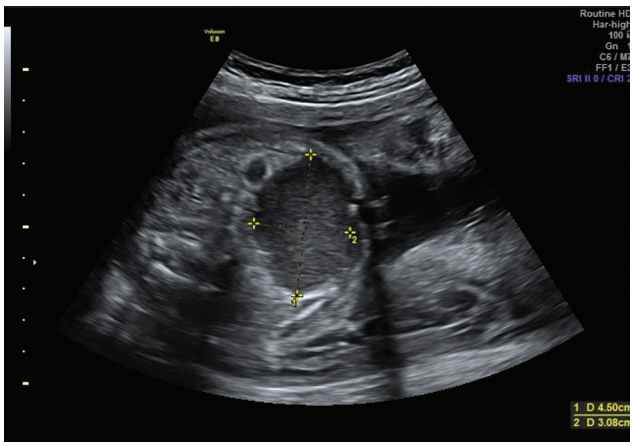

Fig. 2 Isoechoic well-defined cystic lesion.

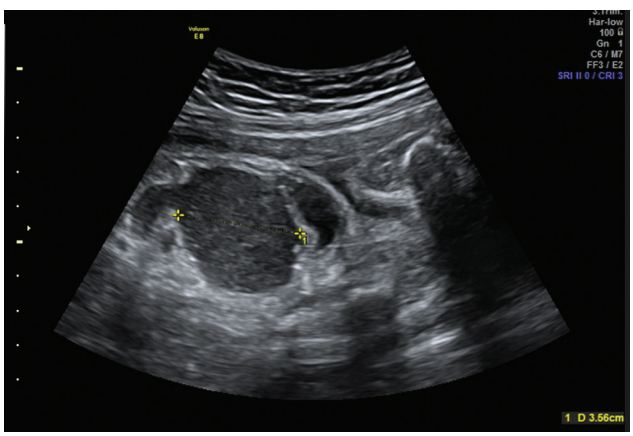

Fig. 3 Relation of cystic lesion to adjacent bowel.

The adjacent bowel was dilated, aperistaltic, and with hyperechoic wall. Scattered peritoneal calcifications and polyhydramnions were seen (►**Fig. 5**).

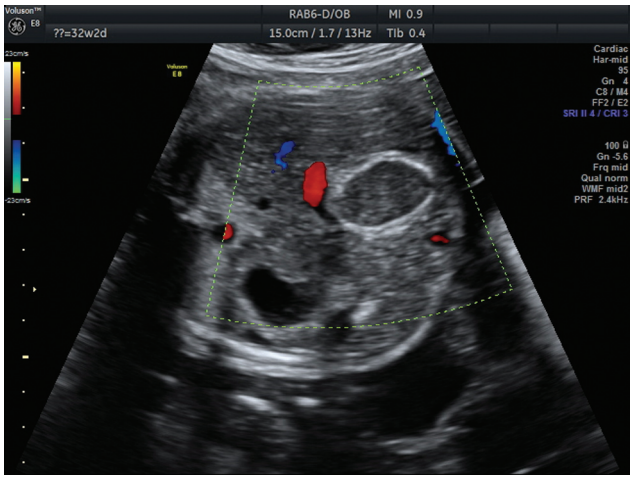

Fig. 4 Avascular cystic lesion with a hyperechoic double contour and diffuse low-level internal echoes.

A diagnosis of meconium peritonitis was made.

At 37 weeks 6 days, the lesions disappeared and ultrasound demonstrated just distended peristaltic bowel (►**Fig. 6**).

The newborn had surgery with adhesiolysis and ileo–ileo anastomosis because of atresia of the small intestine, necrosis and perforation of the ileum with intrauterine peritonitis and intestinal fistula.

Discussion

Meconium peritonitis is a rare condition with an incidence of 3.7 in 10,000.[6] Bowel perforations may result from mesenteric ischemia or intestinal obstruction.[7–9] Meconium leakage into the peritoneal cavity induces a secondary inflammatory process resulting in ascites, fibrosis, calcification and occasionally cyst formation.[10]

Ultrasound has some limitations distinguishing fetal abdominal cysts.[2,11–13]

FMP has rather diverse manifestations. The most common ultrasonographic findings include bowel dilatation, intraabdominal calcification, ascites, intraperitoneal pseudocyst, and polyhydramnios.[5,6,10,14–16]

Our case is quite unusual because of its unusual course starting from ascites and hyperechoic bowel, presenting further with intraperitoneal pseudocyst with intestinal connection, intraperitoneal calcifications, dilated aperistaltic bowel loops, and polyhydramnion. Pseudocyst was not seen later; a possible explanation is the formation of intestinal fistula. Resolvation of prenatal findings because of intestinal perforation healing without atresia/stenosis formation is described, but this was not the case here.[2]

Our case is also unique by its early presentation and by the possible connection with the FLP as a TTTS treatment that may be responsible for severe fetal hemodynamic alterations including intestine ischemia. Meconium peritonitis following TTTS treatment with FLP has been described.[4,17,18]

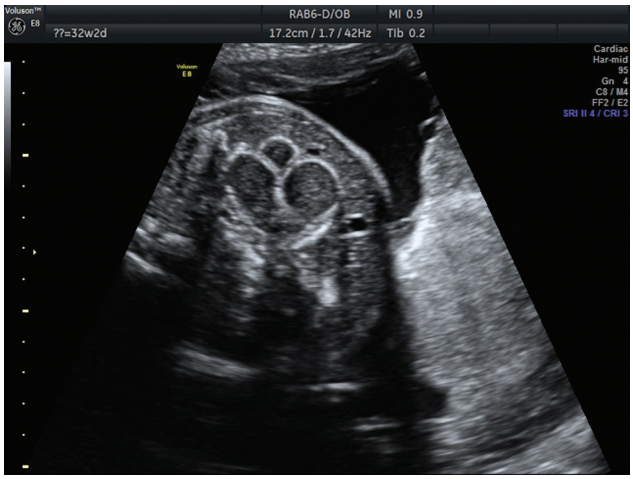

Fig. 5 Dilated aperistaltic bowel loops with hyperechoic wall and scattered peritoneal calcifications.

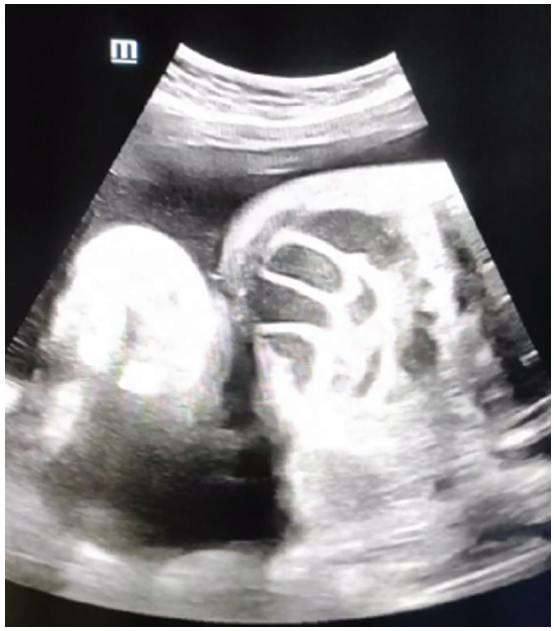

Fig. 6 Distended peristaltic bowel.

Up to 91.9% neonates with FMP require surgery with survival rates up to 91.9%.[6,10] Meconium pseudocyst, intestinal loop dilatation and ascites are considered predictors for surgical treatment.[19]

Conclusion

Meconium peritonitis is observed as a consequence of FLP in TTTS; patients who undergo FLP should be monitored for this condition. FMP should be considered in a fetus with ascites progressing to cyst formation; resolving of an abdominal cyst with bowel loops dilation may be an FMP stage and a sign of intestinal fistula formation. An accurate prenatal diagnosis of FMP may be helpful in counseling parents and planning delivery in a setting with a multidisciplinary team.

Authors' Contributions

I.T. was involved in design of the work; acquisition, analysis, and interpretation of data; drafting of the work; Iryna Tsikhanenka accepted full responsibility for the finished article. M.B. helped in identification and managing of the case and acquisition and interpretation of data. S.V. contributed to acquisition and interpretation of data. K.I. helped in analysis and interpretation of data. M.E. was involved in identification of the case, acquisition, and interpretation of data.

Conflict of Interest

None declared.

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