CASE REPORT

Pre-natal Ultrasonographic Diagnosis of Cystic Meconium Peritonitis with Intestinal Atresia and Its Post-natal Management

Murkey Bhushan Ramesh · Bhalerao Sarita Abhay ·
Jassawalla M. J. · Nadkarni Trupti Kedar ·
Bhatnagar S. N. · Athavale Umesh

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Introduction

Meconium peritonitis occurs in about 1 in 35,000 live births in the USA [1], though its prevalence in the Indian scenario is unknown. Intestinal atresia, among several other causes, seems to be the most common cause of meconium peritonitis [2]. Early detection and immediate post-natal management is imperative for better outcome. A case report of cystic meconium peritonitis with intestinal atresia as the causative factor, diagnosed antenatally on ultrasound, is presented here.

Murkey B. R., Registrar · Bhalerao S. A., Honorary Clinical Associate · Jassawalla M. J., Medical Director and Unit Head · Nadkarni T. K., Lecturer
Nowrosjee Wadia Maternity Hospital, Acharya Dhonde Marg, Parel, Mumbai 400 012, India

Bhatnagar S. N., Professor HOD
B. J. Wadia Hospital for Children, Acharya Dhonde Marg, Parel, Mumbai 400 012, India

Athavale U., Consultant Sonologist
Athavale Imaging Centre, Acharya Dhonde Marg, Parel, Mumbai 400 012, India

Murkey B. R. (✉), Registrar
203, Doctor Center, August Kranti Marg, Above Liteoliar Showroom, Kemps Corner, Mumbai 400 036, India
e-mail: bmurkey@gmail.com

Case Report

A 23-year-old woman, Gravida₄ Para₁, was referred at 33 4/7 weeks of gestation for further evaluation of fetal intra-abdominal mass. Her 1st pregnancy was uneventful and culminated in a term vaginal delivery. Her second pregnancy ended in the first trimester after spontaneous miscarriage. In her third pregnancy, she had a term vaginal delivery and had a 3-kg male child. But, on day 4 of life, the baby was admitted to the hospital with abdominal distension and fever. A diagnosis of intestinal obstruction was made. However, the baby succumbed prior to intervention.

In the current pregnancy, on clinical examination, the patient had polyhydramnios and breathlessness. A high resolution ultrasonography revealed a single live fetus, appropriate for the gestational age, with dilated small bowel loops with a 52 × 64 mm cystic mass lesion at center of the abdomen filled with multiple echoes. Hyperperistalsis was noted. A few curvilinear calcifications were seen around the lesion. No abnormal vascularity in the mass was seen. Large bowel loops were not visualized. These findings were suggestive of ileal atresia with meconium peritonitis. The abdominal mass represented inspissated meconium. Severe polyhydramnios was noted (Fig. 1).

A pediatric surgery reference was done.

The decision to shift the patient to a tertiary care center with neonatal and pediatric surgery facilities was taken.

Repeat sonography was performed every 2 weeks. At 37 weeks, the patient went into spontaneous labor and

Fig. 1 Fetal abdomen—showing cystic mass lesion with curvilinear calcifications around the lesion

vaginally delivered a female child weighing 2.3 kg with a good Apgar score. After initial assessment by the neonatologist, the baby was handed over to the pediatric surgery unit for further management.

The baby was immediately transferred to the neonatal intensive care unit under the care of the pediatric surgeon. The baby had a very tense, distended abdomen, with dilated veins over the abdominal wall as well as central erythema, and a vaguely palpable lump in the upper abdomen with visible peristalsis. In view of previous history, further investigations were not done and the baby was taken for Emergency Exploratory Laparotomy. The intra-operative findings corroborated with the antenatal ultrasonography findings. There was a large cystic lesion with meconium-stained turbid fluid occupying a majority of abdomen, the wall being densely adherent to the contents of the abdomen. A distal jejunal atresia with massive dilatation of the proximal jejunum was found. After dissecting the cyst completely, resection and end-to-end anastomosis were done (Fig. 2).

The post-operative recovery was prolonged with episodes of sepsis, especially fungal sepsis, and delay in normal gut peristalsis, but eventually the baby recovered completely and is now well and gaining weight one and a half months post-operatively.

Discussion

Meconium peritonitis should be considered as a diagnostic possibility when hyperechogenic areas are seen within the fetal abdomen during the second and third trimesters of pregnancy. The etiology of meconium peritonitis is thought to be the result of a sterile chemical reaction resulting from

Fig. 2 Intra-operative photograph showing cyst wall on the right (marked with *arrow*) with intestinal atresia

bowel perforation in utero. A secondary inflammatory response results in the production of fluid (ascites), fibrosis, calcification, and sometimes cyst formation. Experimental research in animals indicates that it takes at least 8 days after meconium has escaped into the peritoneal cavity before calcifications are detected. The most common causes of meconium peritonitis are ischemic lesions of the small bowel associated with mechanical obstruction (atresia, volvulus, intussusception, congenital bands, Meckel diverticulum, and internal hernia). It may also be caused by viral infections (cytomegalovirus or parvovirus B19).

The sonographic findings vary depending on several factors: the etiology, the time interval since perforation, and the degree of inflammatory response. It may be seen as early as 13 weeks of gestation.

In the absence of an intra-abdominal mass such as a meconium pseudocyst, the main differential diagnostic possibility for bright echoes within the abdomen is the “hyperechogenic bowel.”

Functional abnormalities were observed predominantly in the second trimester and associated mainly with cystic fibrosis or amniotic fluid abnormalities. Anatomic lesions were commonly detected later on and associated with ischemic conditions, chromosomal aberrations, and even cystic fibrosis [3].

Degnan, Bulas, and Sze reported a case of ileal atresia with meconium peritonitis, where Fetal MRI evaluation was performed, and it was concluded that Fetal MRI has a definite role in improving the specificity of pre-natal ultrasound in the detection of meconium peritonitis and in the assessment of abdominal cysts and other bowel abnormalities as microcolon. It also helps in planning the delivery and post-natal intervention [4].

Management of this condition is difficult and controversial. Initial drainage of meconium and later definitive

surgery in critically ill patients are safe and effective [5]. Two cases of cystic meconium peritonitis are mentioned where the patients initially underwent emergency percutaneous drainage with ultrasonic guidance under local anesthesia. They found that such a procedure is safe and effective in decompression of the gastrointestinal tract and prevention of bacterial infection. They recommended cyst drainage just after birth and elective surgery later based on the factors like poor general condition of the babies, extensive adhesions, difficulty in identifying the meconium-stained bowel loops, and the significant risk of extensive bleeding from the edematous and inflamed peritoneal surfaces during dissection [5].

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