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A RARE CASE OF GIANT MECONIUM PSEUDOCYST: ROLE OF IMAGING

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ABSTRACT: BACKGROUND: Meconium peritonitis with pseudocyst formation is a rare condition associated with significant fetal mortality and morbidity. Meconium peritonitis is a chemical peritonitis resulting from passage of meconium into the peritoneal cavity due to intestinal perforation. Mostly it is due to small bowel perforation resulting from underlying bowel pathologies which includes ischemia or obstruction. Diagnosis of this condition on antenatal ultrasound is possible which guide to the outcome and management in the postnatal life. Computed tomography plays an important role in establishing the diagnosis of meconium pseudocyst and also demonstrate the probable communication of the cyst with bowel. **AIM:** To assess the role of imaging in diagnosis of meconium pseudocyst with short review of literature. **MATERIAL AND METHOD:** Both antenatal and postnatal ultrasound of the abdomen along with the computed tomography was done in newborn preterm female fetus. **RESULT:** A giant meconium pseudocyst is seen secondary to meconium peritonitis in a newborn preterm female child with classical imaging features. On open laparotomy, a huge meconium pseudocyst was excised with jejunum as entry point and terminal ileum as exit point and jejuno-ascending colon anastomosis was done. **CONCLUSION:** To the best of our knowledge, such a huge size of meconium pseudocyst was not reported in the literature.

KEYWORDS: Meconium peritonitis, Meconium Pseudocyst, Ultrasound, Computed Tomography.

INTRODUCTION: Meconium peritonitis is an aseptic peritonitis caused by rupture of gastrointestinal tract in utero. Perforation is often secondary to the ischemia or obstruction.⁽¹⁾ Meconium peritonitis is a chemical peritonitis to which body tries to wall off the inflammation which sometimes results in pseudocyst formation and dystrophic calcification. Depending on the cause of perforation, peritonitis may resolve in utero or persist in the postnatal life.

Abdominal distension, failure to pass meconium, respiratory distress due to pressure effect on diaphragm and symptoms from the peritonitis are the presenting features.⁽²⁾ Imaging plays crucial role in diagnosing this condition both in utero and after birth. On radiograph, typical egg shell calcification is hallmark of the pseudocyst.⁽³⁾ USG along with CT shows characteristics features and plays an important role in diagnosing the cyst. Most of the imaging features are well demonstrated in our case.

CASE REPORT: A newborn preterm female (delivered at the gestational age of 33 weeks) weighing 2.7kg was referred to the department of Radio-diagnosis for ultrasound of the abdomen. Baby did not cry immediately after birth and had respiratory distress. On antenatal ultrasound scan done at 32weeks of gestation, a large unilocular intra-abdominal cystic lesion was seen in the fetus with mild polyhydramnios (Fig. 1). Mother had pregnancy induced hypertension during the pregnancy. Baby was delivered at 33weeks of gestation by lower segment cesarean section.

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On post natal ultrasound scan, a large unilocular cystic lesion was seen occupying most of the portion of abdomen causing compression over the solid abdominal organs and diaphragm resulting in respiratory distress in the baby (Fig 2). Cyst showed mobile internal echoes within. Only the fundus and portion of the body of stomach were identified on ultrasound. Rest of the bowel loops could not be distinguished.

Plain and contrast Computed Tomography (CT) of the abdomen showed large approximately 7.2 x 12 x 9 cm sized hypodense lesion in antero-posterior, transverse and cranio-caudal dimensions in the abdomen showing thick walled septum within (Fig3). Multiple foci of calcifications are seen in the wall of the hypodense lesion. No enhancement was seen in the lesion or wall on post contrast scan. The lesion was displacing the adjacent solid organs peripherally.

Only stomach was identified on CT scan. Rest of the bowels could not be distinguished. Visualized lung bases showed consolidation on both the sides. So on imaging the differential diagnosis of cystic type of Meconium peritonitis and Meconium pseudocyst was kept. To relieve the respiratory distress cystostomy was planned and drainage tube was inserted. However symptoms of the baby did not reduce, hence open laparotomy was done.

A huge meconium containing cyst with jejunum as entry point and terminal ileum as exit was found occupying whole of the abdomen. Cyst was separated from the surrounding and excised. Anastomosis was done between jejunum and ascending colon. However baby was not able to maintain saturation and due to deranged coagulation profile, baby landed into coagulopathy and was expired due to disseminated intravascular coagulation on second postoperative day.

DISCUSSION: Meconium peritonitis was first described by Morgagni in 1761.⁽⁴⁾ The probable incidence of it is about 1 in 35,000 live births.⁽⁵⁾ Sometimes spontaneous resolution of the perforation is seen in utero.⁽⁶⁾ Meconium peritonitis occur secondary to intrauterine perforation of the intestine early in the fetal life or few hours after birth. The underlying etiology is bowel obstruction due to atresia of the bowel, mal rotation with volvulus, intussusception, congenital bands or meconium plug syndrome as seen in cystic fibrosis.

Cystic fibrosis is the most common cause of meconium peritonitis in babies who are diagnosed in postnatal period and is seen in up to 40% of the cases.⁽⁶⁾ A sterile inflammatory reaction occurs after the leakage of meconium into the peritoneal cavity. Sometimes instead of distributing throughout the peritoneal cavity, meconium gets walled off in a cystic space resulting in formation of meconium pseudocyst which shows calcification of the wall as seen in our case.

Imaging plays important role in establishing a diagnosis in both antenatal and postnatal life. Antenatal ultrasound diagnosis of this condition was first described in 1980.⁽⁷⁾ Most of them are diagnosed in late second trimester or early third trimester. Antenatal diagnosis of the condition is important in reducing the mortality, predicting the post natal outcome and helps in treatment planning.⁽⁵⁾

Fetal ultrasonographic findings in meconium peritonitis are fetal ascites calcification, polyhydramnios, pseudocyst formation and dilated bowel loops. Polyhydramnios is seen in 25–50% of cases with meconium peritonitis.⁽⁸⁾ In our case also on antenatal scan at 32 weeks of gestation, polyhydramnios was reported. In one of the report, leakage of meconium was actually observed during an ultrasound examination and authors stated that the flowing meconium has affinity to the liver surface and portion of the umbilical vein which passed freely through the ascites.⁽⁹⁾

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The closest differential diagnosis on antenatal ultrasound of meconium pseudocyst are cystic lesions of ovary, urachal cyst, mesenteric, omental, and retroperitoneal cysts.⁽¹⁰⁾ On post natal abdominal ultrasound, meconium pseudocyst appears as a well-defined hypoechoic lesion surrounded by thick echogenic wall, suggestive of a contained perforation.⁽¹¹⁾ Settled echogenic material in the dependent position which shows movement on changing the patients position is encountered in meconium pseudocyst.

All these findings are seen in the present case. Calcification along the wall of pseudocyst is sometimes difficult to appreciate on ultrasound particularly in large cysts as in our case. For demonstration of calcification along the wall of pseudocyst, computed tomography (CT) is the modality of choice. On CT, an intra-abdominal hypodense lesion with thick calcified wall, with or without air - fluid level is seen along with calcific foci in the parietal peritoneum, solid organs and sometimes in the scrotal sac or thoracic cavities.⁽¹²⁾

Most of the times, communication of the cyst with intestine is well demonstrated on CT. But in giant cyst as in our case, the exact communication with the bowel is difficult to make out on CT and is seen only during operative procedure. A meconium pseudocyst results due to thinning of the intestinal wall and a muscle layer continuous with the normal intestine which lacks the epithelium. The basis of a meconium pseudocyst formation is unclear. The proposed hypothesis is about an association of dilated bowel resulting from intestinal atresia along with impaired vascular supply caused by inflammation occurring after intestinal perforation.

If the atresia and the impaired blood flow occur before the meconium reaches the small intestine, only intestinal atresia is seen without meconium peritonitis. However, a pseudocyst formation take place if they occur after the meconium reaches the site.⁽¹³⁾ A meconium pseudocyst may occur as a complication of a meconium peritonitis and likely to be confused with cystic-type meconium peritonitis.⁽¹²⁾

Most of the patients with meconium peritonitis and meconium pseudocyst show good response to the treatment with favorable long term outcome. Unfortunately in our case baby did not survive due to disseminated intravascular coagulopathy. In a nutshell, imaging plays important role in diagnosis of meconium pseudocyst not only in the antenatal period but also in the post natal life to reach at the correct diagnosis and helps in planning for treatment strategies.

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Fig. 1: Antenatal ultrasound shows well defined anechoic lesion in the abdomen with settled echogenic material

Fig. 2: Postnatal ultrasound done with high frequency probe shows low levels internal echoes and dependent echogenic debris

Fig. 3: Computed Tomography (plain) of abdomen shows large hypodense lesion with peripheral wall calcification displacing the kidneys posteriorly

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