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Meconium Peritonitis In Neonates: Management Dilemma

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Background: Meconium peritonitis is a rare condition due to perforation of gastrointestinal tract, the management of that condition is controversial.

Objective: To present three cases with meconium peritonitis in neonates.

Design: A retrospective review.

Setting: Surgical Departments, Salmaniya Medical Complex, Kingdom of Bahrain.

Method: Three patients with meconium peritonitis presented to the surgical department between January 2004 to November 2007 were reviewed.

Result: The first baby is 3.5 kg female she was born with respiratory distress. Antenatal ultrasound at 30 weeks of gestation showed polyhydromnios and fetal bowel dilatation suggestive of meconium peritonitis. The second baby is 3.3 kg male who was born and presented with septic shock after birth. The third baby is 2.2 kg male was delivered by cesarean section due to spontaneous preterm rupture of membranes and intrauterine fetal distress. The first two cases underwent emergency peritoneal drainage under local anaesthesia, followed by definitive surgery. The third patient underwent emergency laparotomy and resection of ileal segment and primary anastomosis.

Conclusion: Meconium peritonitis is a rare disorder of intestinal perforation in utero. Management of this condition is difficult and controversial. Initial drainage of meconium and later definitive surgery in critically ill patients, is safe and effective.

Three cases presented to pediatric surgical unit with meconium peritonitis. Two cases were managed successfully by peritoneal drainage followed by definitive surgery and in one case by definitive surgery only.

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Meconium peritonitis is an aseptic chemical peritonitis resulting from in utero perforation of the obstructed gastrointestinal tract and is most commonly secondary to intestinal atresia[1]. Most of these cases can be diagnosed by fetal ultrasound[2,3]. Management of such cases is controversial since the definitive surgery in the early neonatal period is very difficult to perform, due to the poor general condition of the neonate and the presence of

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severe peritoneal inflammation and adhesions[4]. We report three newborns with generalized meconium peritonitis treated with open drainage of meconium, followed by elective surgery in two cases and one case underwent definitive surgery as initial treatment.

METHOD

Three patients with meconium peritonitis presented to the surgical department between January 2004 to November 2007 were reviewed.

RESULT

The first baby is 3.5 kg female she was born with respiratory distress. Antenatal ultrasound at 30 weeks of gestation showed polyhydramnios and fetal bowel dilatation suggestive of meconium peritonitis. The second baby is 3.3 kg male who was born and presented with septic shock after birth. The third baby is 2.2 kg male was delivered by cesarean section due to spontaneous preterm rupture of membranes and intrauterine fetal distress. The first two cases underwent emergency peritoneal drainage under local anaesthesia, followed by definitive surgery. The third patient underwent emergency laparotomy and resection of ileal segment and primary anastomosis.

Case One

A female baby weighing 3.5 kg was born to 25 years-old gravida 2, para1 mother. Antenatal ultrasound at 30 weeks of gestation showed polyhydromnios and fetal bowel dilatation suggestive of meconium peritonitis. At 35 weeks of gestation, the mother underwent caesarean section for premature labor and fetal distress. Immediately after birth, the baby developed severe respiratory distress and was intubated and ventilated. The abdomen was severely distended, tense, silent and dull on percussion; the abdominal wall was edematous and erythematous. The baby did not pass meconium and the nasogastric tube drained minimal greenish fluid. The plain abdominal x-ray (figure1) was suggestive of ascites and the abdominal ultrasound (figure2) showed multiple distended bowel loops and a large collection of meconium with debris in the upper abdomen.

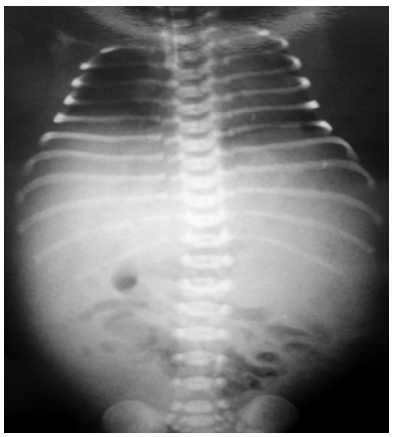

Figure1: Plain X-ray Shows Ascites

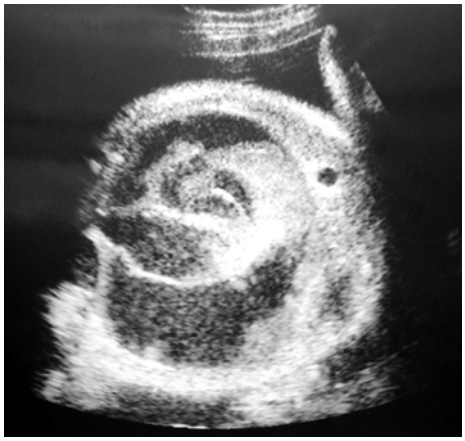

Figure 2: US Shows Multiple Distended Bowel Loops and a Large Collection of meconium

Seven hours postnatally, the baby underwent emergency peritoneal drainage in the lower right quadrant by penrose drain under local anaesthesia. The peritoneal cavity was filled with large amount of free meconium. Postoperatively, the neonate was put on parenteral nutrition, intravenous antibiotics and decompression of the gastrointestinal tract. Abdominal distention significantly reduced and her general condition improved after five days. On seventh postoperative day, gastrograffin study of the large and small bowel showed a perforation in the terminal ileum. At the age of 10 days, the baby underwent laparotomy and a large terminal ileal perforation was identified 10 cm proximal to the ileocecal junction with a large mesenteric defect. Resection of the perforated ileal segment and primary anastomosis was performed. The postoperative course was unremarkable. Histopathology of the resected segment did not show atresia or any other obstructive pathology. She was investigated for cystic fibrosis which was ruled out later.

Case Two

A male baby weighing 3.3 kg was born to 19 years old mother. Antenatal obstetric history was normal. The baby did not pass meconium after birth. The baby was referred to pediatric surgery after history of bilious vomiting 24 hour after birth. The baby was in septic shock accompanied with distended and tense abdomen. The blood tests showed severe electrolytes imbalance and metabolic acidosis. His abdominal x-ray showed dilated bowel loops and pneumoperitonium. Ultrasound of the abdomen showed bowel dilatation and free fluid suggestive of meconium peritonitis. Two hours after resuscitation, the baby underwent emergency peritoneal drainage using penrose drain; it was inserted in the upper right quadrant under local anaesthesia because his condition was not fit for general anaesthesia. On third day of post drainage procedure, the patient general condition improved and laparatomy was performed. Large amount of bile and meconium was found. The caecum was found perforated. The meconium was evacuated and cecostomy was done at the site of perforation. Biopsy from the cecum and appendectomy specimen revealed normal histopathological finding. The patient did well and discharged on seventh postoperative day. Two month later, the patient was readmitted with the clinical features of large bowel obstruction. His gastrograffin enema showed typical finding of rectosigmoid hirshpring's disease, which was confirmed by rectal biopsy. One week later, transanal pullthrough was done, the patient had smooth

recovery.

Case Three

A male baby weighing 2.2 kg was delivered by cesarean section due to spontaneous preterm rupture of membranes and intrauterine fetal distress. At the 34th week of gestation, the mother had routine ultrasound which was reported to have single viable fetus with dilated stomach and bowel loops. The findings were suggestive of distal bowel atresia. In view of fetal ultrasound, repeated ultrasounds were done after birth as well as during pediatric surgical consultation. The post-delivery ultrasound confirmed proximal small bowel dilatation and features suggestive of small bowel obstruction possibly due to mid-gut volvulus. The patient underwent emergency laparotomy. Gangrenous terminal ileal segment volvulus was found. Resection of gangrenous segment and primary anastomosis was done. The patient had unremarkable recovery and he was discharged on the 10th postoperative day.

DISCUSSION

Meconium peritonitis is an aseptic chemical peritonitis resulting from in utero perforation of the gastrointestinal tract. This disease is very rare and the actual incidence is not known. The most common causes are small bowel atresia, volvulus and meconium ileus[4,5].

Meconium peritonitis is classified into three types based on their clinical manifestations; (a) fibroadhesive, (b) cystic, and (c) generalized. The free meconium acts as an irritant and inflammatory serosal reaction develops leading to the formation of adhesions, pseudocyst and calcification[4]. The clinical presentation in the neonatal period includes: abdominal distention with erythematous and edematous abdominal wall, a palpable abdominal mass and occasional respiratory compromise[6].

The diagnosis of meconium peritonitis is possible by prenatal ultrasound examination. Common findings include: intra abdominal calcifications, ascites, intra abdominal masses, bowel dilatation and polyhydramnios[5-14]. The prognostic value of these findings is a subject of controversy. Dirkes et al found that the presence of bowel abnormalities carries 50% risk of postnatal intestinal complications, whereas Moslinger et al found that the postnatal outcome cannot be predicted from the prenatal sonographic findings[6-8].

The prenatally diagnosed meconium peritonitis carries overall morbidity rate of 22% and mortality rate of 11% and it has better prognosis than postnatally diagnosed meconium peritonitis[6,12].

In many cases, immediate surgery is necessary to release the intestinal obstruction and to avoid bacterial infection. Because of the poor general condition and severe intraperitoneal inflammation, many patients can only undergo enterostomy or drainage of the cystic fluid, without complete dissection of the adhesion or detection of the cause of the obstruction[15]. A second laparotomy, and in some patients a third laparotomy is necessary to anastomose the intestine[4,8,9].

Tanaka et al reported two cases of cystic meconium peritonitis which initially underwent emergency percutaneous drainage with ultrasonic guidance under local anesthesia. They found that such procedure is safe and effective in decompression of gastrointestinal tract and prevention of bacterial infection. They recommended cyst drainage just after birth and elective surgery later based on the general condition of the baby[4,8,9].

Two of our patients initially underwent open drainage of the meconium under local anesthesia, and after few days, the definitive surgery was performed. Since the ultrasound showed meconium with large amount of debris, a decision for open drainage instead of percutaneous drainage was made to ensure better evacuation of the free meconium. Such approach was chosen because of the 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. During the second operation, the general condition was stable, the adhesions were less, the identification of the bowel loops was easier and the bleeding was minimal.

CONCLUSION

Meconium peritonitis is a rare disorder of intestinal perforation in utero. Management of this condition is difficult and controversial. Initial drainage of meconium and later definitive surgery in critically ill patients, is safe and effective.

We managed successfully to treat three cases presented to our pediatric surgical unit with meconium peritonitis, two cases managed by peritoneal drainage followed by definitive surgery and one by definitive sugery only.

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