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Experience with meconium peritonitis

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Abstract

Background: Meconium peritonitis is a sterile chemical peritonitis resulting from intrauterine bowel perforation. With the development of neonatal care, the prognosis of meconium peritonitis improved much. We report our clinical experience.

Methods: The medical records of patients with meconium peritonitis admitted to the Asan Medical Center from June 1989 to July 2006 were retrospectively reviewed.

Results: Of 41 patients (17 males, 24 females), 38 (92.7%) were suspected to suffer from meconium peritonitis prenatally, at a median gestational age of 32 weeks (range, 21-40 weeks). The most common prenatal sonographic finding was fetal ascites followed by dilated bowel. Ten patients were managed conservatively, but 31 patients underwent operations including resection and anastomosis (22), drainage procedure (4), ileostomy (3) and primary repair (2). The operative 31 cases comprised generalized (16), fibroadhesive (10), and cystic types (5). The main causes were intestinal atresia and idiopathic bowel perforation. The mortality rate was 2.4%, and the morbidity rate was 34.1%.

Conclusions: Good survival rate was achieved. But there was rather high morbidity. More gentle and delicate approach should be done to lower the morbidity.

Meconium peritonitis is a sterile chemical peritonitis resulting from intrauterine bowel perforation. In 1950 to 1960, meconium peritonitis was regarded as a fatal disease with a mortality rate of 80% to 90%. A significant increase in the survival rate (up to 80%) was observed recently [1]. This might result from improvements in prenatal diagnostic techniques and proper early management. Because the incidence of meconium peritonitis was very low, at 1 case in 30 000 births [2-4], many earlier reports were case reports but overview publications were rare. Here, we report our single-center experience of meconium peritonitis with a focus on the clinical outcome.

1. Patients and methods

A retrospective study was done on a total of 41 patients (17 males, 24 females) with meconium peritonitis at the neonatal intensive care unit of Asan Medical Center from June 1989 to July 2006. Patients were referred to pediatric surgeons if abdominal distention, bilious vomiting, or

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pneumoperitoneum was noted. Asymptomatic patients, even with radiographic evidence of calcifications or localized fluid collection on ultrasonography, were placed on slow feeding regimens and received attentive follow-up. The median follow-up period was 60 months (range, 5-200 months).

2. Results

The median gestational age of patients was 36 weeks (27^{+4}-40^{+3} weeks), and 25 patients were premature babies. The median birth weight was 2776 g (range, 1249-4110 g); 12 patients weighed below 2500 g, and 2 patients, below 1500 g. The median maternal age was 29 years (range, 19-37 years). Prenatal diagnosis of meconium peritonitis was made in 38 patients (92.7%) at a median gestational age of 32 weeks (range, 21-40 weeks). The most common prenatal ultrasonographic finding was fetal ascites (16 patients), followed by dilated bowels in 12, polyhydramnios in 9, calcification in 8, pseudocyst in 2, and echogenic bowel in 2 patients (Table 1). Associated anomalies were found in only 2 patients. One patient had coarctation of aorta with Alagille syndrome, and the other had cleft palate.

Ten patients (24.4%) had multiple ill-defined, scattered calcifications at subphrenic space, Morrison's pouch, spleen margin, liver surface, or paracolic gutters on simple x-rays without gastrointestinal obstruction symptoms nor abnormal physical findings. Ultrasonography revealed no abnormal finding except calcifications. A total of 31 patients underwent exploratory laparotomies. Surgery was performed at a median age of 1 day (range, 0-10 days). Generalized-type meconium peritonitis was seen in 16 patients (39%), fibroadhesive type in 10 patients (24.4%) and cystic type 5 patients (12.2%). The most common cause of meconium peritonitis was intestinal atresia. Other causes of meconium peritonitis included small bowel volvulus (2 cases) and band (1 case). The causes were uncertain in the others (10 cases of ileal perforation, 2 cases of meconium-containing ascites without bowel perforation, and 2 cases of jejunal perforation).

Table 1 Characteristics of patients

Gender (M:F)	17:24
Gestational age [a] (wk)	36 (27^{+4}-40^{+3})
Birth weight[a] (g)	2776 (1249-4110)
Mother's age[a] (y)	29 (19-37)
Delivery type	
Cesarean section	24
Normal vaginal delivery	17
Prenatal diagnosis	38 (92.7%)
Ascites	16
Dilated bowel	12
Polyhydramnios	9
Calcification	8
Pseudocyst	2
Echogenic bowel	2

[a] Median.

Table 2 Morbidities

Morbidity	No.	2nd operation
Sepsis	3	
Adhesive ileus	3	Adhesiolysis
Short bowel syndrome	2	
Intraabdominal abscess	1	Operative drainage
Anastomosis leak	1	Resection and anastomosis
Sigmoid volvulus	1	Detorsion
Enterocutaneous fistula	1	Excision
Ileal stenosis	1	Ileostomy
Wound problem	1	
Total	14 (34.1%)	

The most commonly performed procedure was resection and anastomosis (22 patients). In 4 patients, only drainage procedures were performed. Three patients underwent ileostomy, and 2 patients received primary repair. Among the 4 patients who underwent drainage procedures only, 1 had an abdominal distension and bowel gas only down to the area of the proximal jejunum at birth. Laparotomy of this patient revealed a very large thick-walled inflamed cyst with serous fluid, occupying the whole abdomen. Closed-suction drainage of the cyst was carried out; no other procedure was performed because it was impossible to enter the proper peritoneal cavity. Progressive descent of bowel gas down to the distal was identified without signs of infection. After 25 days, relaparotomy revealed a shrunken cyst 3 cm in diameter with distal jejunal atresia and minimal bowel adhesion. Resection and anastomosis was performed easily. In another patient, we could not surgically manipulate the bowel owing to severe adhesion and bowel conglomeration. At the second operation on the 10th day of life, we found multiple ileal perforations with severe adhesion. The patient underwent jejunostomy and appendicostomy for decompression, but enterocutaneous fistula complicated. At the third operation, the enterocutaneous fistula was excised and jejunocecal anastomosis was performed. We then applied supportive treatment for short bowel syndrome because the remnant small bowel was only 70 cm in length without the ileocecal valve. The other 2 patients were found to have meconium-stained ascites and severe adhesive bowel, and underwent closed-suction drainages. Both were stabilized after drainage and needed no further surgical procedures.

There was one mortality (2.4%). He had massive small bowel necrosis owing to ileal volvulus and underwent an ileal resection with ileostomy at birth but expired at postoperative day 1. The cause of death was suspected as a systemic inflammatory response syndrome owing to toxic