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Focal Intestinal Perforation–A dreaded complication in extremely low birth weight newborn

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Case Report

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Abstract: Focal intestinal perforation (FIP) in neonates presents important challenges and mortality can be high. Neonatal pneumoperitoneum is a surgical emergency indicative of gastrointestinal perforation that requires immediate treatment to prevent death. In preterm infants with very low birth weight (VLBW) <1500 g the most important acquired intestinal diseases are necrotizing enterocolitis (NEC) and focal intestinal perforation (FIP). FIP is a separate clinical entity from necrotizing enterocolitis, the most severe gastrointestinal complication of preterm infants. This differentiation is important because of management. Despite improvements in anesthesia and neonatal intensive care, mortality has remained high, especially in the preterm. We report a case of an extremely low birth weight neonate with a massive pneumoperitoneum and a timely diagnosis and management resulted in favorable outcome.

Keywords: Spontaneous perforation, Neonatal necrotizing enterocolitis, neonate, pneumo-peritoneum

INTRODUCTION

Focal intestinal perforation (FIP) is a much debated topic. Some authors contend that it is a radiologic and histologic distinguishable disease process from necrotizing enterocolitis. Others feel that these disease processes are two ends of the same spectrum [1]. The risk appears to be about 2 to 3 percent of VLBW infants and about 5 percent in ELBW infants [2, 3].

Risk Factors

Prematurity is the only well established risk factor for FIP. Several reported antenatal [4, 5] and postnatal risk factors are (a) severe placental chorioamnionitis (b) antenatal administration of glucocorticoids and nonsteroidal anti-inflammatory drugs (NSAIDs) (c) oligohydramnios, (d) velamentous cord insertion (e) lower one minute Apgar scores, (f)primigravidityand (g) the need for cardiovascular resuscitation in the perinatal period.

Etiology

The etiology of FIP remains unknown. All current animal and cell culture models point to the constellation of skewed trophism (submucosa thinning + mucosal hyperplasia), depleted nitrosylation, and aberrant motility.

Presentations

Sudden onset is characteristic for FIP. Early identification and treatment of FIP significantly reduces mortality and morbidity. Although there can be overlap, the following common findings of FIP typically distinguish it from NEC [6].

- Presentation generally within the first week of life. In contrast, NEC typically presents after the first week of life after the infant has begun to feed.
- Physical finding of abdominal distention, often accompanied by a bluish discoloration
- Abdominal imaging may demonstrate pneumoperitoneum, but there is no evidence of pneumatosisintestinalis or portal venous gas, which are radiograph hallmarks of NEC.

DIAGNOSIS

A diagnosis for suspected FIP is based upon the presence of the characteristic clinical features in a premature infant within the first ten days of life [7]. These findings include hypotension, abdominal distension often with the classical bluish discoloration of the abdominal wall, absence of abdominal wall erythema, crepitus, and induration. The diagnosis of FIP is strongly suspected if there are clinical and radiologic findings of pneumo - peritoneum in the absence of pneumatosisintestinalis and portal venous air. The

diagnosis of FIP is made by operative findings that demonstrate an isolated bowel perforation in the setting of otherwise normal bowel, which is confirmed by histopathology examination.

Management

Initial management of a patient with suspected FIP is directed toward stabilization of the patient and includes the following: (1) Cessation of all feeds and enteral medications (2) Nasogastric suction (3) .Supportive care including fluid resuscitation and inotropic medications (4) Intravenous antibiotics. Surgical strategy in FIP is determined by general condition of the neonate. In the most severe cases the peritoneal drainage is used for stabilization of the neonate and delayed laparotomy is performed [8]. In selected cases peritoneal drainage can be final and effective treatment option for patients with FIP [9] .The most common procedure performed in neonates with FIP is two-stages operation. The first stage includes resection of the intestine with perforation with creation of ileostomy and mucous fistula. The continuity of the digestive system was restored 3-6 months later.

Long-term survival of infants with SIP has improved over the past 30 years with reported survival rates of 64 to 90 percent, regardless of treatment with primary peritoneal drainage (PPD) or laparotomy [10]. The increase in survival is due to advances in neonatal care including improved parenteral nutrition and antibiotics. The relevant factor for prognosis in FIP is frequent occurrence of other diseases in neonates with low birth body weight.

CASE REPORT

A 33-year-old primi-gravida was admitted to the hospitals obstetrics and gynaecology department for leaking amniotic fluid at 27 th week gestation. She received dose of steroids to enhance the maturity of fetal lungs, antibiotics and supportive. On 28th week her leaking was progressive and led to near complete drainage of liquor. The baby was born at 28weeks gestation by normal vaginal delivery. Birth weight was 970 grams and Apgar scores were 7 at one minute and 9 at five minutes. The child was admitted to the neonatal intensive care unit for respiratory distress syndrome requiring continuous positive airway pressure (CPAP) support. He passed meconium within 24 hours. On the third day of hospital stay, although the general condition of the baby was stable, he developed abdominal distension. Soft to palpation. Bowel sounds were normal However; there was no erythema, tenderness or, a palpable lump. Abdominal X-ray revealed pneumoperitoneum, with free gas under both the domes of diaphragm. The hematological and biochemical investigations including the blood gas analysis were normal, except for a low serum calcium level. The temperature, blood pressure, and capillary refill time of the infant were also normal.

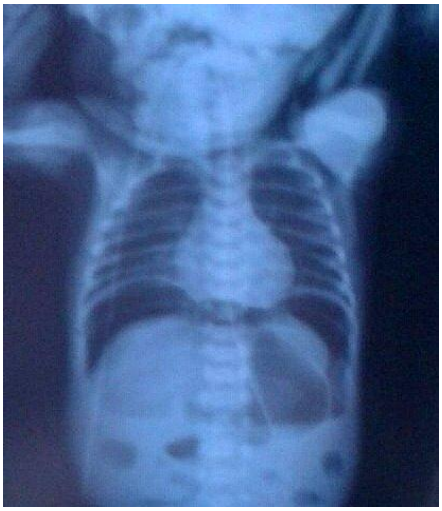

Fig-1: Abdominal X-ray showing pneumo peritoneum

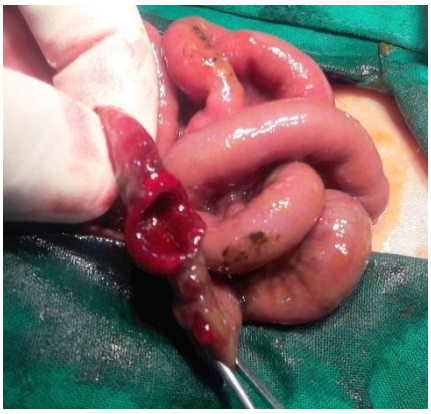

Fig-2: Showing single large perforation 1.5 x2 cm in distal ileum

The baby was resuscitated in the usual manner and a nasogastric decompression effected for bowel rest. Since the baby was active with a good capillary refilling time, the nasogastric aspirates were clear and there was no sign of peritonitis. A peritoneal drain was placed. It drained bilious fluid and fecal mater. In view of fecal mater drainage plan of laparotomy was made. At laparotomy single large perforation 1.5 x2 cm was found in distal ileum about 6 inches proximal to IC junction with peritoneal contamination by bilious fluid and meconium. Ileostomy with distal mucous fistula done. Thorough peritoneal lavage was given. The child was on ventilator for 3 days and then extubated. Gradual feed was started from 5th day after ileostomy started to function. The child was discharged after 56 days with weight reached to 1325 gms.

DISCUSSION

- Focal intestinal perforation (FIP) of the newborn is a single intestinal perforation typically found at the terminal ileum.
- FIP occurs primarily in premature, very low birth weight (birth weight <1500 g)

- FIP generally presents within the first 10 days of life as an acute onset of abdominal distension and hypotension.
- NEC is the main disease in the differential diagnosis of FIP.
- Free air on radiograph is seen in 1/3 of the time.
- The initial management for a neonate with FIP is directed towards stabilization of the patient.
- The treatment for FIP is surgical.
- Think about FIP as a possible etiology of any abnormal abdominal findings in a very low birth weight infant.
- The outcome is quite favorable if the diagnosis and the intervention is timely.

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