

Medical Management of NEC with Intestinal Perforation in a Stable Patient - Case Report

Abdullah Ibrahim Al-Babtain^{1*}, Fahad Alsufayan² and Suzie Khooger³

¹College of Medicine, Imam Abdulrahman Bin Faisal University, Saudi Arabia

²Pediatric Intensive Care Unit Consultant, Imam Abdulrahman AlFaisal Hospital, Dhahran, Saudi Arabia

³Pediatric Surgery Consultant, Imam Abdulrahman AlFaisal Hospital, Dhahran, Saudi Arabia

*Corresponding Author: Abdullah Ibrahim Al-Babtain, College of Medicine, Imam Abdulrahman Bin Faisal University, Saudi Arabia.

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Abstract

Necrotizing enterocolitis (NEC) is an inflammatory gastrointestinal disease that primarily affects the preterm neonates. The exact cause of NEC is still not clear. NEC may Manifest as abdominal distention, bilious gastric residuals after feedings that may develop to bile emesis and gross or microscopic blood in the stools. Sepsis may be manifested by lethargy, temperature variation, increase in apneic spells, and metabolic acidosis. We are presenting a preterm, 1.510-kg patient who has none of these symptoms which indicate the overall stability of the condition and at the end our medical management plan was successful. Most of NEC cases managed by conservative treatment that include abdominal tapping. Only one-third of these cases require surgical intervention. Our study was conducted to investigate if Pneumoperitoneum is always an absolute indication for surgery. In this case report we are reporting a case of NEC with intestinal perforation that was managed medically without any intervention.

Keywords: NEC; Preterm; Intestinal Perforation; Conservative; Medical.

Introduction

Necrotizing enterocolitis is defined as an inflammatory gastrointestinal disease. Mainly It affects the preterm neonates or sick newborns. It is characterized by intestinal necrosis and the incidence of NEC is 0.3 - 2.4/1000 of live births [2]. The exact cause of NEC is still undiscovered but it is believed that an ischemic insult damages the bowel lining which affects the production of the mucus, making the bowel more susceptible to be invaded by bacteria [2]. Manifestations of NEC may include abdominal distention, bilious gastric residuals after feedings that may develop to bile emesis and gross or microscopic blood in feces. Sepsis may be manifested by lethargy, temperature up and downs, increase in apneic spells, and metabolic acidosis [2]. Our patient has none of these symptoms which indicate the overall stability of the condition. The majority of patients with NEC are managed by conservative treatment which includes abdominal tapping and only 33% of them end up in surgical management. In a case of neonate with pneumoperitoneum and normal abdominal examination, medical management should always be considered. In this case report we are reporting a case of NEC with intestinal perforation that was totally managed medically without any intervention. Even abdominal tapping was not part of our management plan.

Case Report

A 30+1 preterm, 1.510-kg male baby, born to a gravida 2 para 2 mother by normal vaginal delivery. The Apgar's score was 3 at 1 minute, 7 at 5 minutes and 10 at 10 minutes. The mother received adequate antenatal and perinatal care. There was history of mother receiving morphine 1 hour prior to delivery and also there was history of respiratory distress at birth to the baby. In the postnatal care,

the baby was on total parenteral nutrition D10% A.A 2, Lipids 1, Total Fluid Intake of 90 ml/kg/day and protocol feeds 3 ml/q 3hrs via OGT, all were tolerated. On the 3rd day of life, he developed abdominal distension. Immediately after abdominal distension was noticed, TFI was increased to 120 ml/kg/day and one feed was skipped to do abdominal x-ray. In general, the baby was stable. On examination, the abdomen was soft and lax with no organomegaly, passed meconium, and passed urine. The only positive sign on examination was slight abdominal distention. His WBC count, hemoglobin and blood gases were within the normal range as well as his other Lab results were also within the normal range. We ordered abdominal x-ray and the final report showed evidence of falciform ligament sign denoting extensive pneumoperitoneum, dilated large bowel and thickened wall (Figure 1 and 2). So, pediatric surgery consultation was done.



Figure 1: Nasogastric tube is seen in proper position with its lower tip below left hemidiaphragm. Evidence of falciform ligament sign is seen denoting extensive pneumoperitoneum.

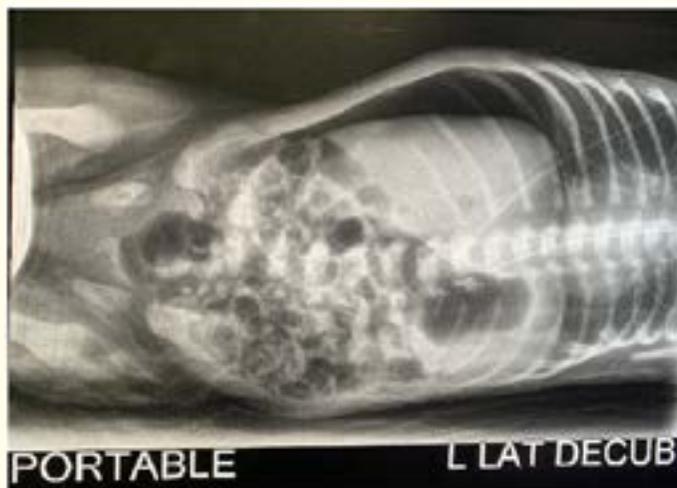


Figure 2: X-ray showing clear extensive pneumoperitoneum in lateral decubitus.

The patient was managed conservatively with TBF 150 ml/kg/day and kept NPO. The pediatric surgeon recommended continuing the conservative management, to put him on antibiotics, daily abdominal x-ray and close monitoring. Since the patient's condition is stable and not in an OR picture, the pediatric surgeon also suggested not to take him to the operation room and expose the patient to the side effects of the surgery like trauma, infections and bleeding at this age. Nasogastric tube was not used for decompression.

In the next two days of the diagnosis, the pneumoperitoneum was slightly increasing and clinically the patient is still stable, no abdominal discoloration, passed stool several times and hemodynamically stable. So, we continued with the same management plan. On the third day of the diagnosis, there was slight improvement. The baby was active, moving all limbs, the abdominal girth was decreasing and the abdomen looks scaphoid, no vomiting, passed stool twice, abdomen moves freely with respiration and no abdominal discoloration. The overall condition of the patient was stable and abdominal x-ray was not done due to his stable condition. After serial x-rays, the last abdominal x-ray showed no significant residual pneumoperitoneum and no pneumatosis intestinalis was seen (Figure 3).

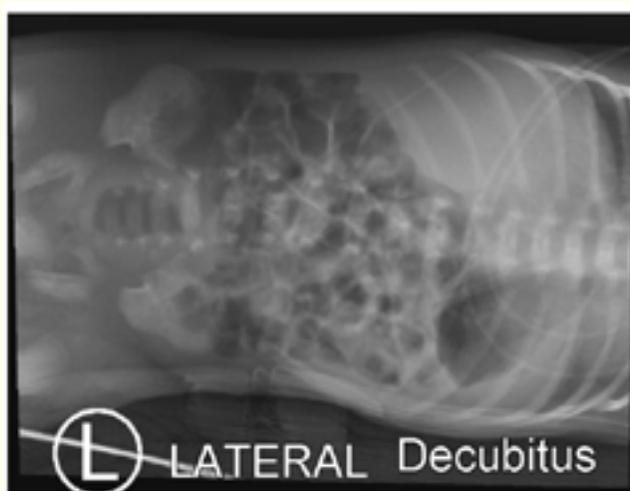


Figure 3: Follow-up x-ray in left lateral decubitus with no significant residual pneumoperitoneum and no pneumatosis intestinalis seen.

After 14 days of conservative management with antibiotics and TPN, abdominal x-ray was done to make sure there is no pneumoperitoneum. After that, the antibiotics were stopped and the patient started on gradual increase of oral feeds which he was tolerating. The patient was given a follow up appointment in the outpatient department after about three weeks. At the time of visit, the baby was doing fine and his weight was doubled to 3.05 kg.

Discussion

NEC is one of the lethal diseases that accounts for 15% of deaths in premature newborns who are weighing less than 1.5 Kg [2]. Two-thirds of NEC cases respond to conservative management, whereas one-third of them required surgical management. Patient who are in a Stable condition who developed NEC can be managed by medical management [3] which includes cessation of enteral feeding, empiric antibiotics, and supportive care [4,5].

The surgical Options in the management of NEC include peritoneal drainage [2] and it is used when the patient is very sick because it is less invasive and the other surgical option is laparotomy with definitive surgery when the patient is stable [2]. Most studies on the outcome of peritoneal drainage and laparotomy showed similar survival rates [2]. Moss, *et al.* [6] stated that the type of operations for perforated NEC does not influence the survival rate in preterm infants. The absolute indication for surgery in NEC is bowel perforation, characterized by either pneumoperitoneum or positive paracentesis [2]. Other indications for surgery are signs of peritonitis, absent

bowel sounds with diffuse guarding and tenderness, erythema and edema of the abdominal wall [9], clinical deterioration [7], persistent abdominal tenderness [9], persistently dilated loop [10] and gasless abdomen with ascites on abdominal radiograph [8,9]. The thing that convinced the pediatric surgeon not to take the patient to the OR is that he was not having any of the mentioned signs. Also, the presence of experienced pediatric intensivist and nursing expert was critical in our case, as the patient should be closely monitored, to notice any changes in the condition of the patient and to be able to send the patient to the OR immediately.

Our case report was initiated to investigate whether pneumoperitoneum is an absolute indication for surgery in all cases of NEC. Pneumoperitoneum seems not to be an absolute indication for surgical intervention in cases of NEC especially if the patient is in a stable condition. Initial medical management may worth a trial as it is safe and less interventions to the patient.

Conclusion

In conclusion, medical management of pneumoperitoneum with IV antibiotics, IV nutrition, close monitoring to the patient and abdominal x-rays appears to be a viable option in the management of NEC without any invasive interventions. The most important advise to be given to a physician is that not to forget that the physician should always look for the treatment of the signs and symptoms that are manifested by the patient rather than treating the x-rays. Future studies, researches and case reports are needed to come out with the best and safest management of NEC.

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Conflict of Interest

All authors have no conflicts of interest.

Ethical Approval

All the roles that were set by the institution were followed.

Patient Consent

This case report does not have any personal information that can lead to the identity of the patient. Therefore, Publication consent was not required.

Authorship

All authors attest that they participated in preparation and writing of this case report.

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