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CASE REPORT

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Neonatal appendicitis in northern Iran: A case report

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Abstract

We presented a case of neonatal appendicitis in a 22-day-old premature infant. The patient developed abdominal distension and perforation was suspected. The patient was transferred to the operating room with a diagnosis of peritonitis. Normal bowel loops were seen during surgery. Gangrenous appendicitis was seen. An appendectomy was performed.

KEYWORDS

appendicitis, case report, neonate

1 | INTRODUCTION

Neonatal appendicitis is an uncommon origin of acute abdominal sepsis in neonates and it can be diagnosed hardly. The frequency of Neonatal appendicitis has been demonstrated from 0.04% to 0.2%.[1] Its occurrence is higher in male infants (75%).[2–4] Premature infants account for 25%–50% of neonatal appendicitis.[2–4] The mortality rate was reported to be between 20% and 25%.[4,5]

Abdominal distension is defined as the most common symptom; however, some unspecific presentations including irritability, vomit, increased gastric remnants, breastfeeding refusal, lethargy, and fever may also happen.[6]

Diagnosing neonatal appendicitis is challenging and is sometimes confused with necrotizing enterocolitis or focal perforation.[7,8] Since it is rare and does not have particular signs and symptoms, it is relatively hard to diagnose it preoperatively and mostly diagnosed with a delay followed by complications. In this study, we reported a case of neonatal appendicitis in a premature infant.

2 | CASE REPORT

The patient was a 22-day-old infant born with normal vaginal delivery (NVD). The gestational age was 32 weeks. He weighed 1600 grams at birth, was 40 centimeters tall, and his head circumference was 29 centimeters. The baby was premature due to preterm premature rupture of membranes (PPROM), which did not need resuscitation at birth. The infant had jaundice. The baby has been hospitalized in the neonatal intensive care unit (NICU) for 20 days since birth due to respiratory distress syndrome (RDS), prematurity, and jaundice. Two days after discharge, he has referred again due to jaundice with bilirubin 17, photo limit 14, and exchange limit 18. The baby was breastfed and had 3 bowel movements and had 4 urinations, daily. The infant underwent intensive phototherapy.

Due to the history of hereditary spherocytosis in the mother and also due to the anemia of the baby (hemoglobin (Hb): 10.6 mg/dL, mean corpuscular volume (MCV): 77 fL, mean corpuscular hemoglobin (MCH): 29.8 pg, and

mean corpuscular hemoglobin concentration (MCHC): 38.8 g/dL), the patient was evaluated for anemia. According to normal abdominal and pelvic ultrasound, normal peripheral blood smear, normal retic, and negative osmotic fragility test, anemia due to hereditary spherocytosis were ruled out in the infant. Due to the history of gestational diabetes of the mother, the infant underwent cardiac counseling and had no problems. The patient's brain ultrasound was normal. During the patient's hospitalization, bilirubin decreased, and phototherapy was stopped. Following a decrease in patient hemoglobin (first 8 and then 6 g/dL), the patient received packed red blood cells.

The patient developed recurrent apnea and a drop in spo2 and was transferred to the NICU. The infant was assessed for sepsis. Meropenem and vancomycin were started. The infant received granulocyte-colony stimulating factor (G-CSF) for 3 days. The patient underwent nasal continuous positive airway pressure (NCPAP). During hospitalization, the patient developed abdominal distension, metronidazole was started for necrotizing enterocolitis (NEC), and surgical consultation was performed. Perforation was suspected in counseling. Finally, the patient was intubated due to a drop in oxygen saturation (spo2). The results of the patient's tests were as follows: C-reactive protein (CRP): 118 mg/L, fasting blood sugar (FBS): 82 mg/dL, Calcium (Ca): 9.3 mg/dL, WBC: 4.35×10^3/μL, Lymphocyte: 59.5%, Neutrophil: l25.8%, Hb: 10.3 mg/dL, Platelets: 225×10^3/μL, Prothrombin time (PT): 13.1 S, Partial Thromboplastin Time (PTT): 37 S, international normalized ratio (INR): 1.1, arterial blood gases (ABGs): (PH: 7.49, partial pressure of carbon dioxide (PCO2): 26.4 mmHg, bicarbonate (HCO3): 20.2 mEq/L, Be:-1.4).

On the blood culture of the patient, Klebsiella had grown. The patient's stool test and stool culture were normal. On the second visit by the surgeon, the abdominal was soft and the distension was still present. Thoracoabdominal imaging showed an increase in the thickness of the intestinal lobes. On abdominal examination the next day, the presence of a mass was felt. The result of the laboratory test was as follow: WBC: 24×10^3/μL, Lymphocyte: 22%, Neutrophil: 64%, Platelets: 191×10^3/μL, Hb: 7.32 mg/dL, CRP: 99 mg/L.

In subsequent visits, the infant still had abdominal distension. Radiographs reported masses as intestinal loops. Negative blood culture was reported again. On thoracoabdominal imaging, the next day, the free air was suspected. A left lateral decubitus X-ray was requested to confirm the presence of free air. The patient was transferred to the operating room with a diagnosis of peritonitis. Normal bowel loops were seen during surgery. Gangrenous appendicitis was seen. An appendectomy was performed, and the patient was transferred to the NICU (Figure 1). Extubation was done for the patient, and he breathed through the hood. In cultures of the endotracheal tube, amikacin-sensitive Enterobacteriaceae have been reported. Amikacin was initiated for the patient. The pathology result of gangrenous appendicitis was reported to have ganglion cells. In other parts of the colon, ganglion cell was observed on superficial biopsy. In the rectosigmoid area, in deep biopsies ganglions were reported. The patient was generally in good condition. There was no abdomen distension and breastfeeding has been done.

3 | DISCUSSION

Appendicitis is the main reason for acute abdominal pain needing surgical interference in children; however, it is very infrequent in infants. Its diagnosis, as well as management, is very complicated as a result of nonspecific clinical symptoms, which may cause great probabilities of difficulties like perforation and peritonitis, therefore, growing the rate of morbidity and mortality.

The low occurrence of neonatal appendicitis can be a result of different factors including the presence of the fetal form of the appendix, and therefore, less susceptible to obstruction, recumbent posture, the liquid diet, and infrequent infections.[9] The reasons for neonatal appendicitis are supposed to differ from those in older children as well as adults. Amyand's hernia, Hirschsprung's disease, and cystic fibrosis may be the reason for neonatal appendicitis.[10,11] Prematurity may result in vascular insufficiency as well as perforation of appendix.[3,12]

Abdominal distension, vomiting, abdominal tenderness, restlessness or lethargy, and fever were the most common symptoms of newborn appendicitis.[13] In radiographs of abdominal abnormal gas pattern, abdominal wall thickness, free peritoneal air, and fluid, obliteration of psoas margin and right scoliosis may be seen.[3] The rise in CRP levels can be a significant issue since it increases in many cases. Free air in the peritoneum is reported as the most significant finding providing for early investigation.[14] In Arroyo et al.'s, study two neonatal appendicitis cases with different presentations were reported. One of them was a 15-day-old newborn with congenital hypothyroidism and abdominal distension and sepsis data. An appendicular plastron was found. The second one was a 27-week-old preterm newborn with a history of necrotizing enterocolitis who presented an incarcerated inguinal hernia consistent with Amyand's hernia.[6]

It was shown that laparoscopy has a potential diagnostic and therapeutic value in acute neonatal appendicitis.[15] Treatment of neonatal appendicitis is principally surgery.

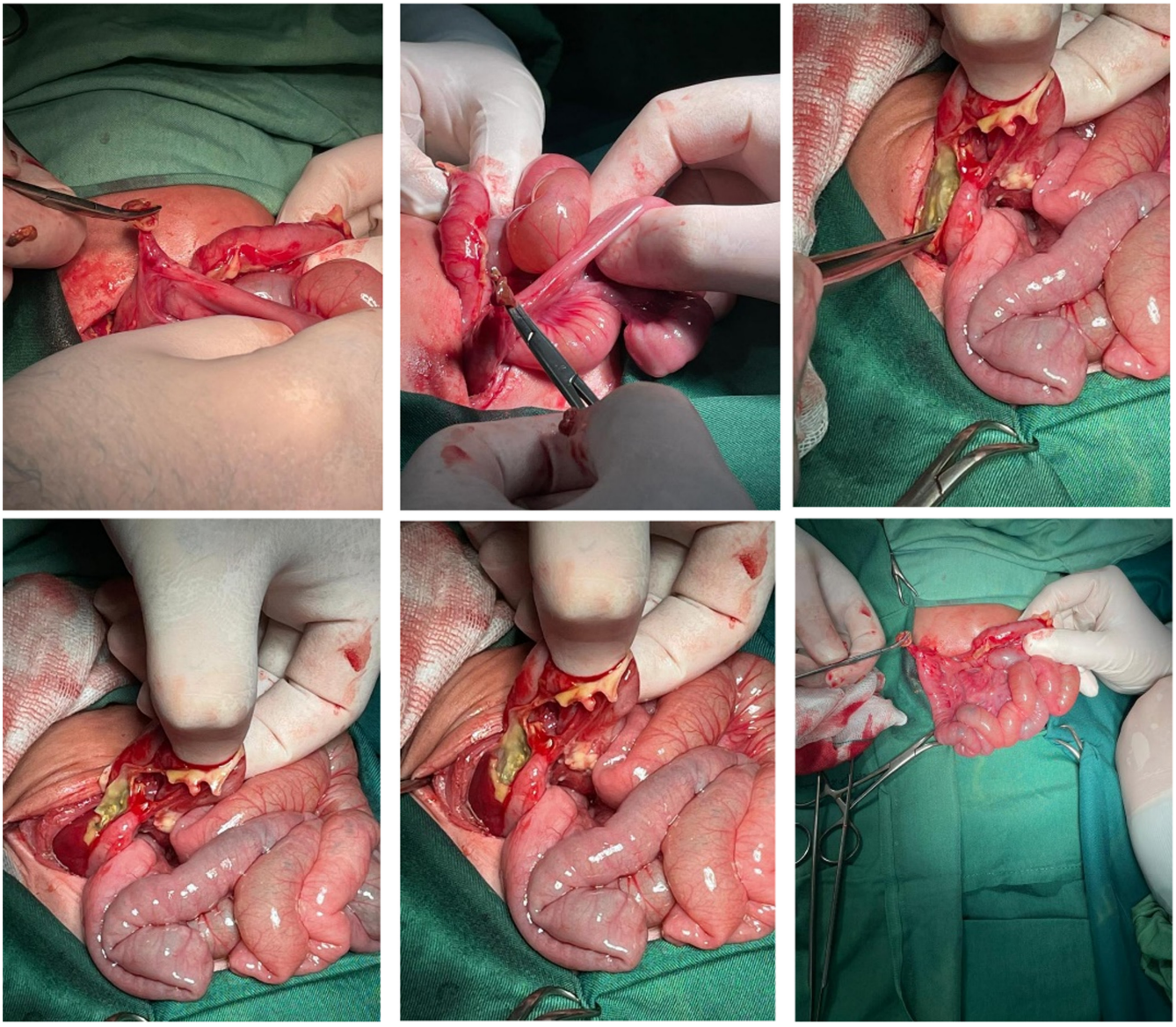

FIGURE 1 The surgical process of neonatal appendicitis

An initial surgical intervention with the aim of appendectomy with peritoneal lavage subsequent to preoperative stabilization and with optimal postoperative care leads to an acceptable improvement and is considered the treatment of choice.[16,17]

4 | CONCLUSION

In conclusion, neonatal appendicitis remains a rare disorder with a high frequency of delayed diagnosis which results in diagnostic challenge, more complications, and a high mortality rate. Additional studies are essential to elucidate its etiology and to define a proper approach to diagnosing neonatal appendicitis in a shorter time.

AUTHOR CONTRIBUTIONS

SM involved in study design and drafting; RF and MEK involved in literature search and drafting; FH involved in performing the study. All authors read and approved the study.

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CONFLICT OF INTEREST

The authors have no potential conflict of interest to declare.

DATA AVAILABILITY STATEMENT

None.

CONSENT

Written informed consent was obtained from the patient's parent to publish this report in accordance with the journal's patient consent policy.

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