

Perforated Appendicitis in a Neonate: A Complicated Diagnosis

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ABSTRACT

Acute appendicitis occurs rarely in premature infants, with a high risk of perforation and rapid progression to peritonitis. The exact aetiology remains uncertain as it cannot be attributed to luminal obstruction as in adults. Due to medical advances in perinatal care, the survival rate of premature babies has increased, leading to a continuous rise in neonatal appendicitis cases. In most cases, neonatal intestinal obstruction is diagnosed through exploratory laparotomy. We present a preterm infant (35 weeks) who was diagnosed with necrotising enterocolitis, but during exploratory laparotomy, a perforated appendix was found. To the best of the authors' knowledge, this is the earliest known case of perforated neonatal appendicitis in Pakistan.

Key Words: Acute appendicitis, Perforated appendix, Neonatal peritonitis, Necrotising enterocolitis.

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INTRODUCTION

Acute appendicitis, although rare in neonates,¹ should still be considered as a possible diagnosis in neonates who show signs of intra-abdominal inflammation. It carries a high mortality rate due to the lack of specific symptoms and the low index of suspicion, leading to delayed surgical intervention. Perforated appendicitis in neonates is recognised as a localised form of necrotising enterocolitis (NEC) involving the appendix.²⁻⁴ NEC is the most common preoperative misdiagnosis for neonatal perforated appendicitis confirmed intra-operatively.⁵ Therefore, it is crucial to have a high level of suspicion and an early appropriate management plan to prevent potential complications.

CASE REPORT

A 35-week premature baby girl was delivered by C-section due to maternal hypertension. She had a normal cry and passed meconium immediately after birth. The patient, a four-day neonate, presented to the emergency department with complaints of not passing stools, reluctance to feed, abdominal distention for one day, and a single episode of non-bilious vomiting.

On examination, the small-sized baby was toxic-looking, dehydrated, tachypnoeic, with normal peripheral perfusion, and warm to the touch. The abdomen was soft, shiny, and grossly distended with no evidence of erythema, visceromegaly, or any palpable mass. No respiratory distress and no abnormalities were detected in CVS, CNS, and respiratory examination. The digital rectal examination (DRE) revealed an empty rectum with no stool staining, and there was no occult blood in the stool. A supine abdominal x-ray showed linear lucencies tracking along the bowel wall representing pneumatosis intestinalis with gas outlining the bowel wall (Rigler's sign), the lucent liver sign, and a rim of air along the abdominal wall representing pneumoperitoneum (Figure 1). The patient's history, physical examination, and x-ray findings indicated NEC. Initially, a diagnosis of pneumoperitoneum was made, and a laparostomy tube was inserted. The empirical treatment was started with cefotaxime and amikacin. Along with nasogastric suctioning, the baby was given total parenteral nutrition (TPN). She was passing scanty stools with 10 ml discharge in the laparostomy tube and 20 ml bilious aspirates in a nasogastric tube. The condition of the child was clinically static. So, after the optimisation of the patient, the decision to do an exploratory laparotomy was made. The child was shifted to the surgical theatre on the sixth day of life.

A right transverse supra-umbilical incision was made. The abdomen was opened in layers, and the whole of the gut was delivered outside and was healthy except for a 1 cm perforation at the mid appendix noted in the retrocaecal appendix (Figure 2 and 3). Appendectomy was performed, haemostasis was ensured, and the layered closure of the abdomen was done. The baby had no postoperative complications and was discharged on the 15th day of life with a smooth recovery. The removed

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appendix was sent for histopathology, which was consistent with the findings of acute inflammation in the appendix with no evidence of malignancy.

DISCUSSION

Acute appendicitis is hardly considered a differential diagnosis for acute abdominal sepsis in neonates. The incidence of appendicitis in newborns has been documented to be approximately 0.04-0.2%.¹ It involves premature infants in 25-50% of all reported cases,²⁻⁷ with mortality ranging from 20 to 25%.^{1,5,6}



Figure 1: Supine abdominal x-ray showing linear lucencies tracking along the bowel wall (black arrow) representing pneumatosis intestinalis with gas outlining the bowel wall (Rigler's sign), the lucent liver sign, and a rim of air along the abdominal wall (blue arrow) representing pneumoperitoneum.



Figure 2: A soft tube passing through the perforated appendix.



Figure 3: Perforation at the mid-appendix level.

The low incidence of acute appendicitis in neonates may be attributed to the wide lumen of the funnel-shaped appendix, absence of fecoliths, liquid diet, and infrequent lymphatic hyperplasia in the periappendiceal region.⁶ The high incidence of neonatal morbidity and mortality associated with a perforated appendix can be attributed to several factors. These include the thinness of the appendix wall, the underdeveloped omentum, the limited physiological reserve, and the small peritoneal cavity which results in a more rapid and widespread contamination.⁷ The diagnosis is usually established by laparotomy or autopsy due to atypical signs and symptoms with the absence of tenderness, guarding,⁸ and the rarity of the pathology in neonates.

Based on the literature review, the presence of various clinical signs and symptoms such as abdominal distention, vomiting, refusal to feed, irritability, temperature instability, and leucocytosis may be indicative of a diagnosis. This is especially true when these symptoms are present alongside radiological signs such as abnormal gas patterns, free peritoneal fluid, obliterated psoas shadow, and right iliac fossa abscess.⁸

It is important to rule out an isolated form of NEC limited to the appendix and Hirschsprung's disease (HD). If there is no suspicion of HD, simple appendectomy with peritoneal lavage using warm saline is the preferred line of management.

PATIENT'S CONSENT:

Informed written consent was obtained from the parents of the patient to publish this case report.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

MB: Operating surgeon, conceptualisation, and writing of the original draft.

NA: Operating surgeon, supervision, and review of the manuscript.

GSP: Data curation, and literature review.

MHM: Critical revision, review, and editing of manuscript.

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