

# Spontaneous Jejunal Perforation in a Term Neonate: Case Report

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## ABSTRACT

Spontaneous Intestinal Perforation (SIP) of the newborn is usually a focal intestinal perforation typically found at the terminal ileum occurring primarily in preterm and very low birth weight babies. Few cases of SIP involving

the jejunum are reported in the literature. We report a case of spontaneous jejunal perforation in a four-day-old term neonate who underwent successful surgical intervention.

**Keywords:** Focal intestinal perforation, Surgical intervention

## CASE REPORT

A four-day-old female neonate was referred in view of abdominal distension. The baby was born to a 23-year-old primigravida mother by elective caesarean section at 40 weeks of gestation and weighed 3500 grams. Mother had regular antenatal visits and there was no history of diabetes, hypertension, fever, urinary tract infection or rupture of membranes. Liquor was clear. Apgar scores were 8 and 9 at 1 and 5 minutes of age.

The baby was tachypnoeic and was admitted in NICU. Tachypnoea subsided in few hours and the baby was shifted to mother. The baby passed meconium soon after birth. On the 3rd day of life, the baby developed tachypnoea and abdomen distension, hence was readmitted in NICU. Septic screen was positive (CRP: 24 mg/L). Baby was kept nil by mouth and IV antibiotics were started. Abdominal radiograph was taken. On the 4th day of life, abdominal distension had increased and baby was referred to Dolphin children's hospital for further care.

At admission, the baby had clinical features of sepsis in the form of tummy toe difference, mottling, decreased activity, poor perfusion and gross abdominal distension [Table/Fig-1]. Her temperature was 99.90F, heart rate 152/min, CRT 4-5 sec, respiratory rate 52/min and SpO<sub>2</sub> of 88% in room air. Laboratory investigations showed haemoglobin of 14.8 gm/dl, platelet count 1.3 lakhs/cu mm, WBC 18,300/cu.mm with a differential count of neutrophils 83%, band forms 10%, lymphocytes 6% and eosinophils 2%. Septic screen was positive (CRP: 72 mg/L). Abdominal radiograph showed air under the diaphragm and fluid levels in pelvis [Table/Fig-2]. Review of previous radiograph taken at the referring centre disclosed a classic football sign [Table/Fig-3].

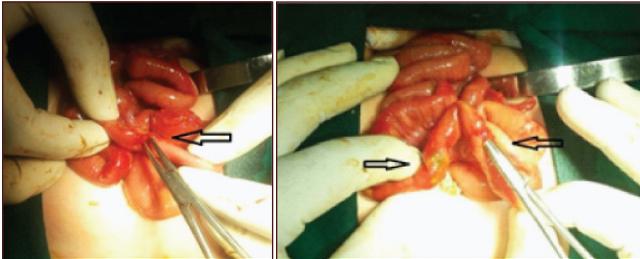


**[Table/Fig-1]:** At admission on day 4 of life, with abdominal distension.



**[Table/Fig-2]:** Air under the diaphragm and fluid levels in pelvis (arrows).  
**[Table/Fig-3]:** Abdominal radiograph showing free sub-diaphragmatic and sub-hepatic air, falciform ligament outlined by intraperitoneal air and Rigler's Sign in upper left quadrant (arrows). (left to right)

The platelet count decreased to 81,000/cu.mm and platelet transfusion was given prior to surgery. Laparotomy done through right supra umbilical transverse incision showed mid jejunal perforation with bile and pus in the abdomen [Table/Fig-4 and 5]. Jejunal perforation was closed by interrupted sutures in 2 layers using 5-0 MERSILK and peritoneal lavage was done. Rest of the intestine was normal and hence, biopsy was not taken.



**[Table/Fig-4]:** Intraoperative photograph showing mid jejunal perforation (arrow). **[Table/Fig-5]:** Jejunal perforation with bile and pus in peritoneum (arrows). (left to right)

Postoperative period was uneventful. Feeds were started on the 7th postoperative day and baby tolerated feeds well. Baby was accepting breastfeeds and was discharged on day 16 of life.

## DISCUSSION

SIP of the newborn is usually a focal intestinal perforation typically found at the terminal ileum. SIP occurs primarily in preterm and very low birth weight babies and is uncommon in term neonates [1-4]. Few cases of SIP involving duodenum, jejunum and colon have been reported [2,4]. Neonatal gastrointestinal perforation most commonly occurs as a complication of Necrotizing Enterocolitis (NEC) followed by SIP. Although prematurity is the only well established risk factor, other risk factors include chorioamnionitis, feeding tubes, perinatal asphyxia, mechanical ventilation, postnatal glucocorticoid and indomethacin therapy [5-7].

NEC and SIP are gastrointestinal complications that typically occur in extreme premature babies of 25 to 27 weeks gestation [3]. Gastrointestinal perforation in neonates most commonly occurs as a complication of NEC followed by SIP [4]. The proposed aetiology was that of ischaemic injury caused by asphyxia and increased intraluminal pressure due to positive pressure ventilation leading to perforation [6].

SIP generally presents within the first 10 days of life as an acute onset of abdominal distension unlike NEC which typically presents after the first week of life after feeds were started. Although, the classical physical finding is a black-bluish discoloration of the abdominal wall; abdominal wall erythema, crepitus and induration commonly seen with NEC are not usually present in infants with SIP. Pneumatosis intestinalis or portal venous gas, the radiograph hallmarks of NEC are not seen in SIP [8].

Perforation as a complication of NEC is seen in upto 42% of cases and is associated with a high mortality (62%). SIP is associated with a lower mortality of 14% [7]. A review of 105 cases of perforated NEC found that abdominal radiographs show evidence of free intra peritoneal gas in only 63% of cases, with 21% showing ascites but not free air and 16% showing neither feature.

Radiographs may need to be repeated frequently if clinical condition deteriorates. Several signs are pathognomonic of pneumoperitoneum. A common sign is a collection of gas in the right upper quadrant adjacent to the liver, lying mainly in the subhepatic space and the hepatorenal fossa visible as an oval or triangular gas shadow not in continuity with the rest of the bowel [8].

The falciform ligament may sometimes be identified as a white streak and when surrounded by the oval lucency of a pneumoperitoneum, it is described as “football sign” [Table/Fig-3]. Gas may accumulate and show up beneath the diaphragm (cupola sign) or on the upper part of the abdomen in a lateral decubitus film. Clear visualization of the outer as well as the inner wall of a bowel loop—Rigler’s sign—is a sign of pneumoperitoneum [8].

Ultrasonography helps to assess the presence and the character of ascites and the presence of particulate matter most likely indicates perforation [9].

Based on the clinical presentation and physical findings SIP is clinically diagnosed. Abdominal radiographs that demonstrate pneumoperitoneum without pneumatosis are supportive of the diagnosis. The definitive diagnosis is based upon direct visualization of the intestinal perforation in the setting of an otherwise healthy appearing small bowel.

Management of neonate with SIP includes stabilization, discontinuing feeds, nasogastric suctioning and supportive care, such as fluid resuscitation, antibiotics and inotropic support. The treatment for SIP is surgical. Primary peritoneal drainage as the initial treatment for SIP is also being considered in some centres [10].

In the present case, we could not identify the cause for the jejunal perforation. There was no perinatal asphyxia. The baby didn’t receive positive pressure ventilation or any medications like steroids and NSAIDs which can cause perforation. Though feeding tubes were reported to cause gastric and duodenal perforations, it is unlikely to cause jejunal perforation.

Early diagnosis of intestinal perforation is imperative to allow prompt surgical intervention for better outcome. Free gas is most easily perceived separate from other bowel, lateral to the liver in decubitus films.

Even though a definitive cause is difficult to determine in the present case, jejunal perforations are associated with a high mortality. Therefore, clinicians should be able to identify such perforations at an early stage to facilitate better patient outcomes.

## CONCLUSION

Clinical suspicion and proper interpretation of radiological signs of pneumoperitoneum will enable the diagnosis of intestinal perforation to be made early thereby facilitating prompt referral to centres with paediatric surgical expertise for better outcomes.

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