

## Unravelling the unexpected: A rare case of 17 spontaneous intestinal perforations in an infant treated at Mbale Tertiary Hospital, Uganda

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### Abstract

Spontaneous intestinal perforations in neonates and infants are rare and pose significant challenges, especially in low-resource settings. We present a unique case of a female infant treated at Mbale Tertiary Hospital, Uganda, with 17 spontaneous intestinal perforations. She presented with acute abdominal distension, peritonitis, and septic shock. Emergency exploratory laparotomy revealed multiple perforations along the small intestine, with no evidence of obstruction, necrotizing enterocolitis, or trauma, confirming the diagnosis.

Surgical management involved resecting affected bowel segments and performing primary anastomosis. Postoperative care included infection control, nutritional support, and close monitoring. Despite the tertiary surgical care due to the complexity of the critical condition, the infant succumbed. This case underscores the importance of early recognition, multidisciplinary collaboration, and timely surgical intervention in managing rare pediatric conditions. Documenting such cases enhances understanding of spontaneous intestinal perforations and informs strategies for improving outcomes, particularly in resource-limited settings.

**Keywords:** Spontaneous intestinal perforations; Neonates; Emergency laparotomy; Pediatric surgery; Resource-limited settings

### 1. Introduction

Spontaneous intestinal perforations (SIPs) in neonates and infants are uncommon yet potentially life-threatening conditions that require prompt recognition and management (1). These perforations, often idiopathic, are distinct from necrotizing enterocolitis (NEC) or traumatic injuries and frequently occur in resource-limited settings, where diagnostic and therapeutic challenges are magnified (2). While single perforations are described in most reports, multiple perforations are exceedingly rare. To our knowledge, this case of 17 spontaneous intestinal perforations represents one of the highest documented numbers, making it a remarkable clinical scenario.

The condition typically presents with nonspecific symptoms, such as abdominal distension, peritonitis, and systemic sepsis, necessitating a high index of suspicion for early diagnosis. Surgical intervention, supported by appropriate postoperative care, remains the cornerstone of treatment, as emphasized in previous studies on intestinal perforations in neonates (3).

#### 1.1. Aims and Objectives

This case report aims to

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- Describe the clinical presentation, diagnostic process, and surgical management of a female infant with 17 SIPs treated at Mbale Tertiary Hospital.
- Highlight the importance of early intervention, multidisciplinary care, and resourceful management in achieving favorable outcomes in such rare cases.
- Contribute to the limited literature on SIPs, particularly from resource-constrained regions, to improve understanding and management of similar cases in the future.

## 1.2. Patient Information

This is the case of a 5-month-old female infant from a rural setting in eastern Uganda, born to peasant parents. She was referred to Mbale Regional Referral Hospital (MRRH) from Ngora Freda Carr Hospital, approximately 80 km away, after an acute worsening of her condition. Her clinical journey began with a two-week history of fever and loose, watery stools, followed by a three-day history of progressive abdominal distension, bilious vomiting, and constipation. Notably, there was no history of blood or mucoid stools, prior surgical interventions, or any developmental delays. Initial treatment at the referring hospital was aimed at managing paralytic ileus, but the lack of improvement prompted her transfer to a higher-level facility. Her case reflects the challenges of managing complex pediatric conditions in resource-constrained settings and highlights the importance of timely referral and specialized care (4).

## 1.3. Clinical Findings

On presentation, the 5-month-old female infant appeared acutely ill, febrile (temperature: 37.8°C), and moderately pale, with bilateral pitting edema and signs of severe dehydration. Dermatological examination revealed circular skin lesions on the gluteal region and left thigh, characterized by central ulceration, suggestive of possible infectious or inflammatory etiology.

Abdominal examination revealed a grossly distended abdomen with generalized tenderness and absent bowel sounds, indicating severe intra-abdominal pathology. Palpation identified stony dullness over most regions of the abdomen, tympanic sounds in the hypochondriac areas, and shifting dullness, consistent with significant intraperitoneal fluid accumulation. No palpable masses were noted.

Digital rectal examination demonstrated normal anal tone and an empty rectum, ruling out distal obstruction. Other systemic examinations, including cardiovascular and respiratory assessments, were unremarkable. The infant weighed 7.5 kg, which, along with the clinical presentation, highlighted the severity of her condition and the urgent need for surgical intervention.

## 1.4. Timeline

On December 14, 2023, the patient sought medical care at Ngora Freda Carr Hospital (CoU) with symptoms of fever, diarrhea, and abdominal distension. Initial management included treatment for malaria with intravenous artesunate and antibiotics (ampicillin and gentamicin) for a suspected bacterial infection. She also received a unit of whole blood to address severe anemia and Resomal solution for hydration.

Despite these interventions, her condition showed no improvement, prompting her referral to Mbale Regional Referral Hospital (MRRH). She arrived at MRRH on December 19, 2023, and was promptly admitted to the emergency ward for further evaluation and resuscitation.

On December 20, 2023, an emergency exploratory laparotomy was performed, revealing 17 spontaneous intestinal perforations, which were surgically managed. Postoperatively, the patient remained hospitalized for five days. Unfortunately, despite intensive care, she succumbed to her condition on the fifth postoperative day. Her case highlights the challenges of managing complex pediatric surgical emergencies in resource-limited settings.

## 1.5. Diagnostic Assessment

Laboratory investigations on admission revealed a mixed picture of severe anaemia and electrolyte imbalance. The haemoglobin level was critically low at 8.1 g/dL, showing microcytic characteristics (MCV 58.1 fL), while the white blood cell count ( $7.35 \times 10^9/L$ ) and platelet count ( $359 \times 10^3/\mu L$ ) were within normal limits. Serum electrolytes highlighted significant hypokalaemia (2.16 mmol/L), with normal sodium and chloride levels. The patient's blood group was O+, and HIV testing returned negative results.

Radiological assessment using an abdominal erect X-ray painted a striking image of pneumoperitoneum, characterized by free air under the diaphragmatic contours. Additionally, multiple gas shadows in the central abdomen, dilated bowel

loops with prominent valvulae conniventes, and free gas in the pelvis strongly suggested gastrointestinal perforation. These findings were pivotal in confirming the diagnosis and directing urgent surgical intervention.

### 1.6. Therapeutic Interventions

Despite the clear radiological evidence of pneumoperitoneum on the abdominal X-ray, the patient was not immediately taken to the operating room. The initial delay of one day in surgery was due to a comprehensive assessment and optimization process, including careful resuscitation and stabilization of her condition. This allowed for fluid and electrolyte balance correction, as well as the administration of appropriate antibiotics and analgesia to manage her sepsis and discomfort. Once the patient's clinical status improved sufficiently, she was evaluated by the anaesthesia team, and the decision was made to proceed with surgery the following day.

In the operating room, the surgical team faced challenges in establishing intravenous access due to the patient's oedematous state while under general anaesthesia. A transverse supra-umbilical midline incision was made, and upon opening the abdomen, a significant release of air was observed. Upon exploration, bilious intestinal contents were encountered, and a total of 14 perforations were identified in the small bowel. These included older perforations near the ileocecal junction and newer ones in the jejunum. No perforations were found in the ascending or descending colon. The largest perforation, measuring 5mm x 2mm, had necrotic margins, while others were circular in shape, grouped in pairs at specific sites. Biopsies were taken from the affected areas and sent for histological analysis to further assess the tissue.

The perforations were meticulously repaired using Vicryl 3/0 sutures, and a loop ileostomy was fashioned 30 cm from the ileocecal junction to divert intestinal contents and facilitate recovery. The abdomen was thoroughly lavaged to clear any contaminants, and the incision was closed in layers to ensure optimal healing. Following the procedure, the patient was successfully extubated and transferred to the high dependency unit for intensive postoperative monitoring and care.



**Figure 1** The perforations on ileum of five months old baby .

## 2. Evolution and Outcome

This case involved a 5-month-old infant with 17 spontaneous intestinal perforations, who presented with severe sepsis and abdominal distension. Despite initial management and stabilization, including resuscitation, antibiotics, and analgesics, the patient underwent emergency laparotomy, where 14 perforations were repaired and a loop ileostomy created. Postoperatively, she was closely monitored in the high-dependency unit. However, despite the surgical intervention, she succumbed to sepsis and multi-organ dysfunction on the fifth postoperative day.

### 2.1. Educational Insights

- **Early Referral:** Timely transfer to a higher-level hospital is crucial for managing complex cases.
- **Comprehensive Care:** Proper resuscitation and stabilization are key for improving surgical outcomes.

- **Surgical Challenges:** Managing multiple perforations requires expert surgical intervention and intensive postoperative care.
- **Resource Constraints:** Limited resources can affect outcomes, highlighting the need for improved pediatric surgical care in resource-limited settings.
- **Critical Care:** Multi-organ failure and infection remain significant risks in severe pediatric cases (5, 6).

This case underscores the importance of early diagnosis, timely intervention, and holistic care in improving survival chances in complex pediatric surgical emergencies.

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### 3. Case Summary

A 5-month-old female from a rural Ugandan setting presented with fever, diarrhea, and abdominal distension. After initial treatment for malaria and bacterial infection at Ngora Freda Carr Hospital, her condition worsened, prompting transfer to Mbale Regional Referral Hospital. Imaging revealed pneumoperitoneum, indicating multiple spontaneous intestinal perforations, a rare occurrence in infants.

Emergency laparotomy revealed 14 perforations in the small bowel, which were surgically repaired, and a loop ileostomy was created. Despite intensive postoperative care, the patient succumbed to sepsis and multi-organ failure on the fifth postoperative day. This case is the first of its kind at Mbale Regional Referral Hospital in this age group, highlighting the rarity of multiple spontaneous intestinal perforations and underscoring the need for early diagnosis, timely intervention, and comprehensive care in managing such pediatric emergencies, particularly in resource-limited settings.

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### 4. Conclusion

This case of multiple spontaneous intestinal perforations in a 5-month-old infant is a rare and unique occurrence, marking the first documented instance of such a condition in a resource-limited setting, providing crucial insights into the challenges faced in managing complex pediatric surgical emergencies in these environments.(6,7)

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### Compliance with ethical standards

#### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

#### *Statement of ethical approval*

This study was approved by the Ethical Review Committee of **Mbale Regional Referral Hospital**. Ethical approval was granted following a comprehensive review of the study design and methodology, ensuring adherence to ethical guidelines, participant welfare, and informed consent processes. The research adhered to the highest standards of confidentiality, privacy, and risk management to ensure the protection of all participants involved.

#### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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