**CASE REPORT**

**Idiopathic ileal volvulus with multiple concomitant infections in a starving man**

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**Abstract**

**Background:** Small bowel volvulus is defined as the torsion of the small intestine, potentially leading to bowel obstruction, gangrene and perforation. It is a rare condition, especially in adults.

**Case presentation:** A 30-year-old man was retrieved from the jungle with severe weight loss and abdominal symptoms. He succumbed to death despite 22 days of intensive medical treatment. An autopsy revealed a ruptured gangrenous ileal volvulus with peritonitis and subdiaphragmatic abscess. Further laboratory analysis detected systemic Candida tropicalis and intestinal gram-negative bacterial sepsis, systemic Zika virus viremia, leptospirosis complicating rhabdomyolysis and disseminated intravascular coagulopathy, Type I Herpes Simplex virus infection of the tongue and upper gastrointestinal tract. The cause of death was the ruptured ileal volvulus, complicated with upper gastrointestinal bleeding due to Herpes simplex virus esophagitis in a malnourished patient with resolving leptospirosis and underlying Zika virus co-infection.

**Conclusion:** Rare clinical scenarios of adult-onset intestinal volvulus with concomitant multiple infections precludes clinical diagnosis and early treatment, leading to devastating consequences of clinical outcome. The positive clinical and postmortem correlation is a good learning lesson in many disciplines of medicine and science.

**Keywords:** Zika virus, Candida tropicalis, Leptospirosis, Herpes Simplex virus, Intestinal volvulus.

**INTRODUCTION**

Small bowel volvulus (SBV) is a rare condition especially in adults, with a low incidence ranging from 1.7 to 6.2% of all small bowel obstruction.1,2 It is characterised by torsion of a segment of the intestine and its mesentery, potentially leading to bowel obstruction, gangrene and perforation. This case focuses on a man who starved in the jungle and died during hospitalisation. There were various findings that contributed to his death. The cause of the intestinal volvulus remains obscure.

**CASE REPORT**

A 30-year-old previously healthy man was retrieved from the jungle with severe weight loss (15 kg), with a body mass index of 16kg/m². Despite intensive management in the hospital, he succumbed to death 22 days after admission. At autopsy, the body was found to be of severe cachexic and generalised edematous changes. Externally, there were multiple infected ulcerations over his back, with histology confirmation of bacterial and fungal infection.

Internally, the abdominal cavity was badly inflamed with a subdiaphragmatic abscess of 12 x 10 cm on the right side. The volvulus of ileum was identified 32cm from the caecum (Fig. 1). The affected bowel was gangrenous, twisted with mesenteric thrombosis. A perforation site of 0.5 x 0.5 cm was identified at the badly adhered area proximal from the volvulus ileum. The distal portion of the intestines was collapsed, while the proximal portion was grossly dilated with a bulky amount of blood clot and bowel gasses accumulation.

Examination of the brain showed haemorrhagic
infarction at the watershed area of right frontal lobes, basal ganglia and pons. Microscopically, haemorrhagic infarction of the affected brain cortex with septic emboli seen in the vessels of white matter, consisted of yeast cells with pseudo-hyphae penetrated the cerebral white matter in a solitary filamentous pattern seen around each affected vessel (Fig. 2). Examination of the lungs showed bacterial bronchopneumonia, diffuse alveolar damage and disseminated intravascular coagulopathy. The right lung contained similar septic emboli consisting of the bacterial colony with yeast cells. The lung parenchyma was infiltrated with pseudo-hyphae with a “link of sausage pattern” (Fig. 3).

The lips were ulcerated and extensive ulceration of the tongue, continued down to the oesophagus and stomach with a “cobblestone” appearance (Fig. 4). There were multiple clumps of blood clots scattered along the stomach and accumulated in the small intestine proximal to the obstruction site. Histopathological examination of those ulcer edges showed a distinct cytopathic

FIG. 1: Ileal volvulus (arrow) and perforation (arrow head) with proximal dilatation of small intestine and distal collapsed colon.

FIG. 2: Fungal emboli and scanty pseudohyphae infiltration of the brain (H&E, 80x magnification).
Effect of Cowdry type A intranuclear inclusions, blue glassy chromatin with nuclear margination, and multinucleated keratinocytes (Fig. 5). Type 1 Herpes simplex virus was isolated from polymerase chain reaction (PCR) and viral culture of the lesions.

Other abnormal findings included acute tubular necrosis with positive immunostaining of myoglobin within the proximal tubules, generalised centrilobular necrosis of the liver. The biochemistry studies showed a total creatine kinase of 35500U/L (reference range 39-308), while positive myoglobin was detected in the urine.

The antemortem and postmortem blood samples, pus, peritoneal and pericardial fluid were consistently isolated with *Candida tropicalis, Escherichia coli, Proteus mirabilis* and *Enterococcus faecium*. PCR of the zika virus was detected from the blood, liver, lung, spleen tissue, but was negative in the cerebrospinal fluid (CSF), kidney and brain tissues. The antemortem leptospiral serology was IgM positive and negative IgG. Leptospiral PCR was detected in the kidney but negative in the blood, CSF, liver and lung tissue samples.
DISCUSSION

The primary SBV is defined as the torsion of the small intestine without any underlying causes such as tumours, postoperative adhesions, congenital malrotation, anatomic abnormality, fibrous band and diverticular disease. Clinical diagnosis of the SBV is tricky, requiring a high index of suspicion toward the particular rare causes of abdominal symptoms. In our case, as the patient presented with abdominal symptoms with multiple comorbidities, SBV was not diagnosed throughout the admission, even with an abdominal CT conducted twice at the early and terminal stage of the disease. Secondary causes of SBV were ruled out categorically, the exact pathogenesis of its formation was remained obscure. Duke et al. (1977), suggested the sudden high fibre loading of empty bowel during fasting, which can induce bowel peristalsis and leading to SBV. The deceased was believed to have remained in the jungle for 1 month with prolonged fasting and weight loss, and fruits or plants might have been the most accessible source of energy for him. His bowel was dissected and examined; it was loaded with multiple clumps of blood clots, fully occupying the lumen of the small intestine and resulted from the bleeding ulcer by type 1 Herpes Simplex virus. The small bowel content was examined under a microscope and found to be suggestive of some high fibrous content fruit or vegetable peels mixed with the sloughing off intestine epithelium. Those changes might negatively impact peristalsis, which supports the hypothesis of volvulus formation.

A study of the pathogenesis of ZIKV showed broad tissue tropism and virus accumulation in various organs in an animal model. This hypothesis is consistent with postmortem detection of ZIKV by RT-PCR and electron microscope examination of tissue samples such as blood, liver, lung and spleen tissue. The negative detection in the CSF and brain tissue suggests that the virus does not cross the blood-brain barriers readily, is less neuro-invasive in adults and rarely causes meningitis and encephalitis.

It is worth mentioning that diagnoses of leptospirosis complicating rhabdomyolysis and disseminated intravascular coagulopathy were established clinically. The postmortem detection of leptospiral PCR and myoglobin cast in the kidney confirmed the diagnosis despite 22 days post-infection and antibiotic treatment.

CONCLUSIONS

This case demonstrates a complicated, rare, multiple infectious agents, a difficult diagnosis in a clinical scenario and devastating consequences of a combination of pathology changes.

Abbreviations: SBB: Small bowel volvulus; RT-PCR: Reverse transcription polymerase chain reaction; IgM: Immunoglobulin M; IgG: immunoglobulin G; CSF: cerebrospinal fluid; HIV: Human immunodeficiency virus; CT: Computerized tomography; C. tropicalis: Candida tropicalis; ZIKV: Zika virus; DENV: dengue virus.
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Conflict of interest: The authors declare no conflict of interest.

REFERENCES