

## CASE REPORT

# Chemotherapy-associated neutropenic enterocolitis of the transverse colon post right hemicolectomy

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## Abstract

Neutropenic enterocolitis (NE) is a life-threatening infection of the immunocompromised. NE ubiquitously affects the cecum, often with involvement of the ascending colon and ileum. Classically, NE is associated with high mortality leading to the frequent use of aggressive treatment strategies including surgery. Although conservative approaches are often successful, there are currently no standardized treatment guidelines for NE and it is unclear when such strategies should be implemented. Here, we describe a patient with suspected chemotherapy-associated NE despite having previously undergone a right hemicolectomy. As computed tomography imaging failed to provide a conclusive diagnosis, we performed a gentle endoscopic evaluation that affirmed a diagnosis of NE of the transverse colon, and suggested the patient would benefit from conservative treatment. This case demonstrates that endoscopy can be a safe and useful tool in the diagnosis of NE, and is an important reminder that NE can affect any part of the gastrointestinal tract.

## INTRODUCTION

Neutropenic enterocolitis (NE) is a life-threatening infection affecting the immunocompromised. Although the precise etiology varies, most cases involve the overgrowth of *Clostridium septicum* causing severe inflammation and thickening of the cecum, often involving the ascending colon and terminal ileum. In some instances, this can lead to life-threatening complications including perforation, peritonitis and septicemia [1]. Diagnosis of NE is often challenging due to its nonspecific presentation and a lack of consensus regarding diagnostic criteria [2]. Patients generally present complaining of vague GI symptoms including abdominal pain, distention, vomiting, diarrhea and fever [1]. As such, diagnosis is dependent on

physical exam, imaging and clinical context. With no standardized treatment guidelines for NE, outcomes can be poor with some estimates suggesting a mortality rate of ~50% [1, 3].

Here, we present the case of a patient presenting with severe neutropenia and diffuse abdominal pain following chemotherapy. Although her symptoms were concerning for NE, her cecum and ascending colon had been previously resected and she had no clinical signs of the right iliac fossa. Imaging showed the presence of gas in the wall of the transverse colon, and based on the results of cautious endoscopy, the patient was diagnosed with atypical NE and managed conservatively. This case serves as an important reminder that NE can affect any part of the gastrointestinal tract, and that diagnosis is not excluded by the absence of right-sided symptoms. Further, this case demonstrates that

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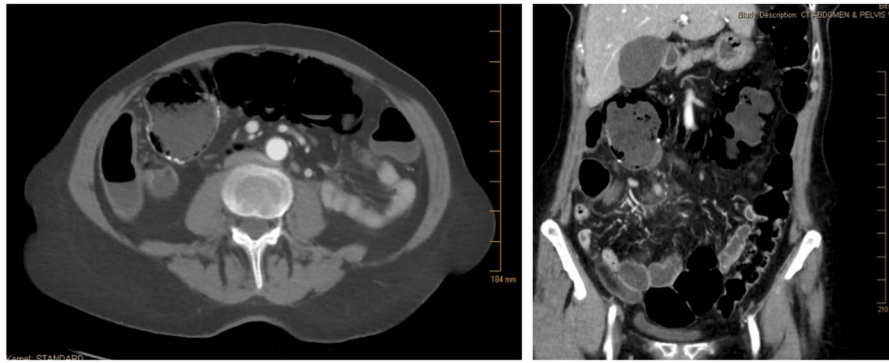


Figure 1: CT imaging showing the presence of gas in the wall of the transverse colon with associated lymphedema.

if performed cautiously, endoscopy can be an important and minimally invasive tool in the management of NE, expediting diagnosis and guiding treatment decisions.

## CASE PRESENTATION

A 70-year-old woman presented to the emergency department complaining of severe, diffuse abdominal pain of 2 days. Her medical history was significant for right-sided stage 3 colon cancer status post open right hemicolectomy with end-to-end ileocolic anastomosis. She had been receiving adjuvant FOLFOX (folinic acid, fluorouracil and oxaliplatin) at a different institution with her last chemotherapy infusion 5 days prior to the time of presentation. On physical exam the patient was afebrile, normotensive and mildly tachycardic. Her abdomen was distended and tender with focal peritoneal signs in the epigastric region, but there was no tenderness in the right iliac fossa. A complete blood count showed a white blood cell (WBC) count of 2300/ $\mu$ l with an absolute neutrophil count (ANC) of 600/ $\mu$ l with 44% bands.

Computed tomography imaging showed the presence of gas in the wall of the transverse colon with associated lymphedema and patent mesenteric vessels (Fig. 1). Due to the degree of neutropenia and clinical context, we strongly suspected an atypical NE. However, imaging alone was unable to exclude the possibility of another etiology such as an infective enterocolitis. Therefore, and we elected for endoscopy with cautious, gentle insufflation to ensure no further damage to the transverse colon. Although the transverse colon was edematous, the patient did not show signs of vascular compromise, necrosis or transmural thickening (Fig. 2). Biopsies were obtained from the diseased colonic segment, which showed normal mucosa with edema. Based on these results, as well as negative stool cultures for infectious processes including *C. difficile*, the patient was diagnosed with NE of the transverse colon. She was managed conservatively with bowel rest, IV fluid resuscitation, antibiotics (vancomycin and meropenem) and filgrastim-sndz to stimulate leukocyte production. The patient's symptoms improved rapidly and her WBC count increased to 5000/ $\mu$ l with an ANC of 2500/ $\mu$ l. She was discharged on hospital day four with oral antibiotics and has had no further issues.

## DISCUSSION

Here, we present the unusual case of NE originating in the transverse colon. To date, there has only been one reported case of chemotherapy-associated NE affecting the transverse colon,

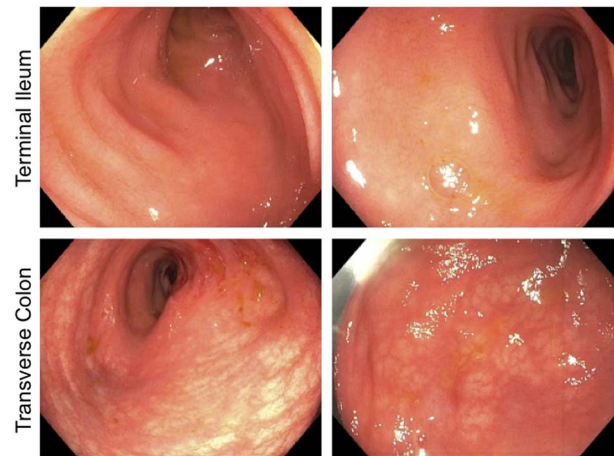


Figure 2: Endoscopy showing edema of the transverse colon consistent with NE.

in which the cecum was intact but uninvolved [4]. Hence, ours in the first documented case of a NE in a patient lacking a cecum, serving as an important clinical reminder that, although NE has been long thought to ubiquitously involve the cecum, it can originate in any part of the GI tract and should be suspected in any myelosuppressed patient presenting with vague abdominal pain.

As mentioned, there are currently no standardized treatment guidelines for NE, particularly for non-classic cases such as ours. In the previously reported case identifying NE of the transverse colon, the patient developed bowel perforation and required immediate surgical correction [4]. However, there are no current standards to determine when surgery is and is not indicated, with most reserving surgery for cases with more severe complications including persistent bleeding, pneumoperitoneum suggestive of perforation or clinical deterioration [5, 6]. As our patient had gas within the wall of the transverse colon but no obvious signs of perforation, it was unclear whether she would benefit from surgery particularly given her history of hemicolectomy. As such, we elected for a minimally invasive approach to better evaluate her condition, which not only affirmed the diagnosis, but also led us to believe that she would benefit most from conservative treatment.

Although we had success using careful endoscopy with gentle insufflation, others have cautioned against endoscopy for fear of further injury to the intestine or increasing the spread of bacteria [7]. Hence, endoscopy should be reserved for patients such as ours with mild-to-moderate disease and hemodynamic

stability, after other non-invasive imaging modalities have failed to adequately inform the treatment plan or rule out other potential etiologies. These techniques include CT, which is the preferred imaging modality in adults due to its high sensitivity and superior accuracy compared to plain radiography [1]. Bedside ultrasound sonography (US) is also an important tool in the diagnosis of NE [8]. For instance, in a small study, early bedside US at the onset of a single symptom was able to diagnose NE in 100% of patients evaluated. However, US was significantly less effective later during disease course [9]. In this study, US identified two patients at risk for wall rupture who were eventually taken for surgery, although these were still confirmed by CT [9]. Hence, while diagnostic guidelines are not standardized at this time, we recommend CT as the first approach when NE is suspect, with additional tools reserved for cases in which this fails to fully determine the treatment plan. However, regardless of the diagnostic tools used, it is imperative that patients suspected for NE receive coordinated, multidisciplinary care to ensure rapid diagnosis and management of what can quickly progress to a life-threatening condition.

### CONFLICT OF INTEREST STATEMENT

None declared.

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### CONSENT FOR PUBLICATION

The patient provided fully informed, written consent to have her clinical information and imaging shared in this report. Additional information is available upon request.

### GUARANTOR

Daniel R. Principe.

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