

# Recurrent Diverticulitis in a Neutropenic Patient: A Case Report

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## Abstract

### Background

Neutropenic patients are at an increased risk of infections. These infections can originate from several sites including the respiratory, urinary or gastrointestinal systems. Diverticulitis is one such infection, that carries a high morbidity and mortality risk in such patients. The management remains controversial and involves deciding between a conservative medical approach and surgical intervention. Regardless, these patients should be closely monitored due to a high risk of developing complications including septic shock.

### Case Report

In this article, we discuss the case of a patient with acute myeloid leukemia (AML) presenting with neutropenic fever and found to have a recurrent episode of diverticulitis. The patient was quickly managed with medical therapy, and surgery was therefore deferred.

### Conclusion

In conclusion, physicians should always maintain diverticulitis as a differential diagnosis in neutropenic patients who present with abdominal pain, especially in those who have had a previous episode. This allows for rapid and more efficient management.

*Keywords: Acute Myeloid Leukemia, Diverticulitis, Neutropenic Fever, abdominal infection, sepsis*

Abbreviations: CABG: Coronary Artery Bypass Grafting; AML: Acute Myeloid Leukemia; HR: Heart Rate; BPM: Beat Per Minute; T°: Temperature; BP: Blood Pressure; WBC: White Blood Count; ANC: Absolute Neutrophil count; CRP: C Reactive Protein; CT scan: Computed Tomography scan; MRI: Magnetic Resonance Imaging

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## Introduction

Diverticular disease affects around 25% of the general population, with an increased prevalence in the industrialized countries [1]. Diverticulosis, the development of colonic pouches due to a loss of mucosal integrity, presents with abdominal pain and rectorrhagia [2]. Almost 15% of patients with diverticulosis will develop diverticulitis [3]. This progression occurs secondary to obstruction of the neck of the diverticulum and loss of the mucosal epithelium leading to bacterial invasion of the bowel wall. This can often lead to a systemic reaction which includes fever and leukocytosis [4].

To make a diagnosis, CT scan of the abdomen and pelvis is the modality of choice. The CT scan can show infected diverticula and allows for grading of the severity of disease. Other modalities include colonoscopy, which allows for direct visualization of infected diverticula, as well as Ultrasound and X-Ray of the lower gastrointestinal tract, though these are often low yield [5].

Conventionally, immunosuppressed patients are considered to be at an increased risk of infection. This is especially true for neutropenic patients, who may progress into a septic shock. Diverticulitis, as one of the potential causes of septic shock, can lead to acidosis, multiorgan damage and death [2]. When bowel perforation or necrosis are present, the mortality risk is increased dramatically [2].

We present in this case report a patient with a history of acute myeloid leukemia who presented for abdominal pain and diarrhea, and was found to have a recurrent episode of diverticulitis.

## Case Presentation

A 49-year-old gentleman presented to our emergency department with a one-day history of high-grade fever and chills. Medical history was significant for coronary artery disease leading to CABG, hypertension, hypothyroidism, and AML, thought to be in remission post-

completion of chemotherapy. The patient reported progressive left lower quadrant pain, along with perianal and anal pain of 5 days duration. Watery, non-bloody diarrhea was also reported by the patient.

A perineal MRI was recommended to rule-out a perianal abscess, though this was not done at the time. Of note, the patient had a previous episode of non-complicated diverticulitis 3 months prior to presentation, for which he underwent conservative management. During the current episode, the patient received a 2-week antibiotic course, along with Neupogen (Filgrastim) as per the recommendations of the oncology team. The patient improved and was discharged home stable and asked to follow up with General Surgery for a possible intervention. Resection and colectomy were a consideration due to this being a recurrent episode of diverticulitis and due to the presence of a fistula. The patient was scheduled to resume his chemotherapy regimen for AML one week after discharge.

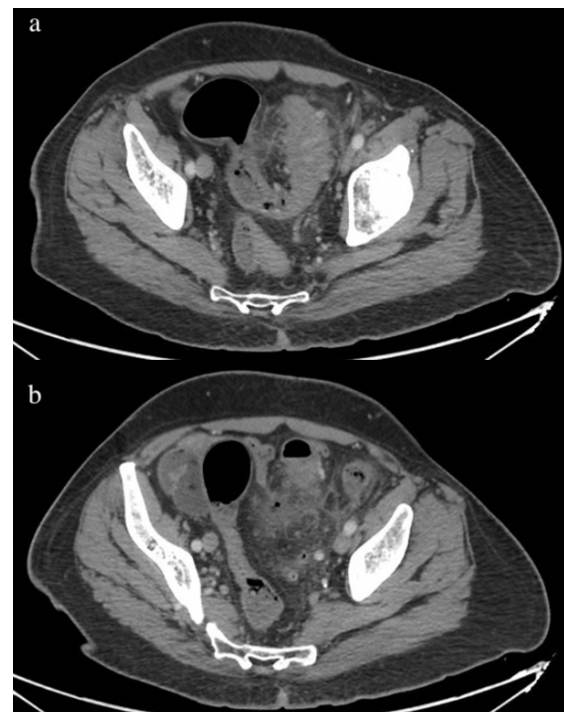


Figure 1a, 1b: Computed Tomography Scan of the abdomen showing a circumferential short segment wall thickening of the sigmoid colon with multiple diverticular pouches and significant surrounding fat stranding

## Discussion

Treatment of infections in patients on chemotherapy should be rapid and aggressive, especially in the setting of neutropenia. Physicians should always suspect diverticulitis in neutropenic patients, especially if these patients have had a previous episode [4]. Pancultures should be taken and broad-spectrum antibiotics should be started promptly within 60 minutes [6]. Some investigators even argue that treatment should be initiated within 30 minutes [7].

Even though the most frequently isolated organisms in neutropenic fever cases are gram positive bacteria, antibiotics coverage should target both gram-positive and gram-negative organisms, especially since the latter are highly virulent and frequently associated with development of sepsis [8,9]. Clostridium difficile colitis and typhlitis should also be considered in every neutropenic patient presenting with abdominal pain and diarrhea. Clostridium infections present as diarrhea, often post hospital stay or post antibiotic therapy. Typhlitis presents with only cecal involvement on CT scan. However, diverticulitis should always be considered as it can lead to complications such as perforation and sepsis [4].

History-guided CT scans should be ordered to find the source of the infection. A CT scan can be very useful in the diagnosis of diverticulitis as it can show a focal inflammatory process with fascial thickening of the diverticula. However, its utility also lies in identifying the presence of complications such as abscesses and fistulas. In our case, the CT scan was helpful in identifying a fistula and possibly a perianal abscess [10].

These patients can be treated medically with antibiotics and supportive care, and do not always require surgery. In fact, surgical interventions in neutropenic patients have increased morbidity and mortality [1]. Surgeries are usually reserved for patients with signs of perforation, peritonitis or more advanced complications [12]. Mortality in

immunosuppressed patients with diverticulitis is up to 25%, regardless of whether they are treated surgically or conservatively. This is higher than the general population where mortality is noted to be 1-5% [13]. There are no clear guidelines on whether medical treatment or surgical intervention is the best approach [4]. A retrospective study done by Wade et al. reviewed 50 neutropenic patients with abdominal pain and analyzed the treatment decision. They found that in patients who failed conservative treatment, surgery increased surviving rate in 59% of those treated [14]. The American Society of Colon and Rectal Surgeons (ASCRS) guidelines in 2014 recommended to maintain a low threshold when considering operative intervention in immunosuppressed patients hospitalized with an initial episode of acute diverticulitis. This is because these patients are at an increased risk for recurrent complicated diverticulitis [15]. Chemotherapy is usually resumed following the resolution of the diverticulitis [15].

### Limitations

The chemotherapy regimen was not documented in this report, and it was not known whether it might increase the risk for diverticulitis. Further studies are needed to determine whether certain chemotherapies can increase the prevalence of diverticulitis, especially in neutropenic patients.

### Conclusion

Physicians should always maintain diverticulitis in their differential diagnosis in neutropenic patients presenting with abdominal pain, especially for those who had a previous diverticulitis episode. Broad-spectrum antibiotics should be started as soon as possible to avoid the possibility of septic shock. Though controversial, conservative medical therapy appears to be superior to surgical treatment in early cases as surgeries might increase morbidity and mortality. Chemotherapy can be resumed whenever the infection resolves, and when the

patient is clinically and hemodynamically stable. This manuscript emphasizes the importance of maintaining diverticulitis on top of the differential diagnosis in neutropenic patients presenting with abdominal pain.

## References

1. Blachut K, Paradowski L, Garcarek J. Prevalence and distribution of the colonic diverticulosis. Review of 417 cases from Lower Silesia in Poland. Rom J Gastroenterol. 2004;13(4):281-285. PMID: 15624024
2. Ismail AK, Milliken S, Buckland ME. Acute neutropenic diverticulitis: a case report. Pathology. 2008;40(4):423-425. PMID: 18446640. <https://doi.org/10.1080/00313020802036814>
3. Parks TG. Natural history of diverticular disease of the colon. Clin Gastroenterol. 1975;4(1):53-69. PMID: 1109820. <https://doi.org/10.1016/B978-0-433-24660-2.50008-4>
4. Vellanki M, Sethi S, Sowmya N, Greene J. Diverticulitis in the Neutropenic Patient. Infect Dis Clin Pract. 2018;26(1):50-52. <https://doi.org/10.1097/IPC.0000000000000526>
5. Radiological Society of North America, American College of Radiology. Diverticulitis. 2018. <https://www.radiologyinfo.org/en/info/diverticulitis#:~:text=Doctors%20often%20diagnose%20diverticulitis%20using,intestinal%20tract%20easier%20to%20see>
6. Bell MS, Scullen P, McParlan D, et al. Neutropenic sepsis guidelines. Northern Ireland Cancer Network, Belfast 2010:1-11.
7. Rosa RG, Goldani LZ. Cohort study of the impact of time to antibiotic administration on mortality in patients with febrile neutropenia. Antimicrob Agents Chemother. 2014;58(7):3799-3803. PMID: 24752269 PMCID: PMC4068526. <https://doi.org/10.1128/aac.02561-14>
8. Viscoli C, Castagnola E. Planned progressive antimicrobial therapy in neutropenic patients. Br J Haematol. 1998;102(4):879-888. PMID: 9734634. <https://doi.org/10.1046/j.1365-2141.1998.00848.x>
9. Viscoli C, Varnier O, Machetti M. Infections in patients with febrile neutropenia: epidemiology, microbiology, and risk stratification. Clin Infect Dis. 2005 Apr 1;40 Suppl 4:S240-5. PMID: 15768329. <https://doi.org/10.1086/427329>
10. Thoeni RF, Cello JP. CT imaging of colitis. Radiology. 2006;240(3):623-638. PMID: 16926320. <https://doi.org/10.1148/radiol.2403050818>
11. Starnes HF Jr, Moore FD Jr, Mentzer S, Osteen RT, Steele GD Jr, Wilson RE. Abdominal pain in neutropenic cancer patients. Cancer. 1986;57(3):616-621. PMID: 3942998. [https://doi.org/10.1002/1097-0142\(19860201\)57:3%3C616::aid-cnrcr2820570337%3E3.0.co;2-4](https://doi.org/10.1002/1097-0142(19860201)57:3%3C616::aid-cnrcr2820570337%3E3.0.co;2-4)
12. Peppas G, Bliziotis IA, Oikonomaki D, Falagas ME. Outcomes after medical and surgical treatment of diverticulitis: a systematic review of the available evidence. J Gastroenterol Hepatol. 2007;22(9):1360-1368. PMID: 17716342. <https://doi.org/10.1111/j.1440-1746.2007.05118.x>
13. Böhm SK. Risk Factors for Diverticulosis, Diverticulitis, Diverticular Perforation, and Bleeding: A Plea for More Subtle History Taking. Viszeralmedizin. 2015;31(2):84-94. PMID: 26989377. PMCID: PMC4789955. <https://doi.org/10.1159/000381867>
14. Wade DS, Douglass H Jr, Nava HR, Piedmonte M. Abdominal pain in neutropenic patients. Arch Surg. 1990;125(9):1119-1127. PMID: 2400304. <https://doi.org/10.1001/archsurg.1990.01410210045006>
15. Samdani T, Pieracci FM, Eachempati SR, et al. Colonic diverticulitis in chemotherapy patients: should operative indications change? A retrospective cohort study. Int J Surg. 2014;12(12):1489-1494. PMID: 25448673 PMCID: PMC4440494. <https://doi.org/10.1016/j.ijssu.2014.10.032>