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## Neoadjuvant Doxorubicin and Docetaxel in Breast Cancer Patients Applied Neutropenic Enterocolitis

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### ABSTRACT

Neutropenic enterocolitis is an acute complication of neutropenia induced by chemotherapy, characterized by inflammatory processes involving the colon and cecum that can lead to necrosis, hemorrhage, perforation, and septicemia. Usually, this condition develops after use of cytotoxic drugs, and fever and abdominal pain are the main symptoms. We present a case of a 38 year old female patient with breast cancer who received doxorubicin and docetaxel and presented typhilitis.

**Keywords:** Neutropenic enterocolitis, neoadjuvant therapy, doxorubicin and docetaxel

### INTRODUCTION

Neutropenic enterocolitis (NE) is a disease characterized by fever and abdominal pain, in which the target tissue is usually the terminal ileum and cecum. NE is observed in cancer patients who develop neutropenia after chemotherapy. It is characterized by the development of ulceration, necrosis, and perforation in the retained intestinal segment and is usually fatal. Conservative treatment applied on time can provide healing without surgery, but, frequently, it is necessary to apply medical treatment together with surgical treatment. It has been shown to be most frequently associated with leukemia and lymphoma (1). NE is less common in solid tumors due to treatment-related short-term neutropenia, but has been shown to be associated with taxane-based chemotherapy (2). In patients receiving chemotherapy due to solid tumors, the incidence of NE has been reported to be 5% and mortality rate has been reported to be 30%–50% (3).

### CASE REPORT

A 38 years old female patient was diagnosed with left breast invasive ductal carcinoma 1.5 months ago. Magnetic resonance imaging revealed a mass of 14×10 mm in the left breast and 27×19-mm and 32×29-mm lymph nodes in the axillary region. Positron emission tomography–computed tomography (CT) scan showed left mammary and axillary involvement, and neoadjuvant doxorubicin and docetaxel chemotherapy protocols were applied. Following chemotherapy, on the 10<sup>th</sup> day, she was admitted to the emergency department due to bloody diarrhea and abdominal pain. She had fever at 39°C, widespread abdominal tenderness, and bloody diarrhea. Ultrasonography revealed cecal wall thickening. The laboratory findings were WBC 0.65, neutrophil 0.37, hemoglobin 12.3, and platelet 183000. There were over 10 bowel movements per day. Although there was no evidence of perforation, cecal wall thickening was observed on abdominal CT scan (Fig. 1, 2). The patient was admitted with a diagnosis of NE. Oral feeding was stopped and antibiotherapy was initiated at a dose of 1×400 mg in a loading dose of parenteral nutrition solution, granulocyte-colony stimulating factor (GCSF), meropenem 3×1 g, teicoplanin 2×400 mg. Intravenous potassium replacement was performed for 5 days to treat gastrointestinal loss of potassium. On the third day after admission, the patient's oral feeding was resumed due to recovery from neutropenia, abdominal tenderness, and bloody diarrhea. On the 6<sup>th</sup> day after admission, she recovered from the bloody diarrhea. GCSF therapy was discontinued when the number of neutrophils reached 5000. No growth was detected in stool, urine, and blood cultures during hospital admission. The clinical and radiological findings of the patient improved completely and the patient's antibiotic treatment was completed in 14 days. No complication was observed in the patient after the combination of doxorubicin and docetaxel was continued.

### DISCUSSION

NE is a rare but serious necrotizing inflammation of the intestine that can occur after chemotherapy in patients with cancer. Docetaxel demonstrates high anti-tumor activity in solid tumors. Docetaxel applied at a dose of 100 mg/m<sup>2</sup> for 3 weeks, as in our case, develops neutropenia in 70%–90% of patients. In the present case, NE developed

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**Figure 1.** CT image of the intestinal wall thickening



**Figure 2.** CT image of wall thickening in the cecum

as a result of combined treatment with docetaxel and doxorubicin. Unlike Dumitra and colleagues, because the patient was quickly given antibiotic treatment and early detection of neutropenia, there was a decline in NE before the surgical procedure (4). Similar to our case, in the literature, there are cases where NE was developed due to combination chemotherapy and controlled by medical therapy (5). NE is most commonly developed by gram-negative bacilli, such as *Escherichia coli* and *Klebsiella species*; however, in our case no growth was detected in urine and blood cultures (6). In most of the cases reported, it has been observed that NE develops when docetaxel and other chemotherapeutic drugs are used together in the same way as in our case (7). According to the literature, the cecum is the most frequently affected intestinal segment because of disturbance of circulation due to distention tendency (8). In a patient with a diagnosis of NE, the presence of a complication that requires urgent surgical intervention should be excluded. First, oral feeding of the patient should be stopped and intravenous feeding should be started. Then, antibiotic therapy, especially with anaerobic coverage, should be provided and treatment should be continued until the clinical symptoms are alleviated (8). Despite intensive medical treatment, surgical intervention should be considered in patients with persistent bleeding, perforation, and clinical worsen-

ing (9). Continuation of chemotherapy without complete healing increases the risk of developing new NE (10). Therefore, chemotherapy should not be started before the treatment is completed.

## CONCLUSION

When patients who have received chemotherapy present neutropenia and bloody diarrhea NE should be considered, diagnosis should be made early and treatment should be started quickly. Otherwise, morbidity and mortality increase in patients.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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