Neutropenic Enterocolitis in a Child With Acute Myelogenous Leukemia

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ABSTRACT

Neutropenic enterocolitis is a potentially life-threatening complication of malignancies and also the other neutropenic conditions. It characterized by typically clinical course of fever, diarrhoea and abdominal pain that may be localized to the right lower quadrant with radiological evidence of ileocecal inflamation. We present a case of an 9-year-old girl with neutropenic enterocolitis who managed successfully by medical treatment and show radiological findings consistent with enterocolitis.

Key words: *Neutropenic enterocolitis, acute myelogenous leukemia, children*

Akut Myeloblastik Lösemili Bir Çocukta Nötropenik Enterokolit

Nötropenik enterokolit maligniteler ve diğer nötropenik durumlarda yaşamı tehdit eden bir durumdur. İlioçekal enflamasyonun radyolojik bulguları ile birlikte sağ alt kadrana lokalize ağrı, ateş ve diarenin tipik klinik seyri ile karakterizedir. Biz akut myeloblastik lösemi seyri sırasında enterokolit radyolojik bulgularını gösteren ve medikal tedavi ile başarılı bir şekilde tedavi edilen bir vakayı sunduk.

Anahtar kelimeler: *Nötropenik enterokolit, akut myeloblastik lösemi, çocuk*

INTRODUCTION

Neutropenic enterocolitis also referred to as typhilitis (from the Greek word “typhlon” that means cecum), is characterized by necrotizing inflammation of the cecum especially in leukemic children on chemotherapy (1). It was first reported in children with leukemia but recently been reported in other leukemias, following immunosuppressive therapy for solid malignancies and transplants as well as in adults (2). The manage-

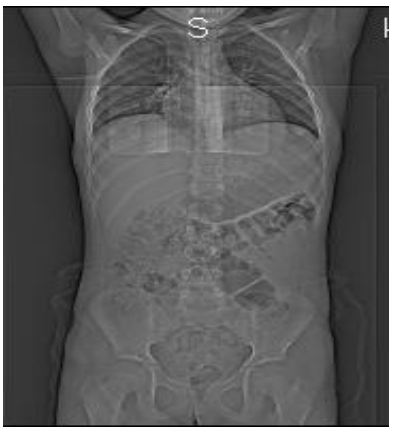

***Figure 1**. Plain radiograph of the abdomen showed dilatation of colons and numerous air-fluid levels*

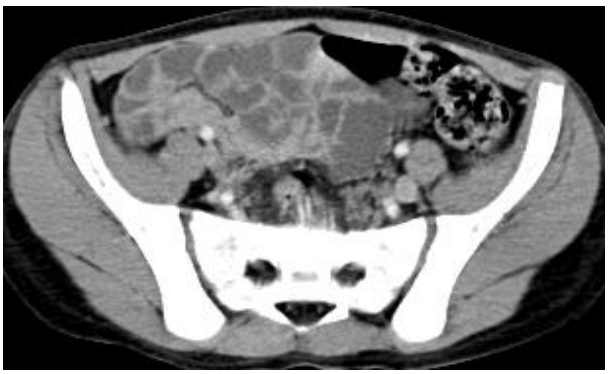

***Figure 2**. Computed tomography scan of abdomen showed wall thickness and dilatation of a 10 cm segment of terminal ileum and also free fluid in abdominal cavity. The measured wall thickness of the distal ileum was 8 mm*

ment usually included nasogastric decompression, bowel rest, antibiotics and supplemental parenteral nutrition. İn some conditions, such as perforation, surgery is needed. In this study we reported a 9-year-old girl with acute myelogenous leukemia (AML) who had enterocolitis that successfully managed by nonoperative approach. Also we present our radiological findings of this condition.

CASE

A 9-year-old girl was presented with weakness and pallor for one week. She was refered to our hospital for further investigation for anemia. Personal and family history was unremarkable. Physical examination revealed only pallor. The remainder physical findings were normal. On laboratory investigation hemoglobin level was 8,5 g/dl, hematocrit 25,5 %, leukocyte count 6100 /mm3, thrombocyte count 165,000 /mm3 and MCV was 98,4 fl. On biochemical analysis, lactat dehydrogenase level was 526 U/l. Renal and liver function tests were both normal. Due to presence of blastic cells on peripheral blood smear, bone marrow aspiration performed. Examination of aspirate revealed 82% myeloid leukemic cells consisted with AML. Morfology and flow cytometric immunophenotype study showed AML-M1 phenotye. Hacettepe AML-MDS induction chemotherapy protocol including metyhl prednisolon, cytarabine, mitoxantrone and etoposide began. On nineth day of treatment, she developed a fever of 38.7°C. At this stage white blood cell (WBC) count was 700 /mm3 with absolute neutrophil count was 300 /mm3. Piperacillin-tazobactam and amicasin were started. After four days of fever she began to complain of severe abdominal pain. Physical examination revealed abdominal distention and tenderness epecially at right lower quadrant. Plain radiograph of the abdomen showed dilatation of colons and numerous air-fluid levels (Fig. 1). Abdominal ultrasonography failed to show the pathology due to the massive gase accumulation. Computed tomography scan of abdomen showed wall thickness and dilatation of a 10 cm segment of terminal ileum and also free fluid in abdominal cavity. The measured wall thickness of the distal ileum was 8 mm (Fig. 2). The diagnosis of neutropenic enterocolitis and sepsis were made then vancomisin and metronidazole added to therapy. She was also treated with nasogastric decompression, bowel rest and total parenteral nutrition. But fever did not resolve at ten days so amphotericin B, linezolid and imipenem were given, piperacillin-tazobactam and amicasin stopped. Red blood cell and platelet transfusions were administered as needed. Blood, urine and fecal aerobe cultures were both negative. After twenty days of fever, she was able to took out gase and gaita, his fever began to resolve, her abdominal pain disappeared, and her WBC count increased to 1,4x109 /L. She restarted induction chemotherapy without problem.

DISCUSSION

BNeutropenic enterocolitis is a potentially life-threatening necrotizing inflammation of the distal ileum, cecum and colon. The true incidence is unknown and mortality rate varies from 50 to 100%, with most deaths due to bowel perforation and sepsis. More recently, early recognition and progress in management probably have reduced mortality (2). But more recent reviews have shown improved survival rates (3). McCarville et al. (4) reported 83 typhlitis case in 3171 children (2.6 %) with cancer and they reported an incidence of 3.3 % among patients with leukemia/lymphoma patients. Our clinic acute leukemias treated with chemotherapy neutropenic enterocolitis incidence rate about 4 %. It first described in children with acute leukemia but subsequently reported in adults with lymphoma, aplastic anemia, acquired immunodeficiency syndrome, granulocytopenias from other causes or after organ transplantation (5). A postmortem study revealed these anatomic involvements: (i) confined to the cecum; (ii) involving the cecum and ileum; (iii) involving the cecum, ileum, and ascending colon; or (iiii) involving the cecum, with sporadic ulcers throughout the intestine (11). Various gastrointestinal complications involving the right lower quadrant in the immunocompromised patient include inflammation or necrosis of the ileum, appendix, and cecum. Bierman et al. (6) refered the term “ileocecal syndrome” to describe these abdominal complications including diverticulitis, pelvic abscess, appendicitis, pseudomembranous colitis, intestinal hemorrhage, and typhlitis. The most frequent symptoms include fever, abdominal pain, diarrhea, and lower gastrointestinal bleeding (7). Pathogenetic mechanisms of this syndrome is poorly understood. The disease appears to be the result of a combination of various host and microorganism’s factors that include mucosal injury by cytotoxic drugs, neutropenia, and impaired host defense to intestinal organisms (2).

Early recognition and treatment are essential for survival. (2) There is general agreement that early management should be conservative and should consist of bowel rest, intravenous fluid administration, total parenteral nutrition, broad-spectrum antibiotics, and normalization of neutrophil counts. (2) In recently reported series surgical management is rarely performed and still Shamberger et al. (8) criteria including; persistent gastrointestinal bleeding, bowel perforation, and uncontrolled sepsis are being used for surgical intervention (2,4).

Radiographic findings include a paucity of bowel gas in the right lower quadrant, small bowel ileus, ascites, and mechanical obstruction (9). Typhlitis was defined as established intramural colonic gas on plain films or thickened cecal wall on ultrasound scan or computed tomography (10). Previous investigations have shown that a colon wall thickness > 0.3 cm is abnormal in adult patients (4). We measured it 10 mm at the distal ileum. McCarville et al. (11) suggested that ultrasonography is better than CT in assesment of wall thickness because they found a statistically significant association between the duration of typhlitis and bowel wall thickness measured by US. Due to gase accumulation we could not perfom US properly to evaluate thickness but we made the diagnosis of neutropenic enterocolitis as the presence of fever, neutropenia, abdominal pain and tenderness with radiologic evidence of a right ileal inflammatory process by CT. On the other hand the value of bowell wall thickness in the diagnosis of typhlitis remains controversial because there is not a study validating the sensitivity and specificity of radiologically detected wall thickness in literature yet (2,5,11,12). US also depends on the experience of the sonographer and is also affected by distended small bowel loops obscuring visualization of the right colon.

In conclusion, newer diagnostic criteria are being recommended to include three basic elements: fever, abdominal pain, and bowell wall thickness of > 4 mm by ultrasound or CT (2). High index of suspicion for the disease and early radiologic investigation followed by intense medical therapy is the modality that should be chosen. As our patient successfully treated by medical management we want to stress the importance of early and effective intervention of this potentially life-threatening condition.

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