



## Typhlitis: A Computed Tomography Diagnosis

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A 77 year old man was admitted with marked weakness and low grade fever. He had been diagnosed with chronic lymphatic leukemia 4 years earlier. His latest course of chemotherapy had been completed 2 weeks earlier. During the first 2 weeks in hospital he developed recurrent subcutaneous petechiae and gastrointestinal bleeding due to severe thrombocytopenia. Thrombocyte treatment was administered with good response. In addition, he had persistent fever and neutropenia. Blood and urine cultures were negative and a chest X-ray was normal. In view of the neutropenic fever, antibacterial therapy was started but the fever persisted. After 2 weeks of hospitalization he developed abdominal pain, and physical examination revealed diffuse tenderness of the entire abdomen, more pronounced on the right side. On sonography a fluid collection in the right lower quadrant was suspected. A subsequent CT showed marked thickening of the wall of the cecum [Figure] with infiltration of the pericecal fat. In view of the patient's history and symptoms these findings were thought to indicate typhlitis. Broad-spectrum antibiotic agents were administered with some improvement in the patient's symptoms. Several days later however, the fever and abdominal pain recurred, and an increasing amount of ascites appeared together with acute gastrointestinal bleeding. His consciousness deteriorated and the patient died one month after admission.

Typhlitis (Greek *typhlon*, cecum), also termed neutropenic colitis or necrotizing

enteropathy, is a life-threatening, necrotizing inflammatory process of the cecum with an increasing incidence [1,2]. It is an infectious condition occurring as a complication of acute leukemia, aplastic anemia, cyclic neutropenia, lymphoma, AIDS and immunosuppression that occurs after renal transplantation [2-4]. Typhlitis is a necrotizing colitis that develops in immunodeficient patients with severe neutropenia. Most patients are leukemic children who are receiving or have received chemotherapy. The common denominator in these cases is severe neutropenia (total neutrophil count  $< 1,000/\text{mm}^3$ ) [3]. The cecum is most commonly involved, but other parts of the colon as well as the distal ileum may also be affected [2,4,5]. The cecum may be a site of predilection for inflammation because of the relative stasis of bowel contents at this location that allows overgrowth of bacteria, and because the cecum is the most distensible part of the colon, compromises its blood supply [5]. Pathologically, the process is an inflammation extending throughout the bowel wall. Bacterial, viral and fungal infections are possi-

ble causative factors, although the role of leukemia, neutropenia, chemotherapy and antibiotics in the pathogenesis of typhlitis is uncertain [4,5].

Clinically, typhlitis presents as fever, abdominal pain, watery diarrhea and occasionally a palpable abdominal mass in neutropenic patients [1,2,5]. Early diagnosis is important because without treatment the inflammatory process can progress rapidly to transmural necrosis and subsequent perforation with a high mortality rate [1,4]. Contrast studies are best avoided because of the danger of perforation and sepsis [2,4]. Although ultrasonography may be used, CT is the preferred imaging mode [1-3].

The most common CT finding is cecal wall thickening (1-3 cm), which is either isodense to surrounding normal gut or



Typhlitis in a 77 year old man with fever and abdominal pain following chemotherapy. CT of the lower abdomen after oral and intravenous contrast administration shows marked thickening of the wall of the cecum (arrow) with infiltration of the mesenteric fat medial to the cecum (thin arrow).

of lower density, reflecting edema [2,4,6]. Pericolonic inflammation may be demonstrated by increased attenuation of the adjacent fat and thickening of fascial planes [4]. Pneumatosis (intramural air) of the cecum, indicating necrosis, occurs rarely and carries a poor prognosis [2,4].

Regarding treatment, prompt aggressive medical support with high doses of antibiotics and intravenous fluids are more effective in lowering morbidity and mortality than is surgical resection of necrotic bowel [4]. The response to treatment can be monitored by CT. A decrease in bowel wall thickening and resolution of pericolonic inflammation reflect a favorable response to medical treatment. On the other hand, the development of intramural air, indicating necrosis with the need for surgery, reflects a poor response to the treatment [4]. Thus, CT is a non-invasive technique that can be useful in deciding whether a

patient should be managed conservatively or surgically [3]. Laparotomy and bowel resection are best avoided, unless gross perforation has occurred [3].

The recognition on CT of a transmural inflammatory process in the bowel in the appropriate clinical setting is highly suggestive of typhlitis. Other disorders showing bowel wall thickening on CT may however simulate typhlitis and should be included in the differential diagnosis. These include leukemic infiltration of the bowel, intramural hemorrhage, ischemic colitis, segmental pseudomembranous colitis, and appendicitis [3].

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## References

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