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Chronic Sigmoid Diverticulitis Mimicking Malignant Neoplasm with Lymph Node Involvement: A Case Report and Review of The Literature

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1. Abstract

Chronic diverticulitis is a distinct disease entity in which symptoms could persist for six months to longer. Herein, I report a case of chronic sigmoid diverticulitis, with associated few clinical symptoms and signs, mimicking malignant neoplasm with lymph node involvement on contrast-enhanced computed tomography (CT), ^{18}F-FDG PET/CT, colonoscopy, and even surgical-field findings.

2. Introduction

Diverticulitis of the colon is a relatively common benign disease with various clinical manifestations from asymptomatic in uncomplicated cases to complicated with bleeding, perforation, abscess, fistula, stricture, or peritonitis. All manifestations of diverticulosis and diverticulitis are covered by diverticular disease. In Asian countries such as Korea, colonic diverticular disease is relatively rare, with a prevalence up to 25%, and it is predominantly right-sided. However, due to the adoption of Westernized low-fiber diets, the aging society, and advances in diagnostic equipments, the frequency of diverticular disease, especially left-sided diverticular disease, is gradually increased. Most cases are acute diverticulitis without complications, treated by antibiotics. However, left colonic diverticulitis recurs in approximately 13–65 % of patients. Approximately 20 % of these recurrent patients will require surgical intervention at some time during the course of the disease, due to complications [1-7]. Overall CT diagnostic performance with an intravenous and luminal contrast material for diverticulitis was reported to have a sensitivity of 99%, a specificity of 99%, a positive predictive value of 99%, a negative predictive value of 99%, and an overall accuracy of 99% (8). Chronic diverticulitis, a recently proposed concept, is characterized by chronic clinical courses with a symptom of colon stenosis and obstruction, surgery is needed due to obstruction symptom or other complications, and the preoperative diagnosis is mostly done based on contrast-enhanced CT findings and clinical courses (5-10). Herein, I present the case of a patient with complicated chronic sigmoid diverticulitis with few clinical symptoms that showed overlapping findings like malignant neoplasm with lymph node involvement on colonoscopy, intravenous contrast-enhanced CT and ^{18}F-fluorodeoxy glucose Positron emission tomography/computed tomography (^{18}F-FDG PET/CT).

3. Case Presentation

A 61-year-old man was incidentally found to have long segmental uneven concentric wall thickening at the sigmoid colon, extensive pericolic fat infiltration to the mesentery and dome of the urinary bladder, and enlargement of multiple lymph nodes on contrast-enhanced CT. The patient had felt intermittent abdominal discomfort and mild pain, and fatigue for a few years. He had denied any subjective and objective symptoms of obstipation, decreased stool caliber, hematochezia, bowel habit change, or weight loss.

His past medical history included chronic arthritis, right total hip replacement with arthroplasty, and recently diagnosed right renal stones.

His laboratory values were within the normal ranges except elevated C-reactive protein (2.76 mg/dl; normal, 0-0.5 mg/dl), carbohydrate

antigen 19-9 (39.3 U/ml: normal, 0-37 U/ml), and abnormal urine analysis (15-30 red blood cells and white blood cells on high power filed; normal, 0-1 on high power field).

Contrast-enhanced abdomen CT images revealed long segmental (17 cm) uneven concentric severe wall thickening (up to 2.5 cm) with moderate enhancement at the distal descending and sigmoid colon, extensive pericolic fat stranding to the mesentery and the dome of urinary bladder, enlargement of multiple lymph nodes along the mesentery, and diverticulosis in the transverse and proximal descending colon (Figure 1A, B, and C). Colonoscopy showed high-grade obstruction at the sigmoid colon by polypoid mass-like lesions with mucosal hyperemia without ulceration or mucosal destruction (Figure 2A) and colonoscopic biopsy at the obstruction site was not diagnostic. ^{18}F-FDG PET/CT revealed the maximum standardized uptake value (SUV max) up to 11.4 at the uneven severe wall thickened sigmoid colon and several enlarged lymph nodes (Figure 2B). He underwent a left hemicolectomy, partial cystectomy, and multiple lymphadenectomies. The surgeon's impression at the operation field was sigmoid colon cancer with invasion to the urinary bladder and multiple metastatic lymph nodes. The histopathology proved inflammatory fibrosis of the pericolic area and colonic subserosa containing organized abscess with a few collapsed diverticula in the mural portion of severe wall thickened sigmoid colon and inflammatory fibrosis extension to the proximal colon with preserved normal mucosa of the resected 28-cm length whole colon (Figure 3A, B), pericolic inflammation with adhesion to the dome of the urinary bladder with mural fibrosis, and twenty-nine reactive lymph nodes.

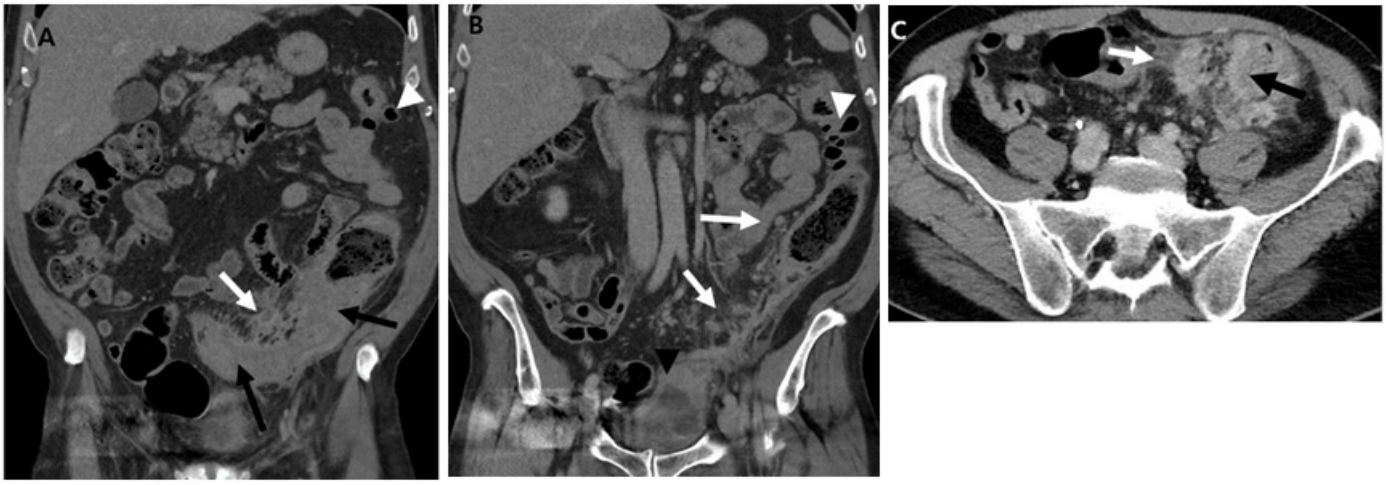

FIGURE 1 (A - C): Initial Computed tomography with intravenous contrast-enhancement

A, B: Coronal CT images show concentric severe wall thickening of distal descending and sigmoid colon (black arrows) with abrupt luminal narrowing at the proximal portion and shouldering at the distal portion, extensive pericolic fat stranding along the mesocolon and to the dome of urinary bladder with wall thickening (black arrowhead), enlarged multiple lymph nodes (white arrows), and diverticulosis (white arrowheads) in the transverse and proximal descending colon; **C:** Axial CT image shows concentric severe wall thickening of sigmoid colon (black arrow) and surrounding enlarged conglomerated lymph nodes (white arrow).

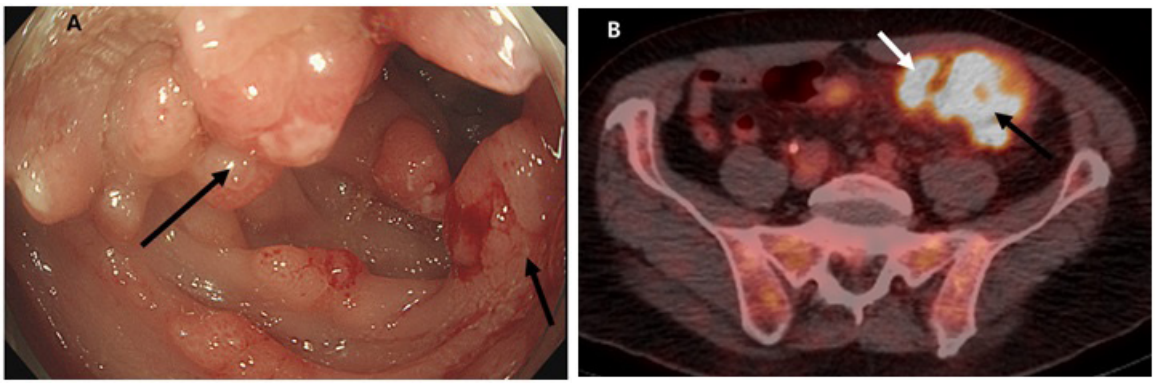

Figure 2 (A, B): Further diagnostic work-up of colonoscopy and ^{18}F-FDG PET/CT

A: Colonoscopy shows high-grade obstruction at the sigmoid colon as abrupt luminal narrowing by polypoid mass lesions (arrows) with hyperemic mucosa; **B:** Axial fusion image of ^{18}F-FDG PET/CT shows highly FDG-avid hypermetabolic lesions of sigmoid colon (black arrow) and surrounding conglomerated lymph nodes (white arrow)

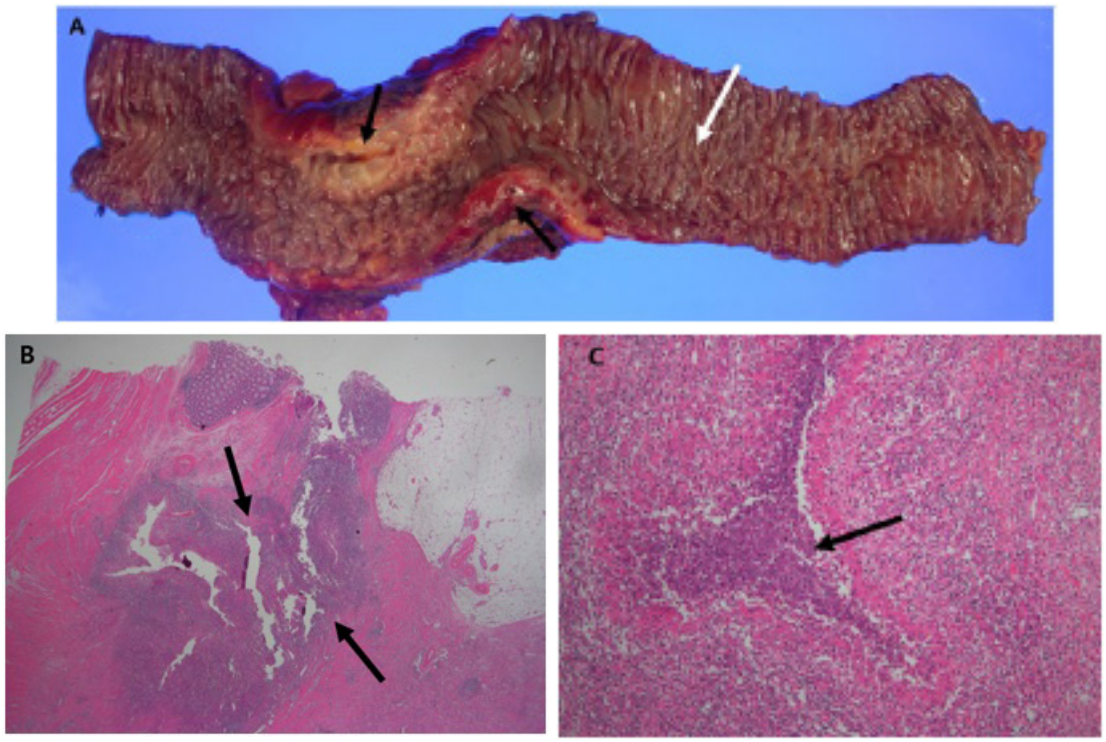

Figure 3 (A - C): Macroscopic and microscopic pathology findings of chronic sigmoid diverticulitis

A: Macroscopic pathology specimen of left hemicolectomy shows segmental wall thickening at the sigmoid colon with subserosal inflammatory fibrosis and organized abscess (black arrows), and preserved normal mucosa of the resected whole colon (white arrow); **B:** Microscopic histopathology (hematoxylin and eosin, x 40) shows the diverticulum (arrows) invagination to muscle and subserosa with surrounding inflammation; **C:** Microscopic histopathology (hematoxylin and eosin, x 40) shows neutrophilic infiltration or abscess (arrow) with surrounding macropahges.

4. Discussion

Chronic diverticulitis is a form of diverticulitis and a distinct pathology entity, has recently been proposed, characterized by the chronic obstruction symptoms and abdominal pain, different from those of the typical clinical symptoms and signs of acute sigmoid diverticulitis including leukocytosis, fever, and left lower abdominal pain for 2-14 days. Therefore, chronic diverticulitis could have a more indolent course and a longer duration

of clinical signs and symptoms, and more than 70% of patients with chronic sigmoid diverticulitis have one or more symptoms of colonic obstruction [1,4,5,7].

For this patient, he had not complained of any colon obstruction symptoms like constipation, hematochezia, stool caliber change, bloating, or left lower quadrant abdominal pain until the contrast-enhanced CT scan showed very unusual descending and sigmoid colon wall thickening with other associated abnormalities. The subjective clinical

symptoms of abdominal discomfort and mild pain were the answer to questions that the clinician-led. The first radiological report for the chronic sigmoid diverticulitis, compared with acute form, described that a relatively long segment (more than 10 cm), circumferential luminal narrowing in the sigmoid colon with a spiculated contour, several diverticula, and tapered margins, sometimes associated with retrograde obstruction on barium enema [9]. Chronic diverticulitis on contrast-enhanced CT and CT colonoscopy shows a mild wall thickening of the colon more than 5 mm thickness usually edematous, presence of inflamed diverticula in the vicinity and narrowing segment, pericolic fat stranding, and fascial thickening. These findings are similar to those of acute diverticulitis [8,11-14]. For the patient, based on the imaging findings of uneven severe wall thickening up to 2.5cm with moderate enhancement of the sigmoid colon with luminal narrowing, extensive pericolic fat strands extension to the dome of urinary bladder, and enlargement of multiple lymph nodes (more than 1 cm short axis) on contrast-enhanced CT, the radiological

diagnostic impressions were adenocarcinoma as the first choice and lymphoma as the second. Additional colonoscopy without bowel preparation suggested the higher grade sigmoid colon obstruction than that of the CT findings. Colonoscopy has played a major role and been a problem-solving tool in discriminating between colon cancer and chronic diverticulitis [7,10,15,16]. However, it was not helpful at all even the biopsy result due to high-grade colon obstruction without definite mucosal destruction at the obstruction site. And the diagnostic impression by colonoscopy was colon malignancy such as adenocarcinoma scirrhous type or lymphoma. Besides, ^{18}F-FDG PET/CT showed markedly increased metabolic activity (SUV max, 11.4) at the severe wall thickened sigmoid colon and sev-

eral mesentery lymph nodes and highly suggested the colon malignancy with lymph node involvement. Considering CT, colonoscopy, and ^{18}F-FDG PET/CT findings, the diagnostic approach was colon malignancy such as adenocarcinoma or lymphoma with lymph nodes involvement. There have been several radiological studies to discriminate between chronic diverticulitis and colon cancer and the following findings are presented as differential points. The presence of diverticula in the affected segment, preserved colon wall enhancement pattern, and longer than 10 cm length involvement are the more preferred imaging findings of chronic diverticulitis. The absence of diverticula in the affected segment, the presence of shoulder phenomenon, more than 2 cm colon wall thickness, intraluminal mass, and enlarged regional lymph nodes more than 5 mm on contrast-enhanced CT, and increased blood volume with permeability on perfusion CT are suggestive of colon cancer 12,15-20). In a few studies, the single strongest morphological sign to suggest the colon cancer differentiating from chronic diverticulitis is the absence of diverticula in the affected segment with shoulder phenomenon at either end [12,15]. The other reports described that enlargement of multiple regional lymph nodes more than 5 mm with/without pericolic fat strands was most likely colon cancer suggesting finding [17,18]. In the previous studies, follow-up intravenous contrast-enhanced CT scan or colonoscopy

has been useful to differentiate and confirm diagnosis between chronic diverticulitis and colon cancer [11,12,15,19]. In this patient, more than 2.5 cm colon wall thickness, shoulder phenomenon at one side, absence of diverticula in wall thickening portion, multiple enlarged lymph nodes, high-grade obstruction in colonoscopy were high priority findings for colonoscopy. In this case, the histopathology revealed inflammatory fibrosis with a few collapsed diverticula in the subserosa of the sigmoid colon and extensive pericolic inflammatory fibrosis, suggesting the initial inflammation from the sigmoid diverticulitis. The CT images showed the diverticulosis was present in the transverse and proximal descending colon except for the affected segment of wall-thickened distal descending and sigmoid colon. And a few CT findings like diverticulosis around the vicinity area of the wall- thickened colon and long segmental colon wall thickening could be considered the possibility of chronic diverticulitis. However, the imaging findings of highly FDG-avid severe colon wall thickening and multiple enlarged regional lymph nodes, colon obstruction on colonoscopy, and few subjective or objective symptoms highly suggested the malignancy more than chronic inflammation. In a previous study, information from T2-weighted and diffusion-weighted MR imaging might contribute to differentiate sigmoid colon cancer from diverticulitis more than that offered by CT scan (5-10). And a few reports indicated that although the diverticular disease does not increase the risk of colon cancer, rarely the two diseases could be accompanied [22-24]. There was only one case report of chronic diverticulitis that the SUV max up to 7.4 in an enlarged reactive lymph node on ^{18}F-FDG PET/CT. However, multiple variable-sized lymph nodes along the sigmoid mesocolon showed the maximum SUV up to 11.4 on 18F-FDG PET/CT, so it was almost impossible to presume the inflammatory condition in this case. This would also be the additional case to show that the high SUV max on ^{18}F-FDG PET/CT did not help to differentiate malignant neoplasm from inflammation [25, 26]. In this case report, complicated chronic sigmoid diverticulitis with few subjective or objective clinical symptoms showed almost typical advanced malignancy with the involvement of lymph nodes on CT, PET/CT, and colonoscopy, and even surgical field findings were highly suggestive of a malignant neoplasm. However, histopathologic findings revealed chronic diverticulitis with perforation. This clinical case report as chronic sigmoid diverticulitis is very extraordinary, unique, and didactic.

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