

# Noninvasive evaluation of active pan-ulcerative colitis with multiple strictures using Fluorine-18-Fluorodeoxyglucose positron emission tomography/computed tomography

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## ABSTRACT

Ulcerative colitis (UC) is an inflammatory bowel disease characterized by waxing and waning inflammation that changes in severity and extent and may progress to neoplasia, especially in the presence of strictures. When patients have nonnegotiable strictures or severe inflammation with ulcers, colonoscopy is difficult and carries the risk of perforation. The authors present a patient with pan-UC with multiple strictures, in whom fluorodeoxyglucose positron emission tomography/computed tomography was used to noninvasively evaluate the extent and severity of the disease.

**Keywords:** Fluorodeoxyglucose positron emission tomography/computed tomography, inflammatory bowel disease, strictures, ulcerative colitis

## INTRODUCTION

Ulcerative colitis (UC) is a chronic disease characterized by diffuse mucosal inflammation of the colon. It involves the rectum and may extend proximally in a contiguous pattern to cause proctosigmoiditis, left-sided colitis, or pancolitis.<sup>[1,2]</sup> UC is initially treated 5-aminosalicylate and oral glucocorticoids or immunosuppressive agents for refractory patients, and proctocolectomy in advanced cases.<sup>[3-6]</sup> Fluorine-18 fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) can be used to identify regions of active inflammation in UC.<sup>[7]</sup> Here present a patient with pan-UC with multiple strictures, in whom FDG PET/CT was used to noninvasively evaluate the extent and severity of the disease.

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## CASE REPORT

A 60-year-old male patient with a history of UC for 2 years presented with fever for 3 weeks duration while on treatment with standard immunosuppressive drugs. FDG PET/CT was performed to look for any inflammation in the large bowel [Figure 1a-c]. A few FDG avid retroperitoneal lymph nodes were detected [arrows in Figure 1], with no definite abnormality in the large intestine. The entire large intestine showed healthy mucosa during colonoscopy, and he reported relief of symptoms with conservative management. One year later, he reported increased frequency of bowel movements (>6/day) and more than 10% weight loss. Sigmoidoscopy showed loss of vascular pattern with granularity, ulcerations, and pseudopolyps in the rectosigmoid. Biopsy from this region showed changes suggestive of acute colitis. With his symptoms persisting for more than 6 months, FDG PET/CT [Figure 2a-c] was repeated 18 months

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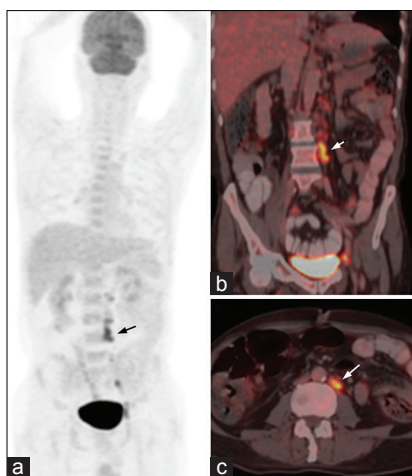
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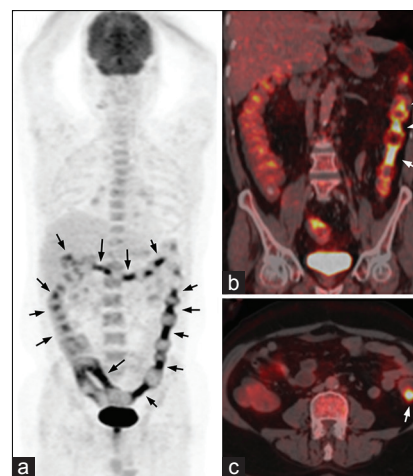


**Figure 1:** Maximum intensity projection, (a) coronal fused (b) and axial fused (c) images of initial fluorodeoxyglucose positron emission tomography/computed tomography show a few fluorodeoxyglucose-avid retroperitoneal lymph nodes (arrows), with no definite abnormality in the large intestine

after the first scan to rule out malignant transformation in the sigmoid colon, after stopping oral steroids for 15 days. Diffusely increased FDG uptake was seen in homogeneous mural thickening involving the entire large intestine. The scan showed intensely FDG avid multiple segmental strictures [arrows in Figure 2] located closely in the ascending colon and approximately every 5 cm in the transverse colon, descending colon and sigmoid colon, the longest measuring 7 cm. Compared to the previous scan, the lymph nodes showed decreased FDG avidity. Since the patient was not responding to medical treatment, total proctocolectomy with ileo-pouch anal anastomosis (TPIAA) and loop ileostomy was performed. The surgical specimen revealed chronic colitis with no evidence of neoplasia. After 12 weeks, a second surgery was conducted to restore bowel continuity. The patient showed clinical improvement on follow-up.

## DISCUSSION

UC is a chronic disease characterized by diffuse mucosal inflammation of the colon. It involves the rectum and may extend proximally in a contiguous pattern to cause proctosigmoiditis, left-sided colitis, or pancolitis.<sup>[1,2]</sup> Increased frequency of bowel movements (>6/day) with more than 10% weight loss constitutes a severe form of the disease.<sup>[3]</sup> UC is initially treated with a combination of rectal and oral 5-aminosalicylate and oral glucocorticoids or immunosuppressive agents for refractory patients, followed by maintenance therapy.<sup>[4,5]</sup> This patient initially had nonactive left-sided colitis that progressed to active pancolitis over a period of 2 years as demonstrated noninvasively by FDG PET/CT. Diagnosis with colonoscopy would have been difficult due to nonnegotiable strictures in the sigmoid colon. As the patient was not responding to medical management, TPIAA was



**Figure 2:** Maximum intensity projection, (a) coronal fused (b) and axial fused (c) images of second fluorodeoxyglucose positron emission tomography/computed tomography show diffusely increased fluorodeoxyglucose uptake in homogeneous mural thickening involving the entire large intestine and intensely fluorodeoxyglucose-avid multiple segmental strictures (arrows). No abnormal extra-intestinal fluorodeoxyglucose uptake is seen in the maximum intensity projection image

performed.<sup>[4,6]</sup> FDG PET/CT can be used to identify regions of active inflammation in UC.<sup>[7,8]</sup> This uncommon case demonstrates that, in patients with multiple segmental strictures involving the entire colon, this investigation can be used to noninvasively evaluate the extent and activity of the disease to guide further management.

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## Conflicts of interest

There are no conflicts of interest.

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