

## Case Report



# Diverticulitis Becoming More Prevalent Amongst Younger Generations: What to Look For?

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## Abstract

Diverticular disease has been a common occurrence in the later generation of life but is now starting to become prevalent amongst people under 40. The ramifications for misdiagnosing diverticulitis as acute appendicitis or enteritis could pose a problem for the future need of resection in individuals diagnosed at an earlier age. This case report presents a 29-year-old male with severe repeat diverticulitis events necessitating resection. He presented to the emergency department 3 times with a progressive diverticular episode that led to abscess and perforation formation. He states he was never told about the importance of nutrition and fiber for prevention of worsening diverticular disease. Physicians should keep diverticulitis on the differential when young patients present with tachycardia, leukocytosis, and lower abdominal pain.

**Keywords:** *diverticula, diverticulosis, diverticulitis, tick, gastrointestinal, gastroenterology, sigmoid diverticula, colonoscopy.*

## Introduction

Diverticulitis becoming more prevalent amongst younger generations: what to look for?

Diverticular disease occurs as a result of high intraluminal pressures and/or abnormalities in colonic motility, resulting in sac-like protrusions throughout the alimentary canal. Previous research indicates a diet low in fiber and high in red meat and fatty foods or connective tissue diseases are the leading reasons for diverticular disease. The risk of diverticular bleeding is higher in obese patients, smokers and as a result of taking steroids, opiates or NSAIDs [1]. Western diets and decreased fiber intake have been linked diverticulosis, which reduces stool bulk and results in increased peristaltic contraction, particularly in the sigmoid colon. Diverticular disease usually occurs after the age of 40 and affects 20% of the population, increasing to 60% by age 60 [2].

Diverticulosis occurs as a result of muscular weakness in a focal area of the alimentary canal and/or micro or macro perforations of the diverticula occurring from increased intraluminal pressure from thick-food matter. This leads to focal necrosis and inflammation. In addition, hyperplasia of the muscularis resulting from inflammation can propose a mechanism by formation of segmentation of the colon leading to disordered movement and adds to another multifactorial hypothesis for diverticula formation.2 Diverticulitis occurs when fecal matter becomes lodged into the diverticula, causing inflammation, bleeding, and systemic symptoms of fever and fatigue and gastrointestinal symptoms of nausea, vomiting, abdominal pain, and change in bowel habits. Diverticulitis can lead to abscess formation, fistula, obstruction, and in rare cases, perforations that are large enough to lead to peritonitis [1,3].

Diverticulitis is reported to occur in 10-25% of patients with diverticulosis, with a higher likelihood of hospitalizations for patients younger than 44; however, the average age of admission is 63 years old [3]. In a retrospective study, subjects under 30 years old had the highest rate of large bowel resection out of all the age groups

researched [4]. Additionally, female sex was associated with a reduced risk of surgery compared to males, despite having a higher risk of readmission, males being 15% more likely to receive surgery [4,5]. Patients less than 50 years of age were found to have higher readmission rates for diverticulitis episodes, noting the largest readmit group age was 31-40 years of age [4]. Treatment for moderate to severe inpatient diverticulitis continues to be IV to oral antibiotics and bowel rest, although new research suggests for mild diverticulitis antibiotics may not be necessary. For complicated diverticulitis with an abscess greater than three centimeters, percutaneous drainage using CT guidance and appropriate antibiotics are necessary. In severe complicated diverticulitis, surgical resection and anastomosis should be considered. Repeat episodes of diverticulitis increase the risk of fibrosis and stricture formation, which may ultimately lead to obstruction [3].

This report will review a case study of a case of complicated diverticulitis in a 29-year-old male and explore the current generational change in diverticular disease, and whether younger people have worse outcomes.

## Case Report

A 29-year old Caucasian male with BMI of 55 presented to ER with chief complaint of abdominal pain, and associated tachycardia, urinalysis consistent with cystitis, and mild leukocytosis. Past medical history was significant for diverticulitis at 24 years old, former smoker, hypertension, and sleep apnea with negative surgical history. He did not take any medications. CT indicated acute sigmoid diverticulitis and fat stranding with absence of free air or abscess. He was discharged with oral amoxicillin-clavulanate.

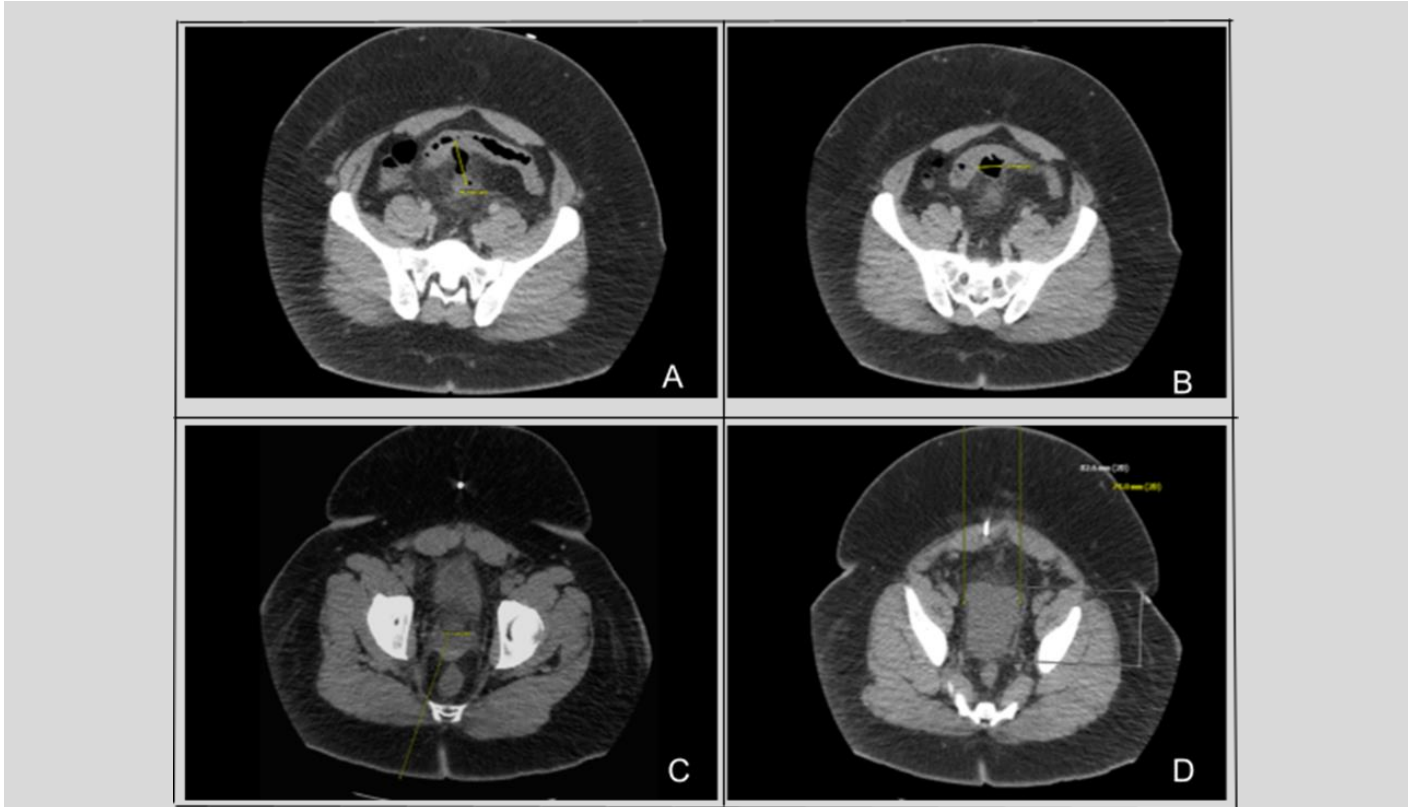
He returned to the ER two days later for abdominal pain that radiated into his testicles. U/S of testicles performed and negative for any pathology, and repeat abdominal CT indicating sigmoid diverticulitis with development of acute perforation but lack of abscess formation. He was given piperacillin-tazobactam and pain

coverage, NPO and IVF hydration with surgery consulted. Surgery discussed the necessity of sigmoidoscopy in the future but planned on conservative measures with antibiotics, and was discharged on ciprofloxacin and metronidazole.

He returned to the ER the following day with complaints of abdominal pain and vomiting and having felt a pop-like sensation in his lower left quadrant. A repeat CT indicated sigmoid diverticulitis with micro-perforation and development of abscess measuring 3 x 4.5 cm. A percutaneous drain was placed and grew *E. coli*, *Klebsiella*

sp., *Bacteriodes fragili*. Given the patient's BMI, the surgical consultant recommended transfer to a facility with a colorectal specialist.

The colorectal surgeon recommended surgical removal of a 30 cm portion of the sigmoid colon to prevent future complications. The patient underwent resection and pathology indicated perforation of the sigmoid colon due to diverticulitis and peri-colonic abscess with serosal inflammatory exudate but no atypia.



**Figure 1: CT images of sigmoid diverticulitis before and after drainage**

The figure above shows descending- sigmoid colon diverticulitis. Sigmoid perforation with 3x4.5cm abscess and fluid level consistent with abscess (A&B) and post percutaneous drainage, pigtail drain tip near the absent original abscess; however, a new fluid collection positioned further inferiorly within the pelvis (C&D)

## Discussion

This case highlights similar findings to those reported with diverticulitis in patients less than 60 years of age. This patient presented with repeat acute diverticulitis, was male, and obese - all risk factors for repeat diverticulitis. However, while his sex and risk factors are consistent with newly reported trends in young, obese males developing recurrent diverticulitis, he appears to represent a more severe case, which was previously thought to be more likely in cohorts older than 50 [6]. A study published found of 21 patients, 17 of which were men, with a mean age of 34 all presenting with abdominal pain, mild tachycardia leukocytosis were found to have plain abdominal X-rays normal in 79% of patients, CT showing diverticulitis in 93%, and 6 patients needed surgery for either perforation or cecal involvement. There appeared to be a predilection in males in this investigation [6,7]. A retrospective study, performed at University Medical Center in Lubbox, Texas, found that, among 94 patients with presentations of diverticulitis and younger than 40 years old, there was a higher incidence among males who had a BMI greater than 30, a temperature less than 99.5 F, tachycardia, and appeared to have a higher predilection towards Hispanic ethnicity.

This study found that younger patients present a greater concern clinically due to a presumptive diagnosis of appendicitis; however, if younger patients were admitted rather than being

discharged, would have a longer stay in the hospital due to complications [8]. The younger cohort of less than 60 was found to present with lower right quadrant pain, although the majority still presenting with left lower quadrant pain and presented more acutely [9]. Younger cohort of less than 50 was found to have a higher value of leukocytosis and mean CRP value when compared to greater than 50 cohort [10].

This case shows a severe presentation of diverticulitis, most likely based on associated risk factors concerning this new shift in onset of presentation. With nearly 42% of the population of the United States being obese and rising rates of obesity amongst adolescents, it is plausible to anticipate more cases of diverticular disease in younger patients. The recurrence and severity of the patient's disease course highlights the need for further investigation into the necessity of surgery in younger patients and whether they have worse outcomes compared to older patients.

Factors contributing to diverticulosis in young adults are similar to those in older adults. One relationship that can be explored is the relationship between prior bacterial colitis and the development of diverticula in younger patients. The 29-year-old patient listed in this study had a prior *Campylobacter* and Enteropathogenic *E. coli* infection 4 months prior to the onset of this series of hospitalizations. This patient had already reported diverticula, but the bacterial colitis could be postulated to have contributed to weakening of the colonic wall, increased pressure from

change in stool and frequency, altered gut microbiota and the formation of scar tissue.

This 29-year old patient was already diagnosed with hypertension, a hypothesized contributor to diverticula formation. One study found a positive association between uncontrolled hypertension and the risk of asymptomatic diverticulosis. Obesity, lack of physical exercise, smoking and poor dietary health are all contributors to both hypertension and diverticulosis, therefore one could argue a positive correlative relationship [11].

Future research should focus on whether younger patients experience fibrotic changes at an earlier age and the potential consequences of such changes for the development of diverticulosis and the occurrences of future diverticulitis events. It is important to consider the long-term effects of segmental resection with and without dietary changes. Given that this disease previously mainly affected individuals in their 60s, and current research is based on a later onset is a cause for concern. As discussed earlier, repeated episodes tend to occur in younger people. Due to fibrotic change in the colon and scarring it leads to concern for future consequences with the development of diverticulosis and anticipated diverticulitis events for the future health of the Patients [3,9]. Additionally, it has been found that ulcerative colitis can develop post severe diverticulitis, as described [12]. This is not to be confused with segmental colitis associated diverticulosis syndrome, which is also a very relevant concern for aging youth that already have developed diverticula and the sequela that follows.

While diverticulitis has been a relatively uncommon occurrence in patients less than 50, due to the increase in prevalence in the last 20 years and the Western Diet, clinicians with a patient with leukocytosis, acute abdominal pain, and tachycardia with a moderate index of suspicion should consider CT. Younger patients may be misdiagnosed with viral gastroenteritis or presumed acute appendicitis, so clinicians should keep diverticulitis in mind when assessing these patients. Promoting healthy diet habits, including the importance of fiber, weight loss, and decreased consumption of red meat and high-fat foods, should remain a priority for physicians to prevent development of diverticular disease.

## Abbreviations

NSAIDs: Non-steroidal anti-inflammatory drugs

IV: Intravenous

CT: Computed Tomography Scan

BMI: Body mass index

ER: Emergency room

U/S: ultrasound

NPO: Nothing by mouth

IVF: intravenous fluids

## Declarations

## Ethical Approval and Consent to participate

This case report in question does not involve the collection, use, disclosure, or sharing of any personally identifiable information (PII), sensitive data, or confidential records related to human subjects. There is no potential for harm or adverse consequences to individuals' privacy or rights through participation in this case report. Anonymity and De-identification: All data collected in this research has been published and/or is anonymized and de-identified to the extent that no individuals can be identified, directly or indirectly, through the data or its analysis. Any potential identifiers have been removed or altered to ensure anonymity. This research largely relies on publicly available information or data sources that are accessible to the public, and can be assumed informed consent was taken, if necessary.

## Consent for publication

I, Bianca Glass, give my consent for the publication of identifiable details, which can include photograph(s) and/or videos and/or case history and/or details within the text to be published in the above Journal and Article.

## Availability of supporting data

Not Applicable

## Competing interests

Not Applicable

## Funding

There is not funding for this case report/series.

## Authors' contributions

Bianca Glass: Supervision, writing-original draft, writing-review and editing, visualization, project administration, methodology, investigation

Samir Dalia: Supervision, validation, writing-review and editing

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