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Acute Transverse Colon Diverticulitis: A Case Report and Literature Review

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Abstract

Diverticular disease is a condition that ranges from asymptomatic disease to severe complications, such as abscesses, fistulas, and perforations. It is prevalent in Western countries, with up to 60% of people aged 60 having diverticula. In Asian countries, the prevalence is lower, ranging from 13 to 25%. Diverticulitis can occur in any location of the diverticula, with increasing incidence with age. Complications occur in 12% of patients with diverticulitis, with phlegmon or abscesses being the most common. Perforation is a life-threatening complication with a 1-year mortality rate of 20%. Recent studies suggest that chronic inflammation and alteration of the gut microbiome may play a role in diverticulitis, leading to a less aggressive and conservative approach to treatment. Even though diverticular disease represents a very common clinical entity, diverticula located in the transverse colon it is an extremely rare presentation.

We present the case of a 39-year-old female with a history of multiple medical conditions who presented to the Emergency Room (ER) with severe diffuse abdominal pain predominantly in the right lower quadrant associated with shortness of breath. Upon physical examination, she was found to have severe pain, bilateral rhonchi, and a diffusely tender abdomen with guarding without rebound tenderness. Lab analysis showed leukocytosis, and a CT scan of the abdomen and pelvis revealed acute transverse diverticulitis which was treated medically.

Keywords: Diverticulitis, Transverse colon, Inflammation

1. Introduction

Diverticular disease is a spectrum of clinical pathology that may range from asymptomatic disease to painless gross bleeding, diverticulitis with acute or chronic inflammation, and its associated complications such as abscess, and enterocutaneous fistulas or viscus perforations. The presence of diverticula is common in Western countries and those who follow a Western diet with prevalence ranging from 20% and increasing with age up to 60% by the age of 60. Up to 95% of diverticula are in the sigmoid colon in the Western world, whereas they are predominantly right-sided with about 70% in Asian countries; it is important to note that the prevalence of diverticula is lower in Asian countries, reported being around 13–25%.¹

Diverticulitis can occur in any location of the diverticula and becomes more common as people get older.¹ Transverse colon diverticula are an

extremely rare clinical entity with less than 6% reported cases in the Western world.² Further complications as described above occur in 12% of patients with diverticulitis, and among those men were more commonly affected than women until the 6th decade of life, after which women were commonly afflicted. About 70% of complications are phlegmon or abscesses with an increased mortality rate in those with complicated diverticulitis. Perforation is a life-threatening complication and is the major cause of mortality with a reported 1-year mortality of 20% as compared to age- and sex-matched controls.³

In theory, diverticulitis results from obstruction of the diverticula resulting in ischemia, micro-perforation, and infection leading to the widespread use of antibiotics. However, more recent studies have now suggested that antibiotics may not result in hastened recovery or improved outcomes allowing new theories to suggest the role of chronic inflammation and

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alteration of the gut microbiome.⁴ With consideration of these new theories, a less aggressive and conservative approach is now utilized for treatment including recommending a selective use of antibiotics in diverticulitis restricted to patients with severe disease, immunocompromised state, or significant comorbidities; Surgical intervention remains restricted to those with severe complications or persistent disease with conservative medical therapy.³

It is important to note that recent and prior studies and randomized control trials did not stratify treatment strategies based on the location of diverticulitis, i.e., left-sided, right-sided, or transverse. Presumably due to the abovementioned prevalence of each type, most studies are based on the treatment of left-sided colonic diverticulitis. Hence, our literature will focus on reporting the approach (conservative vs surgical) of different authors in the literature regarding transverse colon diverticulitis.

2. Case presentation

This is a 39-year-old Haitian female with a past medical history of lupus, antiphospholipid syndrome, deep vein thrombosis and pulmonary embolism on rivaroxaban, syndrome of inappropriate sinus tachycardia, chest wall syndrome, rheumatoid arthritis, chronic insomnia, and migraine headaches who presented to the Emergency Room complaining of diffuse abdominal pain, predominantly in the right lower quadrant, 10/10 in intensity without radiation and associated with shortness of breath. The patient endorsed that the pain started the night prior to admission and increased gradually until it was severe enough to preclude her from walking or standing up, prompting her to seek immediate medical attention. The patient stated that she had a bowel movement just prior to presentation to the ER, it was normal in consistency without any evidence of blood or mucus. Pertinent negatives included fever, chills, diaphoresis, chest pain, diarrhea, or constipation.

Upon physical examination, the patient was normotensive with a blood pressure of 101/67 mmHg, tachycardic with a heart rate of 119 per min, non-tachypneic with a respiratory rate of 20 per min, and afebrile with a temperature of 98.2 °F. The patient was found to be in distress due to severe pain, lung fields examination was remarkable for bilateral rhonchi, and the abdomen was soft but diffusely tender predominantly in the right lower quadrant associated with guarding without rebound tenderness.

Pertinent labs analysis included leukocytosis with WBC 12.4 [4.8–10.8 K/UL], troponin of 0.01 [<0.5 ng/ml], lipase was 23 [22–51 U/L], and Beta HCG was

negative. A CT scan of the abdomen and pelvis was performed, and it showed the presence of a small, round, and hyperdense lesion exophytically projecting from the proximal to the mid-transverse colon with inflammatory changes likely an inflamed diverticulum (Fig. 1). Furthermore, findings were consistent with acute transverse diverticulitis.

In the ER, the patient received ondansetron 4 mg IV, ketorolac 15 mg IV, and the first dose of piperacillin-tazobactam 3.375 g IV. The patient was subsequently admitted to the medical floors for further management of acute transverse colon diverticulitis.

During her hospital course, she developed chest wall tenderness with reproducible pain upon palpation in both parasternal areas over her costochondral junctions. In light of multiple comorbid conditions, cardiology was consulted. EKG showed sinus rhythm with sinus tachycardia. No ischemic ST-T wave change. Since the patient has had extensive ischemic workup in the past, her symptoms were consistent with musculoskeletal chest pain and the EKG showed no ischemic changes, hence further workup or intervention was not recommended.

The patient continued to be hemodynamically stable with a course of IV antibiotics with piperacillin-tazobactam and an advancing diet as tolerated. Surgery was consulted, and they recommended any surgical intervention at that time. However, after 5 days of the antibiotic course, the patient continued to have moderate epigastric abdominal pain and multiple episodes of non-bloody loose stools, hence the decision was made to repeat a CT scan of the abdomen and to send stool analysis including occult blood test and *C. difficile*.



Fig. 1. CT scan of the abdomen and pelvis is showing an inflamed diverticulum proximal to the mid-transverse colon (orange arrow).

A repeat CT scan of the abdomen showed decreasing inflammatory changes involving a portion of the proximal to the mid-transverse colon, consistent with improved colonic diverticulitis (Fig. 2). Stool analysis was negative for occult blood and *C. difficile*. At that time, metronidazole 500 mg IV q 8 h was added to the antibiotic regimen.

Since the patient continues to have epigastric abdominal pain, an EGD was performed which showed changes consistent with chronic gastritis. In the following days, the abdominal pain improved. The patient completed a 10-day course of piperacillin-tazobactam with the first 5 days as monotherapy and the last 5 days in combination with metronidazole, and she was successfully discharged with follow-up as an outpatient within 1 week.

3. Literature review

Major medical databases including PubMed and Cochrane were used introducing keywords such as “transverse colon diverticulitis” or “diverticular disease of transverse colon”. All of the cases reports or case series describing patients with diverticular disease of the transverse colon which were found using this methodology were included. Case reports or case series that describe patients with diverticulitis in an anatomic location other than the transverse colon were excluded. This review was not registered at any review protocol site.

A total of 9 published articles were selected for review based on our search profile; of the 9, 7 were individual case reports, and 2 were case series. All articles isolated the transverse colon as the location of diverticulitis. The 2-case series highlighted 7 cases in total, and the additional 7 resulted in 14 cases (Table 1).

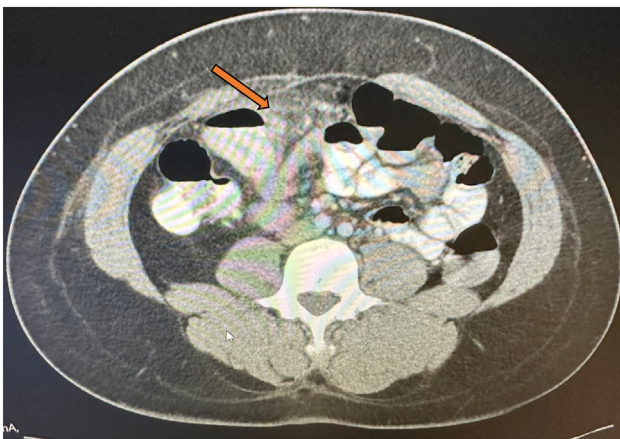


Fig. 2. CT scan of the abdomen is showing decrease inflammatory changes involving a portion of the proximal to mid-transverse colon (orange arrow).

Along with our patient, we present a total of 15 cases with transverse colon diverticulitis, all female, with a median age of 56.4 years ranging from 24 to 87 years, and 7 out of 15 patients between the ages of 50–69 years. The right lower quadrant (RLQ) was the most common site of pain localization (6 out of 15) followed by periumbilical (5 out of 15), right upper quadrant (RUQ), left lower quadrant (LLQ), and diffuse pain observed in 1 patient each; 1 other patient reported no localizing pain. CT scan of the abdomen was the most common imaging modality to identify location and pathology in 10 out of 15 patients.

Within the transverse colon, the proximal 1/3 transverse and mid-transverse colon were the most common location with 7 patients each followed by an isolated distal 1/3 transverse colon diverticulitis. 8 patients underwent surgical treatment, amongst which 5 had complications at the onset of diagnosis, 4 patients with perforation, and 1 with enterocutaneous fistula who unfortunately passed away after operative treatment due to ventilator-associated complications. The other indications for surgical treatment were refractory symptoms and diagnostic uncertainty due to Appendicitis and Meckel's diverticulitis. 7 patients were managed with antibiotics alone, with one experiencing a recurrent episode of diverticulitis within the year.

6 out of the 8 cases with surgical intervention had documented pathology reports with only 2 of the cases showing acute inflammatory changes alone – the others were noted to have acute and chronic inflammation, whereas one case showed abscess formation consistent with a more chronic process.

4. Discussion

We conducted a case report along with a literature review of 9 articles that met our search criteria encompassing a total of 15 cases of transverse colon diverticulitis to better delineate the presence of any variable presentation, complications, and unique management strategies compared to sigmoid colon diverticulitis. We were unable to find any retrospective or prospective observational studies or randomized controlled trials that attempted to assess treatment strategies for transverse colon diverticulitis given the neuromuscular difference between the sigmoid and ascending colon.³

There appears to be some correlation between the location of pain based on the clinical history and colonic involvement based on imaging as 5 out of 7 patients who had proximal transverse colon involvement endorsed RLQ pain, 4 out of 7 patients with mid-transverse colon involvement endorsed periumbilical pain and the sole patient with distal

Table 1. Literature review with description of similar cases reported in the literature.

Age/Gender	Clinical presentation	Location	Diagnostic Evaluation	Management	Outcome
Romero et al. 39 y/o F	RLQ pain	Proximal transverse colon	CT: small, round, and hyperdense lesion exophytically projecting from the proximal to the mid transverse colon with inflammatory changes	Antibiotics	Improved
Kent et al. (1973) ⁵ 59 y/o F	RLQ pain	Mid-transverse colon	None	Surgery due to suspicion of appendicitis. Path: Acute inflammatory changes and ulcerated mucosa	Improved
McClure et al. (1979) ⁶ 52 y/o F	RLQ pain	Proximal transverse colon	Abdominal XR: multiple air-fluid levels in hypogastrium. Barium study: scattered diverticula	Surgery due to perforation Path: Perforated diverticulum with acute & chronic inflammation in the mesocolic fat.	Improved
62 y/o F	Periumbilical pain	Proximal transverse colon	Upper GI series: Duodenal ulcer Barium study: diverticula in descending & sigmoid colon	Antibiotics initially however required surgery due to refractory & persistent symptoms Path: Acute & Chronic inflammatory changes	Improved
47 y/o F	RLQ pain	Proximal transverse colon	None	Surgery due to perforation Path: Acute & Chronic inflammatory changes	Improved
Jasper et al. (1999) ⁷ 55 y/o F	Periumbilical pain	Mid-transverse colon	CT: Eccentric inflammatory mass in mid-transverse colon	Antibiotics	Recurrent sigmoid diverticulitis after 1 year.
24 y/o F	Periumbilical pain	Mid-transverse colon	CT: Phlegmon in mid-transverse colon	Antibiotics	Improved
66 y/o F	LLQ pain	Distal transverse colon	CT: Colonic wall thickening with mesenteric fat infiltration at splenic flexure	Antibiotics	Improved
87 y/o F	RLQ pain	Proximal transverse colon	CT: Irregular thickening and mesenteric fat infiltration at hepatic flexure	Antibiotics	Improved
Wilkinson et al. (2007) ⁸ 62 y/o F	Periumbilical pain	Mid-transverse colon	CXR: pneumoperitoneum Path: Chronic inflammatory infiltrate with lymphocytes & histiocytes	Surgery due to perforation	Improved
Salehomoum et al. (2012) ⁹ 27 y/o F	RLQ pain	Proximal transverse colon	CT: Thickened blind ending tubular structure in RLQ concern for Meckel's diverticulitis	Surgery due to diagnostic uncertainty Path: Acute inflammatory changes	Improved

Solak et al. (2013) ¹⁰ 69 y/o F	Periumbilical pain	Mid-transverse colon	MRCP: Thickening & edema of transverse colon. CT: Transverse colon diverticulitis with calcified fecalith	Antibiotics	Improved
Shah et al. (2017) ¹¹ 74 y/o F	Diffuse abdominal pain after bowel prep	Mid-transverse colon	CT: Pneumoperitoneum, large bowel perforation and gas in small bowel & sigmoid mesentery	Surgery due to perforation Path: Perforated diverticulum with abscess	Improved
Chavez et al. (2017) ¹² 44 y/o F	RUQ pain	Proximal transverse colon	CT: Ascending & Descending colon diverticula. Mesenteric fat stranding, micro-abscesses and surrounding free air bubbles at hepatic flexure.	Antibiotics	Improved
Bakopoulos et al. (2018) ² 80 y/o F	Passage of gas and fecal material at the skin	Mid-transverse colon	CT: Inflamed transverse colon diverticula with communicating entero-cutaneous fistula	Surgery due to entero-cutaneous fistula	Expired

transverse colon involvement endorsed LLQ pain. Although, given the location of RLQ pain per Kent et al., diverticulitis of the proximal transverse colon may be difficult to distinguish from appendicitis warranting immediate surgical exploration.⁵ This may be relevant as all patients who required surgical intervention were noted to have either proximal or mid-transverse colon involvement, and therefore necessitate more aggressive management strategies due to the higher risk of complications compared to distal transverse colon involvement.

Overall, a CT scan of the abdomen/pelvis was the imaging test of choice to diagnose diverticulitis of the transverse colon non-invasively; an invasive surgical histopathological diagnosis was only pursued in patients that were hemodynamically unstable from the onset with evidence of intestinal perforation. This finding is consistent with current literature and guidelines regarding CT scan as the imaging test of choice for suspected cases of diverticulitis in the inpatient setting as mild uncomplicated cases may be treated empirically as out-patient.⁴

We noticed no differences or significant variations in management strategies in relation to transverse diverticulitis. In hemodynamically stable patients with uncomplicated diverticulitis without perforation, conservative medical management with antibiotics was routine. 8 patients were treated with medical management alone, however, 1 of them required surgical intervention due to persistent and refractory symptoms. It is also worth noting that the only case with the recurrent disease was the one treated with antibiotics alone. Whether the recurrence was related to medical instead of surgical treatment due to lack of perforation remains unclear as there are several confounding factors including lifestyle and dietary variables that are unaccounted for.

What does appear unique is the incidence of transverse colon diverticulitis in women only in this literature review regardless of age. Although diverticulitis is more common overall in women, all 15 of our patients were female representing an extreme shift. Whether or not this finding is specific and relevant to only transverse colon involvement remains to be seen and requires further exploration and analysis of data. Some theories behind this may be the neuromuscular difference in the transverse colon between males and females either related to the gut microbiome, mucosal distensibility, or immune dysregulation.

5. Conclusion

Diverticulitis of the colon commonly involves the right or sigmoid segment. Transverse colon

diverticulitis is a rare clinical entity that most commonly affects women with a median age of 56 years old.

There is some correlation between the location of pain based on the clinical history and the colonic involvement evidenced on imaging, since patients with proximal transverse colon involvement endorsed RLQ pain, whereas patients with mid-transverse colon involvement endorsed periumbilical pain and patients with distal transverse colon involvement endorsed LLQ pain.

Regarding management strategies, transverse diverticulitis does not differ from diverticulitis in other colonic locations. Patients who are hemodynamically stable are usually treated medically with antibiotics and supportive measures. On the other hand, surgical intervention is recommended in hemodynamically unstable patients, those with persistent symptomatology despite medical management, or patients who developed complications (enterocutaneous fistulas or viscus perforation).

A high suspicious index for this clinical entity should be kept among clinicians for patients presenting with acute abdominal pain since this pathology could mimic surgically approachable entities such as acute appendicitis and acute cholecystitis.

Conflicts of interest

There is no conflict of interest.

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