

## Abdominal pain – a common presentation with unusual diagnosis: a case report

Yeshaswini. P.S. Reddy, Sriviji Senthil Kumaran, Varun Vanka, Asra Rab and Viren Patel

### ABSTRACT

Acute abdominal pain is a frequent cause for evaluation in the clinic and emergency room. A number of causes of abdominal pain are diagnosed easily based on the history, physical exam, and some laboratory findings. However, unusual conditions may pose a challenge and require invasive procedures for diagnosis. Rare anomalies such as mobile caecum may present as either typical or atypical acute appendicitis. Endometriosis and pinworm infections can also present as acute appendicitis but are uncommon presentations. To increase the awareness of these uncommon causes of appendicitis, we present a 32 year old female who was previously diagnosed with irritable bowel syndrome later found to have all of the above mentioned rare conditions contributing to abdominal pain. She presented to the emergency room with a one day history of acute right lower quadrant abdominal pain along with nausea and non-bilious vomiting. Physical exam revealed right lower quadrant tenderness to palpation. A computerised tomography of the abdomen and pelvis demonstrated a mobile cecum in the left abdomen. She subsequently underwent a diagnostic laparotomy with cecopexy and appendectomy. Pathology of the appendix showed findings suggestive of endometriosis and intraluminal enterobius vermicularis. She was treated with two doses of pyrantel pamoate for the parasitic infection, and subsequently had resolution of her symptoms.

### ARTICLE HISTORY

Received 26 May 2020  
Accepted 13 August 2020

### KEYWORDS

Enterobius-Vermicularis;  
Volvulus; endometriosis

## 1. Introduction

Volvulus as a cause for intestinal strangulation was initially described in 1837 by Rokitansky and occurs when the sigmoid colon twists in its mesentery leading to intestinal obstruction [1,2]. A wide spectrum of clinical presentations related to this disease include nausea, vomiting, abdominal pain, distension, and constipation based on the intestinal viability and severity [1]. Mobile cecum is a rare congenital anomaly due to loss of the fixation of the cecum and ascending colon to the peritoneum during embryogenesis [3]. Diagnosing volvulus preoperatively is very difficult and rare, especially in the presence of a mobile cecum as it mimics acute appendicitis on presentation [3,4].

Enterobius vermicularis is a parasitic infection prevalent in tropical countries and is transmitted by faeco-oral ingestion of contaminated food and water with the parasitic egg [2,5]. Patients with this infection are usually asymptomatic but may experience nocturnal anal pruritis [2]. These parasites usually affect the lumen of the appendix mimicking acute appendicitis and are diagnosed on histopathology findings [2,5].

Endometriosis occurs when there is extra-uterine implantation of the inner layer of the uterus or the endometrial tissue, and presents with a wide variety of symptoms depending on the location of the implant [6,7]. This condition is usually seen in

reproductive females and can be complicated with obstruction of the bowel due to gut involvement. This diagnosis may be overlooked as it may mimic other common gastrointestinal disorders such as irritable bowel syndrome, inflammatory bowel disease, appendicitis, or malignancy [7,8]. Therefore, it also requires pathological confirmation for diagnosis and treatment to prevent further symptoms [6–8].

We here present a young reproductive age female with recurrent abdominal pain who was found to have a mobile cecum, volvulus, and appendicitis. On histopathological exam, she was found to have both enterobius vermicularis infection and endometriosis which makes this a rare entity.

## 2. Case presentation

A 32 year old female presented to the emergency room with a one day history of severe right lower abdominal pain associated with nausea and vomiting. She denied any symptoms of recent bloody stools, weight loss, bowel changes, urinary changes, or irregular menstruation. Surgical history was significant for two cesarean sections. Further questioning revealed a history of intermittent right-sided abdominal pain with radiation to the left, along with alternating episodes of constipation and diarrhoea present since childhood. She was taking OCPs for a brief duration for contraception and stopped prior to conceiving her two kids. The patient followed with

gastroenterology for 5 years prior to this presentation and had extensive work up including a celiac panel, helicobacter pylori testing, inflammatory bowel disease evaluation, multiple abdominal imaging studies, and luminal exams with biopsies all of which were unremarkable. She was diagnosed with irritable bowel syndrome after the thorough workup did not demonstrate any significant findings; she was treated with dicyclomine which provided mild symptom relief.

During this hospitalisation, she remained hemodynamically stable but endorsed significant distress due to the abdominal pain. Severe tenderness in the right lower quadrant to mild palpation with guarding, positive McBurney's point tenderness, and positive rovsing's sign were observed; psoas sign and obturator sign however were negative. Mildly decreased bowel sounds and absence of organomegaly were noted. Given the presentation, our differential diagnosis included acute appendicitis, acute ovarian torsion, Mckel's diverticulum, acute ileitis, PID, ovarian cyst, renal calculus, endometritis, ectopic pregnancy, or tubo-ovarian abscess.

The following investigations were done that were normal or negative: common blood count, basic metabolic panel, lipase, urinalysis, and urine pregnancy as mentioned in Table 1. She had a repeat CT with intravenous contrast of abdomen and pelvis this visit that showed a mobile cecum in the left abdomen without evidence of obstruction or volvulus.

General surgery consultation recommended an elective Ladd's procedure as her symptoms had improved with morphine. Intraoperatively the surgeon found the small bowel to traverse normally through the colon mesentery on the left side, but the right colon was noted to be unusually mobile, easily reaching the left lower quadrant. He also found the right-sided lateral peritoneal reflection to be very loose with easy visibility of the right kidney, duodenum, and pancreas with simple retraction of the right colon. These findings are typical for cecal volvulus and were suspected to be the cause of her chronic abdominal symptoms. Later, pathology findings of the appendix were consistent with endometriosis and intraluminal parasite suggestive of enterobius vermicularis. She was then treated with over the counter pyrantel pamoate 11 mg/kg and a repeat dose in two weeks. On follow up visits the patient did not have any complications from the procedure and her abdominal symptoms had resolved. She was not restarted on OCPs as she did not have any gynaecological issues currently. We are convinced that her chronic abdominal symptoms were due to the mobile cecum, but still not sure whether her acute abdominal symptoms were due to the volvulus, endometriosis, or enterobius

**Table 1.** Laboratory values on presentation.

Presentation Laboratory results		Reference Interval
Common Blood Count		
White Blood Count	4.13 10 (3)/mcl	4.00–12.00 10 (3)/mcl
Neutrophils	69.3%	47.0–73.0 %
Lymphocytes	40.7%	18.0–42.0%
Monocytes	6.4%	4–12%
Eosinophils	1.7%	0–5.0%
Basophils	0.7%	0.0–1.0%
Red Blood Count	4.12 10 (6)/mcl	3.80–5.30 10 (6)/mcl
Hemoglobin	12.8 g/dl	12–15.8 g/dl
Hematocrit	36.7%	36.0–47.0%
Mean Corpuscular Volume	89.1 fl	82.0–96.0 fl
Platelet Count	224 10 (3)/mcl	140–440 10 (3)/mcl
Basic Metabolic Panel		
Sodium	138 mmol/L	136 – 145 mmol/L
Potassium	3.7 mmol/L	3.5–5.1 mmol/L
Chloride	106 mmol/L	98–107 mmol/L
Bicarbonate	23 mmol/L	22–30 mmol/L
Anion Gap	9 mmol/L	<18.0 mmol/L
Glucose	86 mg/dL	70–99 mg/dL
BUN	7 mg/dL	5–18 mg/dL
Creatinine	0.69 mg/dL	0.60–1.00 mg/dL
Albumin	4.5 g/dL	3.5–5.0 g/dL
Calcium	9.9 mg/dL	8.4–10.2 mg/dL
GFR	>60	>60
Lipase	58 U/L	8–78 U/L
Urine Analysis		
Specific gravity	1.020	1.003–1.030
Urine PH	7.0	5.0–9.0
WBC esterase	Negative	Negative
Nitrite	Negative	Negative
Random protein, urine	Negative	Negative
Urine glucose	Negative	Negative
Urine ketones	Negative	Negative
Urobilinogen	3.0 mg/dL	2.0 mg/dL
Urine bilirubin	Negative	Negative
Urine blood	Negative	Negative
Urine color	Pale yellow	Pale yellow
Urine Pregnancy Test	Negative	Negative

vermicularis infection as each of them can mimic acute appendicitis.

### 3. Discussion

Patients with a mobile cecum can present with a wide range of symptoms but up to 50% present with recurrent intermittent abdominal pain and distension that is temporarily relieved with passing gas or following a bowel movement [1]. These symptoms are then followed by intermittent acute volvulus which in untreated patients can progress to bowel ischemia and necrosis from gut strangulation resulting in perforation [1,6]. Some authors classify the symptoms into three stages: mobile cecum syndrome/recurrent intermittent pain, acute obstruction that is tolerable, and acute obstruction with complications of perforation [1,8]. During this last stage patients have intolerable abdominal pain, guarding, rigidity, and tympanic abdomen also referred to as acute abdomen which is a surgical emergency [1]. It is important to identify patients with volvulus early as up to 20% may progress to intestinal necrosis with a 3 fold increase in mortality [9]. Although volvulus is most commonly related to the anatomic variation of the gut

**Table 2.** Differential diagnosis for irritable bowel syndrome.

Inflammation
Ulcerative colitis
Crohn's Disease
Appendicitis
Diverticulitis
Microscopic Colitis
Infection
Giardia
Yersinia
Clostridium Difficile
Enterobius Vermicularis
Tuberculosis
Campylobacter
CMV
Disease of Malabsorption
Celiac disease
Lactose intolerance
Pancreatic insufficiency
Small Intestinal Bacterial Overgrowth
Endocrine
Hyperthyroidism
Diabetic autonomic dysfunction
Gynecological
Endometriosis
Drug Induced/Iatrogenic
NSAIDS
Laxative abuse
Antibiotics
Chemotherapy
Neoplasms
Colon cancer
Carcinoid tumor
Lymphomas
Pancreatic cancer

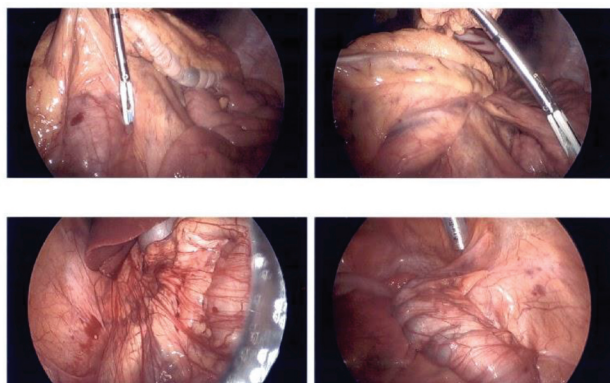
at birth, there are other conditions that can lead to volvulus such as adhesions from prior surgeries, severe jumping that causes change in the colon

position, chronic constipation leading to stagnation of the colon, extreme high fibre diet, or rarely underlying psychiatric illness [4,6,8]. Mobile cecum is evident in 10–20% of the population with several cases of concurrent cecal volvulus and appendicitis [3,4]. This may be overlooked as the presentation mimics other gastrointestinal diseases as noted in our patient with an initial diagnosis of irritable bowel syndrome [7]. The differential diagnosis for irritable bowel syndrome is very broad we illustrate the most common ones in Table 2 with clinical findings of our patient highlighter in blue.

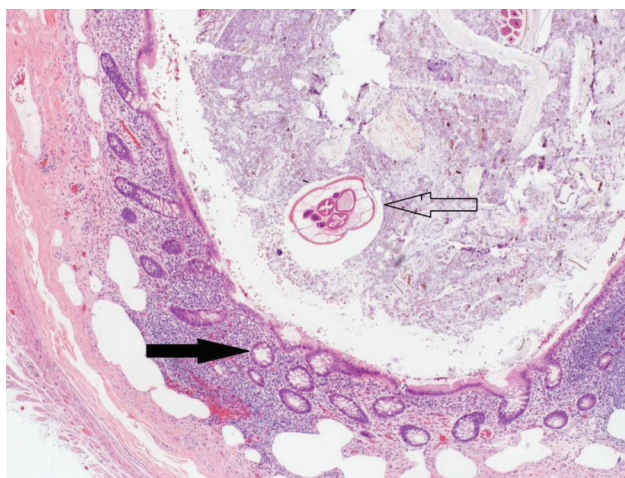
Volvulus and appendicitis can also be seen in patients with endometriosis as it most commonly involves the rectum, sigmoid colon, and appendix [6,10]. These patients can be asymptomatic or have alterations in bowel habits, dyschezia, and hematochezia in a cyclical pattern [6–8]. Intestinal involvement with endometriosis can occur in 3–37% patients usually involving the serosa and muscularis propria, but rarely can involve the mucosa as well [6,7,10]. Therefore, depending on the layer of the gut mucosal involvement, the clinical presentation varies and histopathological diagnosis is considered the confirmatory diagnostic test [7]. In our patient despite having intermittent abdominal symptoms for many years, endometriosis was not considered as a differential as her symptoms did not correlate with her menstrual cycles. Enterobius vermicularis uses humans as the hosts for their



**Figure 1.** CT abdomen and pelvis. Enlarged, mobile cecum located in the left side of the abdomen. There is gaseous distention of the cecum without obstruction or evidence of rotational torsion/volvulus.



**Figure 2.** Laparoscopic images of abdomen. Mobile right colon easily reaching the left lower quadrant, and loose right peritoneum.



**Figure 3.** Histopathology. Solid arrow showing endometrial tissues, and the transparent arrow showing enterobius vermicularis in the lumen of appendix.

transmission and have been reported to be associated with acute appendicitis [2]. When the host ingests the contaminated food with the parasitic eggs they are hatched in the stomach and transformed into larvae. These larvae then migrate to the cecum and mature into grown pinworms. These worms then reproduce in the host gastrointestinal tract producing more eggs which are excreted and continue to cycle of transmission to humans. The adult parasites move to the anal canal to deposit the eggs leading to nocturnal pruritis as the most common and some times the only complaint in patients. Hosts can also present with symptoms of acute appendicitis due to luminal obstruction and appendiceal wall contraction caused by the adult mobile pinworms [2,5]. This infection spreads from poor hand hygiene and is more prevalent in up to 38% of the pediatric population; our patient likely acquired it from her children [2]. From our literature review, we were able to find cases of acute appendicitis and volvulus associated with endometriosis, or appendicitis with enterobius vermicularis, or appendicitis with mobile cecum. There are no reported cases of all the three conditions present in one patient which makes our

case very unique. Based on our patient's presentation it appears her intermittent abdominal symptoms of volvulus mostly were due to mobile cecum as it was present from childhood even before menarche. It is unclear whether her acute appendicitis was primarily related to endometriosis or from the parasitic infection.

#### 4. Conclusion

Although the presentation of abdominal pain is common, clinicians should be aware of the uncommon cause. A broad differential is necessary before classifying it as a functional syndrome as some patients may have increased mortality due to complications with bowel ischemia and necrosis. The plethora of diagnostic modalities available aid us in arriving at the appropriate diagnosis, although there are still some diseases that are difficult to diagnose preoperatively.

#### Disclosure statement

No potential conflict of interest was reported by the authors.

## References

- [1] Ramirez-Ramirez MM, Villanueva-Saenz E, Ramirez-Wiella-Schwuchow G. Elective laparoscopic right colectomy for cecal volvulus: case report and literature review. *2017* Jan-Feb;85(1):87–92.
- [2] Efares B, Atsame-Ebang G, Soumana BM, et al. Acute suppurative appendicitis associated with *Enterobius vermicularis*: an incidental finding or a causative agent? A case report. *BMC Res Notes*. *2017*;10:494.
- [3] Yazawa K, Azuma Y, Kurokawa T, et al. Abdominal CT-aided diagnosis of acute appendicitis in the presence of mobile cecum: A case report. *Int J Surg Case Rep*. *2018*;42:258–260.
- [4] Miyao M, Takahashi T, Okusa M, et al. Recurrent bowel obstruction caused by cecal volvulus: A case report. *J Nippon Med Sci*. *2019*;86(3):183–186.
- [5] Saravi KH, Fakhar M, Nematian J, et al. Co-infection with *Enterobius vermicularis* and *Taenia saginata* mimicking acute appendicitis. *J Infect Public Health*. *2016* Jul-Aug;9(4):519–522.
- [6] Ito D, Kaneko S, Morita K, et al. Cecal volvulus caused by endometriosis in a young woman. *BMC Surg*. *2015*;15:77. DOI:10.1186/s12893-015-0063-8.
- [7] Badipatlaa KR, Vupputuria A, Niazic M, et al. Colonic endometriosis: dig deeper for diagnosis. *Gastroenterol Res*. *2017*;10(1):59–62.
- [8] Rose I. Volvulus of caecum, associated with putrid puerperal endometritis and gangrenous volvitis. *Br Med J*. *1941*;2:577.
- [9] Tsushimi T, Kurazumi H, Takemoto Y, et al. Laparoscopic cecopexy for mobile cecum syndrome manifesting as cecal volvulus: report of a case. *Surg Today*. *2008*;38(4):359–362.
- [10] Dimoulios P, Koutroubakis IE, Tzardi M, et al. A case of sigmoid endometriosis difficult to differentiate from colon cancer. *BMC Gastroenterol*. *2003*;3:18.