

# Presentation, Diagnosis, and Management of Epiploic Appendagitis: A Case Series

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## Introduction

Epiploic appendages are fatty appendages originating in two rows (anterior and posterior) parallel to the external surface of the 3 taenia coli. It was first anatomically described in 1543 by Vesalius however they were not given any surgical significance until 1853 when Virchow introduced the idea that their detachment might be a source of free intraperitoneal bodies<sup>1,2</sup>. Epiploic appendages are situated along the entire colon and are more abundant and larger in the transverse and sigmoid colon. Each appendage is supplied by one or two small colonic end-arteries and a small draining vein. It has been presumed that these function as a protective and defensive mechanism similar to that offered by the greater omentum. In addition to this, they may serve as a site of fat storage to be accessed in prolonged periods of starvation and also as a protective cushion during peristalsis.

Inflammation of the epiploic appendages is usually caused by torsion, but the reason remains unclear. The vein, which is longer than the artery by virtue of its tortuous course, alters the anatomy such that the pedicle is predisposed to twisting, subsequently causing venous thrombosis of a draining vein, or twisting of the appendage pedicle, leading to aseptic fat necrosis.

A variety of complications can follow epiploic appendagitis. Accompanying surrounding inflammation can trigger adhesions with multiple secondary symptoms. Another possible complication is local abscess formation, which may simulate a neoplastic lesion. Intussusception, bowel obstruction, abscess formation, and peritonitis have also been reported

Epiploic appendagitis, also known as appendicitis epiploicae, or appendigitis, is an inflammation of the appendices epiploicae of the colon. It is a benign and self-limiting condition of the epiploic appendages that usually affects middle-aged men<sup>3, 4</sup>. The frequency of epiploic appendagitis is estimated at 1.3% and its incidence at 8.8 cases per million in a year<sup>5</sup>. However, epiploic appendagitis has been reported in 2 to 7 percent of patients who were initially suspected of having acute diverticulitis and in 0.3 to 1 percent of patients suspected of having acute appendicitis. Patients commonly present with acute or subacute onset of lower abdominal pain. In 60 to 80% of cases, the pain is located in the left abdomen. The pain is often described as a constant, dull, localized pain that does not radiate. Other less common symptoms include postprandial fullness, early satiety, vomiting, bloating, diarrhea and low-grade fever. On physical examination, patients usually do not appear to be seriously ill and are usually afebrile. The pain is localized to the affected area, and rebound tenderness is usually absent. A mass is palpable in 10 to 30% of the time.

Epiploic appendagitis is often misdiagnosed due to the paucity of pathognomonic clinical features other than the fact that it is actually quite rare in which case more common causes of abdominal pain such as appendicitis and diverticulitis are considered first. Inaccurate diagnosis can lead to unnecessary hospitalizations, antibiotic therapy, and surgical intervention. In a case series by Vinson et al wherein 2 cases of epiploic appendagitis were presented, one was mistaken for acute appendicitis, the other for acute diverticulitis and the correct diagnosis was made in the operating suite. With the aid of contemporary imaging modalities, however, the diagnosis of epiploic appendagitis need no longer hinge on the pathologic specimen but may be established by the emergency physician. As this disorder recently has been demonstrated to be predominantly self-limited, laparotomy no longer is considered necessary. Conservative management has been shown to be safe.

In spite of the fact that epiploic appendagitis is being recognized early during admission, with the aid of CT scan, the management remains to be firmly established. This report illustrates five inpatient cases with epiploic appendagitis with different presentations of abdominal pain seen by the department of Internal Medicine over the course of January 2015 to November 2015 at St. Luke's Medical Center, Quezon City. Clinical and radiological findings as well as the management will be discussed as well.

## Case Report

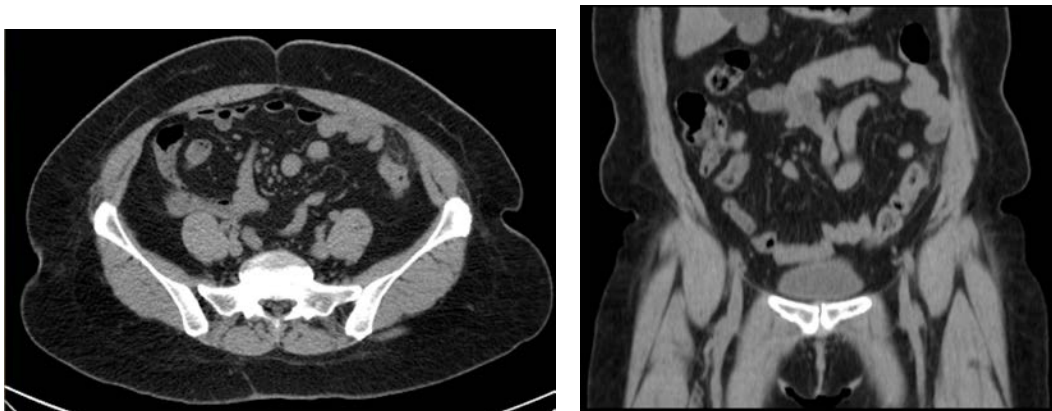
### Case 1

A 59 year-old female with a background of hypertension presented at the emergency department because of left lower quadrant pain aggravated by changes in position. She had no change in bowel habits and no urinary symptom. On physical examination she was noted to be overweight, with a BMI of 29.9, and appeared uncomfortable, grimacing in pain. She was afebrile and hemodynamically stable. Her abdomen was soft with normoactive bowel sounds, but with direct tenderness over the left lower quadrant with light palpation.

Blood tests showed normal complete blood count and electrolytes. Her urinalysis was normal as well.

She was initially treated as a case of diverticulitis and was started on Ciprofloxacin and Metronidazole. Further radiological investigation was performed with a computed tomography (CT) scan of the whole abdomen which showed a 1.5 x 2.9 cm (WxAP) focal fatty density/stranding densities in the left lower abdomen (Fig. 1), anteriorly, for which epiploic appendagitis is primarily considered. Differential diagnoses include fat necrosis and peri-colonic stranding densities from mild colitis. A small diverticulum in the partially visualized distal transverse colon without signs of inflammation was also noted.

Antibiotics were continued with subsequent resolution of symptoms. She was discharged improved on the 4<sup>th</sup> hospital day.



**Figure 1 (a)** axial view of epiploic appendagitis (yellow circle) and **(b)** coronal view

### Case 2

A 24 year-old female with no co-morbidities sought consult at the emergency department because of few hours history of colicky right flank pain, which was non-radiating. This was not associated with fever, nausea, vomiting, or bowel changes. She did not have any urinary

symptoms either. On physical examination, the patient was overweight (BMI 25.47) and was in distress because of the abdominal pain with a visual analog scale (VAS) of 6/10. She was afebrile and hemodynamically stable. Her abdomen was soft, with generalized direct abdominal tenderness, the most tender being the right lower quadrant. There was also noted right costovertebral angle tenderness.

Complete blood count, electrolytes and urinalysis were all within normal limits.

Initial clinical impression was urolithiasis vs acute appendicitis. She was given Hysocine-N-acetylbutylbroide and NSAIDs which provided relief. A CT stonogram was done, and this showed no evidence of radiopaque lithiasis in both kidneys and along the course of the urinary tract. There was however, note of a non-specific inflammatory process described as a focal area of haziness measuring 2.0x1.7x3.0 cm which was signed out as epiploic appendagitis anterior to the cecum (Fig. 2). Other findings include non-obstructing choletithiasis, and a prominent appendix with no signs of inflammation.

On the 2<sup>nd</sup> hospital day, there was complete resolution of the abdominal pain, and patient was discharged improved.



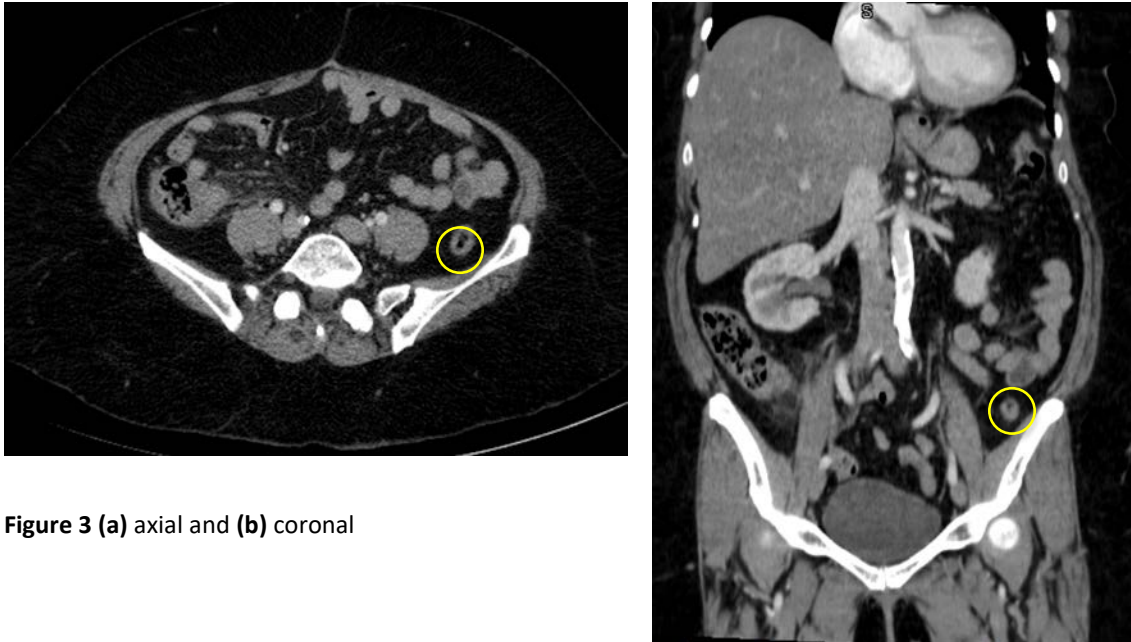
**Figure 2 (a)** axial view **(b)** coronal view

### Case 3

A 72 year-old hypertensive, diabetic and hypothyroid female came into the emergency department because of 5 days history of left lower quadrant pain not associated with food intake or bowel movement, with no accompanying fever, nausea, vomiting, bowel or urinary changes . Pertinent past medical history included an appendectomy, cesarian section, total abdominal hysterectomy and bilateral salphingoophorectomy. On physical examination, she was obese (BMI 33.05) cringing in pain with a visual analog scale of 9/10. She was afebrile and hemodynamically stable. Her abdomen was tender at the epigastric, periumbilical and mostly, at the left lower quadrant. There was no rebound tenderness or guarding.

Complete blood count, liver function tests and urinalysis were all within normal limits.

CT scan of the whole abdomen done showed an irregularly-defined fat density mass with soft tissue stranding densities in the hypogastric region (Fig. 3), more towards the left, for which an inflammatory process such as epiploic appendagitis vs mesenteric panniculitis was considered. She was started on Ciprofloxacin, Meperidine and NSAIDs. On the 3<sup>rd</sup> hospital day, she was discharged improved.



**Figure 3 (a) axial and (b) coronal**

#### **Case 4**

A 25 year-old pre-hypertensive female arrived at the emergency department with the presentation of 4 month history of intermittent, crampy, left lower quadrant pain radiating to the back, accompanied by one episode of undocumented fever. 3 days prior to admission, there was increase in severity of pain, which prompted consult at the emergency department. This was not associated with food intake or bowel movement, with no accompanying fever, nausea, vomiting, bowel or urinary changes. She was noted to be obese (BMI 30.86) with a visual analog scale of 6/10. Her abdomen was noted to be soft, with direct tenderness at the left lower quadrant. There was no rebound tenderness or guarding noted.

Blood tests, that included complete blood count, electrolytes and creatinine were all within normal limits. She was noted to have urinary tract infection by urinalysis. Plain CT scan of

the whole abdomen revealed focal fibrolinear strandings, haziness, and an apparent fat attenuating crescentic shaped structure at the left anterior omentum, adjacent to the distal ascending colon at the level just below the iliac crest (Fig. 4) for which epiploic appendagitis was primarily considered. Other findings included a prominent appendix with appendicolith without CT signs of appendicitis. She was then started on Cefoxitin, Metronidazole and Tramadol. On the 3<sup>rd</sup> hospital day, patient was noted to be improved with complete resolution of the abdominal pain, such that she was discharged.



**Figure 4 (a)** axial and **(b)** coronal

### Case 5

A 21 year-old male with no significant co-morbidities presented at the emergency department because of stabbing left lower quadrant pain, associated with one episode of non-projectile, non-bilious vomiting. This was not associated with food intake or bowel movement, with no accompanying fever or bowel and urinary changes. On physical examination, he was noted be normosthenic, hemodynamically stable, and afebrile, with tolerable abdominal pain with a visual analog scale of 6/10. He had a soft abdomen with direct tenderness at the left lower quadrant without guarding or rebound tenderness.

Complete blood count showed normal WBC but slightly elevated neutrophils (83). Initial impression at this time was diverticulitis. A plain CT scan of the whole abdomen was done, and this showed focal haziness and fat stranding densities adjacent to a segment of the distal descending colon suggestive of inflammatory/infectious changes. Considerations would include epiploic appendagitis, or less likely diverticulitis. Other findings included probable sigmoid diverticles with no signs of inflammation and subcentimeter to marginal-sized paracecal, mesenteric and inguinal lymph nodes. He was then started on Ciprofloxacin, Metronidazole and NSAIDs. His symptoms improved, and by the 2<sup>nd</sup> hospital day, he was discharged.



**Figure 5 (a) axial and (b) coronal**

## Discussion

In this case series we are presented with 5 patients, 3 of which were in their 20' s and the other 2 were 59 years old and 72 years old. In addition to this, all except one, were female. These demographics are actually atypical of epiploic appendagitis. According to studies the typical patient is a middle-aged male. Epiploic appendagitis has been shown to be largest and most prominent in obese persons and in those who have recently lost weight<sup>5,6,7</sup>. Most of the patients presented in the case series were overweight to obese.

Epiploic appendagitis may occur anywhere in the colon; however it is said to have been more prominent in the rectosigmoid junction accounting for 57% of cases. It can also occur in the ileocecal region in 26%, in the ascending colon in 9%, in the transverse colon in 6% and in the descending colon in 2% of cases<sup>8,9,10</sup>. Two of the cases that were discussed earlier showed CT evidence of epiploic appendagitis located at the left hemiabdomen, most likely at the rectosigmoid area, one at the cecal area, one at the distal ascending, and one at the distal descending colon. All cases did not develop any complications.

Laboratory findings such as the white blood count, erythrocyte sedimentation rate, and C-reactive protein are usually normal but may be mildly elevated. In the 5 cases discussed, laboratory findings were essentially normal..

Most of the time, epiploic appendagitis is diagnosed incidentally in patients undergoing imaging for acute/subacute onset of lower abdominal pain. The diagnosis should be considered



when exploration of the abdomen is inconclusive. Abdominal CT scan especially when done with oral, iv ore rectal contrast is the gold standard in reaching the diagnosis, with a sensitivity and a true positivity rate nearing 100%<sup>11</sup>

By abdominal CT scan, the classic finding of epiploic appendagitis is a 2 to 3 cm, oval shaped, fat density, paracolic mass with thickened peritoneal lining and peripappedageal fat stranding. A highly attenuating central dot within the inflamed appendage that corresponds to a thrombosed draining appendageal vein is occasionally evident. In the absence of inflammation, epiploic appendices are usually not seen on CT scan unless they are surrounded by a sufficient amount of intraperitoneal fluid (eg, ascites or hemoperitoneum) or inflammation. The CT scan findings of the cases discussed were described as either fat stranding denisities, focal area of haziness or crescentic-shaped fat-attenuating densities.

Ultrasonography is usually reserved when CT scan findings are equivocal or if CT scan is not readily available. Moreover, ultrasonography is best suited for patients with a thin body habitus. On abdominal ultrasound, the inflamed appendage appears as a noncompressible, solid, hyperechoic ovoid mass with a subtle hypoechoic rim located at the point of maximal tenderness. The inflamed fatty mass is fixed to the colon and often also to the parietal peritoneum during inspiration and expiration. Doppler studies typically reveal absence of blood flow in the appendage and normal blood flow in the hyperechoic inflamed fat surrounding the appendage. Contrast-enhanced ultrasound shows a central area of no enhancement with moderately increased vascularization around the avascular necrotic appendage.

On magnetic resonance imaging (MRI), the involved epiploic appendage is hyperintense on unenhanced T1-weighted imaging but is slightly less intense than normal peritoneal fat. On the other hand, T2-weighted images show marked loss of signal, confirming the fatty nature of the lesion. The thin peripheral rim and peritoneal inflammatory changes appear hypointense on T1-weighted imaging and hyperintense on T2-weighted imaging, and show marked enhancement on contrast-enhanced T1-weighted fat-suppressed images. The central draining vein usually has low signal on both T1-weighted and T2-weighted imaging.

Four of the cases were managed with antibiotics and NSAIDs whereas only one was managed solely with NSAIDs. Patients can be managed conservatively with oral anti-inflammatory medications (eg, Ibuprofen 600 mg PO every eight hours for four to six days) and if needed a short course of opiates (acetaminophen or codeine300/30 every six hours) for four to seven days. Anti-inflammatories provide analgesia but probably do not modify the disease course. Patients usually do not require hospitalization or antibiotics.

Surgical management is reserved for patients whose symptoms fail to improve with conservative management, those with new or worsening symptoms (eg, high fever, progressive pain, nausea, vomiting, or inability to tolerate an oral diet), or complications (e.g., intussusception, bowel obstruction, abscess) that cannot be managed nonoperatively. The inflamed appendage should be ligated and resected.

With conservative medical management, most patient ' s symptoms are resolved between a few days and 4 weeks. Judicious clinical examination and appropriate diagnosis of epiploic appendagitis with imaging studies, specifically CT, enables successful non-operative, outpatient treatment of patients with epiploic appendagitis. Such an approach avoids unnecessary abdominal surgery and associated additional healthcare costs.

## **Conclusion**

This case series discussed five patients with epiploic appendagitis, most of which were overweight to obese females in their 20 ' s who presented with abdominal pain, most commonly



at the left lower quadrant, and not accompanied by other symptoms. Diagnosis was clinched by use of CT scan in all cases. As for the treatment, the use of antibiotics and NSAIDs was a common finding.

It seems that epiploic appendagitis has become more recognizable with the use of CT scan. However, with regards to management of the disease, the use of antibiotics is still a common mistake. There is no role of antibiotics in the treatment of antibiotics. Conservative management with NSAIDs and analgesics has been recommended except for those refractory to NSAIDs and those with complications. Guidelines that tackle the diagnosis and management of epiploic appendagitis have to be established in order to avoid unnecessary expenses and hospitalizations.

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