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Case Report

Left site perforated appendicitis associated to midgut malrotation in a patient in the third decade of life: a case report

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ABSTRACT

Acute appendicitis represents the most common surgical emergency in the world. Clinically, it presents with pain in the right iliac fossa. One third of patients presents with pain in another location, secondary to the variability of the anatomical position of the appendix. Acute left appendix is a very rare pathology, and it is commonly associated with congenital anomalies such as intestinal malrotation or situs inversus. The patient in this case, a 30-year-old male, presented with abdominal pain in the epigastrium which later radiated to the hypogastrium. Initially with a diagnosis of suspected gastroenteritis, with no improvement with treatment, it was decided to perform an abdominal tomography, where the left cecal appendix was observed, with increased diameter, associated with signs of midgut malrotation. Diagnostic laparoscopy was performed, and no appendix was identified. It converted to open surgery, revealing small intestine on the right side, colon on the left side and perforated left cecal appendix. Acute left appendicitis it should be suspected early to avoid delay in diagnosis and treatment, and to avoid future complications. Abdominal tomography is a highly sensitive diagnostic tool in the case of acute appendicitis associated with intestinal malrotation. Laparoscopy is the first choice in suspected left appendicitis, but the surgeon must take into account the difficulties that may arise during the procedure, the time of evolution and not delay definitive treatment; it must also decide when open surgery is necessary.

Keywords: Left side acute appendicitis, Midgut malrotation, Case report

INTRODUCTION

Appendicitis is a common cause of abdominal pain and represents one of the most common surgical emergencies worldwide.[1] The incidence of acute appendicitis is approximately 90-100 per 100,000 person-years.[1] The appendix is usually located in the right lower quadrant of the abdomen, where it arises from the posteromedial region of the cecum and inferior to the ileocaecal junction.[6] The classic symptoms of acute appendicitis include periumbilical pain, anorexia, intermittent nausea and vomiting, right lower quadrant pain migration and fever. The diagnosis of acute appendicitis is made in 90% of patients presenting with these symptoms.[2] The predominant signs and symptoms of acute appendicitis in adults are right lower quadrant pain (positive likelihood ratio (LP+)=7.3 to 8.5), abdominal rigidity (LP+=3.8) and migration of periumbilical pain to the right lower quadrant (LP+=3.2).[3,4] The tip of the appendix can have a variable location, being retrocecal in more than 60% of patients.[6] Other positions such as pelvic, subcecal, preileal, post ileal, subhepatic, mesoceliac, intraherniary and left lower quadrant are more rarely seen.[6] The presentation of left appendicitis has been associated with

two congenital anomalies: intestinal malrotation and situs inversus, which complicate diagnosis and management.[5,13] According to the literature, few cases of acute appendicitis associated with anatomical anomalies of the appendix have been reported, mostly associated with situs inversus.[11] The presence of anatomical abnormalities should be considered when clinical and imaging features are misleading.[15]

We present here the case of a 30-year-old male patient presenting with atypical abdominal pain, initially diagnosed as gastroenteritis, and finally identified as acute perforated left appendicitis.

CASE REPORT

This is a 30-year-old male patient of Mexican nationality, with only a history of alcoholism and positive smoking, denies surgical history and previous illnesses, He presented with sudden abdominal colic of 24 hours' evolution in the epigastrium which later radiated to the mesogastrium and hypogastrium accompanied by nausea and emesis on multiple occasions and a fever of 39 ºC. He decided to go to the emergency department where he was initially diagnosed with gastroenteritis, where only analgesics and antibiotics were prescribed. On physical examination he had a blood pressure of 110/080, heart rate of 90 beats per minute, respiratory rate of 16 breaths per minute, temperature of 36.0 ºC and oxygen saturation of 94%, all of which were normal, with pain on palpation in the epigastrium, mesogastrium and left iliac fossa, negative appendicular signs, with no evidence of peritoneal irritation. Initial labs showed total leukocytes of 17,000 with 84.7% neutrophilia and platelet count of 306,000 mcl, haematocrit of 48% and haemoglobin of 15.8 g/dl, random glucose of 107 mg/dl, serum electrolytes Na 138 mEq/l and K 4.1 mEq/l, renal function tests creatinine 0.86 mg/dl, urea 28.2 mg/dl and general urine test in normal parameters. With no clinical improvement after 48 hours, it was decided to request an intravenous contrasted abdominal tomography scan showing: Signs compatible with intestinal malrotation, with location of the colon towards the left hemiabdomen. In the left iliac fossa, with a cecal appendix with a diameter of 10.4 mm and a wall of 3.7 mm corresponding to acute appendicitis (Figure 1 and 2). Hepatomegaly and perisplenic fluid. So, it was decided to perform diagnostic laparoscopy. The surgical findings reported the following: Intestinal malrotation, ascending, descending and transverse colon in left hemiabdomen and small intestine in right hemiabdomen, cecal appendix 6×3×3 cm, diameter of 10 mm, edematous, erythematous, abscessed and perforated in its distal third (Figure 5), distended cecum, with abundant purulent liquid in pelvic fossa, parietocolic and perisplenic slides, approximately 250 ml, lax bowel adhesions secondary to inflammation (Figure 3 and 4). However, access to the surgical site was difficulty due to the impossibility to generate pneumoperitoneum at adequate pressure and the evidence of abscess in the cavity and multiple inter-asa adhesions, so it was decided to convert to open surgery, performing appendectomy using the Pouchet technique. During trans-surgery, antibiotic therapy was started with ceftriaxone and metronidazole. After surgery, the patient was extubated without any eventualities. The patient was admitted for postoperative surveillance to the Surgery service, where he was hospitalized for 10 days due to persistent evidence of inflammatory response due to leukocytosis associated with a fever peak of 39ºC. An abdominal ultrasound was requested, with no evidence of collections. Due to adequate clinical evolution and improvement of paraclinical tests, it was decided to discharge him.

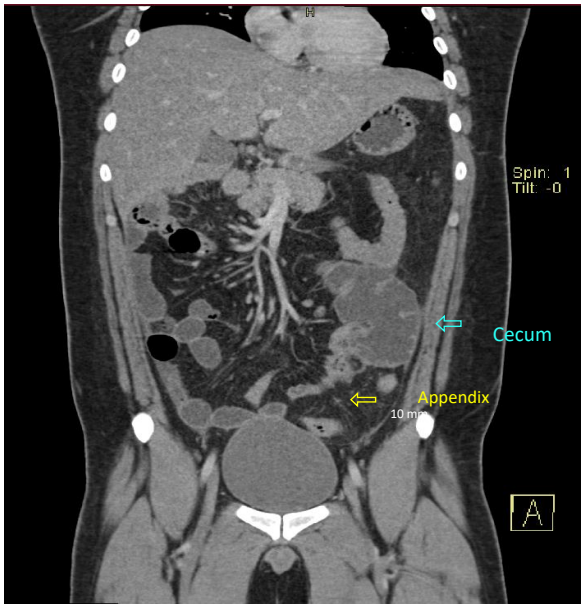

Figure 1: Abdominal CT scan (coronal view) showing cecal appendix with thickened wall and cecum on the left side.

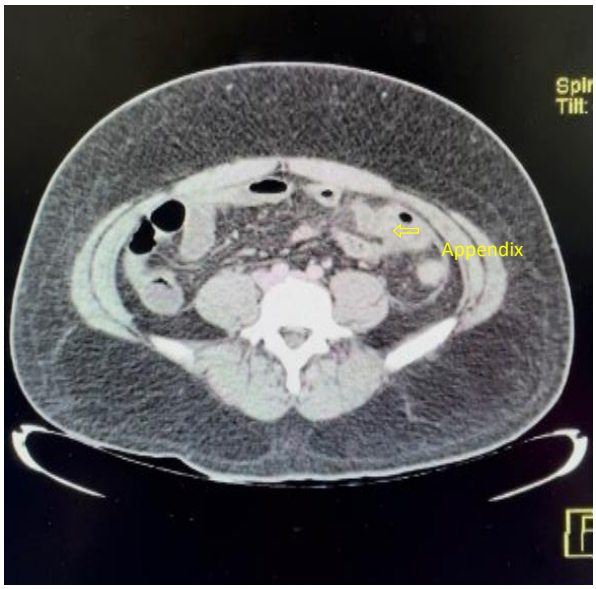

Figure 2: CT of the abdomen (axial view), illustrating the cecal appendix on the left side.

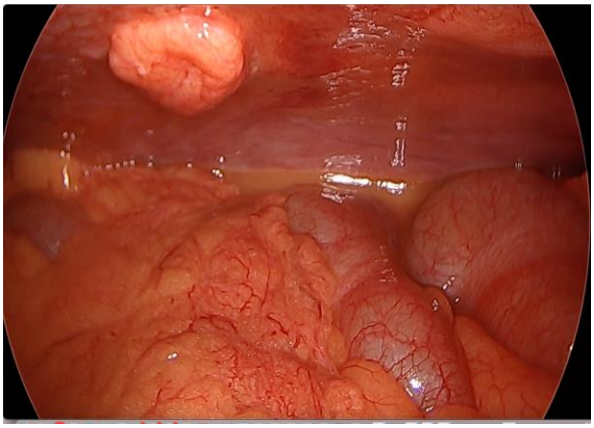

Figure 3: Laparoscopic view of left parietocolic slide with abundant purulent liquid and colon in left hemiabdomen.

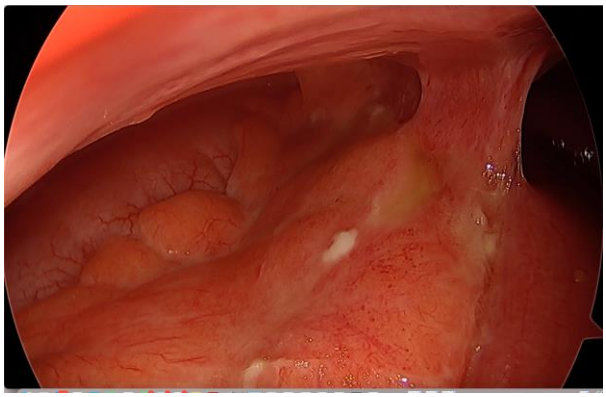

Figure 4: Laparoscopic view of large bowel loop with multiple adhesions and purulent fluid in the left lower quadrant at the site of the inflamed appendix.

Figure 5: Open surgical view of the inflamed cecal appendix with abscess along its course.

DISCUSSION

Acute appendicitis is the most common cause of acute abdomen and surgical disease in the world.[1,7] Diagnosis is based on clinical history, physical examination, surgeon experience, laboratory and imaging findings.[8] In case of suspected perforated appendicitis, the diagnosis is higher when the white blood cell count is greater than 15×10 to the 9/l and CRP is found to be elevated greater than 10 mg/dl.[9] Delayed diagnosis and surgical treatment can lead to multiple serious complications such as periappendicular abscess, perforation, gangrene, and even death.[8-11] Approximately one third of patients with acute appendicitis have pain located outside the right lower quadrant.[10,12] This occurs when the cecal appendix is in another location such as retrocecal, subcecal, preileal, postileal, pelvic, subhepatic, mesoceliac, in the left hemiabdomen, or a long projection of a right appendix.[6] Left appendicitis is a rare condition, which should therefore have a high index of suspicion. The presentation of left appendicitis has been associated with two congenital anomalies: intestinal malrotation and situs inversus.[5,13]

Intestinal malrotation is a congenital anomaly of the intestine that occurs secondary to a lack of rotation or incomplete rotation of the primitive intestinal loop about the axis of the superior mesenteric artery during fetal life.[5,17] The incidence of such anomalies varies from 0.016% to 0.024% in live births.[8,9] It is a rare entity in adults, which remains asymptomatic throughout life.[15] Di Buono et al performed a review of 73 clinical cases of acute appendicitis with some anatomical abnormality, where he identified that of the 73 patients, 61 (83.6%) patients did not previously know that they had any anatomical abnormality.[8] In our case, the patient had never presented any symptomatology. There are different types of intestinal malrotation according to Stringer: non-rotation type Ia, reverse rotation type II and incomplete rotation type III.[16] In the case of type Ia, it is characterized by the small intestine on the right side and the large intestine including the cecum and appendix on the left side, as was the case in our patient after the abdominal CT scan.[17] This being the most common type of malrotation.[8,18]

In this case the patient already had more than 48 hours of evolution at the time of laparoscopy, which according to the findings of laparoscopy and exploratory laparotomy, the cecal appendix was perforated associated with purulent peritonitis. It has been determined that the risk of perforation increases by 5% for every 12 hours of evolution.[13] In our case, the patient had no previous symptomatology, and when he presented it, it was atypical, presenting pain in the hypogastrium without associated rebound sign. Di Buono et al performed a review of 73 clinical cases of acute appendicitis with some anatomical abnormality, showing that 69.9% reported pain in the left lower quadrant, while the other 31.1% reported pain elsewhere.[8] The presentation of pain in another type of location could complicate the diagnostic suspicion according to the evidence. Imaging studies such as USG and CT are the best diagnostic tool when it is required to confirm the diagnosis of suspected

intestinal malrotation, with CT having a sensitivity of 90%-97% and a specificity of 94-100% respectively in the case of acute appendicitis associated with intestinal malrotation.[15] CT will not only help preoperative planning but also to avoid delay in diagnosis.[18] CT findings of intestinal malrotation include transposition of the superior mesenteric vein to the left (instead of the right) of the superior mesenteric artery, hypoplasia or aplasia of the uncinate process of the pancreas, small bowel with right abdominal location and large bowel with left location and consequently left-sided cecum and appendix.[20] In the patient's case, the CT scan showed the presence of an inflamed cecal appendix, associating all the imaging signs of intestinal malrotation, except for hypoplasia or aplasia of the uncinate process of the pancreas (Figure 1-3), being useful to rule out differential diagnoses, determine the diagnosis of acute appendicitis, making preoperative planning possible and reducing postoperative complications.

Diagnostic laparoscopy is currently the approach of choice, as it is both safe and effective in the diagnosis and treatment of acute ectopic appendicitis.[1] Other advantages are that it can be adapted to provide a better operative field. However, one of the drawbacks of laparoscopy in these cases is the reverse laparoscopic vision or "mirror image", which can be complex even for experienced surgeons.[5] Open surgery should be chosen when there is the presence of abscess, ileum or obstruction.[5] In our case it was decided to start as diagnostic laparoscopy, but it was not possible due to the difficulty of the technique, as well as the evidence of abscess in the cavity and multiple adhesions that made it impossible to access the surgical site, so it was reconverted to open surgery, being able to resolve the pathology, presenting no postoperative complications.

CONCLUSION

While on the one hand acute appendicitis is the most frequent surgical pathology, on the other hand acute left appendicitis is a very rare pathology that should be suspected early to avoid delay in the diagnosis and treatment of this pathology that can lead to multiple complications. Emergency physicians, surgeons and radiologists should be made aware of the anatomical variations of the cecal appendix, as well as the association of congenital anomalies such as intestinal malrotation and situs inversus and always keep it in mind as a differential diagnosis in case of pain in the left lower quadrant. Considering that not all patients will present pain in this site, as it was in our patient, complementary radiological examinations should be requested in case of diagnostic suspicion, such as abdominal tomography, a highly sensitive diagnostic tool in the case of acute appendicitis. Finally, laparoscopy should be considered as the first resource of choice in patients with suspected left appendicitis, but it should also take into account the difficulties that may arise during the procedure, the time of evolution, so as not to delay the definitive treatment; so, the surgeon must decide when open surgery is necessary.

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REFERENCES

1. Bhangu A, Søreide K, Di Saverio S, Assarsson JH, Drake FT. Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management. Lancet (London, England). 2015;386(10000):1278-87.
2. Moris D, Paulson EK, Pappas TN. Diagnosis and Management of Acute Appendicitis in Adults: A Review. JAMA. 2021;326(22):2299-11.
3. Snyder MJ, Guthrie M, Cagle S. Acute Appendicitis: Efficient Diagnosis and Management. Am Family Physician. 2018;98(1):25-33.
4. Wagner JM, McKinney WP, Carpenter JL. Does this patient have appendicitis? JAMA. 1996;276(19):1589-94.
5. Akbulut S, Caliskan A, Ekin A, Yagmur Y. Left-sided acute appendicitis with situs inversus totalis: review of 63 published cases and report of two cases. J Gastrointestinal Surg. 2010;14(9):1422-8.
6. Moore KL, Dalley AF, Agur AMR. Abdomen. In: Clinically Oriented Anatomy, 7th edition, Wolters Kluwer, Lippincott, Williams and Wilkins, Philadelphia. 2014;249.
7. Van Dijk ST, Van Dijk AH, Dijkgraaf MG, Boermeester MA. Meta-analysis of in-hospital delay before surgery as a risk factor for complications in patients with acute appendicitis. Brit J Surg. 2018;105(8):933-45.
8. Di Buono G, Buscemi S, Galia M, Maienza E, Amato G, Bonventre G, et al. Acute appendicitis and situs viscerum inversus: radiological and surgical approach-a systematic review. Eur J Med Res. 2023;28(1):85.
9. Andersson RE. Meta-analysis of the clinical and laboratory diagnosis of appendicitis. Bri J Sur. 2023;91(1):28-37.
10. Palanivelu C, Rangarajan M, John SJ, Senthilkumar R, Madhankumar MV. Laparoscopic appendectomy for appendicitis in uncommon situations: the advantages of a tailored approach. Singapore Med J. 2007;48(8):737-40.
11. AlKeileh TB, Elsayed S, Adam RM, Nour M, Bhagchandi T. Left-sided appendicitis managed laparoscopically: a case report. J Med Case Rep. 2024;18(1):21.
12. Lee SC. Left Side Appendicitis with Abscess Caused by Midgut Malrotation Mimicked by Complicated Diverticulitis of Sigmoid Colon: A Case Report. Kor J Gastroenterol. 2023;81(2):95-9.
13. Saliba C, Diab SH, Nicolas G, El Sayegh JS, Osman D, Azzo JM, et al. Pitfalls of Diagnosing Left Lower Quadrant Pain Causes: Making the Uncommon Common Again. Am J Case Rep. 2019;20:78-82.

14. Wagner PL, Eachempati SR, Soe K, Pieracci FM, Shou J, Barie PS. Defining the current negative appendectomy rate: for whom is preoperative computed tomography making an impact? Surgery. 2008;144(2):276-82.
15. Assefa MA, Molla YD, Yasin MO, Ali OA, Desita ZT. Left side perforated appendicitis with intestinal non-rotation: a case report. J Med Case Rep. 2023;17(1):302.
16. Alani M, Rentea RM. Midgut Malrotation. In StatPearls. StatPearls Publishing. 2023.
17. Bhattarai AM, Devkota Y, Bhattarai AM. Left-sided Appendicitis with Intestinal Non-rotation: A Case Report. J Nepal Med Assoc. 2022;60(248):396-8.
18. Singla AA, Rajaratnam J, Singla AA, Wiltshire S, Kwik C, Smigelski M, et al. Unusual presentation of left sided acute appendicitis in elderly male with asymptomatic midgut malrotation. Int J Surg Case Rep. 2015;17:42-4.
19. Prada Arias AM, Barreira AS, Sanchez MM. Appendicitis versus nonspecific acute abdominal pain: paediatric appendicitis score evaluation. An Pediatr. 2018;88(1):32-8.
20. Ben Ely A, Gorelik N, Cohen-Sivan Y, Zissin R, Carpineta L, Osadchy A, et al. Appendicitis in adults with incidental midgut malrotation: CT findings. Clin Radiol. 2013;68(12):1212-9.

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