

6-23-2022

An Unusual Case of Perforated Appendicitis in Situs Inversus Totalis in Indonesia

Valencia J. Martin

Faculty of Medicine, Universitas Indonesia, valenciajane@hotmail.com

Immanuel T. Parinding

RSUD Balikpapan, East Kalimantan, Indonesia, imanuelaba.parinding@gmail.com

Follow this and additional works at: <https://scholarhub.ui.ac.id/nrjs>



Part of the [Surgery Commons](#)

Recommended Citation

Martin, Valencia J. and Parinding, Imanuel T. (2022) "An Unusual Case of Perforated Appendicitis in Situs Inversus Totalis in Indonesia," *The New Ropanasuri Journal of Surgery*. Vol. 7: No. 1, Article 5.

DOI: 10.7454/nrjs.v7i1.1117

Available at: <https://scholarhub.ui.ac.id/nrjs/vol7/iss1/5>

This Case Report is brought to you for free and open access by the Faculty of Medicine at UI Scholars Hub. It has been accepted for inclusion in The New Ropanasuri Journal of Surgery by an authorized editor of UI Scholars Hub.

An Unusual Perforated Appendicitis in Total Situs Inversus in Indonesia: A Case Report

Valencia J. Martin,¹ Imanuel T. Parinding²

1) Faculty of Medicine, Universitas Indonesia, 2) RSUD Balikpapan, East Kalimantan, Indonesia

Corresponding author: valencijane@hotmail.com Received: 18/Feb/2022 Accepted: 10/Jun/2022 Published: 23/Jun/2022

Website: <https://scholarhub.ui.ac.id/nrjs/> DOI: 10.7454/nrjs.v7i1.1117



Abstract

Situs inversus is a rare congenital anomaly where the internal organs are transposed in a mirror image. It is commonly unrecognized until a patient comes with a complaint, especially in developing countries where people do not have a routine medical checkup. We report a case of a young female with unusual left lower quadrant abdominal pain. Perforated appendicitis leading to peritonitis was confirmed using ultrasonography and successfully treated with laparotomy. Appendicitis should be considered a working diagnosis in lower left quadrant abdominal pain.

Key words: total situs inversus, abdominal pain, appendicitis, case report

Introduction

Abdominal pain can have a wide range of diagnosis, from genitourinary and gastrointestinal to reproductive origin. However, appendicitis is one of the most common causes of surgery in abdominal pain. The symptoms of appendicitis, although classic, can be inconsistent. Most patients experience right-sided abdominal pain, fever, and other gastrointestinal complaints. Diagnosis can be confirmed with imaging showing an inflamed appendix. However, an atypical abdominal pain in the lower left quadrant may be misleading. We report a previously misdiagnosed young female diagnosed with perforated appendicitis with peritonitis in situs inversus. Situs inversus is a rare congenital anomaly rarely diagnosed without imaging. This case is interesting due to its scarcity, challenge in diagnosis, and lack of reports in developing countries such as Indonesia.

Case report

A 20-year-old female came to the emergency department (ER) with abdominal pain that had been occurring for the past 24 hours. The pain was felt continuously, and the stomach felt rigid. Six days before admission, the pain was felt on the epigastrium, which later shifted to the lower left quadrant. She also complained of anorexia and nausea. No diarrhea, but she could not defecate for the past week – however, no problem with flatus. In addition, she got a fever in the last five days.

She had already visited the ER three days before this visit for a lower left quadrant abdominal pain and fever and was diagnosed with dyspepsia and urinary tract infection. At the time, she had analgetic and antibiotics. There is no significant medical- or surgical history.

On physical examination, she was moderately ill with a fever. Abdominal tenderness and muscular guarding were shown, and bowel sounds decreased. The blood tests showed a leucocyte count of 19.6 mg/dL, and other parameters were normal. The urinalysis test showed leukocytes and bacteria in the urine three days before this visit. The

ultrasound showed target signs in the appendix with a 7 mm diameter. Non-peristaltic, non-compressible, thickened ileocecal wall, and no gynecological problem (Figure 1). The chest x-ray showed dextrocardia (Figure 2), and the plain abdominal x-ray showed inverted organs where the descending colon was located on the right side (Figure 3). She was then diagnosed with generalized peritonitis due to perforated appendicitis in situs inversus totals.

Laparotomy proceeded with a midline incision. The operative findings showed 100 mL of a purulent fluid collection with a perforated, 7 cm vermiform appendix on the left side of the abdomen. The appendectomy proceeded, and the specimen was objected to a pathology exam. Situs inversus was confirmed with all organs and vice versa (Figure 4). Other organs were inverted, with the liver on the left side, the spleen on the right, and other organs mirroring the normal position. She was stable postoperatively and discharged on the fourth postoperative day.



Figure 1. Ultrasonography of the appendix shows the increased size, indicating an inflamed appendix.



Figure 2. Chest radiograph showing dextrocardia. The apex of the heart is on the right side.



Figure 2. Abdominal x-ray (colon in loop) showing colon on the right side.



Figure 3. Intraoperative findings show organs on the left side of the abdomen. Caecum, gall bladder and liver are mirrored to the left.

Discussion

Situs inversus is a rare congenital condition where internal organs are located in a mirror image compared to normal anatomy. Situs inversus is more common in males than in females, with a ratio of 3:2.¹ Marco Severino first recognized it in 1643, then further described by Matthew Baillie hundred years later.² While the normal position is called situs

solitus, and the mirror image is called situs inversus. It can manifest as a partial or total mirror image. In a total situs inversus, the right cardiac atrium is on the left, the left lung with three lobes, the right lung with two lobes, the left liver and gallbladder, and the right-sided spleen and stomach as other organs in the complete mirror.² In partial situs inversus, the transposition may only include thoracic or abdominal organs alone. Total situs inversus with dextrocardia is common in the whole population.^{3,4} Other extrahepatic biliary, venous, and arterial anomalies are usually absent in situs inversus.³ However, cardiac anomaly found in some cases, i.e., levocardia in situs inversus. It was infrequently found with dextrocardia.⁵

Situs inversus is rarely recognized in adults, especially those with no complaint. A condition is diagnosed incidentally with other entities such as appendicitis or cholecystitis. The incidence is 0.001% to 0.01% of the general population.⁶ However, no data regarding the incidence in Indonesia. A few cases of situs inversus with congenital heart anomaly,⁷ coronary artery disease,⁸ and soft tissue tumor⁹ were reported previously. The presence of situs inversus is hardly recognized. People with a total situs inversus are not predisposed to a specific disease. However, its recognition is essential to diagnose a condition properly. The confusion might relate to the position of pain and the underlying organs affected. More than 50% of patients with appendicitis also come with right iliac fossa abdominal pain in the presence of situs inversus.¹⁰

Abdominal pain can have many differential diagnoses, especially in young women. Therefore, the differential diagnosis should be one's concern before diagnosing appendicitis. There were many differential diagnoses, such as gynecologic issues, i.e., pelvic inflammatory disease, ectopic pregnancy, ovarian torsion, ovarian cyst, genitourinary causes such as nephrolithiasis, urinary tract infection, hydronephrosis, renal abscess, and the more common infectious causes such as gastroenteritis, ileitis or colitis, then other gastrointestinal causes such as diverticulitis, Chron's disease, small bowel obstruction, cholecystitis, hepatitis, and pancreatitis should be on minds.¹¹ Proper history taking and physical examination are absolute for accurate diagnosis. Nevertheless, appendicitis is one of the most common causes of abdominal pain. Therefore, it should always be included as a differential diagnosis.

In situs inversus, it is believed that the nervous system may not be reversed as the organs, so pain might occur elsewhere and not specific to the left lower quadrant.⁶ In 50% of cases, pain is also felt on the right iliac fossa.⁶ To help diagnose appendicitis, the physician can use the Alvarado score to help determine the need for surgery. A score of 5 or 6 should indicate suspicion of appendicitis. In addition, a physician may require imaging such as ultrasonography, plain photos, and CT-scan, which are especially helpful for observing possible pathology.

In this reported case, diagnosis is challenging as the patient came with epigastric pain followed by lower left quadrant pain and pain in the whole abdominal area. At first, the patient was diagnosed with urinary tract infection, as the urinalysis confirmed the diagnosis. However, the patient came with worsening pain with ongoing fever in the following days. McBurney's sign was also positive. Thus, the physician tried measuring Alvarado's score with a total score of 6. Imaging showed situs inversus was then revealed through the chest and abdominal radiographs and ultrasonography. Lab tests can also be helpful in a case of atypical presentation, commonly measuring complete blood count, C-reactive protein, liver and pancreatic function, and urinalysis. Beta-hCG should also be measured to eliminate ectopic pregnancy. However, physicians must note that leukocytosis is physiologic in pregnant women, leaving imaging the best tool for diagnosis.

In a limited resource facility, the physician must be able to diagnose with merely basic technology. Acute appendicitis, although a common

pathology, was not the initial diagnosis as the chief complaints are not in conjunction with the usual presentation. The presence of appendicitis in situs inversus is possible, although not commonly reported. Imaging can provide the physician with appropriate management, surgical indication, and type of incision.¹² With diagnosis challenges, there might be a delay in diagnosing acute appendicitis let the appendix perforated, and peritonitis.

Laparotomy proceeded for peritonitis. However, in uncomplicated appendicitis, laparoscopic appendectomy may be proceeded instead of laparotomy. Contini et al.¹³ showed that laparoscopy in situs inversus allows a complete abdominal exploration compared to the traditional open appendectomy.

Conclusions

This report reminding the possibility of congenital anomaly in common practice with atypical complaints of left-sided abdominal pain in acute appendicitis. Recognizing this will be a benefit in building the diagnosis and proper, timely surgical management.

Disclosure

Authors declare no conflict of interest

References

1. Huang SM, Yao CC, Tsai TP, Hsu GW. Acute appendicitis in situs inversus totalis. *Journal of the American College of Surgeons*. Dec 2008;207(6):954. doi:10.1016/j.jamcollsurg.2008.03.030
2. Wilhelm A, Holbert JM. Situs Inversus Imaging. Website. Medscape. Updated May 31st 2018. Accessed March 30th 2020. <https://emedicine.medscape.com/article/413679-overview>

3. Machado NO, Chopra P. Laparoscopic cholecystectomy in a patient with situs inversus totalis: feasibility and technical difficulties. *JSLs*. 2006;10(3):386-91.
4. Ahadi R, Shamshirband H. Two Case Reports of Situs Inversus Totalis. *Anat Scies J*. 2013;10(2):111-6.
5. Fulcher AS, Turner MA. Abdominal Manifestations of Situs Anomalies in Adults. *RadioGraphics*. 2002;22(6):1439-1456. doi:10.1148/rg.226025016
6. Golash V. Laparoscopic management of acute appendicitis in situs inversus. *J Minim Access Surg*. 2006;2(4):220-221. doi:10.4103/0972-9941.28184
7. Madiyono B, Pulungan I, Peluassy PMC, Affandi M. Levocardia With Situs Inversus Atria. *Paediatric Indones*. March 1976;16(3-4):105-8. doi:<https://doi.org/10.14238/pi16.3-4.1976.105-18>
8. Munawar M, Hartono B, Iskandarsyah K, Nguyen TN. Successful percutaneous coronary intervention for chronic total occlusion of right coronary artery in patient with dextrocardia. *Cardiovasc interven ther*. 2013;28(3):303-6. doi:10.1007/s12928-013-0166-z
9. Tiong D, Santosa YP. Asymptomatic Situs Inversus with Dextrocardia. *M Kedokt Indones*. 2011;61(1):30-4. doi:<http://ojs-mki.idionline.org/index.php/jinma/article/view/205/202>
10. Nelson MJ, Pesola GR. Left lower quadrant pain of unusual cause. *J emerg med*. 2001;20(3):241-5. doi:10.1016/s0736-4679(00)00316-4
11. Zinner M, Ashley JS. Maingot's Abdominal Operations, 12th Ed. In: Zinner M, Ashley JS, eds. McGraw-Hill; 2012:chap 31. Appendix, Meckel's, and Other Small Bowel Diverticula; vol. 31.
12. Nisolle JF, Bodart E, de Caniere L, Bahati M, Michel L, Trigaux JP. [Acute left-side appendicitis: diagnostic contribution of tomodensitometry]. *Arch pediatr* 1996;3(1):47-50. Appendicite aigue d'expression clinique gauche: apport diagnostique de la tomodensitometrie. doi:10.1016/s0929-693x(96)80009-1
13. Contini S, Dalla Valle R, Zinicola R. Suspected appendicitis in situs inversus totalis: an indication for a laparoscopic approach. *Surg laparosc endosc*. 1998;8(5):393-4.