



Laparoscopic Gallbladder Surgery in A Patient with Situs Inversus Totalis and Cholecystitis without Stones

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| Article History | Abstract |
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| Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 11 Sept 2023 | <p><i>This article presents a relevant clinical case of a 72-year-old female patient with recurrent episodes of acute abdomen. Two rare conditions were confirmed: Situs Inversus Totalis (SIT) and Cholelithiasis, leading to the scheduling of elective surgery. In addition, an association with Kartagener's syndrome is suspected, adding complexity to her medical condition. Situs Inversus Totalis is a rare congenital anomaly in which the internal organs are inverted compared to their normal anatomical position. The incidence varies, affecting an average of 1-2 of every 10,000-15,000 live births. Early detection of this condition is essential to guide the patient and medical staff in invasive procedures or surgeries. The patient presents cholelithiasis, which led to the planning of surgery to remove the gallbladder. The possible association with Kartagener's syndrome, characterized by situs inversus, chronic sinusitis, and bronchiectasis, adds complexity to clinical care, requiring a multidisciplinary approach. The report of this clinical case highlights the importance of early detection of Situs Inversus Totalis, especially when associated with other pathologies.</i></p> |
| CC License CC-BY-NC-SA 4.0 | <p>Keywords: Cholelithiasis, Inverted internal organs, Situs Inversus Totalis, Anomaly, Kartagener syndrome</p> |

1. Introduction

"Situs inversus" is an autosomal recessive genetic condition that manifests in approximately 0.00025% (1:400,000) of the population described in various epidemiological reports. It is a rare condition in which there is an error in the migration of organs during the development of the embryo, placing them as a "mirror image" with respect to the sagittal axis of the normal anatomical position of an individual.

The accidental finding frequently found in these patients is dextrocardia, "first described by Marco Severino in 1643; and the Situs inversus was described a century later by Matthew Baillie, there is a historical document from 1760 kept in the Archives of the Royal Basque Society, which includes the first human scientific description of a Situs Inversus Totalis, carried out in the autopsy study of the corpse of the Viceroy of Mexico at the time, known as the Marques de las Amarillas." (1-3-4).

In addition to the abnormal position of the viscera, some patients have associated pathologies such as recurrent sinusitis, chronic bronchitis, bronchiectasis, cardiovascular anomalies such as transposition of large vessels, pulmonary stenosis, Meckel's diverticulum, absence of colon, absence of appendix, anal atresia, megacolon, pancreatic fibrosis, cholecystitis, obstruction pictures, infertility, among others. (2-5-6)

One of the best-known syndromes is Kartagener's, in which ciliary dysgenesis (involvement of the microstructure of the dynein arms in the cilium) is manifested. The patient has a generalized condition of the microstructures responsible for the movement of fluid or extracellular particles that come into contact with the cell walls so, in the case of the bronchial tree, since there is no motility that helps expel bacteria and waste to the outside through coughing and expectoration, patients have frequent respiratory infections that respond to routine antibiotic therapy. Similarly, at the level of the urogenital tract, those who suffer from this syndrome have infertility (there is no movement of sperm or movement of the egg through the fallopian tubes). The above is gathered in a pathognomonic triad of this syndrome: situs inversus, sinusitis (respiratory conditions) and infertility.

The percentage of patients who present Kartagener's Triad per se is low, and even less those who associate another pathology such as those previously described, however, it is necessary to identify this type of patients, guide them about their condition and indicate the importance of mentioning it when for reasons of disease they come into contact with a health service. The relevance is even greater when a picture of surgical resolution is presented because among surgeons "the precise diagnosis determines an adequate behavior for its management, estimating for it a scheduled surgery, preventing all possible contingencies and avoiding complications. That is why a surgeon will always have to think beforehand about a pathology such as ITS" (2-7-8).

2. Materials And Methods

A retrospective clinical case study will be conducted, with the aim of describing the experience of performing laparoscopic gallbladder surgery in a patient with Situs Inversus Totalis and cholecystitis without stones.

Sample selection: A female patient with a confirmed diagnosis of Situs Inversus Totalis and cholecystitis without stones who has undergone laparoscopic gallbladder surgery in a specific period of time will be included.

Inclusion Criteria:

- Female patient diagnosed with Situs Inversus Totalis.
- Presence of acute cholecystitis without stones on imaging studies and clinical findings.

Exclusion Criteria:

- Patients diagnosed with acute cholecystitis with gallstones.
- Patients who have not undergone laparoscopic gallbladder surgery.

Data Collection:

- The medical records of patients who meet the inclusion and exclusion criteria will be reviewed to obtain detailed information on their diagnosis, previous treatment and clinical evolution.
- Results of imaging studies, including abdominal ultrasonography and computed tomography, confirming the diagnosis of Situs Inversus Totalis and cholecystitis without stones will be obtained.
- Data on the surgical technique used during laparoscopic gallbladder surgery as well as relevant intraoperative findings will be collected.

Operation:

- Laparoscopic gallbladder surgery will be performed in an operating room equipped with the necessary instruments and materials for this type of procedure.
- Standard guidelines of laparoscopic surgery for gallbladder removal in patients with acute cholecystitis without stones will be followed, adapting the technique according to the abnormal position of the organs due to Situs Inversus Totalis.
- A complete intraoperative evaluation will be performed to confirm the absence of gallstones and ensure proper removal of the gallbladder.

Postoperative evaluation:

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- A postoperative follow-up of the patient will be carried out to evaluate her recovery and possible complications.
- The results of follow-up studies, including imaging studies, should be recorded to ensure adequate resolution of cholecystitis and the absence of surgical complications.

Data Analysis:

- A descriptive analysis of the collected data will be performed, presenting the clinical findings, results of imaging studies and details of the surgical technique used.
- Potential complications associated with the procedure will be identified and special considerations related to laparoscopic surgery in patients with Situs Inversus Totalis will be discussed.

Ethical Considerations:

- The ethical principles of medical research will be respected, guaranteeing the privacy and confidentiality of the patient.
- The study will be conducted with the informed consent of the patient.

Study Limitations:

- Due to the rarity of the condition of Situs Inversus Totalis and cholecystitis without calculations, the sample size may be limited, which could affect the generalizability of the results.
- The possible presence of biases inherent in retrospective studies will be considered.

3. Results and Discussion

Clinical picture reason for consultation

Abdominal pain

Current disease history

A 72-year-old female patient with a personal pathological history of hypertension and COPD under drug treatment, without surgical history or drug allergy, with previous admissions in October 2017 due to presenting abdominal pain of moderate intensity localized at the level of epigastrium with irradiation to the left hypochondrium and back, picture that was exacerbated in 4 days, also manifested that 3 days ago does not defecate or expel gases, referred multiple vomiting of large volume with food content, a rectal examination was performed finding fecal impaction, in addition to performing a liver and bile duct echo. He was admitted to the surgery department with a diagnosis of obstructive abdomen to be ruled out. Subsequent studies ruled it out, leaving as the final diagnosis that of fecal impaction and acute alithiasic cholecystitis⁽³⁻⁹⁻¹⁰⁾.

In the month of December 2017, he went to the emergency service for presenting abdominal pain of moderate intensity located in the left iliac fossa accompanied by nausea that reached vomiting on 4 occasions, laboratory tests were performed finding leukocytosis plus neutrophilia, cataloging the picture of acute inflammatory abdomen the same that was ruled out when performing an EMO that resulted in a urinary infectious process. In January 2018, he entered the surgery service with prior pre-surgical assessment by outpatient consultation for elective surgical intervention; to be performed laparoscopic cholecystectomy.

Physical exam on admission

Respiratory system: conversed thoracic expandability, normal and present vesicular murmur, no crackling rales or wheezing are required. Cardio vascular system: no heartbeat, rhythmic heart sounds of good tone and intensity, no murmurs, gallops or rubbing, fill capillary less than 3 seconds. Strong and synchronous peripheral pulses. Abdomen: globose, soft, depressible with slight tenderness in left hypochondrium, RHA: present and normal.

CNS: conscious patient oriented in time space and person, No meningeal signs.

Complementary exams:

ECO Hepatic and Bile Duct: A regular-bordered, normal-sized liver located on the left side. (Figure A) **Left bile ducts:** there is no dilation of intrahepatic bile ducts, the common bile duct is normal diameter. **Gallbladder:** located on the left side of thickened walls 6.1 mm, alithiasic, but with biliary mud inside towards the bottom of the gallbladder. **Pancreas:** of normal characteristics. No inflammatory signs. **Echocardiogram:** Situs inversus with dextrocardia and dextroposition of the apex. Heart chambers of diameter, thickness and motility at rest preserved, systolic function of the left ventricle preserved, normal valvular flowchart. (Figure B) **and Normal EKG.** (Figure C). **Laboratory: Hemoglobin:14.1, Hto: 44.4, Platelets 347000, Leukocytes 14620, Neutrophils 87.5, BT: 0.9 BD: 0.37, TGO: 25, TGP: 17, GGT: 55.0, ALKALINE PHOSPHATASE: 63, Na: 135, K: 3.07, UREA: 32.9, CREATININE: 0.85, GLUCOSE: 112, VDRL: NON-REACTIVE**



. **Figure A.** Hepatic Echo and Left Bile Ducts

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Figure B. Echocardiogram (Situs Inversus, Dextrocardia and Dextroposition of Apex)

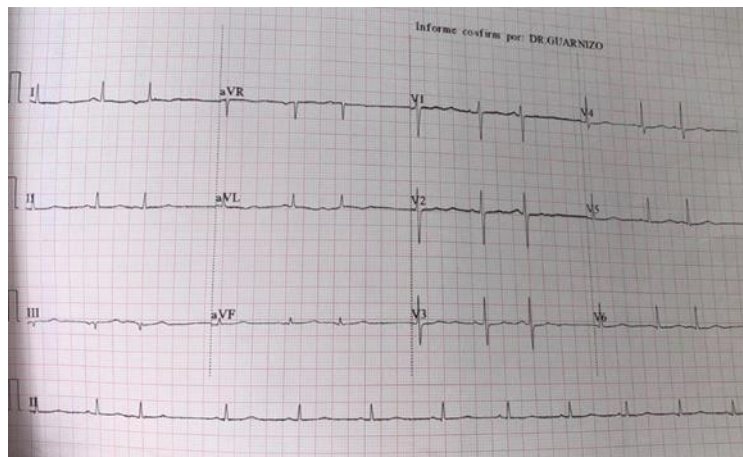


Figure C. Electrocardiogram Dextrocardia

Annexes:



Figure 1. Laparoscopic Equipment to The Left of The Patient. Ambato Teaching General Hospital



Figure 2. Gallbladder, Liver to The Left Side. Ambato Teaching General Hospital



Figure 3. Liver, Hartmann, Cystic Duct. Ambato Teaching General Hospital



Figure 4. Liver, Stomach, Sickle Ligament, Vesicular Bed. Ambato Teaching General Hospital



Figure 5. Completion of surgery. Trocar patches located in the patient's left hypochondrium. Ambato Teaching General Hospital

Patient with a history of arterial hypertension, chronic obstructive pulmonary disease, who clinically presented abdominal pain. Episodes of colic type of moderate intensity located in epigastrium with irradiation to left hypochondrium of months of evolution, having as diagnosis acute cholecystitis alitiásica revealed by hepatic echo and bile ducts, which reports intra-abdominal structures located on the left side and a gallbladder with thickened walls (6.0 mm) alithiasica, but with biliary mud inside. Due to the personal history of previous respiratory conditions, and now COPD in a non-smoking patient, a presumptive diagnosis of Kartagener's Syndrome is added ⁽¹¹⁻¹²⁾.

In proposed surgery, laparoscopic cholecystectomy is performed. Laparoscopy monitor is placed towards the left side of the patient, surgeon and first assistant are placed to the right, second assistant and instrumentalist to the left of the patient (illustration 1), we proceed to the placement of 10 mm trans-umbilical trocar, 10 mm subxiphoid, left subcostal 5 mm and 5 mm left flank. Thick-walled distended gallbladder measuring 12x6x3 in diameter with microliths and biliary mud inside (Figure 2). Normal bile duct. Anterior cystic artery. Short, thin cystic duct (Figure 3). Situs inversus totalis (Figure 4). Surgery lasting one hour and 50 minutes, without complication, during the postoperative period the patient receives antibiotic therapy with intravenous ceftriaxone 1gr every 12 hours (Figure 5).

The importance of this case justifies, fundamentally, that, although the association of gallbladder pathology and that of patients with SITUS INVERSUS is scarce, its incidence may vary (0.04% in the Philippines, 0.0049% in the United States of America and up to 0.001% in Mexico) ⁽¹¹⁻¹²⁾. As health professionals we must be attentive to any eventuality that patients present both in the clinical and surgical aspects, be able to adapt to the situation, remembering that each patient must be treated as an individual being

4. Conclusion

In conclusion, this research on laparoscopic gallbladder surgery in a patient with Situs Inversus Totalis and cholecystitis without stones has provided significant and relevant results for the field of surgery and medicine. Despite the rarity of this medical condition, this patient was successfully identified and treated, highlighting the importance of early detection and a multidisciplinary approach in atypical cases.

Performing laparoscopic surgery in this setting proved feasible and safe, although careful adaptation was required due to the abnormal position of the organs. The surgical technique used was adjusted to the situation of Situs Inversus Totalis, which evidences the need for an experienced and trained medical team to face unusual clinical situations. The postoperative results were satisfactory, since the patient presented an adequate recovery and absence of significant complications. The successful resolution of cholecystitis without stones in this patient highlights the efficacy of laparoscopic surgery in the treatment of this condition, even in cases with atypical anatomy.

The identification of these types of clinical cases is essential, as Situs Inversus Totalis and cholecystitis without stones are rare conditions that can present a challenge for healthcare professionals. The publication and dissemination of this research will contribute to medical knowledge and allow a better understanding of management strategies in unique and challenging clinical situations.

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