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Case Report

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Laparoscopic cholecystectomy in patient with situs inversus totalis: Diagnostic and treatment pitfalls

Roberto Marcellus de Barros Sena[1], Marcelo Barros Weiss[1], Ana Paula Teixeira de Abreu[2], Luisa Pires Costa[3], Rodrigo Pereira Peixoto[3], Camila Couto Gomes[3], Ana Paula Fernandes Braga[3], Felipe Couto Gomes[4], Carlos Augusto Gomes[1,5]

ABSTRACT

Situs inversus totalis, a rare congenital recessive autosomal malformation described in humans by Fabricius, in 1600, is characterized by the viscera's transposition. It presents the incidence of approximately one case to each 10.000-20.000 newborns. The main etiology is still unknown and when the abdominal and thoracic visceral commitment is associated, including dextrocardia, it is described as situs inversus totalis. We report the case of a female patient, 16-years-old, who came to the Digestive Surgical Department, in hospital Therezinha de Jesus, Juiz de Fora – MG – Brazil, complaining of pain in the left hypochondrium, associated to nauseas and vomiting. The patient mentioned that she had been suffering for 4 months and that the pain worsened in the previous 2 days. At the general clinical examination, she presented a cardiac focus ausculta in the right hemithorax, however, without abnormalities. The abdomen was flat, without surgical scars, ventral or inguinal hernias. There was hyperthermia, pain in the deep palpation on the left hypochondrium, associated guarding and rebound tenderness. The patient told that she had a previous diagnosis of situs inversus totalis. The aim of this case report is to describe a patient with cholecystitis associated with situs inversus totalis, who was previously aware of her congenital abnormality. Moreover, we review some aspects for the correct diagnosis, and propose recommendations for a safe laparoscopic cholecystectomy.

Key words: Cholecystectomy, cholelytiase, laparoscopy, situs inversus

Introduction

Situs Inversus Totalis is a rare congenital recessive autosomal malformation, which is characterized by the viscera's transposition and it was described, in humans, in 1600 by Fabricius [1-3]. It presents the incidence of approximately one case to each 10.000-20.000 newborns. The main etiology is still unknown and when the abdominal and thoracic visceral commitment is associated, including dextrocardia, it is described as situs inversus totalis. The partial commitment, although rare, has been related in the literature. When combined with bronchiectasis, sinusitis, trachea-bronchial tree cilia de-

Author affiliations : *[1]Department of Surgery, Surgery Unit, Hospital Universitário Terezinha de Jesus, Faculdade de Ciências Médicas e da Saúde de Juiz de Fora (SUPREMA), Brazil, [2]Department of Internal Medicine, Faculdade de Ciências Médicas e da Saúde de Juiz de Fora (SUPREMA), Brazil, [3]Department of Internal Medicine, Hospital Universitário (HU), Universidade Federal de Juiz de Fora (UFJF), Brazil, [4]Department of Morphology, Faculdade de Ciências Médicas e da Saúde de Juiz de Fora (SUPREMA), Brazil, [5]Department of Surgery, Hospital Universitário (HU), Universidade Federal de Juiz de Fora (UFJF), Brazil*

Correspondence : *Carlos Augusto Gomes, MD, Department of Surgery, Surgery Unit, Hospital Terezinha de Jesus, Faculdade de Ciências Médicas e da Saúde de Juiz de Fora (SUPREMA), Brazil. e-mail: caxiaogomes@terra.com.br*

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ficiency, it is well known as Kartagener's syndrome [4].

The diagnosis and the treatment of acute illnesses, especially those located in the abdomen, can present difficulties. The most important aspect refers to a change in the viscera's laterality. In this way, prevalent diseases like cholecystitis could have the diagnosis delayed because of the presence of the malformation. Thus, a great diagnosis suspicion and the appropriate use of image methods are important. Usually, the abdominal echography is requested, which allows the diagnosis of the anomaly and the cause of acute illness.

The first laparoscopic cholecystectomy performed in a patient with situs inversus totalis was described by Campos and Sipes [2,4,5]. From a surgical point of view, the surgeon needs a quick visual adaptation and motor skills reorientation. This is a crucial aspect when the cholecystic pedicle dissection is to be performed. The aim of this report is to describe a case of a patient with cholecystitis associated with situs inversus totalis, who was previously aware of her congenital abnormality. Moreover, we review some aspects for the correct diagnosis, and advance recommendations for a safe laparoscopic cholecystectomy.

Case Report

A female patient, 16-years-old, came to the Digestive Surgical Department, in hospital Therezinha de Jesus, Juiz de Fora – MG – Brazil, complaining of pain in the left hypochondrium, associated to nauseas and vomiting. She mentioned that she had been suffering for 4 months and that the pain worsened in the last 2 days. The symptoms disappeared temporarily with intravenous analgesics.

At the general clinical examination, she presented a cardiac focus ausculta in the right hemithorax, however, without abnormalities. The abdomen was flat, without surgical scars, ventral or inguinal hernias. There was hyperthermia, pain in the deep palpation on the left hypochondrium, associated guarding and rebound tenderness. The patient told that she had been previously diagnosed with situs inversus totalis.

The laboratory test showed that the patient had a slight anemia and mild leukocytosis. A thorax radiogram was requested, which confirmed the diagnosis of dextrocardia. A total abdominal echography revealed the upside-down abdominal visceral positions and the presence of gallbladder stone and minor wall thickening compatible with the diagnosis of acute cholecystitis. The main biliary tree had a regular and normal diameter (Figure 1).

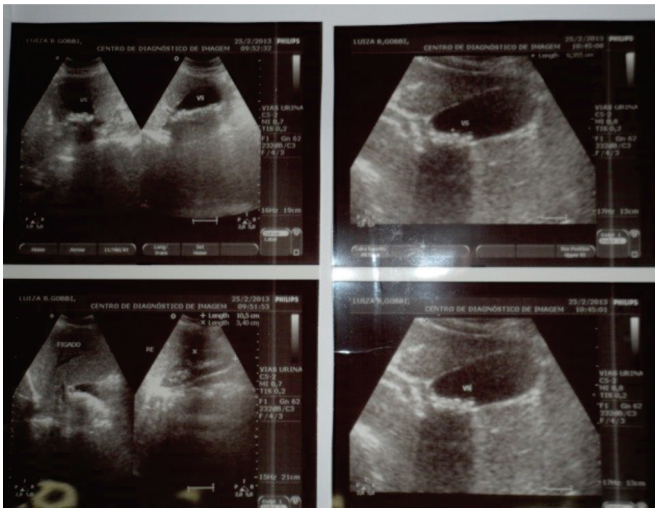

Figure 1. Abdominal echography: The liver and the biliary tract in the opposite side of abdomen (Situs Inversus Totalis) associated with cholecystolithiasis and mild cholecystitis.

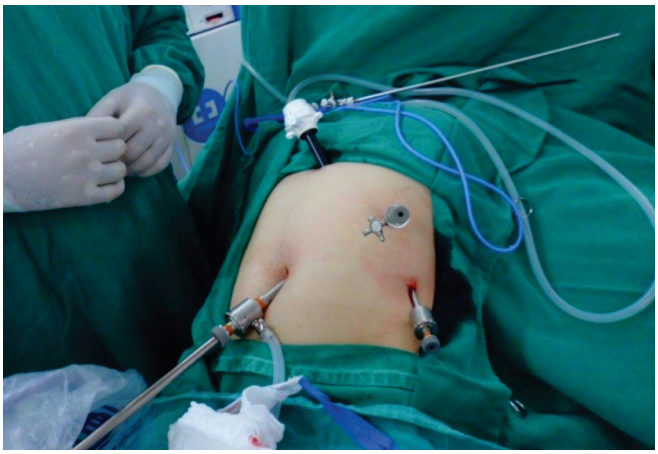

Figure 2. The trocars positioned in the left side of abdomen.

The exploration of the abdominal cavity with a 30° optical instrument confirmed the diagnosis of situs inversus totalis. Consequently, the patient was submitted to a laparoscopic cholecystectomy. In this way, the classical triangular position of the usual three surgical sites was done on the left side of the abdomen (Figure 2). The procedure lasted for about 50 min and there was no further complication. The patient was discharged in the day following the surgery and had an uneventful recovery. The histological exam of the gallbladder diagnosed chronic and acute cholecystitis.

Discussion

The presence of situs inversus has not been related to the predisposition on stone formation in the gall-

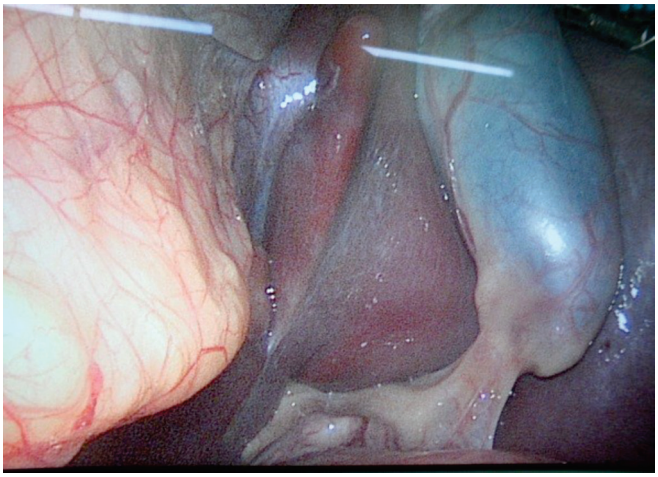

Figure 3. Gallbladder and cholecystic pedicle exposition during laparoscopy cholecystectomy. Observe the falciform ligament on the left side of abdome.

bladder and biliary tree. Accordingly, the incidence of cholecysttholitiase and acute cholecystitis is the same than in the general population. Unlike patients suffering from visceral transposition, these patients usually do not show arterial, venous or bilious tractus abnormalities [6].

The clinical diagnosis of cholecystitis in patients with situs inversus totalis is confusing, mainly because of laterality and the referred pain area. It has been seen that about 10% of them have initially shown clinical pain in the right hypochondrium [6]. These findings suggest that the central nervous system may not share the same mechanisms involved in the visceral transposition [6]. This information must be kept in mind and is a warning for the diagnosis of the unusual clinical cases of acute abdomen.

The image methods such as abdominal echography, tomography and nuclear magnetic resonance help the diagnosis of the abdominal visceral transposition, as it is seen in this case and confirmed by the laparoscopic examination [6,7] (Figure 3). The laparoscopic cholecystectomy is the procedure of choice and the easiest performance for the surgeon for whom the left side is the dominant. Since the Campos and Sipes [2,4,5] descriptions, 50 additional cases of laparoscopic cholecystectomy in patients with situs inversus totalis were reported and none of them needed laparotomy. The absence of the laparotomic approach, despite the unfamiliar anatomy, might be due to a publication bias. However, it is worth to remember the classical recommendation: The compromise for any surgeon is not the approach (laparoscopy) but with your patient (safe procedure). Therefore, if the anatomy is not clear enough, it is advised to convert the procedure for a laparotomic approach. At the same time, it is known that situs inversus seems to be a well-known factor for iatrogenic injuries in the biliary tract [8-11].

From a surgical point of view, it is important to highlight the necessity of a new pre-operatory planning, which involves a repositioning of the surgical team and the trocars in the left side of the abdomen [Figure 2]. For the surgeon a quick visual adaptation and motor skills reorientation are required. This detail is a crucial aspect when the cholecystic pedicle dissection is being performed. In fact, the most important step of the operation is to achieve the critical level for safety of cholecystic pedicle [12,13]. The dissection of the colecystic pedicle is nor time-consuming, but may be uncomfortable and difficult [14]. Once again, it advised the use of critical view for safety in all cases of laparoscopic cholecystectomy as an alternative to reduce iatrogenic biliary tract injuries. The clip positioning in any structure of cholecystic pedicle is unsafe without observing this recommendation [12,13].

Nowadays, four-trocar conventional cholecystectomy is the gold standard for symptomatic cholelithiasis, but a less invasive approach was developed in 1990's to decrease the number of ports, known as "minimal access surgery" [15]. The single incision laparoscopic surgery (SILS) has better cosmetic results, and less postoperative pain [16,17]. In addition, it has been noticed that the learning curve is short [10]. SILS cholecystectomy performed by experienced surgeons may be as successful, feasible, effective and safe as a standard laparoscopic cholecystectomy [15]. The right-handed surgeons can use their right hands for the dissection and their left hands for the traction [17], in the same portal. However, further randomized controlled trials, with large series and long-term follow-up, are needed to evaluate the potential benefits of SILS before its use can be widely recommended [10,15,16].

In short, the situs inversus totalis is a rare disease, and the diagnosis for acute cholecystitis may be difficult. The treatment of choice is the laparoscopic cholecystectomy. This procedure is recognized as a risk for iatrogenic injury in the biliary tract. The cholecystic

pedicle dissection to achieve the critical level of safety is a quick procedure, but may be uncomfortable and difficult. Therefore, if the anatomy is not clear enough, the recommendation is to convert the procedure to a laparatomic approach.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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