

# Technical Aspects of Laparoscopic Cholecystectomy in a Patient with *Situs Inversus Totalis* – Case Report

## Aspectos Técnicos da Colecistectomia Videolaparoscópica num Paciente com *Situs Inversus Totalis* - Relato de Caso

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### ABSTRACT

*Situs inversus* is a rare anomaly characterized by transposition of organs to the opposite side of the body. We report a 16-year-old woman with known *situs inversus totalis* and gallstone disease who underwent a successful laparoscopic cholecystectomy. Diagnostic and technical challenges of the operation are discussed.

**Key words:** *Situs inversus totalis*, Laparoscopic cholecystectomy, Gallstone Disease.

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### INTRODUCTION

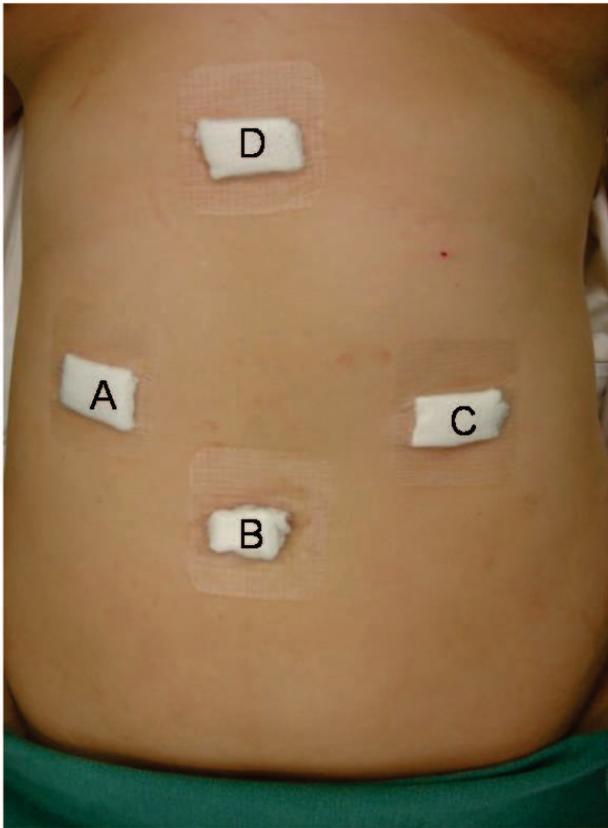
*Situs inversus* is a autosomal recessive morphogenetic abnormality, characterized by the transposition of the abdominal viscera to the opposite side.<sup>1</sup> This inversion of the topography can occur in the abdominal cavity *and* the chest or, more rarely, in one of the two. Its incidence is estimated at 1:5,000 to 1:20,000 live births.<sup>2</sup> The clinical diagnosis of gallstones in these patients is more difficult because the clinical presentation is confusing, especially because of the pain localized to the left hypochondrium. There is no evidence showing a higher incidence of gallstones in people with *situs inversus* than in those with the orthotopic topography of the abdominal viscera.<sup>2</sup> Several studies have shown that laparoscopic cholecystectomy is safe in these patients, however, due to the rarity of this condition, there is no standardization of procedure's technique.<sup>1-5</sup> Our objective is to present the case of a women with *situs inversus* and cholelithiasis who underwent laparoscopic cholecystectomy and discuss the technique used.

### CASE REPORT

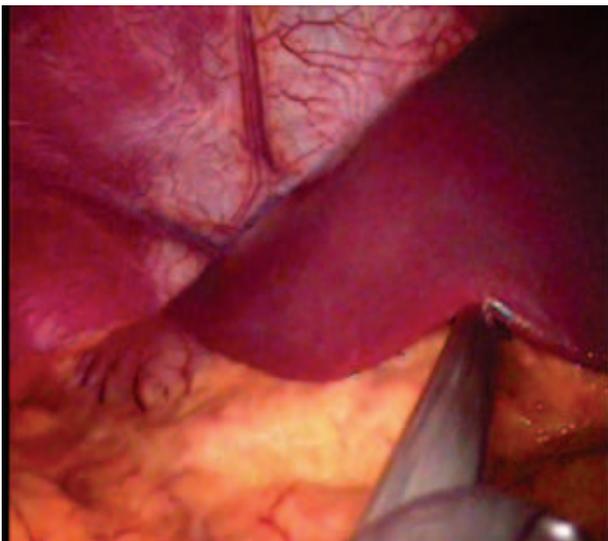
The patient was an overweight (BMI = 26.9) 16 year old adolescent female with an established diagnosis of *situs inversus totalis*, who presented with a four month history of biliary colic, that localized to the left hypochondrium. Chest radiograph, electrocardiogram, and ultrasound revealed dextrocardia, sinus rhythm and *situs inversus totalis* with the presence of multiple gallstones with an average diameter of 6 mm.

The laparoscopic cholecystectomy was performed with the patient in the semi-lithotomy position with the surgeon between patient's legs. The trocars were positioned as shown in Figure 1. After the optic was introduced, the mirrored anatomy of the abdominal organs was noted (Figure 2).

The surgeon maneuvers his instruments through the pararectus trocars and performs the dissection of the infundibulum with the right-hand forceps while both the Assistant surgeon on the right and the Assistant surgeon on the left of the patient pull the bottom of the gall bladder postero-superiorly



**Figure 1** – Dressings corresponding to the trocar positions. A) Right Pararectus (10mm); B) Umbilicus (10mm); C) Left Pararectus (5mm); D) Epigastric (5mm).



**Figure 2** – Videolaparoscopic view of the mirrored anatomy of the abdominal organs.

through trocar placed adjacent to the xiphoid process while the Assistant surgeon on the right of the patient maneuvers the camera. Cholangiography was

performed intraoperatively (Figure 3) to identify anatomical variations of the biliary tree; none was noted. After 90 minutes of surgery the gallbladder was removed through the umbilicus. The patient was discharged the next day.

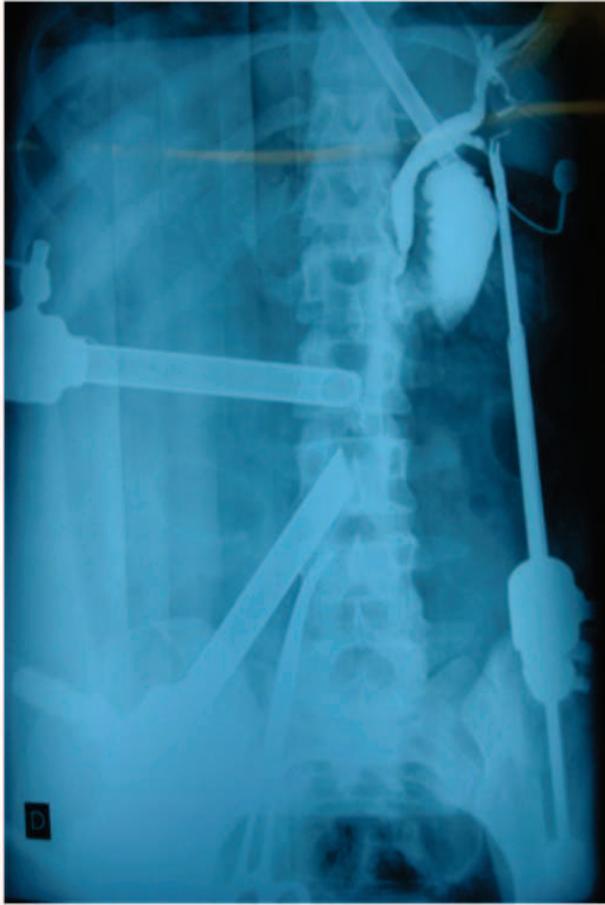
## DISCUSSION

In 1600, Fabricius described the transposition of the abdominal organs in a man.<sup>5</sup> The first report of a laparoscopic cholecystectomy in a patient with *situs inversus* was published in 1991.<sup>5</sup> Although it is a condition in which there is an alteration of the anatomy, there is no predisposition to gallbladder disease.

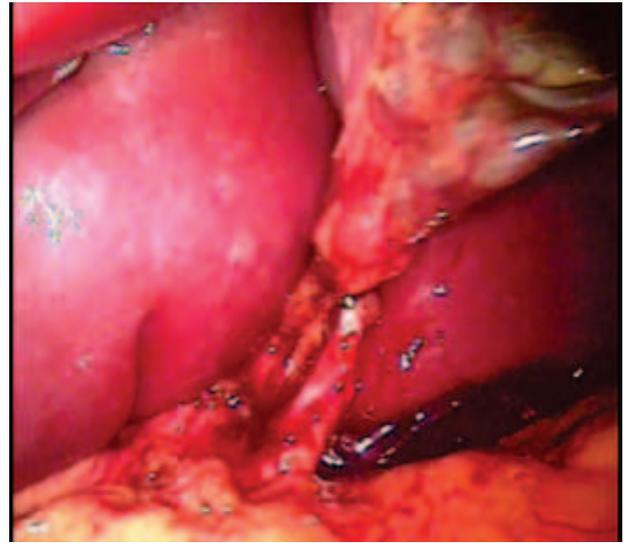
The technical challenge performing a laparoscopic cholecystectomy in a patient with inversion of the abdominal organs – when confronted with the mirror image – consists in adapting the position of the surgeon, the Assistants, and the trocars for the dissection of the gallbladder hilum and the exposure of the gallbladder.

Most reports in the literature describe the mirrored arrangement of both the trocars and the surgical team<sup>1,3,5</sup> corresponding to the inversion of the abdominal organs. This positioning, which at first seems more logical, accentuate the cognitive bias and hampers the dissection of the Calot's triangle. The surgeon is not accustomed to seeing the falciform ligament crossing superiorly and to the left across the video screen. There is constant crossing of the instruments as the base of gallbladder is brought forward, a frequent need for dissection with the left hand,<sup>4</sup> and even placement of an extra trocar.<sup>2</sup> In this context it was suggested that laparoscopic cholecystectomy would be more easily performed by a left-handed surgeon.<sup>4</sup>

When operating between the legs of the patient, the adaption to the inversion of the position of the intracavitary organs seems faster. The surgeon performed the dissection of the gallbladder hilum with his right hand in the region anterior and posterior to Cabot's triangle (Figure 4) and there were no crossing of the instruments. The camera and the forceps adjacent to the xiphoid were handled by both the first and second Assistant surgeons as needed during the surgeon's dissection. The placement of clips and the sectioning of the cystic duct were performed with the surgeon's left hand, while the catheter for cholangiography was inserted with the right hand. If a 10mm trocar is placed in the left flank, the surgeon



**Figure 3** - Intra-operative Cholangiography.



**Figure 4** - View of Calot's Triangle.

could clip and section the structures exclusively with the right hand.

We conclude that laparoscopic cholecystectomy in patients with *situs inversus totalis* has advantages when performed by the technique described above, since it avoids crossing of the instruments and permits the dissection with the right hand, facilitating the adaptation to the cognitive bias associated with the inversion of the abdominal organs.

## RESUMO

*Situs Inversus* é uma anomalia rara caracterizada pela transposição dos órgãos para o lado oposto. Neste relato de caso apresentamos uma paciente com diagnóstico de *situs inversus totalis* e colelitíase, sendo submetida, em nosso serviço, a uma colecistectomia videolaparoscópica bem sucedida. As dificuldades diagnósticas e técnicas da cirurgia são discutidas.

**Palavras-chaves:** *Situs Inversus Totalis*, Colecistectomia videolaparoscópica, colelitíase.

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