



LAPAROSCOPIC CHOLECYSTECTOMY IN INDIVIDUALS WITH SITUS INVERSUS TOTALIS: REVIEW OF LITERATURE

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ABSTRACT

Introduction: Situs inversus totalis is a congenital anomaly characterized by transposition of the thoracic and abdominal organs, presenting the liver on the left side of the body. Thus, a diagnostic confusion is common in these cases, including diseases related to gallbladder. Performing cholecystectomy in these situations usually presents as a challenge, even in experienced hands. Besides of technical challenges to perform a surgery in such individuals, there are a few reports related to laparoscopic cholecystectomy in the current scientific literature. **Objectives:** This article aims to out a review of the literature about the American technique for laparoscopic cholecystectomy in mirror positioning for adult patients with situs inversus totalis and describe the describe critical points. **Methods:** Clinical review of the medical record and review of the literature on PubMed / MEDLINE / Scielo / Google Scholar. **Conclusion:** Laparoscopic cholecystectomy by the American technique in mirrored positioning is possible in patients with situs inversus totalis and is a safe procedure.

KEYWORDS : Situs Inversus, Cholecystectomy, Laparoscopy, Pancreatitis.

INTRODUCTION

Situs inversus totalis is a rare congenital anomaly caused by an autosomal recessive genetic disorder that can be linked to the X chromosome. It has an incidence of 1 in 5,000 to 20,000 live births and is also found in identical twins. The first case was reported by Fabricius in 1600.^{1,2}

Anatomically, there is a mirror transposition of the thoracic and abdominal organs through the sagittal plane, presenting as a mirror image, so that the heart, stomach and spleen are situated on the right side of the body and the liver on the left side.^{3,4,5}

Although not considered as a pathological alteration and does not alter longevity, this condition may be associated with some affections, including heart disease, bronchiectasis, sinusitis and tracheobronchial ciliary deficiency.⁵ However, no evidence was found that showed an increase in the prevalence of diseases related to calculus of the biliary tree or gallbladder in patients with situs inversus totalis.⁵

Thus, we aim to describe the literature review of the laparoscopic cholecystectomy technique in patients with situs inversus totalis (Figure 1)

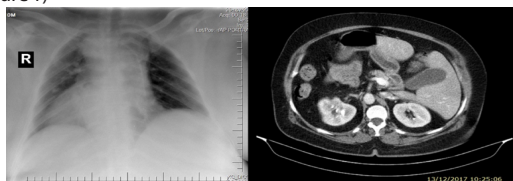


Figure 1. Chest X-ray (left) and computed tomography (right) of patient with situs inversus

DESCRIPTION OF THE TECHNIQUE

The American technique was used in a mirrored position, in which the video tower and the auxiliary surgeon were to the left of the patient and the surgeon and the camera to the right. The pneumoperitoneum can be done by the open technique or by the Veress needle. The first incision was made in the umbilical region for the 10mm trocar passage (camera), followed by a 10mm trocar 1.5cm below the xiphoid appendix and two 05 mm trocars on the left flank and left subcostal flank (Figure 2). It can be observed in figure 3, the situs inversus, with the gallbladder in topography of left hypochondrium. It is important to note that dissection of the Callot triangle (Figure 3) is difficult because the hands of the surgeon are in the opposite direction to the technique commonly performed. During dissection, the assistant surgeon applies counter-traction to the bottom of the gallbladder, facilitating such maneuver. From the dissection, clamping and dieresis of the cystic duct and cystic artery were performed by similar technique to that of conventional surgery. It took 110 minutes to perform the procedure, contemplating the onset of anesthesia until its end.

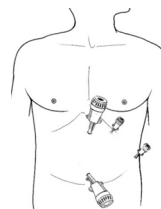


Figure 2. Positioning of the trocaters during laparoscopic cholecystectomy in a mirrored American

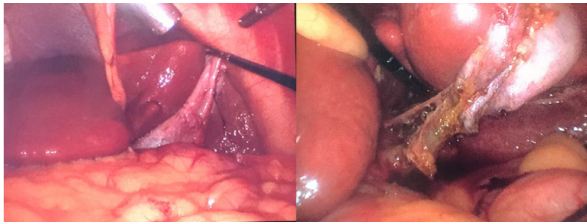


Figure 3. Location of the vesicle in situs inversus (left) and critical vision (right)

Literature Review

Situs inversus is a rare autosomal recessive condition with prevalence varying from 0.04% to 0.30%. It can be classified into two types: partial, involving only thoracic or abdominal organs, and the total, involving both.⁷

In patients with situs inversus totalis, the diagnosis of gallstones can be delayed due to the inverted positioning of the organ and also to the localization of symptoms which varies from vague abdominal pain to pain in upper abdomen. Only 10% of the patients present with the classic symptomatology: pain in the right hypochondrium.^{2,8} This variation occurs because the central nervous system does not share the general transposition of the intracavitary organs.⁹ However, situs inversus does not interfere with patient survival nor predispose to the formation of cholelithiasis.³

In 1991, Campos and Sipes described the first case of laparoscopic cholecystectomy in a patient with successful situs inversus.¹⁰ In 2017, of Ren et al. reported 70 other cases with several modifications of the classic laparoscopic technique.¹ However guidance and ergonomics are critical points that may increase surgical time, there is no evidence to suggest an increased risk of bile duct injury in patients with situs inversus in laparoscopic surgery.⁹

In patients with situs inversus totalis, the whole image is mirrored in laparoscopy, which requires the surgeon to position himself on the right side of the patient, with the video monitor on his left shoulder.¹³ Another position that can be adopted by the surgeon is the so-called French position, in which the surgeon positions himself between the patient's abducted legs, allowing good ergonomics.¹²

One of the most used techniques is the insertion of the trocars in a mirrored way, with the trocars of 05 mm on the left side, in the hemiclavicular line and anterior axillary.⁹ It is preferable to use the medial and lateral anatomical relations instead of right and left, since the medial and lateral relations are preserved in the situs inversus.¹³

The dissection of the Callot triangle can be performed by both the right hand and the left hand of the surgeon.¹¹ At this point, dissection is difficult because the right hand is used for retraction and the left for dissection.¹⁴ Due to the difficulty of the use of the left hands by right-handed surgeons in the dissection of the Callot triangle, they can use the right hand for this purpose, since such procedure would be inaccurate if performed by a non-dominant hand without training.^{15,16} On the other hand, the left-handed surgeon can alternate good dissecting performance with both hands, so that the procedure is facilitated when performed by such a hand.^{7,17}

Other technical difficulties for right-handed surgeons include crossing the hands and visual and motor adjustment, contributing to the longer time elapsed in the dissection of the Callot triangle and longer duration of the surgical procedure in patients with situs inversus.^{5,11} Thus, the role of the first auxiliary or other element in the retraction of the infundibulum is fundamental to facilitate the dissecting maneuvers of the surgeon with the right hand.²

Laparoscopic retrograde cholecystectomy is an alternative option for open cholecystectomy in difficult cases, but a high degree of surgeon experience is required.¹⁷ Until now there are no reports of conversion to open surgery in the literature. This may be related to the excess of precaution taken in these cases, or the tendency to report only the successful cases.¹⁸

The surgeon can choose which method to use, respecting the principles of dissection of the Callot triangle and safety vision before clipping or sectioning any structure.¹⁹ Due to the possibility of anatomical variation associated with the condition, the option of performing intraoperative cholangiography may reduce complications.²⁰

Thus, laparoscopic cholecystectomy can safely be performed in patients with situs inversus totalis by several different methods.²¹ In the case presented, despite the technical difficulties encountered, adequate dissection was possible without intercurrents.

Finally, laparoscopic cholecystectomy is a technically difficult procedure in patients with situs inversus totalis, but it is not contraindicated for its accomplishment. Thus, adaptations of positioning, trocar apposition, dissection and clipping are important aspects for the accomplishment of the task without inadvertent lesions.

CONCLUSION

Despite the technical difficulties found, laparoscopic cholecystectomy is reproducible and safe for patients with situs inversus totalis with surgical indication, being considered the gold standard treatment for calculi biliary diseases.

Several techniques and surgical adaptations have already been described, and it is up to the surgeon to choose the one that best fits, making surgery safer.

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