

Retrograde (fundus first) Laparoscopic Cholecystectomy in *Situs Inversus Totalis*

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استئصال المرارة العكسي بالمنظار الجراحي في حالة انعكاس وضع الأحشاء الكلبي

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الملخص: انعكاس وضع الأحشاء الكلبي من العيوب نادرة الحدوث وتتميز بانعكاس وضع الأحشاء إلى الجانب من الجسم، وهذا قد يسبب صعوبة في تشخيص وعلاج الأمراض التي تصيب الأحشاء. نقدم هنا تقريراً لعلاج حالة التهاب المرارة الحصوي المزمن تم استئصالها بالمنظار الجراحي.

مفتاح الكلمات: انعكاس كلي لوضع الأحشاء، حصى المرارة، منظار البطن الجراحي، استئصال المرارة، تقرير حالة، مصر.

ABSTRACT: Situs inversus totalis (SIT) is an uncommon anomaly characterised by transposition of organs to the opposite side of the body in a mirror image of normal. It may cause difficulties in the diagnostic and therapeutic management of abdominal pathology due to the mirror-image anatomy. We report the management of a case of symptomatic cholelithiasis with emphasis on its surgical technique.

Keywords: Situs inversus totalis; Cholelithiasis; Laparoscopy; Cholecystectomy; Case report; Saudi Arabia.

SITUS INVERSUS CAN BE EITHER TOTAL OR partial. Total *Situs inversus* is characterised by a heart on the right side of the midline, aorta turning to the right and reversed position of all cardiac chambers. The liver and the gall bladder are on the left side. The patients are usually asymptomatic and have a normal longevity, but at times this condition may be associated with other ailments, which may lead to its chance detection either preoperatively, or as an intraoperative surprise.^{1,2} Laparoscopic cholecystectomy has become the standard operative procedure for gall bladder disease. It is associated with reduced hospital stay, fewer complications, less pain and a faster return to work.³

We report a patient with complete *Situs inversus* who presented with biliary colic and underwent a difficult laparoscopic cholecystectomy that was completed by laparoscopy and not converted to open cholecystectomy.

Case Report

A 24 year-old single Saudi female with *Situs inversus totalis* presented to our general surgery clinic with a long history of pain in the left upper abdomen. The pain was colicky in nature, radiating to the back and this condition was aggravated by fatty meals. Physical examination showed positive Murphy's sign in the left hypochondrium. The patient was in good general condition apart from mild controlled bronchial asthma. Examination of the cardiovascular system revealed the apex beat to be in the right fifth intercostal space. There was mild tenderness in the left hypochondrium and the adjoining epigastrium. Haematological, biochemical and echocardiography parameters were within the normal range.

Ultrasound showed the location of gall bladder on the left side of the body and this was confirmed by a computed tomography (CT) scan of the abdomen

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Figure 1: Computed tomography scan of the chest revealing heart mainly in the right side of the chest.

[Figures 1 and 2]. She had been previously unaware of this anomaly. A laparoscopic cholecystectomy was performed on an elective basis.

The patient was placed in the supine position with both the surgeon and cameraman on her right side and the assistant on the left side. Laparoscopic cholecystectomy was undertaken using the 4-port technique. The video monitor was placed near the left side of the patient's head. Pneumoperitoneum was created to a pressure of 14 mm Hg using an open technique through an umbilical incision and the 0-degree telescope was inserted through a 10-mm umbilical (primary) port (Port 1). A 5-mm port was placed about 10 cm just below the left costal cartilage in the anterior axillary line and a grasper was inserted to catch and retract the fundus of the gall bladder (Port 2). A 10 mm port was inserted 4 cm below the xiphoid process, 1 cm left to midline (Port 3) and another 5 mm port was inserted just 5 cm below the previous port (Port 4) [Figure 3]. Being right-handed, it was difficult to dissect through port 3, as is routinely done, so we alternately used port 3 and port 4 for dissection. The dissection of Calot's triangle was difficult and the anatomy not clear so we dissected the gall bladder retrograde (fundus first) and applied an ENDOLOOP[®] (AutoSuture, USA) ligature to the cystic duct and artery then division. The gall bladder was removed from port 3 and a suction tube drain was placed in the subhepatic space.

The operation took nearly 2 hours and was completed successfully. The patient made an uneventful recovery and was discharged home the next day.

Discussion

Situs inversus occurs once in approximately 20,000 live births and has an autosomal recessive inheritance. The frequency of cholelithiasis in patients with *Situs inversus* is similar to that in the general population; however, the condition may present diagnostic difficulty. The pain of biliary colic may be located in the epigastrium or in the left subcostal region and that of cholecystitis radiates to the left infrascapular region and the left shoulder.⁴ *Situs inversus* usually remains undiagnosed, as exemplified by the present case, unless it is diagnosed accidentally while investigating for another associated problem. *Situs inversus totalis* is an extremely rare condition and performing successful laparoscopic cholecystectomy in these patients is even rarer.⁵ In a MEDLINE search, only 38 cases were identified, one of these cases being from Saudi Arabia.⁶ In patients with *Situs inversus*, the mirror image anatomy poses difficulty in orientation during laparoscopic cholecystectomy. First, various laparoscopy ports need to be positioned at sites that are mirror image of those in the usual patient. Second, the surgeon needs to reorient visual images and surgical steps in an anatomical field that has undergone clockwise rotation. In the reports described previously, the surgeon dissected with his left hand, or asked for



Figure 2: Computed tomography scan of the abdomen revealing left-sided gall bladder with stone shadow inside.



Figure 3: Port sites after closure and before stitch removal

assistance to grasp the neck of the gall bladder while he dissected the Calot's triangle.^{7,8} In our case, both surgeons were right-handed; therefore the technique had to be adjusted. It is much easier for a left-handed surgeon to perform laparoscopic cholecystectomy in such patients. We performed the dissection alternatively from both cannulae of ports 3 and 4. Retrograde ("fundus first") dissection is frequently used in open cholecystectomy and, although feasible in laparoscopic cholecystectomy (LC), it has not been widely practiced.⁹ The dissection was difficult as we could not dissect the Calot's triangle because of dense adhesions obscuring the anatomy so we started fundus first. It was a safe procedure and we could complete the procedure laparoscopically.

Though laparoscopic cholecystectomy in such patients is technically more demanding, an experienced laparoscopic surgeon can perform it safely. Thus, *Situs inversus totalis* does not appear to be a contraindication to laparoscopic cholecystectomy.

Conclusion

We conclude from this case that retrograde laparoscopic cholecystectomy is the alternative choice instead of open cholecystectomy in difficult cases and can be carried out even in *Situs inversus totalis*, but that these cases need a high degree of experience

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