

Laparoscopic cholecystectomy for a symptomatic cholelithiasis in a patient presenting situs viscerum inversus totalis

A case report



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INTRODUCTION: *Situs Viscerum Inversus totalis (SIT) is a rare anomaly with genetic predisposition, in which organs are translated, completely or partially, on the opposite side of the body. Generally there are no organic dysfunctions. Situs Inversus can cause difficulties in the diagnostic and therapeutic management of abdominal diseases because of the mirror-like anatomy. On a clinical point of view the symptoms of cholelithiasis may be confused by the opposite position of the gall bladder*

CASE PRESENTATION: *We report the case of a 48 year old female latin-american with symptomatic cholelithiasis and Situs Viscerum Inversus Totalis, treated with Laparoscopic Cholecystectomy.*

CONCLUSION: *Videolaparoscopy represents the gold standard treatment in managing cholelithiasis in SIT patients. Surgical treatment can be facilitated in case of well-experienced operators, as it is well recognised a major difficulty for surgeons in managing the anatomical condition of SIT.*

KEY WORDS: Laparoscopic cholecystectomy, Situs Viscerum Inversus Totalis

Introduction

Situs Viscerum Inversus Totalis (SIT) is an uncommon condition; its incidence is estimated to be in the region of 1:10000 to 1:20000 reported cases. The visceral transposition may be complete or partial: the complete one affects thoracic organs, as well as the abdominal organs. This condition can be associated to the Kartagener's

Syndrome ¹. Situs Inversus has been described for the first time in 1793 by the Scottish physician and pathologist Matthew Baillie. Since Mouret executed for the first time in 1987 a laparoscopic cholecystectomy (LC), this has become the standard surgical procedure for cholelithiasis.

Since 1992, 32 cases of cholelithiasis in patients with SIT have been reported in the English language medical literature that were treated by open surgery ². In 1991, Campos and Sipes were the first to report a successful laparoscopic cholecystectomy (LC) in a patient with Situs Inversus Totalis, and since then another 31 patients with Situs Inversus (Table I) have undergone laparoscopic cholecystectomy. Previous reports have established that SIT is not a contraindication to laparoscopic cholecystectomy.

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Case presentation

Female latin-american patient, 48 year old, slight overweight (BMI 26), with Situs Viscerum Inversus Totalis diagnosed at age 9. The patient was referred to our department for the onset of upper left abdominal pain radiated to the back, associated with nausea and bilious vomit. The diagnosis was acute cholecystitis and cholelithiasis. The patient was afebrile, with no evidence of bowel obstruction. Hemato-biochemical parameters reported an increase in white blood cell count (18×10^3) with neutrophilia (95%), a slight increase in sGOT and sGPT and an increase of non-specific markers of inflammation (VES and C-Reactive Protein). Ultrasonography of the abdomen showed an enlarged gallbladder with a 7 mm infundibular stone but no signs of biliary obstruction in intrahepatic and extrahepatic biliary ways. The patient underwent Esophagogastroduodenoscopy (EGD) that showed: Esophagus: no evidence of obstruction; Cardia: protruded through the esophageal opening of the diaphragm for 1.5 cm for sliding hiatal hernia; Stomach: nothing to report concerning the fundus, gastric mucosa appearing to get thinner and slightly hyperemic according to diffuse chronic gastritis. ERCP was not performed during the gastroscopy because sonography showed no signs of biliostasis. The ECG showed normal sinus rhythm and left ventricle overload. The patient then underwent laparoscopic cholecystectomy. Early postop was uneventful; oral feeding was resumed on postoperative day I. No postoperative complications were documented and the patient was discharged in good clinical conditions on postoperative day II. No infection of the surgical incisions was documented in the postoperative period. The ultrasonographic control 30 day after the operation has showed no pathological alteration. The histology confirmed the diagnosis of acute gall bladder inflammation and demonstrated no evidence of incidental cancer.

Operation technique

The operation technique in SIT is specular to the conventional technique for non-SIT cholecystectomy. The patient was placed in French position, with the surgeon standing between the patient's legs. A 10-mm peri-umbilical incision was made to insert a OMS 10/12 trocar and carbon dioxide pneumoperitoneum was then established according to Hasson's technique³.

After the abdominal cavity inspection we proceeded with the insertion of three more trocars under direct view. Trocars were placed in epigastric region, left hypocondrium and left lumbar region. A careful dissection of Calot's triangle was performed followed by the exposure of the cystic duct and cystic artery. Both structures were divided after being closed by titanium clips. The gallbladder was finally separated from the liver bed and removed with an Endobag through the 10-mm operating port.

Discussion

SIT is a recessive autosomic condition, although it could be X-linked: this anatomic anomaly of the left/right organ symmetry develops in the early stages of the embryonic development and it is due to the mutation of the DNAH11 region, encoding a gene called dynein. Dynein, a micro-tubule-based motor, is involved in the determination of left/right-handed asymmetry and provide insight into the early molecular mechanisms of this process. Cytoplasmic dyneins have been implicated in vesicular transport, nuclear migration, and spindle orientation, whereas axonemal dyneins produce the motive forces that cause the sliding of adjacent microtubules in the axoneme and thus produce ciliary and flagellar movement. In absence of congenital cardiac defects, individuals with Situs Inversus do not have phenotypic alterations. There is a prevalence of 5-10% of congenital cardiac defects in individuals with SIT. The most common is the transposition of the great vessels, which must be evaluated in the pre-operating phase.

There is no scientific evidence of an increased incidence of cholelithiasis in SIT patients.

Since Mouret in 1987 performed the first videolaparoscopic cholecystectomy, this has become the gold standard technique for this pathology. As shown in the Mochado article, this operation is generally lengthier than in no SIT patients, with a main operative time of 90 minutes reported in literature. This increase in operative time might be due to the need in redirecting the visual-motor skills of the surgeon and assistant in a mirror-like operative field and the difficulty in skeletonizing Calot's triangle.

The review of literature with the 29 cases in Table 1 showed that the shortest operative time was 65 minutes and no conversions to open surgery have been reported. In our opinion this might be attributable to the fact that every surgeon takes much more precaution in approaching laparoscopic cholecystectomy in these patients.

This anatomical anomaly may create difficulties in isolating the vascular and biliary structures thus determining accidental arterial or biliary lesions⁴. In our personal experience we found an important advantage in having a left-handed surgeon with an excellent experience in laparoscopy as first operator approaching the videolaparoscopic cholecystectomy in the SIT patient. This might be related to the use of the principal hand to perform the fine dissection of the hilar structures while the secondary hand is used to simply hold the bladder and expose the surgical field⁵. Anyway it stands to reason that a more experienced surgeon with a great learning curve in the laparoscopic technique starts with a clear advantage in approaching an operation already standardized in no-SIT patient, reducing considerably the operative time. Operative time may be furthermore influenced by the local situation of the operative field, as in our case there were no particular alterations except the

Table I - Summary of Patients With Situs Inversus Treated by Laparoscopic Cholecystectomy

No. (days)	Series	Year	Age/sex	Diagnosis*	Partial/Total	Time (min)	Postop	stay
1.	Current study	2005	65/F	Mucocele	T	80	1	
2.	Pitiakoudis	2005	47/F	CC	T	65	2	
3.	Mc Kay	2005	32/F	AC	T	-	-	
4.	Decimo	2004	41/F	CC	T	-	2	
5.	Kang	2004	64/F	CC/CBD calculi	T	240	7	
6.	Jesudason	2004	69/F	CC	T	-	-	
7.	Zan	2003	70/F	Biliary colic	T	-	-	
			65/M	AC	T	-	-	
8.	Polychronidis	2002	68/M	CC	T	-	-	
9.	Tronge A	2002	28/F	CC	P	-	-	
10.	Wong J	2001	68/F	CC/CBD calculi	T	-	-	
11.	Al Jumaily	2001	46/F	micro-lithiasis	T	-	-	
12.	Yaghan RJ	2001	48/F	CC	T	70	1	
			38/F	AC	T	80	3	
13.	Donthi R	2001	43/F	CC	U	-	-	
			39/F	CC	T	-	-	
14.	Nursal TZ	2001	42/F	CC	T	-	1	
15.	Singh K	2000	42/F	CC	T	-	-	
16.	Demetriades	1999	61/F	AC	T	-	3	
			37/M	CC	T	-	2	
17.	Habib	1998	45/F	CC	U	-	-	
18.	D'Agata	1997	72/F	CC	T	-	-	
19.	Elhomsoy	1996	-	AC	P	90	-	
20.	Crosher	1996	63/M	biliary colic	T	-	1	
21.	Malatani	1995	25/F	AC	U	70	2	
22.	Mc Dermott	1994	66/M	cholangitis	U	-	-	
				CBD calculi				
23.	Schiffino	1993	53/F	CC	T	-	-	
24.	Huang	1992	36/M	CC	T	-	1	
25.	Driver	1992	29/F	CC	P	-	1	
26.	Goh	1992	62/M	empyema	T	-	3	
27.	Lipschutz	1992	80/M	cholangitis	T	-	4	
				CBD calculi				
28.	Takie	1992	51/F	biliary colic	T	-	1	
29.	Campos	1991	39/F	CC	T	-	1	

*AC = Acute cholecystitis, CC = Chronic cholecystitis, CBD = Common Biliary Duct T = total situs inversus, P = partial situs inversus, U = unknown

Source: Machado NO, Chopra P. *Laparoscopic cholecystectomy in a patient with situs inversus totalis: feasibility and technical difficulties.* JLS. 2006 Jul-Sep;10(3):386-91.

SIT. In our case the operative time has been reduced to just 30 minutes without impairment of morbidity and post operative stay.

Conclusion

As already demonstrated in international medical literature, our case report confirms that Videolaparoscopy represents the gold standard treatment in managing cholelithiasis in SIT patients.

Laparoscopic cholecystectomy can be carried out safely in this group of patients by an experienced laparoscop-

ic surgeon. A surgeon with an excellent experience and a great learning curve in the laparoscopic techniques could have a clear advantage because he is able to perform a more fine dissection of hilar structures, reducing the operative time without affecting morbidity.

Riassunto

Il Situs Viscerum Inversus Totalis (SIT) è una rara anomalia a predisposizione genetica, nella quale gli organi sono trasposti in maniera parziale o completa dalla parte opposta del corpo. Generalmente non vi sono disfun-

zioni organiche. Il Situs Inversus può causare difficoltà nel trattamento diagnostico e terapeutico delle patologie addominali a causa dell'anatomia speculare rispetto al normale. Da un punto di vista clinico i sintomi della colelitiasi possono essere confusi a causa della posizione della colecisti nel lato opposto dell'addome.

Nel nostro lavoro presentiamo il caso di una paziente di sesso femminile di 48 anni con una colelitiasi sintomatica e Situs Viscerum Inversus Totalis trattata con una colecistectomia laparoscopica. Al momento del ricovero la paziente lamentava dolore addominale al quadrante superiore sinistro associato a nausea e vomito biliare, era apiretica e con alvo canalizzato. Gli esami clinico-strumentali mostravano leucocitosi neutrofila, lieve aumento degli enzimi epatici e degli indici aspecifici di flogosi; l'ecografia mostrava una colecisti con pareti ispessite ed un calcolo subcentimetrico nell'infundibolo.

La tecnica operatoria adottata è stata quella convenzionale, con il paziente in posizione francese ed il chirurgo tra le gambe del paziente.

Il decorso postoperatorio si è svolto privo di complicanze cliniche e chirurgiche e la paziente è stata dimessa in buone condizioni cliniche in II giornata postoperatoria. L'esame istologico ha successivamente confermato la diagnosi di colecistite acuta litiasica.

Non esistono evidenze scientifiche di un'aumentata incidenza di colelitiasi in pazienti con SIT.

Da una revisione della letteratura scientifica internazionale si evince che dal 1991 sono stati 32 i pazienti con SIT sottoposti a colecistectomia laparoscopica e che non esistono controindicazioni a tale intervento.

Dallo stesso articolo si evidenzia che nei pazienti considerati il tempo operatorio era di 90 minuti, probabilmente per il bisogno del chirurgo di riadattare le pro-

prie capacità visuo-motorie ad un campo operatorio speculare al normale, alla difficoltà nella scheletrizzazione del triangolo di Calot e non ultimo al fatto che ogni chirurgo prestava molta più attenzione nell'approcciare questo intervento laparoscopico in tali pazienti. Nel nostro caso invece il tempo operatorio è stato di soli 30 minuti, senza compromissione della morbilità.

La colecistectomia laparoscopica può essere eseguita in maniera sicura in questo gruppo di pazienti da un chirurgo esperto e con una buona curva di apprendimento nelle tecniche di laparoscopia, che ha un chiaro vantaggio in quanto in grado di effettuare una più fine dissezione delle strutture ilari, riducendo il tempo operatorio senza compromettere la morbilità.

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