

# Our Experience of Laparoscopic Cholecystectomy in Situs Inversus Totalis

MR Attri<sup>1</sup>, Rajni<sup>2</sup>, Abdul H Samoon<sup>3</sup>, Irshad A Kumar<sup>4</sup> 

## ABSTRACT

**Introduction:** First laparoscopic cholecystectomy in situs inversus totalis (SIT) patients was described by Campos and Sipes. We present a retrospective study of five cases in whom laparoscopic cholecystectomy was done for symptomatic cholelithiasis.

**Methodology:** This is a retrospective study from 2005 to 2021. All the patients in the study were done by a single surgeon at various hospitals in the state. All recorded data from patients and from hospitals was taken and analyzed.

**Results:** Our study included five patients with the mean age of 31.6 years. All the patients were females. Our patients presented with complaints of epigastric pain (2), dyspepsia (1), and pain in the left upper abdomen (2). There was no associated cardiac anomaly in our patients. The first three patients were operated on using conventional mirror image technique, the fourth one by modified mirror image, and the last one using French technique. In initial cases operating time was 45–50 minutes which decreased up to 35–40 minutes in the last cases. All patients were discharged on the first postoperative day after tolerating orals and with the satisfactory condition on discharge. There was no intra- or postoperative complication in our study. There was no 30-day mortality in our patients.

**Conclusion:** SIT is a rare congenital anomaly. A laparoscopic cholecystectomy is a safe approach with meticulous dissection in these patients with cholelithiasis. Technical difficulties could be overcome due to learning and better understatement of ergonomics of these patients.

**Keywords:** Laparoscopic cholecystectomy, Mirror image, Situs inversus.

*World Journal of Laparoscopic Surgery* (2022); 10.5005/jp-journals-10033-1495

## INTRODUCTION

Situs inversus is a rare recessive congenital anomaly with an incidence of 1:10,000–1:20,000.<sup>1</sup> Fabricius first reported situs inversus totalis (SIT) in 1,600.<sup>2</sup> Genetically it shows an autosomal recessive pattern and the genetic defect occurs in 2nd week of embryonic life.<sup>3</sup> In SIT, the transposition of organs is opposite to their normal position and hence gallbladder is present in the left hypochondrium instead of right hypochondrium.<sup>4</sup> Cardiac anomalies and a triad known as Kartagener Triad (Bronchiectasis, Sinusitis, Situs inversus) have been associated with this condition.<sup>5</sup> Male and female gender have equal incidence.<sup>3</sup> In literature no higher association is reported with cholelithiasis.<sup>5</sup> Laparoscopic cholecystectomy since its introduction in 1987 has revolutionized the world and has set new principles of minimal invasiveness in the surgical field.<sup>6</sup> Laparoscopic cholecystectomy is widely accepted as the treatment of choice for cholelithiasis in SIT patients despite the difficulties in the orientation and the ergonomics of the surgical field.<sup>7,8</sup> First laparoscopic cholecystectomy in SIT patients was described by Campos and Sipes.<sup>9</sup> Since then more than 90 cases have been described.<sup>10</sup> We present a retrospective study of five cases in whom laparoscopic cholecystectomy was done for symptomatic cholelithiasis.

## METHODOLOGY

This is a retrospective study from 2005 to 2021. All of the patients in the study were done by a single surgeon at various hospitals of the state. All recorded data from patients and from hospitals was taken and analyzed. All patients with SIT with laparoscopic cholecystectomy done by the single surgeon were included. A total of five patients were included in the study. All our patients were evaluated by baseline blood tests, ultrasonography, and chest

<sup>1,3,4</sup>Department of Surgery, Government Medical College, Srinagar, Jammu and Kashmir, India

<sup>2</sup>Department of Surgery, Government Medical College, Jammu, Jammu and Kashmir, India

**Corresponding Author:** Irshad A Kumar, Department of Surgery, Government Medical College, Srinagar, Jammu and Kashmir, India, Phone: +91 07006122289, e-mail: irshadahmadkumar@gmail.com

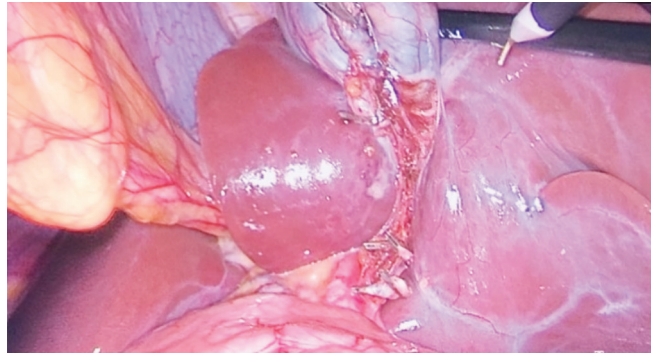
**How to cite this article:** Attri MR, Rajni, Samoon AH, *et al.* Our Experience of Laparoscopic Cholecystectomy in Situs Inversus Totalis. *World J Lap Surg* 2022;15(1):18–20.

**Source of support:** Nil

**Conflict of interest:** None

X-ray, which showed cholelithiasis and confirmed patients of SIT. Magnetic resonance cholangiopancreatography (MRCP) was done to confirm cholelithiasis and to rule out any other biliary anomaly. ECHO cardiography was done to rule out any cardiac anomaly. After all necessary investigations' patients were listed in elective lists for laparoscopic cholecystectomy.

The patients were operated using mirror image technique, modified mirror image, and French technique for laparoscopic cholecystectomy. In the mirror image technique all instruments, surgeons, assistants, and ports were the mirror image of the conventional laparoscopic cholecystectomy. While in modified mirror image technique 10-mm port was used at the midclavicular line as the main working port and for gall bladder removal. While a 5-mm port was used at the epigastric point. In the French technique, the difference with the modified mirror image technique was the placement of the surgeon in between legs instead of the right side of the patient. Calot's triangle was



**Fig. 1:** Showing gallbladder dissection from the liver bed

**Table 1:** Descriptive data of patients

Sl. No.	Age (years)	Gender	Comorbidity	Operative technique	Year	Postoperative complication
1	45	Female	Hypothyroid, hypertension	Conventional mirror image	2005	Nil
2	34	Female	Nil	Conventional mirror image	2006	Nil
3	33	Female	Nil	Conventional mirror image	2011	Nil
4	32	Female	Nil	Modified mirror image	2012	Nil
5	14	Female	Nil	French	2021	Nil

delineated and cholecystectomy was done using the duct first method (Fig. 1). The gallbladder was retrieved either through the epigastric or midclavicular port. All recorded data was analyzed and results were interpreted.

## RESULTS

Our study included five patients with the mean age of 31.6 years (14–45 years). As shown in Table 1. All the patients were females. Our patients presented with complaints of epigastric pain (2), dyspepsia (1), and pain in the left upper abdomen (2). There was no associated cardiac anomaly in our patients. Only a single patient was hypothyroid and had hypertension, and was on optimum treatment. The first three patients were operated using the conventional mirror image technique, the fourth one by modified mirror image and the last one using French technique. In initial cases, operating time was 45–50 minutes which decreased up to 35–40 minutes in the last cases. This decrease in operating time was due to a better understanding of operative ergonomics in SIT patients. All patients were discharged on the first postoperative day after tolerating orals and with the satisfactory condition on discharge. There was no intra- or postoperative complication in our study. There was no 30-day mortality in our patients.

## DISCUSSION

SIT is a rare congenital anomaly with a global prevalence of about 0.01%.<sup>11</sup> The characteristics of SIT is that all the organs of the body have an exact mirror image position than their normal counterparts.<sup>12</sup>

Biliary colic diagnosis in these patients is a challenge owing to the anatomical variation if earlier diagnosis of SIT is not known. The patients usually present with pain left upper abdomen or epigastrium and leading to misdiagnosis and treatment. There is no evidence of increased incidence of cholelithiasis in SIT patients.<sup>13</sup> In our study each 40% of patients presented with pain left upper abdomen and epigastric pain while the rest 20% with dyspepsia only. This is similar to the studies done earlier.<sup>10</sup>

The first laparoscopic cholecystectomy in SIT patients was performed by Campos and Sipes.<sup>9</sup> Since then, more than 90 cases have been reported in the literature and none has mentioned any complication despite the difficulty in ergonomics in SIT patients. However multiple techniques have been put forward in order to ease the biliary dissection.<sup>14</sup> In our study we used multiple techniques like a conventional mirror image, modified mirror image, and French technique. In neither case, any complication occurred despite dissection difficulty in mirror image, nor was any case converted to open. The meticulous dissection is the only option of safety in this group of people. Our study had similar results as other case reports, studies or, reviews done earlier.<sup>10,15</sup>

## CONCLUSION

SIT is a rare congenital anomaly. A laparoscopic cholecystectomy is a safe approach with meticulous dissection in these patients with cholelithiasis. Technical difficulties could be overcome due to learning and better understatement of ergonomics of these patients.

## ORCID

Irshad A Kumar  <https://orcid.org/0000-0002-6451-5535>

## REFERENCES

- Ahmed Z, Khan S, Chhabra S, et al. Our experience with surgery in situs inversus: Open peptic perforation repair and laparoscopic cholecystectomy in 1 patient and 3 patients respectively. *Int J Surg Case Rep* 2016;29:34–38. DOI: 10.1016/j.ijscr.2016.10.035.
- Yaghan RJ, Gharaibeh KI, Hammori S. Feasibility of laparoscopic cholecystectomy in situs inversus. *J Laparoendosc Adv Surg Tech A* 2001;11(4):233–237. DOI: 10.1089/109264201750539763.
- Bozkurt S, Coskun H, Atak T, et al. Single incision laparoscopic cholecystectomy in situs inversus totalis. *J Surg Tech Case Rep* 2012;4(2):129–131. DOI: 10.4103/2006-8808.110264.
- Goyal S, Goyal S, Garg A, et al. Laparoscopic cholecystectomy in situs inversus totalis: a review article. *Arch Clin Exp Surg* 2016;5(3):169–176. DOI: 10.5455/aces.20150610060815.

5. Crosher RF, Harnarayan P, Bremner DN. Laparoscopic cholecystectomy in situs inversus totalis. *JR Coll Surg Edinb* 1996;41(3):183–184. PMID: 8763185.
6. Jaffary B. Minimally invasive surgery. *Arch Dis Child* 2005;90(5): 537–549. DOI: 10.1136/adc.2004.062760.
7. Machado NO, Chopra P. Laparoscopic cholecystectomy in a patient with situs inversus totalis: feasibility and technical difficulties. *JSL* 2006;10(3):386–391. PMID: 17212902.
8. Khiangte E, Newme I, Patowary K, et al. Single-port laparoscopic cholecystectomy in situs inversus totalis using the E.K. glove port. *J Minim Access Surg* 2013;9(4):180–182. DOI: 10.4103/0972-9941.118838.
9. Campos L, Sipes E. Laparoscopic cholecystectomy in a 39-year-old female with situs inversus. *J Laparoendosc Surg* 1991;1(2):123–125. DOI: 10.1089/lps.1991.1.123.
10. AlKhilawy O, AlMuhsin AM, Zakarneh E, et al. Laparoscopic cholecystectomy in situs inversus totalis: case report with review of techniques. *Int J Surg Case Rep* 2019;59:208–212. DOI: 10.1016/j.ijscr.2019.05.050.
11. Ren JJ, Li SD, Geng YJ, et al. Modified laparoscopic cholecystectomy technique for treatment of situs inversus totalis: a case report. *J Int Med Res* 2017;45(3):1261–1267. DOI: 10.1177/0300060517703258.
12. Fanshawe AEE, Qurashi K. Laparoscopic cholecystectomy for gallstone pancreatitis in a patient with situs inversus totalis. *J Surg Case Rep* 2017;2017(2):rjx003. DOI: 10.1093/jscr/rjx003.
13. Takei HT, Maxwell JG, Clancy TV, et al. Laparoscopic cholecystectomy in situs inversus totalis. *J Laparoendosc Surg* 1992;2(4):171–176. DOI: 10.1089/lps.1992.2.171.
14. Schiffrino L, Mouro J, Levard H, et al. Cholecystectomy via laparoscopy insitus inversus totalis: a case report and review of the literature. *Minerva Chir* 1993;48(18):1019–1023. PMID: 8290144.
15. Chaouch MA, Jerraya H, Dougaz MW, et al. A systematic review of laparoscopic cholecystectomy in situs inversus. *J Invest Surg* 2021;34(3):324–333. DOI: 10.1080/08941939.2019.1622822.