

Alternate Technique for Doing Laparoscopic Cholecystectomy in Situs Inversus*

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ABSTRACT

A 45-year-old female with known situs inversus totalis presented with left-sided abdominal discomfort. Chest X-ray, abdominal ultrasonography and CT scan confirmed the diagnosis of a gallstone, as well as, situs inversus; Laparoscopic cholecystectomy was safely performed with mirror image of standard 4 ports. Callots triangle dissection was done with epigastric working port by surgeon, but gallbladder fossa dissection was done by surgical assistant from midclavicular port as main working port. Laparoscopic surgeon should be careful for view of reversed relationships and also for existence of other anomalies.

Keywords: Situs Inversus Totalis; Laparoscopic Cholecystectomy; Anomalies

1. Introduction

Situs inversus is a morphological anomaly of positioning of internal viscera wherein there is a reversal of the usual “handedness” of visceral topography. The reversal may be thoracic, abdominal or both. It is estimated to occur in 1 in 5000 - 20,000 births [1,2]. In the published literature, there have been only about 40 reports of open cholecystectomy in the pre-laparoscopic era and 20 reports of laparoscopic cholecystectomy in patients with situs inversus [2-4]. Although there are many reports of patients with situs inversus and cholelithiasis, there is no evidence that the incidence of cholelithiasis is greater in these patients [5]. It has been reported that about a third of patients with situs inversus and symptomatic gall stones may, however, present with epigastric pain and about 10% of patients may present with right-sided pain [6].

2. Case Report

Our patient was a 45-year-old female patient, who had four children. Patient presented with pain left side of abdomen and was been treated with antibiotics and painkillers with no relief, after which ultrasound was done which re-

vealed left sided gallbladder with stones in it. Patient had no co-morbidities or anomalies.

Chest X-ray showed dextrocardia consistent with situs inversus but there was no evidence of Bronchiectasis (**Figure 1**).

CECT showed situs inversus with Cholelithiasis (**Figure 2**).

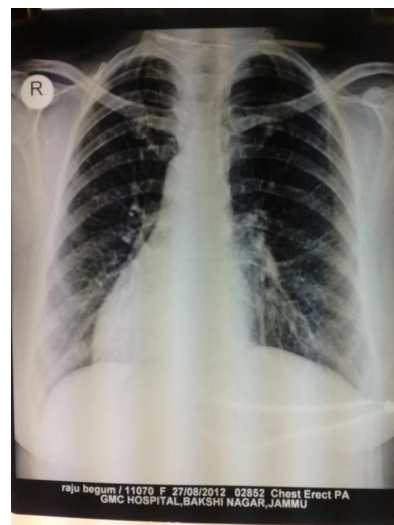


Figure 1. Chest X-ray showing dextrocardia consistent with situs inversus.

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Echo revealed dextrocardia with grade 1 diastolic dysfunction.

MRCP revealed situs inversus with Cholelithiasis (Figure 3).

The surgical procedure was modified according to our comfort. The surgeon and the camera man were positioned on the right side of the patient. An assistant and the scrub nurse were positioned on the left side (Figure 4). The video monitor was placed on the head end of patient. Standard 4-port mirror image technique was used—an umbilical (10 mm), epigastric (10 mm) and two subcostal (5 mm) ports. Pneumoperitoneum was established by open technique. 10 mm camera port was inserted. A head-end-up and left-side-up positioning of the patient was adopted to optimize views of the gall bladder and the Callot's triangle. The epigastric port (10 mm) was placed just to the left of the falciform ligament. This port was one of the two main operating ports and the instruments used were controlled by the right hand of the surgeon. It was used for dissection of callots triangle. The medial subcostal port was used for retraction of the Hartmann's pouch of the gall bladder initially and later for gallbladder bed dissection. The lateral subcostal port was used for fundal traction.

Diagnostic laparoscopy revealed a total situs inversus with left-sided liver and gall bladder, greater curvature and cecum. The organs on right side included spleen and the greater curve of the stomach (Figure 5).

Surgery was started with fundal retraction through lateral subcostal port, Hartmann's pouch retraction was done with medial subcostal port, and Callot's triangle dissection was done with epigastric port. Cystic artery and cystic duct were identified after dissection and clipped separately. After clipping cystic duct and cystic artery epigastric port was used as retraction port and medial subcostal port was used as dissecting port. This switching

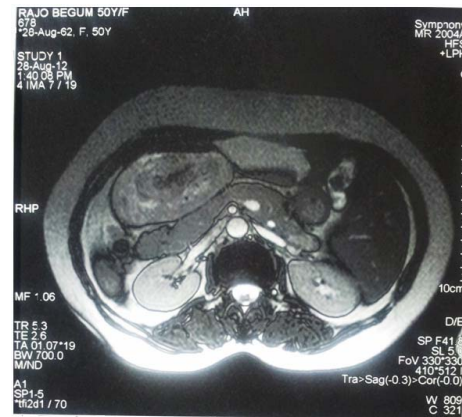


Figure 3. MRCP revealed situs inversus with cholelithiasis.

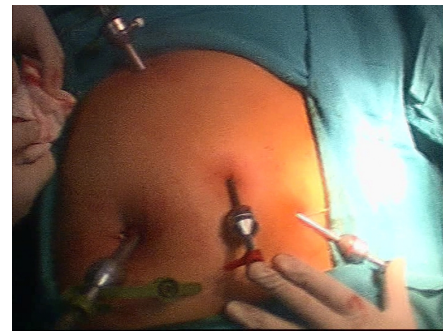


Figure 4. Port placements in situs inversus patient for laparoscopic cholecystectomy.

of dissecting port facilitated easy and smooth dissection of gallbladder from the gallbladder fossa. The gall bladder bed dissection was done by the surgeon who was assisting the case and standing on left side of patient. Our total operative time was 90 minutes.

3. Discussion

The cause of the situs inversus is unknown, but it is claimed to be due to a genetic predisposition, with an autosomal recessive transmission [2,4]. Drover *et al.* reported the first case to have laparoscopic cholecystectomy with this type of anomaly. Literature reveals very few reports of anomalies of biliary system especially in situs inversus totalis like that of Kamitani *et al.* who reported aberrant cystic artery running inferior to cystic duct [7]. Fabricius in 1600 reported first human case of situs inversus. Situs inversus may be total including abdominal and thoracic viscera (situs inversus totalis), or, more rarely, partial (situs inversus partialis). The transposition of the organs may be associated with other congenital anomalies, such as renal dysplasia, biliary atresia, congenital heart disease, or pancreatic fibrosis. Situs inversus totalis associated with bronchitis, chronic sinusitis, and deficient tracheobronchial cilia is known as the Kartagener's syndrome [8,9]. Table 1 has been made

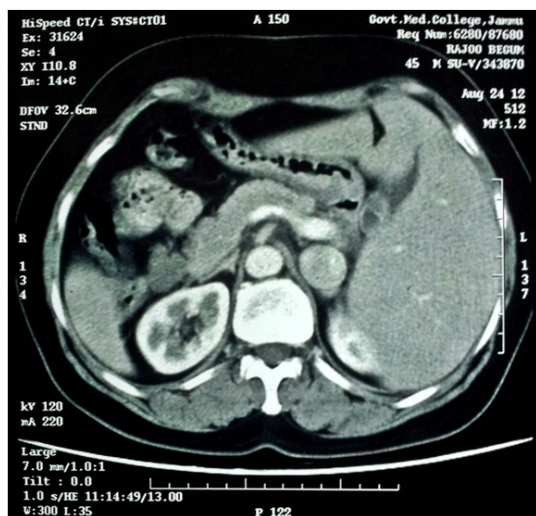


Figure 2. CECT showed situs inversus with cholelithiasis.

Table 1. The literature on cholecystectomy in patients of situs inversus.

S. No	Author	Journal	Year	Ref. No
1	Campos L <i>et al.</i>	J Laparoendosc Surg 1991(1):123-125	1991	1
2	Lipschutz JH <i>et al.</i>	Am J Gastroenterol 1992 87:218-220	1992	1
3	Takei HT <i>et al.</i>	J Laparoendosc Surg 1992:2:171-176	1992	1
4	Drover JW <i>et al.</i>	Can J Surg 1992:35:65-66	1992	1
5	Huang SM <i>et al.</i>	Endoscopy 1992: 24:802	1992	1
6	Goh P <i>et al.</i>	Endoscopy 1992:24:799-800	1992	1
7	Schiffino L <i>et al.</i>	Minerva Chir 1993:48:1019-1023	1993	1
8	Mc Dermott JP <i>et al.</i>	Surg Endosc 1994:8:1227	1994	1
9	Idu M <i>et al.</i>	Br J Surg 1996 83:1442	1996	1
10	Grosher RF <i>et al.</i>	Jr Coll Surg Edinb 1996:41:183	1996	1
11	D Agata A <i>et al.</i>	Minerva Chir 1997:52:271-275	1997	1
12	Habib Z <i>et al.</i>	Ann Saudi Med 1998:247-248	1998	1
13	Demetriades H <i>et al.</i>	Dig Surg 1999: 16 (6):519-521	1999	1
14	Djohan RS <i>et al.</i>	JSLs 2000:4:251-254	2000	1
15	Yaghan RJ <i>et al.</i>	J Laparoendosc Adv Surg Tech A 2001:11(4):233-237	2001	1
16	Nursal TZ <i>et al.</i>	J Laparoendosc Adv Surg Tech A 2001:11	2001	1
17	Al-Jumaily M <i>et al.</i>	J Laparoendosc Adv Surg Tech A 2001:11	2001	1
18	Wong J <i>et al.</i>	Surg Endosc 2001:15:254	2001	1
19	Polychronides A <i>et al.</i>	Surg Endosc 2002:16(7):1110	2002	1
20	Singh K <i>et al.</i>	Surg Techno Lint 2002:10:107-108	2002	1
21	Oms LM <i>et al.</i>	Surg Endosc 2003:17:1859-1861	2003	1
22	Kang B <i>et al.</i>	J Laparoendosc Adv Surg Tech A 2004:14(2):103-106	2004	1
23	Docimog <i>et al.</i>	Hepatogastroentology 2004:958-960	2004	1
24	Antal A <i>et al.</i>	Magy Seb 2004:81-83	2004	1
25	Pitiakoudis M <i>et al.</i>	Acta Chir Belg 2005:11 105 (1):1114-117	2005	1
26	Mc Kay D <i>et al.</i>	Bmc Surg 2005:5-5	2005	1
27	Kamitani S <i>et al.</i>	World J Gastroenterol 2005:11 (33):5232-5234	2005	1
28	Puglisi F <i>et al.</i>	Chir Ital 2006:58(2):179-183	2006	1
29	Bedioui H <i>et al.</i>	Ann Chir 2006:131(6-7):398-400	2006	1
30	Machado No <i>et al.</i>	Jsls 2006: 10(3):386-391	2006	1
31	Aydin U <i>et al.</i>	World J Gastroenterol 2006:21:12(47):7717-7719	2006	1
32	Kirsteinb <i>et al.</i>	Surg Lap Endosc Perc Techn 2006:169-171	2006	1
33	Kumar S <i>et al.</i>	Ann R C S Engl 2007:89(2):W 16-18	2007	1
34	Pavlidis TH <i>et al.</i>	Diagn Ther Endosc 2008:46:52-72	2008	1
35	Hamdi J <i>et al.</i>	Saudi J Gastroenterology 2008:14(1):31-32	2008	1
36	Garcia-Nunez L <i>et al.</i>	Rev Gastroenterol Mex 2008:73(3):149-152	2008	1
37	Pereira-Graterol F <i>et al.</i>	Cir Cir 2009:77(2):145-148	2009	1
38	Romano GG <i>et al.</i>	G Cir 2009:30(8-9):369-373	2009	1

Continued

39	Taskin M <i>et al.</i>	Obes Surg 2009;19(12):1724-1726	2009	1
40	Masood R <i>et al.</i>	J Ayub Med Coll Abbottabad. 2009;Jan-Mar; 21(1):162-3	2009	2
41	Ghosh <i>et al.</i>	Internet Journal of Surgery; 2009;Vol. 19 Issue 2, p21	2009	3
42	Simmons <i>et al.</i>	American Surgeon; 2009;75(4), 353	2009	4
43	Pataki I, <i>et al.</i>	Magy Seb. 2010;63(1):23-5	2010	6
44	González Valverde FM <i>et al.</i> [10]	Acta Gastroenterol Latinoam. 2010;40(3):264-7	2010	7
45	Sandu C, Toma M <i>et al.</i>	Chirurgia (Bucur). 2010: Sep-Oct; 105(5):705-7	2010	8
46	Patle, Nirmal <i>et al.</i>	Indian Journal of Surgery; 2010;72(5), 391	2010	9
47	Mehmet Uludag <i>et al.</i>	JSLs. 2011;15(2):239-243	2011	10
48	Han HJ <i>et al.</i> [11]	Surg Today. 2011;41(6):877-80. Epub 2011 May 28	2011	11
49	Weber-Sánchez A <i>et al.</i> [12]	Rev Gastroenterol Mex. 2011;76(3):255-9	2011	12
50	Mustafa Ozsoy <i>et al.</i> [13]	BMJ; Case Reports 2011; doi:10.1136/Bcr.08.2011.4581	2011	13
51	M. V. de Campos Martins <i>et al.</i> [14]	J Med Case Reports. 2012;6:96	2012	14
52	Pahwa HS <i>et al.</i> [15]	BMJ; Case Rep. 2012;5; 2012	2012	15
53	Vagholkar <i>et al.</i> [16]	Journal of Minimal Access Surgery; Apr-Jun2012, Vol. 8 Issue 2, p65	2012	16

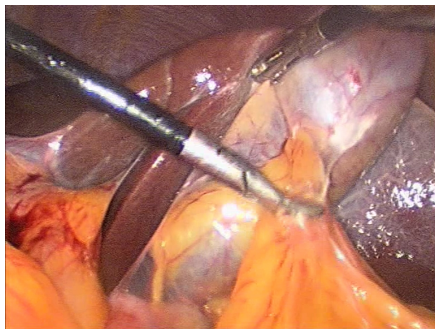


Figure 5. Laparoscopic picture of gall bladder in patient of situs inversus.

after thorough search from internet which revealed 53 published cases of cholecystectomy in situs inversus.

4. Conclusions

Asymptomatic or undiagnosed situs inversus with symptomatic gall stone provides a diagnostic dilemma for clinician as the symptoms are predominantly on the left side.

The principles of surgery are the same except for slight modification of port placement.

Switching the dissecting port from epigastric to medial subcostal port facilitates easy gallbladder fossa dissection.

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