



## Laparoscopic Cholecystectomy in Situs Inversus Viscerum with Mucocele of Gall Bladder. Technical Considerations.

### KEYWORDS

Situs Inversus Viscerum (SIV), harmonic scalpel, mucocele, laparoscopic cholecystectomy (lap chole)

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**ABSTRACT** *Situs inversus totalis is a rare anomaly with a genetic predisposition which can present difficulties in the management of the pathology due to mirror image anatomy. We herein present the technical details and challenges faced during the conduct of surgery as discussed in the context of available literature, of a patient of situs inversus totalis with mucocele of the gall bladder. The patient underwent a successful laparoscopic cholecystectomy.*

### INTRODUCTION

Situs inversus viscerum (SIV) has been observed in animals since the time of Aristotle [1]. The first known case has been reported by Fabricius in 1600 A.D. [2]. It is a rare autosomal condition in which the organs are transposed from their normal location to the opposite side of the body. The incidence of SIV occurrence ranges from 1 : 10,000 to 1: 20,000 [3]. Situs Inversus may be total, including both the thoracic and abdominal viscera ( Situs Inversus Totalis) or partial ( Situs Invertus partialis) wherein either the thoracic or the abdominal organs are transposed. The diagnosis of SIV is based on physical examination, routine electrocardiogram, chest X-Ray, abdominal sonography and CT abdomen.

The prevalence of gall bladder stones in SIV is like that for the general population. Laparoscopic cholecystectomy which is the accepted treatment of choice for symptomatic cholelithiasis has also been performed for in patients of SIV with cholelithiasis. The first reported case of laparoscopic cholecystectomy in such a patient was in 1991 by Campois and Sipes [4].

### CASE PRESENTATION

A 45 year old female from a rural area presented to our causality with severe pain in upper left abdomen since three days followed by vomiting . She developed fever and constipation since one day

On examination she was febrile (100 F), dehydrated, pulse rate of 90/min, BP100/70 mm hg. Abdominal examination revealed mild distension, severe tenderness, a vague lump over left hypochondrium and sluggish bowel sounds. She was admitted with a clinical diagnosis of acute pancreatitis.

She had total leukocyte count of 14,000/cumm with 72% neutrophilia. Her other biochemical parameters including amylase were within normal limits.

Her chest X-ray showed dextrocardia [Fig.1] and her ultra sonogram showed a large distended LEFT SIDED gall bladder with multiple stones [Fig.2]. Confirmatory Contrast Enhanced Computerized Tomogram (CECT) showed a left sided liver and a large distended, thick-walled gall bladder with multiple stones and a right sided spleen [Fig.3]. She now was diagnosed as a case of Empyema of Gall Bladder with SITUS INVERSUS VISCERUM TOTALIS.

She was initially managed conservatively with antibiotics, intravenous fluids and analgesics with an aim to do an interval cholecystectomy but since there was no relief of her symptoms and persistence of the left hypochondriac lump she was placed for laparoscopic / open cholecystectomy.

Opposite to the convention the laparoscopic trolley was placed on the left side while the surgeon and camera assistant stood on the right side in what is described as a mirror image position. The optical 10 mm trocar was placed by an open technique in an infra-umbilical position so as to get more working space on a large distended gall bladder. The sub-xiphoid 10 mm trocar was placed slightly right to the midline coming to the left through the falciform ligament, again for better manoeuvrability. Two 5mm sub coastal trocars were placed on the left midclavicular and left anterior axillary lines respectively. A 0 degree telescope was used initially which was subsequently changed to a 30 degree for the procedure. Inside of the abdomen viewed. There was total reversal of the position of the organs. The stomach and the spleen were seen to the right while the liver with the distended gall bladder were to the left side. There was significant omental and duodenal adhesions to the mid-portion of the gall bladder [Fig.4-5]

After retraction of the gallbladder fundus through the axillary port, dissection and retraction was carried through the other two working ports. The dissection was predominantly done through the sub-xiphoid port as the surgeon found it to be easier. The omental adhesions were carefully released by using the harmonic scalpel (ace) [Fig.6]. The duodenum was very carefully released from the gall bladder. In a deviation the Calot's triangle was dissected left handed by an anterior approach as the dissecting plains could be identified more distinctively with a 30 degree scope. The services of a good camera assistant are critical at this juncture and the surgeon was fortunate enough to have one. The cystic artery and duct were identified as was the junction with the common duct [Fig.7]. The Duct and the artery were clipped and cut [Fig. 8]. There was much difficulty in dissecting the gall bladder from the liver bed due to dense adhesions which entailed a little more blood loss than usual [Fig.9]. The gall bladder was extracted through the umbilical port with little lateral extension. After achieving haemostasis and suction irrigation, a 24 French abdominal tube drain was placed in the sub-hepatic space. Total operative time was 100 minutes. The gall bladder, on section was found to

contain clear mucoid fluid and multiple large stones with an impacted one at the neck. Hence the diagnosis was changed to mucocele of gall bladder. She had an uneventful recovery. The drain was removed after 24 hours and she was discharged on second post operative day

## DISCUSSION

The cause of Situs Inversus Viscerum (SIV) is unknown. There is no evidence that SIV predisposes to cholelithiasis. However it may be a cause of diagnostic confusion and delay in correct diagnosis as happened in our case.

SIV is a rare entity. A Medline search performed in 2003 revealed reports of 25 patients with SIV and cholelithiasis who had successful laparoscopic cholecystectomies [5]. Further searches by this author has reported another 9 cases [6-15] till now totaling 36 cases including ours. To the best of our knowledge this is the first reported case of a mucocele of gall bladder in a patient of SIV to undergo a successful laparoscopic cholecystectomy.

Laparoscopic cholecystectomy in patients of Situs Inversus Viscerum, where there is loss of orientation due to complete transposition of the internal organs is challenging. This gets even tougher, with complications like mucocele of gall bladder, where one has to deal with a hugely distended gall bladder and extensive adhesions. We suggest a few technical aspects to be taken care of during the procedure so as to make it more safe and smooth.

Optical trocar should be placed 1 cm sub-umbilical. This gives one more space and a wider view when dealing with a very large gall bladder. This also helps in optimal placement of the retracting and working trocars.

One gets the best possible general view and the detailed dissecting view by utilizing 0 and 30 degree scopes.

Dissection of the Calot's triangle by the left hand is the "step of the procedure [6]. It greatly facilitates the procedure almost making it like a conventional right sided laparoscopic gall bladder surgery. Hence it should be the Endeavour of every surgeon to every trained in left hand dissection. A large unmanageable gall bladder should be aspirated but this invariably causes spillage. In our case it was not required.

A Harmonic scalpel [5] is an invaluable tool in the surgeon's hand when operating in such unfamiliar situations, which we did find.

Last but not the least services of a laparoscopic surgeon as a camera assistant makes the procedure easier as he thinks as if he is doing the surgery and instinctively guides you to the right areas.

## CONCLUSION

In conclusion, one can say that laparoscopic cholecystectomy in a patient of Situs Inversus Viscerum with complications like mucocele; empyema etc. is more difficult than that done for uncomplicated cholelithiasis in SIV. Sufficient expertise in left handed dissection, an ultrasonic energy source and other above mentioned technical aspects is to be considered to avoid catastrophes and achieve success.

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Figure 1: X-Ray chest: Dextrocardia



Figure 2: Ultra sonogram abdomen



Figure 3: CECT ABDOMEN



Figure 4: Left sided gallbladder with adhesions



Figure 5: Stomach to the right of falciform ligament



Figure 6: Dissection by harmonic scalpel



Figure 7: CBD and cystic duct junction. Left hand dissection



Figure 8: Clipping and cutting of cystic duct and artery.



Figure 9: Dissection of gall bladder from liver bed

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