Situs Inversus Totalis: A Puzzling Anatomic Variation in a Clinical Setting

Case Report

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ABSTRACT

This case report highlights the anesthetic management of a 31-year-old male patient who presented to the surgical outpatient department with a chief complaint of persistent left hypochondrial pain over the past 5 days, accompanied by symptoms of nausea and vomiting. The patient's clinical examination and diagnostic investigations revealed an acute abdominal condition requiring urgent surgical intervention.

The anesthetic strategy involved a comprehensive preoperative assessment, considering the patient's medical history and the nature of the abdominal pathology. Anesthesia induction was carefully tailored to the patient's hemodynamic stability, with close monitoring of vital signs throughout the perioperative period. Intraoperatively, the surgical team successfully addressed the underlying pathology, necessitating meticulous coordination between the anesthesia and surgical teams.

Postoperative care included pain management, monitoring for complications, and ensuring a smooth transition to the recovery phase. The case report emphasizes the importance of individualized anesthetic planning in the context of acute abdominal pain, with a focus on optimizing patient outcomes and safety. Additionally, it underscores the collaborative effort required between anesthesia and surgery teams to ensure effective perioperative management in such cases.

Key Words: Acute abdominal pain, Individualized planning, Intraoperative coordination.

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INTRODUCTION

Situs Inversus is a congenital morphological anomaly of positioning of internal viscera characterised by transposition of abdominal viscera and if it is associated with right sided heart (dextrocardia), it is called Situs Inversus Totalis with an incidence of one in 10,000[1,2]. During embryological development, a 270 degree clockwise rotation occurs instead of a normal 270 degree anticlockwise rotation of developing thoraco- abdominal organs[3]. It can be associated with syndromes such as Kartagener Syndrome, cardiac anomalies and spleen malformations[4]. Generally these patients are asymptomatic and have a normal life expectancy. Recognition of situs inversus is important for preventing surgical mishaps that may happen in cases of cholelithiasis and appendicitis. We are reporting a case of situs inversus who was operated for symptomatic cholelithiasis with aim of discussion of anaesthetic considerations and implications.

CASE PRESENTATION

A 31 year old male patient presented to surgical OPD with chief complaints of pain in left hypochondrium for last 5 days associated with nausea and vomiting. With the help of radiological investigations, surgeons were able to confirm it as a case of situs inversus totalis. Chest *X*-Ray typically depicted dextrocardia (Figure 1). CT scan showed transposition of major abdominal organs. On Pre Anaesthetic evaluation patient had no positive history for any chronic illness. Airway examination revealed adequate mouth opening with MPG grade 1. Vitals were blood pressure of 118/78mmhg, pulse rate of 64/min and normal profile of laboratory investigations. ECG was normal. Echocardiography revealed normal parameters with an ejection fraction of 60%. Patient had bilateral rhonchi on chest auscultation. There was no history of any breathing difficulty but history of repeated respiratory tract infections was present but none required hospital admission. No current respiratory infection was diagnosed. He was a non smoker. He gave history of immotile spermatozoa and has two children born by IVF. Patient had no other systemic complaints except gall bladder disease. Patient had rhonchi on chest auscultation 2 months ago and HRCT chest findings showed airway dilatation and bronchial wall thickening. Patient was given antibiotic treatment before surgery and was nebulised with salbutamol and budecort one night before surgery and on the day of surgery in view

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of HRCT findings. Tablet Pantoprazole 40mg and Tablet Alprazolam 0.25mg were administered a night before and 2 hours prior to surgery with sips of water. In OT, IV access was secured and all routine monitors (spO2, ECG, NIBP) attached (Figure 2). Induction of anaesthesia done with 100mcg fentanyl, 120mg propofol and 5mg vecuronium. Airway secured with PLMA of size 4 and maintenance of anaesthesia achieved with oxygen, nitrous and sevoflurane. Injection hydrocortisone 100mg was given prophylactically. Tidal volume was kept low (6ml/kg) and frequency was kept as 16 breaths/min. Pneumoperitonium was created with IAP of 12mmhg (Figure 3). The surgical procedure was smooth and uneventful but the duration of surgery was prolonged due to distorted anatomy of vessels and location of gall bladder. 1g paracetamol given intravenously slowly and 8ml of 0.25% bupivacaine given locally at incision site for post operative pain relief. At the end of surgery, all inhalational agents were stopped and patient was breathing spontaneously. Inj. Neostigmine and inj. Glycopyrrolate were administered. Patient was breathing with adequate tidal volume and RR. All protective reflexes returned, patients was moving all limbs, opening eyes, following verbal commands. PLMA removed along with suctioning. Extubation was smooth and uneventful. Recovery period was uneventful and patient was discharged on 8th postoperative day.

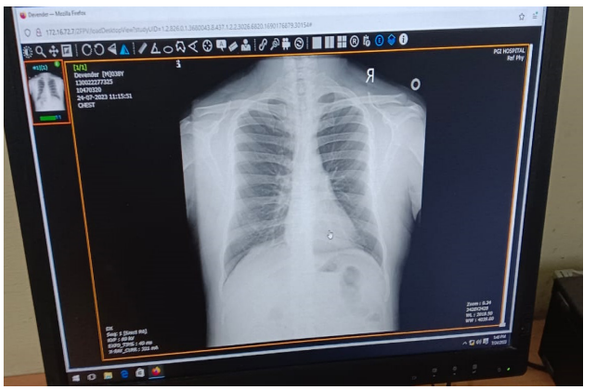

Fig. 1: Patient's CXR.

DISCUSSION

Patients of situs inversus are rare with unknown etiology and presents with pain of cholelithiasis in the left hypochondrium. It may mimic other abdominal presentations like pancreatitis, duodenal perforation, etc. The most preferred diagnostic modality is chest and abdominal skiagrams and CT scans which were used for our patient to confirm diagnosis. The diagnostic findings included dextrocardia, stomach bubble under the right dome of diaphragm and liver shadow on left side[5-7]. Situs inversus can be associated with Kartagener syndrome, mucociliary dysfunction, airway anomalies which may predispose the patient to various airway difficulties

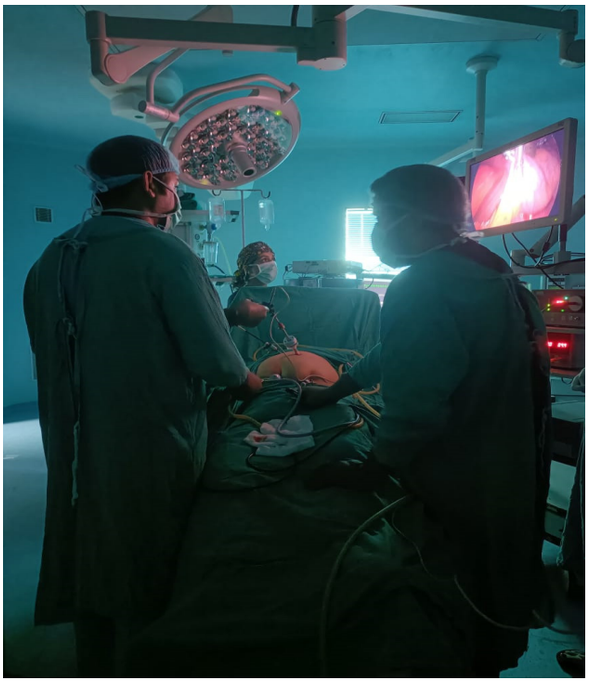

Fig. 2: OR setting.

Fig. 3: Intraoperative ventilation parameters.

during induction of anaesthesia as well as respiratory complications postoperatively, hence HRCT chest was done and an antibiotic therapy and nebulisation was given preoperatively. Studies have shown bronchodilators, antibiotics, corticosteroids are very beneficial for such patients with chest physiotherapy and incentive spirometry as a mandatory modality postoperatively. A frequently associated appearances of mutation in lateral defects is Primary Ciliary Dyskinesia (PCD)[8]. Such patients commonly suffer from respiratory infections recurrently and infertility in males that was seen in this patient. It can be associated with cardiac anomalies such as ASD, VSD, TGA etc. thus a preoperative ECG with echocardiography was advised for this patient. ECG electrodes are applied as mirror image to normal placement otherwise right axis deviation, *P* wave inversion and *T* wave inversions are seen that may confuse with findings of ischaemia perioperatively[9]. We must evaluate the patient for

presence of any spinal deformities if any surgery is planned under neuraxial anaesthesia. Due to above mentioned implications in case of situs inversus totalis, regional anaesthesia is preferrable choice for any surgery but as our patient was planned for a laparoscopic cholecystectomy, general anaesthesia was the preferred choice for this case. This condition affects majority of the structures in the thorax and abdomen and generally, these organs are simply transposed through the sagittal plane. All the blood vessels, nerves, and lymphatics are also transposed. Laparoscopic surgery is even more challenging as the complete orientation, setup, ergonomics gets changed[10]. Hence surgical complications are common and thus require extra vigilance from the surgical and anaesthesiology team.

CONCLUSION

The diagnosis of situs inversus and a thorough pre operative evaluation can minimize the difficulties and challenges associated with its anaesthetic management. The requirement of an experienced laparoscopic surgeon needs to be emphasised and requires impeccable coordination and team management with the anaesthesiologist.

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CONFLICT OF INTERESTS

There are no conflicts of interest.

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