

Successful anesthetic management of laparoscopic cholecystectomy in patients with situs inversus totalis

Mustafizur Rahman^{1*}, Deepankar Sarma²

^{1,2}Consultant, Dept. of Anesthesiology and Critical Care, Al-Salam Hospital, Assam, India

***Corresponding Author: Mustafizur Rahman**

Email: mustaffizur@gmail.com

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Abstract

Situs inversus totalis is a condition where visceral and thoracic organs are transposed from their normal anatomic position to the opposite and posed as mirror image. It is also a rare congenital condition. It may present some significant difficulty in diagnosing acute abdomen and in management of anesthesia also. Anesthesiologists must have a thorough knowledge regarding this condition and its associated abnormalities to conduct smooth anesthetic management. Here we are reporting three cases of situs inversus totalis posted for laparoscopic cholecystectomy under general anesthesia which went uneventful.

Keywords: Laparoscopy, Cholecystectomy, Situs inversus totalis, Kartageners syndrome.

Introduction

Situs inversus totalis is a rare congenital condition in which a 270 degree clockwise rotation of both abdominal and thoracic organs occurs during embryological development of organs resulting in a mirror image.¹ Its incidence is around 1:5000 to 1:20000 among general population.^{2,3} It was Fabricius who first described situs inversus.⁴ Situs inversus totalis may be associated with cardiovascular anomalies like Transposition of Great Arteries, septal defects, respiratory anomalies like Kartageners syndrome which is a variant of Immotile cilia syndrome also called Primary Ciliary Dyskinesia. Situs inversus totalis, sinusitis, and bronchiectasis together in a patient, is known as Kartagener's syndrome.⁵ In 50% of patients situs inversus associated with kartageners syndrome.⁶ It may be also associated with splenic anomalies. It may lead in diagnostic confusion in cases of acute cholecystitis, appendicitis, spleen lesions and myocardial infarction also. But the clinical scenario for management of anesthesia along with these associated conditions are extremely challenging for anesthesiologists.

Case 1

A 53 years female weighing 62kg, height 161cm, Mallampatti class 1 was posted for laparoscopic cholecystectomy. She was having pain in left hypochondrium for 2 months. Ultrasonography revealed chronic calculous cholecystitis with situs inversus. She was hypertensive on treatment with tab. olmesartan 40mg /hydrochlorothiazide 12.5mg and hypothyroid on thyroxine replacement 50mcg. Her other laboratory parameters were normal. Chest x-ray and ECG revealed dextrocardia. CECT abdomen also showed situs inversus totalis with cholelithiasis. Echocardiography was normal with ejection fraction 67.33%. On OT table ecg electrodes were placed in reverse manner. Premedication was done with inj. midazolam 1mg, inj. glycopyrrolate 0.2mg and for analgesia infusion paracetamol 1g with inj. tramadol 100mg was given. Esmolol 30mg and lignocaine 60mg intravenous given to blunt laryngoscopic sympathetic stimulation. Preoxygenation was done for 3 minutes followed by induction with inj. propofol

150mg and after proper bag and mask ventilation inj. succinylcholine 90mg given for muscle relaxation. An endotracheal tube size 7.5mm ID was placed and bilateral breath sounds confirmed by auscultation and air entry by ETCO₂ wave form. Anesthesia was maintained with O₂:N₂O 33:66, Isoflurane 0.5 to 1.5% and neuromuscular blockade by inj. atracurium. Surgery took half an hour. At the end of surgery neuromuscular blockade was reversed with inj. neostigmine and glycopyrrolate and patient was extubated smoothly. Perioperative period was uneventful.

Case 2

A 19 years female, weighing 35kg, height 153cm, Mallampatti class 1 was posted for laparoscopic cholecystectomy. Ultrasonography revealed chronic calculous cholecystitis with situs inversus. All other laboratory parameters were normal except ECG and chest x-ray revealed dextrocardia. She was also premedicated with inj. midazolam, inj. glycopyrrolate, inj. ondansetron and for analgesia inj. tramadol and infusion paracetamol were given. Patient was induced with inj. propofol and for neuromuscular blockade inj. atracurium was used. Anaesthesia maintained with O₂:N₂O 33:66 and Isoflurane 0.5-1.5%. ETCO₂ ranges were 32-46mmHg. At the end of surgery residual neuromuscular blockade was reversed by inj. neostigmine and inj. glycopyrrolate and extubated normally.

Case 3

A 42 years female, weighing 70kg, height 167cm, Mallampatti class 2 presented with the same setting of left hypochondrial pain for 20 days was posted for laparoscopic cholecystectomy. Her pre anesthetic check up was unremarkable except ECG and chest x-ray showed dextrocardia and ultrasonography revealed cholelithiasis with situs inversus. Echocardiography was normal. She was premedicated with inj. midazolam, inj. glycopyrrolate, inj. ondansetron and for analgesia inj. tramadol and infusion paracetamol were given intravenous. Patient was preoxygenated for 3 minutes and induced with inj. propofol and sevoflurane. For blunting

laryngoscopic stimulation inj.lignocaine and inj.esmolol given intravenous in the dose of 1mg/kgBW and 0.5mg/kgBW respectively. A 7.5mmID endotracheal tube was placed in trachea after muscle relaxation with inj.succinylcholine. Maintenance of anesthesia was done with O₂:N₂O33:66, sevoflurane 1-2% and inj.atracurium. Her ETCO₂ ranges were 38-41mmHg. Nitroglycerin infusion was started as her blood pressure was shot upto 180/100mmHg after 10 minutes of starting of surgery. At the end of surgery she was extubated normally with inj.neostigmine and glycopyrrolate.



Fig. 1: Chest X-ray showing dextrocardia

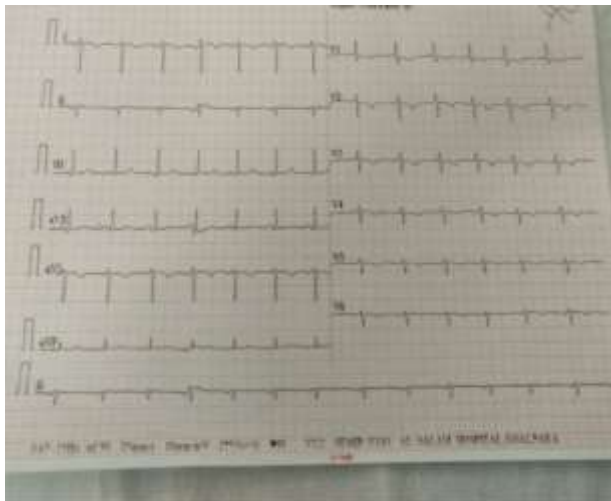


Fig. 2: ECG of dextrocardia

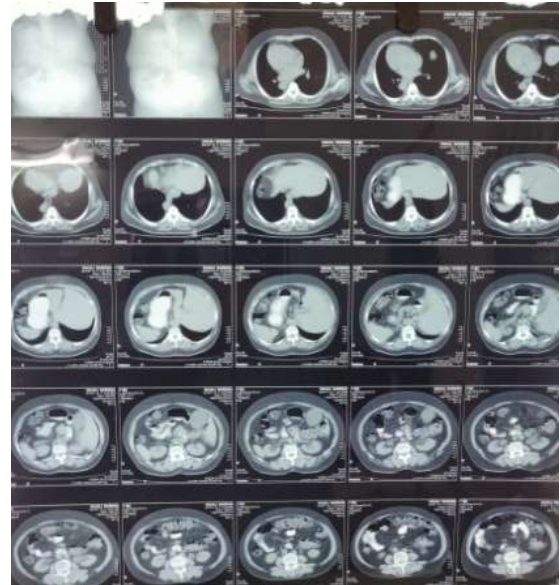


Fig. 3: CT scan showing dextrocardia with situs inversus



Fig. 4: Lead 2 showing QRS negative



Fig. 5: ECG in lead 2 when electrodes placed in mirror image

Discussion

Situs inversus totalis may be extremely challenging for the anesthesiologist if it is associated with other systemic anomalies. Here we would like to focus on a few important points which anesthesiologists must remember during planning of anesthetic management.

1. Clinical history is very important. Ask the patient if he/ she has recurrent cough or respiratory tract infection, pneumonia, any male sterility problem. If the answer is YES then it may be due to Primary Ciliary Dyskinesia or Kartagener's syndrome. CT-thorax and pulmonary function test may be advised for planning of anesthesia. Chest physiotherapy, bronchodilators, antibiotics, postural drainage also have important role in optimization prior to surgery.⁷
2. Since situs inversus totalis may be associated with cardiac anomalies like atrial septal defect, ventricular septal defect, transposition of great arteries, pulmonary valvular stenosis etc echocardiography must be done to rule out this anomalies.⁸
3. ECG electrodes must be placed on reverse direction to avoid diagnosing peri-operative ischaemia.⁹
4. In case of lung surgeries it may pose extreme difficulty in placing double lumen tube to separate the lungs.⁹
5. Situs inversus totalis may be associated with spinal deformities like split cord, meningocele, spina bifida, scoliosis etc. So prior planning regional anesthesia these deformities must rule out.¹⁰

Conclusion

Anesthesiologists must have the precise knowledge and meticulous preparation about situs inversus totalis and its associated anomalies for the successful and safe anesthetic management.

Conflict of Interest: None.

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