Case Report

The Challenges in Successful anesthetic management in a case of Situs inversustotalis

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Abstract

Situs inversus is an uncommon congenital positional anomaly in which orientation of all asymmetric organs in the body are mirror image of normal morphology. The condition if undetected may pose a diagnostic problem in patients of abdominal pathology. Though the problems related to such patients are mainly surgical, an anesthesiologist must be aware of the problems associated with situs inversus. Here we successfully managed a case of obstructed umbilical hernia with situs inversustotalis in an adult who was previously unaware of the anomaly.
Key words: Situsinversus, Obstructed Umbilical hernia, Dextrocardia.

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INTRODUCTION

Situs inversus is a congenital positional anomaly characterized by transposition of the abdominal viscera. Situs inversus may be abdominal, thoracic or both and whenassociated with right sided heart (Dextrocardia) it is calledsitus inversustotalis.[1,2] The incidence varies from 1:5000 to 1:20,000 births.[3,4] Except for positional anomaly cardiac functions are normal.[5,6] Transposed thoracic and abdominal organs are a mirror image of the normalanatomy.[7] Such patients are asymptomatic and have a normal life expectancy.[8] We report the successful perioperative management of an adult female with situs inversustotalis who underwent emergency exploratory Laparotomy for obstructed umbilical hernia.

CASE REPORT

A 55 year old woman weighing 90 Kgs presented to casualty with a history of acute abdominal Pain, vomiting, and low grade fever. Per abdominal examination revealed tenderness and lump in the umbilical region. It was only after radiological investigation that the diagnosis of situs inversustotalis was done. Her Chest X ray depicted dextrocardia. Computerized Tomography (CT) revealed transposition of all major abdominal organs with ascites and decreased peristalsis. Ultrasound showed situs inversus with obstructed Umbilical hernia. The patient had history of hypertension since 2 years and was on T. Amlodipine 25mg OD. She had complaints of breathlessness with limitation of physical activity. On physical examination patient was obese. BMI 37.5 kg/m^2 with short neck, adequate mouth opening and Mallampatti grade 3. Her pulse rate was 82/min, blood pressure 160/100 mmHg, Examination of the cardiovascular system revealed, location of the apex beat at right 5thintercostals space 1.5 cm medial to the mid clavicular line. On auscultation heart sounds were heard on the right side of the chest with reduced bilateral air entry and basal crepitations. Laboratory investigations were within normal limits. Plain radiograph of chest revealed dextrocardia and fundal gas shadow on the right side.[fig1]. ECG showed right axis deviation with T wave inversion in leads V1-V6 [fig 2]. Echocardiography showed EF-55% with

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concentric Left Ventricular Hypertrophy and dextrocardia. After all preparation the patient was shifted to the operation theatre. An intravenous access was secured with a 20 G cannula.ECG leads (mirror image of normal), NIBP and pulse oximeter were connected. SpO_2 was 90% on air. Patient was adequately pre oxygenated with 100% oxygen. Patient was Premedicated with Inj. Glycopyrrolate 0.2 mg i.v., Inj. Midazolam 1 mg i.v., Inj. Fentanyl 150mcg i.v. Induction of anaesthesia was achieved with Inj. Propofol 150 mg and intubation was done with 7.0 mm internal diameterendotracheal tube after giving Inj. Succinylcholine 100mg. Maintenance of Anaesthesia was carried out with Inj. Atracurium, Isoflurane in Oxygen and air mixture (50%:50%). During the procedure the vitals remained stable. The surgical procedure was uneventful and lasted for 90 minutes. Infiltration of surgical incision was done with 20ml of 0.25% bupivacaine before reversal of neuromuscular blockade with Inj. Glycopyrrolate and Neostigmine. Patient was shifted to surgical intensive care unit (SICU) for further observation. The post operative course in the ICU was uneventful and patient was discharged on the 5th post operative day.

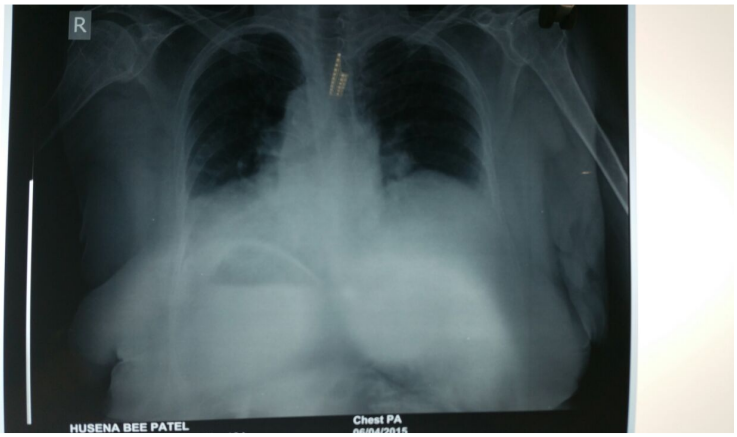

Figure 1: Chest X-ray showing dextrocardia and right-sided gastric air bubble indicating the presence of both dextrocardia and situs inversus (the most common combination).

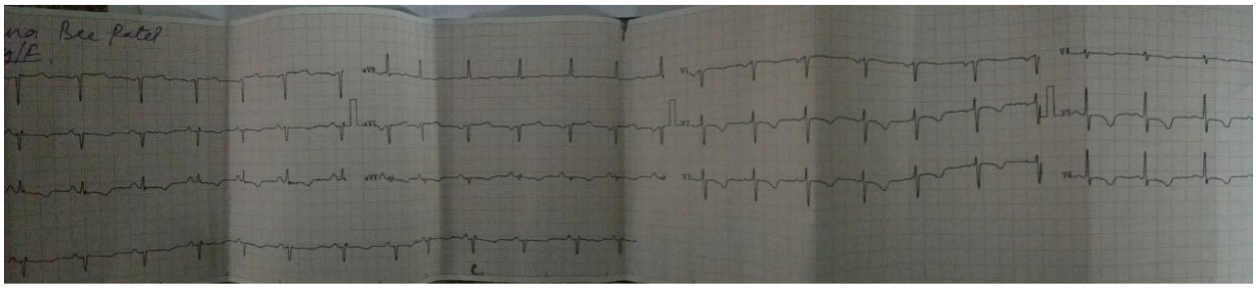

Figure 2 Electrocardiogram with normal lead placement showing right axis deviation with T wave inversion in V1-V6.

DISCUSSION

Situs inversustotalis is a rare condition of autosomal recessive inheritance, with an estimated prevalence of around 1:5000 births to 1:20,000 births.[3] Distribution is the same for both genders (1:1), and there is no difference between races. Situs inversustotalis usually remains undiagnosed, as in our present case, unless it is diagnosed incidentally while investigating another associated ailment. It is characterized by the transposition of the major thoracic organs and all the visceral organs of the abdomen to the side opposite to the normal position in the body. The liver and gall bladder are located to the left, while the stomach and spleen are on the right. In acute abdomen it is important to be aware of the presence of situs inversus to ensure correct diagnosis and treatment. Acute appendicitis causes left lower quadrant pain, whereas cholecystitis causes left upper quadrant pain. The most preferred diagnostic technique involves chest and abdominal skiagrams as well as CT scans. The diagnostic parameters of simple skiagrams include the presence of dextrocardia, stomach bubble under the right dome of diaphragm and liver shadow on the left.

The challenging aspects for anesthesiologists in such patients with situs inversus are:

1. The ECG leads should be placed in reverse orientation for accurate interpretation.[9]

2.The association of situs inversus with other syndromes and diseaseslike Kartagener's syndrome[9], mucociliary dysfunctioncan have considerable implications during induction of anesthesia and intubation.Moist and filtered mixture of gases should be administered during mechanical ventilation.. The role of bronchodilators, chest physiotherapy, postural drainage, antibiotics and incentive spirometry is mandatory in optimizing the pulmonary status before any surgical procedure and to prevent post operative respiratory complications.[9]

3.A case of prolonged paralysis after administration of succinylcholine has been reported earlier in a patient with situs inversustotalis.[13] However we used succinylcholine since there was anticipation of difficult airway.

4.The syndrome is associated with numerouscardiac anomalies such as atrial septal defects, ventricular septal defects, transposition of great vessels, absent coronary sinus, and pulmonary valve stenosis either singly or in combination.[11] No such anomaly was present in our patient.

5.The spinal deformities like split cord, spina bifida, meningomyelocele, scoliosis have been described in the literature, and one has to evaluate the patient carefully if any surgery is planned under neuraxialanaesthesia.[12]

6. In case of cardiac arrhythmias and cardiac arrest, great care has to be taken while applying direct current with defibrillator pads on the right side.[9] A successful resuscitation of such patients requires a thorough knowledge and skills on the part of the attending anesthesiologist.

7. Mainstream intubation can occur on the left side and should be kept in mind while intubating the trachea.[10]

8. In case of inversion of great vessels, preference should be given to the left internal jugular vein for cannulation (to avoid thoracic duct and ensure direct access to the right atrium)[10]

From the mentioned implications, in a case of situs inversustotalis it can be safely established that regional anaesthesia is the preferred choice for any infra-umbilical surgery as compared with administration of general anaesthesia provided that there is no spinal anomaly.

CONCLUSION

Patients with situs inversus are asymptomatic and have a normal life expectancy. Thorough pre operative evaluation, can minimize the various difficulties and challenges associated during anesthetic management. With meticulous planning the patients with situs inversustotalis can be successfully managed in the operation theatre and in intensive care units.

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