

# Anesthetic management of a geriatric patient with situs inversus totalis with bilateral varicose veins for left-sided Trendelenburg's operation with bilateral superficial ligation of perforators

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## Abstract

Situs inversus is featured by the switching of the organs to the opposite side of the body. When associated with dextrocardia, it is known as situs inversus totalis. This disease is a uncommon congenital anomaly and can lead to a diagnostic misperception for surgeons because of infrequent location of symptoms resulting in late diagnosis of known pathologies and operative complications because of changed anatomy. Varicose veins of leg, although being commonly reported, to be diagnosed specially in elderly can be notorious if associated with its complications such as ulcers, bleeding, and so on, and when associated with underlying medical illness. We report a rare case where these conditions coexisted. A 62-year-old woman presented with swelling in bilateral lower limbs with pain on walking with hypertension, type-2diabetes mellitus, and situs inversus totalis electively posted for left-sided Trendelenburg's operation with bilateral superficial ligation of perforators, which we managed successfully under sole epidural anesthesia.

**KEY WORDS:** Bilateral superficial ligation of perforators, situs inversus totalis, sole epidural anesthesia, Trendelenburg's operation, varicose vein

## Introduction

Situs inversus totalis is a rare congenital anomaly with autosomal recessive pattern of inheritance in which all the major visceral organs are mirrored from their normal position.<sup>[1,2]</sup> The condition occurs in less than 1 of 10,000 people,<sup>[3]</sup> although its incidence differs across population. At the time of the embryological growth, the normal 270° anticlockwise rotation is substituted by abnormal 270° clockwise rotation of the evolving thoracoabdominal organs, which ends in mirror image

positioning of the abdominal and thoracic viscera, from the regular (situs solitus) to the abnormal position.<sup>[4]</sup> The rotation may be incomplete, thereby the switching is limited to either the abdominal or the thoracic viscera, or complete: that is relating both the cavities.

## Case Report

A 62-year-old moderately build and nourished woman presented with complain of swelling in bilateral lower limbs, gradual in onset, progressive in nature since 5–7 years. Swelling was also associated with tropical skin changes in the form of ulcer. Patient also experienced pain in bilateral lower limbs on walking, which subsided on taking rest.

Patient is a known case of hypertension since 10 years and is on telmisartan (40 mg OD) tablets and of type 2 diabetes mellitus since 5 years on Glycomet M (OD) tablets. Patient was put on insulin according to sliding scale since 5 days. Ophthalmologic fundoscopy showed grade 2 hypertensive changes with grade 1 diabetic retinopathy changes.

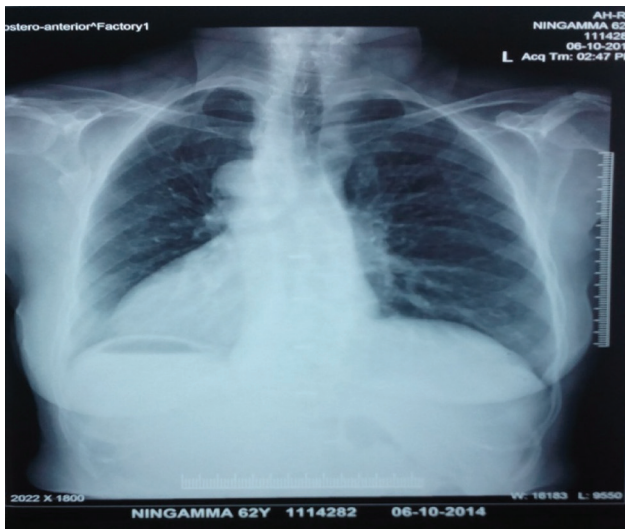
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**Figure 1:** Chest X ray (PA-view) showing dextrocardia.

On examination, patient showed mild pallor. Airway assessment revealed adequate mouth opening with Mallampatti grade III. Spine examination was normal. Her pulse rate was 86 bpm, regular with good volume. Her blood pressure was 146/92 mm Hg. in left arm supine posture. Patient's respiratory rate was 14 cpm. Auscultation of her chest revealed bilateral normal vesicular breathing sound. On cardiovascular system examination, apex beat was located at right 5th intercostal space 1.5 cm medial to mid clavicular line. On auscultation, heart sounds were heard on the right side of the chest; no murmurs heard.

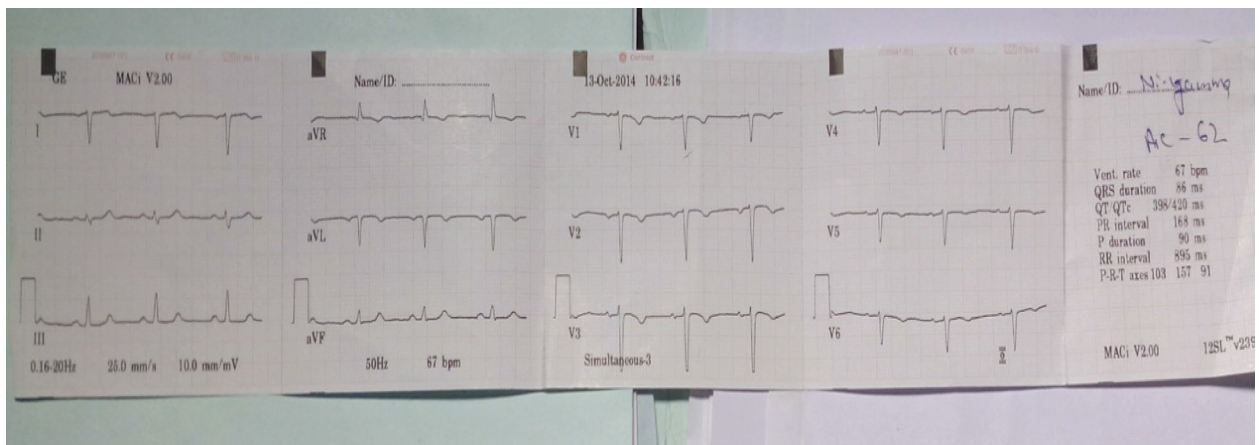
Her routine blood investigation along with serum electrolytes were within normal limits. HbA1c was 7.0%, and fasting blood sugar level was 140 mg/dL and postprandial blood sugar level 176 mg/dL. Chest X-ray showed dextrocardia with fundal gas shadow on right side [Figure 1].

On routine positioning of ECG leads, patient's ECG showed marked right axis deviation with negative "p" wave in lead aVL and I with T wave inversion in V1 to V6 [Figure 2]. Two-dimensional echocardiogram with M-mode Doppler showed dextrocardia with no shunting with normal valves and chambers with ejection fraction of 60% [Figure 3]. USG abdomen revealed situs inversus [Figure 4]. The patient was accepted for anesthesia with ASA grade II.

Patient was asked to take morning dose of antihypertensive with sips of water and to skip morning dose of insulin. Patient was shifted to OT table with 18 G iv cannula in the right arm. One pint RL was connected. Monitors including pulse oxymetry, ECG, and NIBP were connected. An ultrasound-guided double lumen 7-Fr central line was secured in left internal jugular vein. Under aseptic condition, L3–L4 interspace was identified, skin infiltration was done with 2 mL of 2% Inj. lignocaine. Using 18-G Touhey's epidural needle, epidural space was identified using loss of resistance technique and 18-G epidural catheterization was done. After test dose, Inj. lignocaine with 2% adrenaline (5 mL) and 5% bupivacaine (5 mL) was introduced into the epidural space. After 5 min, adequate analgesia was obtained up to T-10. After 1 h, 2 mL of 0.5% bupivacaine top up was given. Operative procedure lasted for about 2 h and 30 min. Intraoperative urine output was 270 mL; 1,500 mL of crystalloids were used intraoperatively. Patient was hemodynamically stable throughout the procedure and was shifted to postoperative ward, and her postoperative course was uneventful.

## Discussion

Situs inversus (also known as situs transversus or oppositus) is a condition featuring the perfect mirror image arrangement of the organs of the chest and abdomen, which is a reversal of the normal positioning. Dextrocardia may or may not be associated with this condition; if so, then, it is known as situs inversus totalis. Fabricius in 1600 recorded the first case



**Figure 2:** ECG on conventional positioning of ECG electrodes.

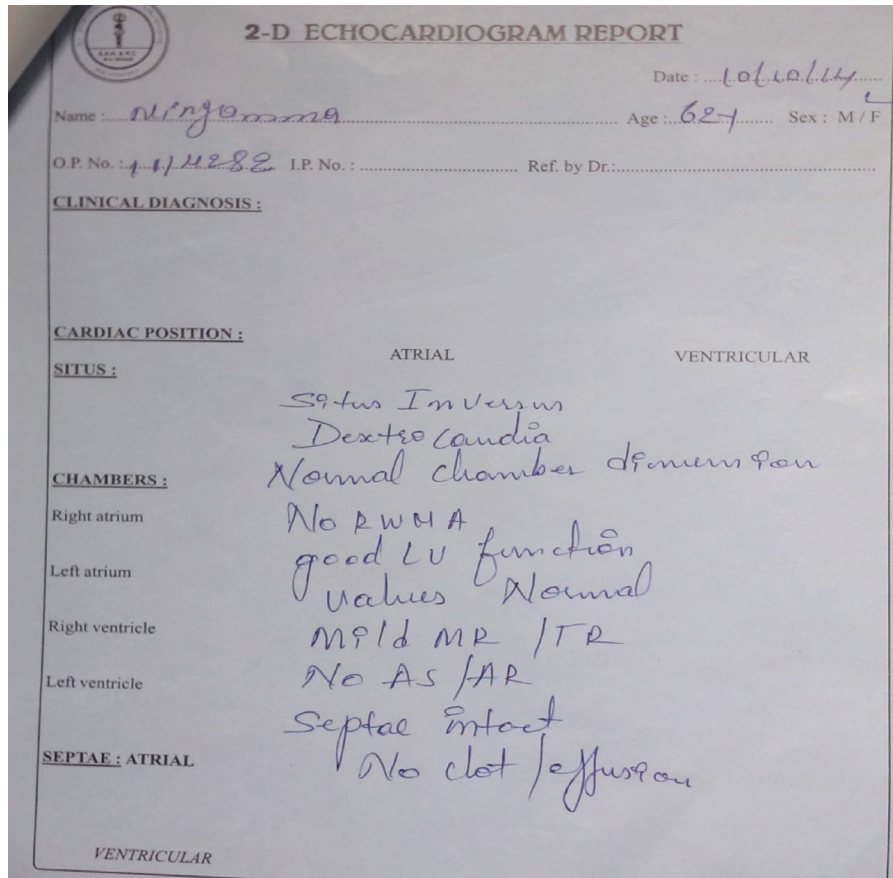


Figure 3: 2D-Echocardiogram showing dextrocardia.

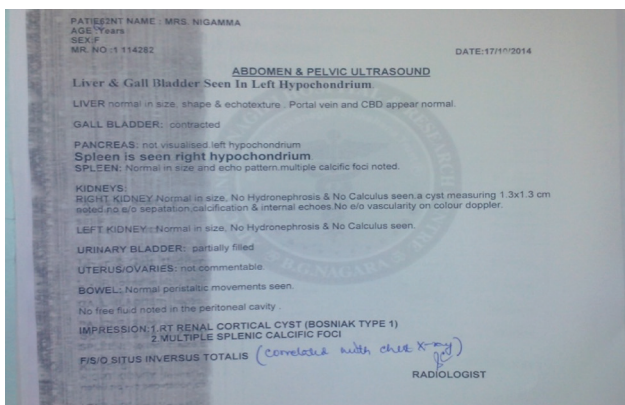


Figure 4: USG abdomen showing situs inversus totalis.

of situs inversus in humans. The prevalence is observed to be 1:5,000 to 1:20,000. Although it is known to follow autosomal recessive transmission, a knowledge gap prevails in its accurate genetic mechanism. It is related to many other conditions such as Kartagener's (bronchiectasis, sinusitis, and situs inversus) and cardiac anomalies.

About 25% of patients with situs inversus experience an primary anomaly as primary ciliary dyskinesia (PCD). Dysfunction of cilia causes increased susceptibility to lung infections. Furthermore, only 3%–5% of people with situs inversus show other forms of functional heart defect; however, when compared with general population rate (less than 1%), this rate is higher. An individual with situs inversus show better prognosis and possesses normal life expectancy if there is no heart defect or other underlying diagnosis. However, because of altered anatomy, patients present with unusual symptoms of common pathologies. This might lead to diagnostic confusion and delay in diagnosis. In addition, it may lead to difficulty during surgery.

The challenging aspects for anesthesiologists in successful management of patients with situs inversus totalis should be thoroughly evaluated, as discussed further.

The relationship of situs inversus with other anomalies and diseases (such as Kartagener's syndrome, mucociliary dysfunction, airway anomalies, etc.) predisposes the patient to several other airway problems and pulmonary infections, which impact considerably during the induction of anesthesia and intubation. So, it is always preferred to perform regional techniques of anesthesia unless and until abso-

lute contraindication to perform them exist. The syndrome is associated with numerous cardiac anomalies such as atrial septal defects, ventricular septal defects, transposition of great vessels, absent coronary sinus, double-outlet right ventricle, total pulmonary anomalous venous defect, and pulmonary valve stenosis either singly or in combinations.<sup>[5]</sup> Literature describes the association of spinal deformities such as split cord, spina bifida, meningomyelocele, scoliosis, and so on, and a careful evaluation of the patient is must if the surgery is to be performed under neuraxial anesthesia.

Opposite direction application of the ECG electrodes is must as the altered surface electric polarity may result in pseudo-scenario of the perioperative ischemia. Lung separation in cardiothoracic surgery forms a difficult task owing to switching of the thoracic viscera. A double-lumen tube insertion leads to several difficulties, and the fiberoptic bronchoscope usage is a must to achieve successful intubation and separation of the lungs. The switching of the thoracic viscera also modifies the several other anatomical landmarks, and one must be familiar with ultrasound-guided techniques if a scenario of invasive central venous cannulation and brachial plexus blockade arises.

Situs inversus in Kartagener's syndrome is habitually found with mucociliary dysfunction. PCD is present in 25% of the patients with situs inversus totalis with an elevated possibility of evolving with respiratory complications.<sup>[6]</sup> In scenarios of cardiac arrhythmias and cardiac arrest, one needs to be extra cautious in applying direct current with defibrillator pads on the right side. A fruitful revival of such patients warrants anesthesiologists and intensivists with a complete knowledge and skills. The aforementioned consequences and deliberations in a case of situs inversus totalis reveal without doubt that regional anesthesia is the ultimate option for any infraumbilical surgery when compared with the usage of general anesthesia, as long as no spinal defect recorder.

## Conclusion

The accurate diagnosis of situs inversus totalis and a complete preoperative examination can reduce, greatly, the complications and several other potential challenges associated with its anesthetic management. With all these deliberations and repercussions in mind, successful management of the patients with situs inversus totalis in the operation theater and intensive care units can be achieved easily and safely.

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