

Case report of asymptomatic situs inversus totalis with dextrocardia in primigravida: Is cesarean section necessary?

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ABSTRACT

Introduction: Situs inversus, a congenital anomaly, is defined by the transportation of thoracic and abdominal organs. A variety during pregnancy this condition has often a challenge for obstetricians, gynecologists, and midwives as there is concern about cardiovascular dysfunction, leading to recommendations for cesarean section. **Case Report:** A 28-year-old primigravida at 40 gestational weeks. She was admitted arrival at the emergency room. Dextrocardia was already present, as was sinus inversus totalis and antenatal assessment revealed no abnormalities. Patient underwent a spontaneous vaginal delivery of a healthy male infant with normal birth weight. **Discussion:** Situs inversus totalis with dextrocardia does not compromise organ function or the typical physiological changes of pregnancy including cardiovascular system. Therefore, routine cesarean section is not indicated for these patients unless other obstetric factor necessitate it, as this condition does not independently contribute to increased maternal or fetal complications. **Conclusion:** Delivery of a pregnancy, dextrocardia, and situs inversus totalis via vaginal delivery is feasible without any significant cardiovascular risks. Cesarean section was not necessary unless other obstetric indications.

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INTRODUCTION

Situs inversus, where the organs in the chest and abdomen are arranged in the opposite way from where they usually are. The heart is positioned in a reversed dextrocardial orientation on the right side of the thoracic cavity (Devera et al., 2021). Situs inversus with dextrocardia affects one in 10,000 to 20,000 individuals, and the majority of patients exhibit no clinical symptoms. Nevertheless, complications associated with other congenital abnormalities or gastrointestinal issues may arise in certain circumstances (Pidvalna et al., 2022). Therefore, routine medical examinations and monitoring may be necessary to ensure prompt resolution of any potential

health issues. Consequently, the majority of situs inversus and dextrocardia cases are discovered by chance (Aljure Reales et al., 2017; Edzie et al., 2019; Eitler et al., 2022).

Situs inversus with dextrocardia is exceedingly rare in pregnant women. Situs inversus is an abnormal condition, with a prevalence of 0.01%. The arrangement of the thorax and abdomen is reminiscent of a mirror in situs inversus. The heart's position is reversed as a dextrocardia (Deepika et al., 2016). Situs inversus is identified as a congenital condition that causes the organs, particularly the thorax and abdomen, to reverse or appear out of their normal position. The heart is typically in the left thoracic cavity (levocardia), with the liver positioned on the right and the spleen on the left. The right lung comprises three lobes, whereas the left lung consists of two lobes. The arrangement of these organs in situs solitus is unique (Srikant et al., 2021). Typically, the heart and other inverted organs continue to operate as expected. Nevertheless, situs inversus and dextrocardia exhibit abnormal organ structures (Deshimo et al., 2024). The majority of patients with asymptomatic situs inversus do not experience significant complications during pregnancy, as their bodies adjust by increasing blood volume, cardiac output, and vascular resistance (Anggraini et al., 2021). In patients with this condition, there is no compelling rationale for performing surgical interventions, such as pelvic floor surgery, according to specific literature. Cesarean section administered without any additional obstetric indications (Calle et al., 2016; Rao & Rao, 2022).

A 28-year-old primigravida pregnant woman who underwent a standard vaginal delivery is the subject of this report. The patient was in a state of health without any complaints and no abnormalities in organ dysfunction. However, they had a history of dextrocardia with a mirror image or visceral organ malposition. This case report emphasizes that normal cardiovascular physiology allows for natural and minimal intervention delivery.

RESEARCH METHOD

A primigravida pregnant female patient visited the emergency room of PKU Muhammadiyah Hospital Yogyakarta, aged 28 years, with a gestational age of 40 weeks. The G1P1A0 patient came with contractions 4 hours ago; the amniotic fluid had not broken, and 3 cc of blood mucus had come out. We planned to induce the patient. The patient was diagnosed with dextrocardia and has known since 2012 during a medical checkup. The anamnesis revealed that the patient had no complaints of shortness of breath, chest pain, history of allergies, or asthma. The patient also had no complaints of high blood pressure either before or during pregnancy. During her pregnancy, the patient underwent routine antenatal care examinations, which revealed that both the mother and fetus were in normal condition. Vital signs data were obtained; blood pressure measurement was 117/83 mmHg, with a pulse calculation of 93x/minute, respiration 19x/minute, and a temperature measurement of 36.6 degrees Celsius. In the blood test, the patient's overall results were within normal limits, with hemoglobin levels of 13.6 g/dL, hematocrit 40.3%, leukocytes 7.50 103/ μ L, and platelets 293,000/ μ L.

Uterine fundus height was 28, and the estimated fetal weight was 2700 grams. Palpation was conducted during the obstetric examination using the results of Leopold 1 in the form of buttocks. Contractions were experienced by the patient on a 3-to-10-minute basis, with each contraction lasting approximately 30 seconds at moderate intensity. The fetal heart rate data was obtained at 142x/minute following the auscultation. Cervical dilatation of 2 cm, amniotic membrane (+), fetal head as high as S-2, and bloody mucus (+) are all observed during the vaginal examination. The diagnostic history of dextrocardia indicated that the cardiac apexes are situated in the hemithorax of the dextra. This was confirmed during the cardiac examination. The result of the thoracic radiography revealed a shadow of the heart in the hemithorax dextra, with no abnormalities in the size of the heart or the lungs. The electrocardiogram (ECG) revealed P-wave inversions in lead 1 and aVL, as well as results indicative of dextrocardia. Dextrocardia is confirmed by an echocardiography examination, which also demonstrates normal heart function.

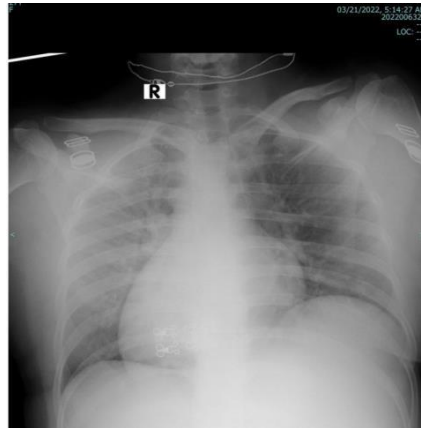


Figure 1. Results of chest X-ray examination with mirror-imaging dextrocardia, the heart's apex is in the right hemithorax, while the liver is on the left.

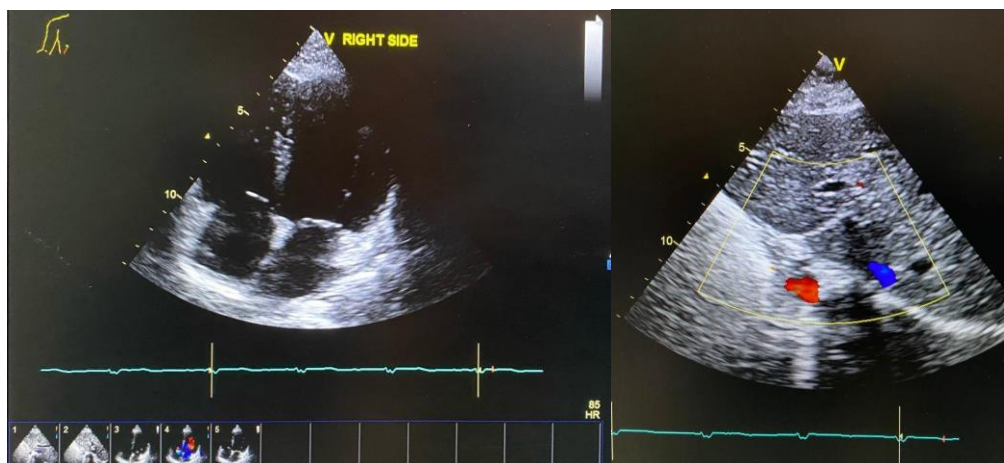


Figure 2. Echocardiography results confirmed dextrocardia with normal heart function.

The patient delivered a single, healthy fetus vaginally without any complications. According to the medical diagnosis, the baby's weight was within the normal range for the pregnancy period, as evidenced by its birth weight of 2640 grams, an Apgar score of 9/10, a body length of 46 cm, a head circumference of 34 cm, an upper arm circumference of 9.5 cm, and a chest circumference of 31.5 cm. The infant was conscious, male, exhibited active movement with good muscle tone, cried loudly, and maintained regular breathing. The baby's head-ENT was within normal limits, the thorax was within normal limits, the heart rhythm was regular, the abdomen was supple, and the extremities were within normal limits with excellent perfusion upon examination. A normal anogenital examination revealed the presence of testes and an anus.

RESULTS AND DISCUSSIONS

Situs Inversus

A congenital malformation known as situs inversus causes the chest and abdomen to invert or mirror their normal positions. The heart is on the left (levocardia), and the liver is on the right. The right lung has three lobes, while the left lung has two. In situs solitus, the right and left lungs typically arrange separately (Srikant et al., 2021). Situs inversus is derived from the Latin phrase "situs inversus viscerum," meaning reverse position compared to normal anatomy. Situs inversus comes in two categories: complete and partial. Dextrocardia is known as situs inversus

totalis, where the liver is on the left and the heart is on the right. In addition, there are also abnormal lung positions: the right lung has two lobes, and the left lung has three lobes (Xu et al., 2023).

Furthermore, the opposite side houses the blood vessels, intestines, and stomach. The majority of patients with situs inversus totalis do not exhibit any symptoms, as organ dysfunction does not always occur (Edzie et al., 2019; Eitler et al., 2022). Organs with situs inversus usually function well. The physiological processes carried out by some organs of the body, such as the heart and lungs, are the same as those carried out by individual organs in their normal positions, even though they are reversed from right to left. Except for additional abnormalities or other special conditions, medical care for patients with situs inversus totalis is usually no different from that of people with normal anatomy (Enciu et al., 2022). The etiology of this disease is not yet known. Because they have a better prognosis, patients with situs inversus and clinical dextrocardia are generally less likely to have heart problems at birth than patients with situs inversus and clinical levocardia.

Dextrocardia

Dextrocardia refers to a heart positioned in the right hemithorax, with its apex directed towards the right and inferiorly. Dextrocardia, as a rare abnormality, can be associated with other heart diseases. It is estimated that 1 in 12,000 live births are affected by this condition. There is an equal likelihood of both boys and girls (Franqui-Rios et al., 2023).

The classification of dextrocardia is based on the rightward rotation of the heart (D-looping) and the leftward rotation of the heart (L-looping) during cardiac development. The bulboventricular loop differentiates into a left ventricle, while the bulbus cordis evolves into a right ventricle (Mehrotra et al., 2022). In fetuses exhibiting normal organ placement and distinct cardiac morphology during early cardiac development, the apex of the heart is located on the right side of the thorax. By the conclusion of the first month of fetal development, the apex transitions from the right to the left side of the thorax. Ultimately, all bulboventricular D-loops are in the left hemithorax (Oztunc et al., 2015; Zepeda-Mendoza et al., 2021).

Dextrocardia may occur when the bulboventricular D loops does not shift to the left hemithorax. The bulboventricular L loop can induce dextrocardia by effectively repositioning its cardiac apex to the right hemithorax (Mikołajczyk et al., 2019). Dextrocardia with situs solitus, the D loop of the ventricle and the main arteries connect normally, a situation known as dextroversion, which happens because the left ventricle didn't move to its correct position during early development (Mozayan & Levis, 2019).

Dextrocardia is a condition that is particularly important to accurately identify for patients who are undergoing surgical procedures. Dextrocardia can be diagnosed through physical examination, electrocardiogram, and other supporting imaging studies (Deepika et al., 2016; Yeo et al., 2018). Valves and ventricular function, blood flow, and heart contractions are all examples of cardiovascular system physiology (Idowu et al., 2020; Sule et al., 2021). The management of patients with dextrocardia is symptomatic and supportive, as required. Medical care for patients with situs inversus totalis is typically identical to that of individuals with normal anatomy, with the exception of any supplementary abnormalities or special conditions. The treatment options are more varied for patients with more severe symptoms and organ dysfunction (Hur et al., 2014; Xu et al., 2023).

A rare condition known as situs inversus totalis with dextrocardia in pregnancy can present a challenge for obstetricians, gynecologists, and midwives due to their apprehensions regarding the potential for specific cardiovascular risks (Taranikanti, 2018). The cardiovascular physiology of mothers with situs inversus totalis is largely comparable to that of mothers with normal anatomy. Elevated blood volume, cardiac output, and alterations in vascular resistance are typical physiological adaptations that transpire during pregnancy (Yao et al., 2019). As long as there are no other underlying cardiovascular disorders, the heart's pumping capacity remains

unaffected by the inverted position. Consequently, this condition does not cause any direct harm to the mother or fetus during pregnancy (Deshimo et al., 2024).

Maternal care is typically administered in a manner similar to that of a typical pregnancy. Routine cesarean sections are not recommended for patients with dextrocardia and situs inversus totalis (Gao et al., 2020; Wang et al., 2017). Vaginal delivery is feasible as long as there is no obstetric indication. The decision to perform a cesarean section should not be solely influenced by the absence of situs inversus totalis or dextrocardia (Song et al., 2021).

Situs inversus totalis with dextrocardia is typically not a concern for the mother or the baby during pregnancy, unless there are concealed heart conditions or other birth defects (Bolcal et al., 2019). Typical cardiovascular physiology in pregnancy results in an elevation of blood volume and heart rate. Furthermore, the fetus may develop normally without any direct consequences from this condition. As a result, mothers with situs inversus totalis and dextrocardia can have pregnancy and labor just like anyone else, without any extra risks linked to this body condition (Hill et al., 2015).

CONCLUSION

Pregnancies with situs inversus totalis accompanied by dextrocardia could undergo vaginal delivery safely, as this condition did not pose a significant cardiovascular risk. Cesarean section was not necessary unless there were other underlying obstetric indications.

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