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Case Report

# Complete Situs Inversus with Polysplenia Revealed by Syncope in a 40-Year-Old Asymptomatic Adult: A Case Report and Review of the Literature

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## Abstract

A uncommon congenital disorder known as situs inversus totalis causes the major visceral organs to be mirrored from their usual anatomical locations. The 45-year-old adult described in this case study had with recurrent syncope and was incidentally found to have complete situs inversus with polysplenia on imaging. We discuss the detailed findings of the computed tomography (CT) scan and provide a review of the literature regarding the clinical significance of situs inversus with polysplenia, diagnostic imaging, and potential complications associated with the condition.

***Keywords:*** *Computed Tomography (CT); Polysplenia; Syncope*

## Introduction

A uncommon congenital disorder called situs inversus affects about 1 in 10,000 persons [1]. The organs in the thoracic and abdominal chambers are not in their normal places when this condition occurs. Situs inversus totalis, in which the thoracic and abdominal organs are inverted, and situs inversus with levocardia, in which the afflicted organs are limited to the abdomen, are the two main types of situs inversus. Multiple spleens, or polysplenia, can occasionally coexist with situs inversus and may make a person more vulnerable to certain side effects, like an elevated risk of infection [2].

In most cases, individuals with situs inversus totalis remain asymptomatic, and the condition is often discovered incidentally. This case report discusses a rare presentation of complete situs inversus with polysplenia in a 45-year-old male who presented with syncope. The findings from the CT scan are detailed, and we review relevant literature regarding the clinical implications of situs inversus and associated polysplenia.

## Case Report

A 45-year-old male patient with no significant medical history presented to the emergency department following three episodes of syncope over the previous six months. The syncopal episodes were preceded by dizziness and light-headedness, but there was no history of chest pain, palpitations, or shortness of breath. On physical examination, the patient was hemodynamically stable, and heart sounds were noted in the right chest area. This prompted an initial chest X-ray was performed, showing dextrocardia with the heart positioned on the right side of the thorax. To further evaluate the underlying cause, a computed tomography (CT) scan of the chest and abdomen was performed, which revealed the following:

- Thoracic findings: The heart was located on the right side of the chest, with the aortic arch curving to the right. The lung lobes were also inverted, with the right lung consisting of two lobes and the left lung consisting of three.
- Abdominal findings: The liver was located in the left upper quadrant, while the stomach and spleen were located in the right upper quadrant. Notably, the patient had polysplenia, with multiple small spleens (splenules) scattered in the right upper abdomen. The pancreas was transposed to the right side.
- Vascular anatomy: The inferior vena cava (IVC) was observed on the left side, while the abdominal aorta remained in its usual right-sided position. The mesenteric vasculature was also inverted, corresponding to the mirror-image anatomy of the viscera.

The CT scan confirmed a diagnosis of complete situs inversus with polysplenia. No acute vascular abnormalities or masses were detected that could explain the syncopal episodes.

Electrocardiogram (ECG) results showed an inverted pattern typical of dextrocardia, but no ischemic changes were noted. Echocardiography was performed to rule out congenital heart defects, and no abnormalities were detected. Holter monitoring and tilt table tests were also carried out to investigate the cause of syncope, and it was concluded that the syncopal episodes were likely of vasovagal origin, unrelated to situs inversus.

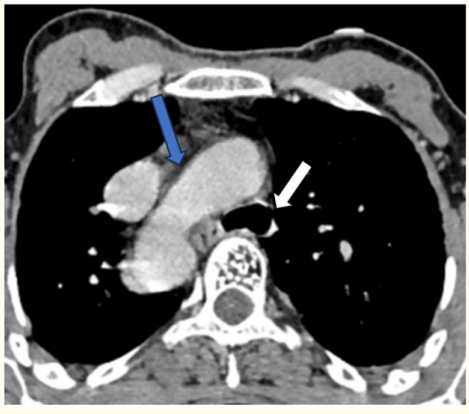

***Figure 1:*** *Axial CT section with contrast injection showing the aortic arch and superior vena cava on the right (blue arrow) and the trachea on the left (white arrow).*

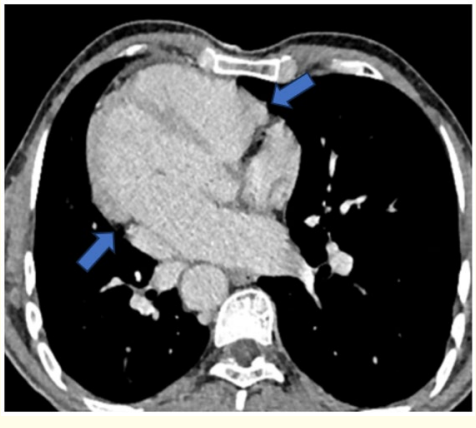

***Figure 2:*** *Axial section of CT scan with contrast injection showing dextrocardia (blue arrow).*

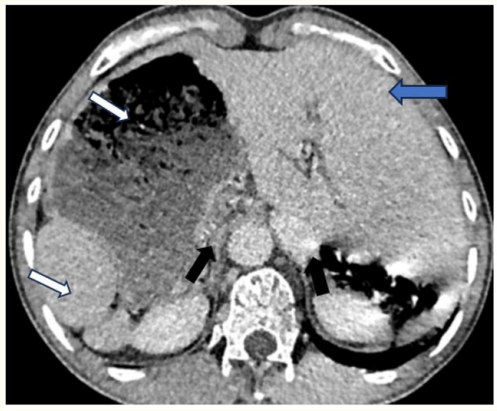

***Figure 3:*** *Axial section of CT scan with contrast injection showing liver on left (blue arrow) and stomach and spleen on right with polysplenia (white arrow), as well as abdominal aorta on the right and vena cava on the left (black arrow).*

## Discussion

A rare birth condition known as situs inversus totalis causes the major visceral organs to be positioned as mirror images of their typical positions. The majority of patients don't show any symptoms, and like in this case, the illness is frequently found by accident. Although the patient's syncopal episodes did not cause the situs inversus, they did contribute to its discovery, which emphasizes the significance of comprehensive diagnostic examinations in cases with atypical clinical symptoms like dextrocardia. Although many people with situs inversus lead trouble-free lives, the illness might present particular difficulties in terms of diagnosis and treatment [1].

Polysplenia occurs in approximately 10 - 20% of individuals with situs inversus and often leads to altered splenic function [3], which can increase the risk of overwhelming postsplenectomy infection (OPSI). However, in asymptomatic adults without a history of recurrent infections or other associated malformations, the clinical course is usually benign.

Several case reports in the literature describe situs inversus with polysplenia as being discovered incidentally, with few if any associated symptoms. Some cases, however, are linked with cardiovascular anomalies, including atrial septal defects, pulmonary stenosis, or transposition of the great vessels. Our patient presented with syncope, but no cardiovascular abnormalities were detected on imaging. The cause of the syncope may have been unrelated to situs inversus, and further cardiac workup, including an electrocardiogram and echocardiography, were planned [5].

Given the normal function of the patient's polysplenic tissue, prophylactic measures against infection, such as vaccination [6] were not immediately indicated, though the patient was advised on the potential risks should splenic dysfunction arise.

The literature on situs inversus with polysplenia suggests that while the condition itself is typically benign, it can present diagnostic challenges due to the mirror-image anatomy. When these patients require surgery or interventional procedures, awareness of the altered anatomy is critical to avoid complications [7].

In a review of the literature, cases of situs inversus with polysplenia have been associated with a variety of clinical manifestations, ranging from asymptomatic presentations to severe congenital defects. For instance, Ivemark syndrome, a subset of heterotaxy syndromes involving situs ambiguus and polysplenia [4] is associated with severe cardiac anomalies and poor prognosis. However, isolated situs inversus totalis with polysplenia, as seen in our patient, tends to follow a more favorable clinical course [8].

## Conclusion

Complete situs inversus with polysplenia is a rare congenital anomaly that often remains asymptomatic and is typically discovered incidentally. Our case demonstrates the importance of recognizing this condition during imaging, especially when patients present with unrelated symptoms like syncope. While the presence of polysplenia does not usually result in significant clinical consequences, it can pose challenges for diagnosis and management in cases where the anatomy is unfamiliar. Awareness of this condition and its variations is essential for clinicians, particularly when planning surgical or diagnostic procedures.

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