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RESEARCH ARTICLE

CASE SERIES: SITUS INVERSUS WITH AND WITHOUT KARTAGENER'S SYNDROME—A COMPARATIVE CLINICAL PERSPECTIVE

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Abstract

This case series highlights two adult male patients diagnosed with situs inversus totalis, presenting with distinct clinical profiles—one with co-existing Kartagener's syndrome and suspected pulmonary tuberculosis (TB), and the other with an incidental finding of situs inversus and congenital heart disease without pulmonary symptoms. The comparativ e analysis underscores the spectrum of manifestations, diagnostic consi derations, and clinical implications associated with situs inversus and its related syndromes.

Introduction:-

Situs inversus totalis is a rare congenital condition in which the major visceral organs are mirrored from their normal positions. While often asymptomatic, it may be associated with syndromic conditions like Kartagener's syndrome, a subset of primary ciliary dyskinesia (PCD), characterized by situs inversus, chronic sinusitis, and bronchiectasis. Co-occurrence with pulmonary tuberculosis (TB) is uncommon but diagnostically significant. This case series presents two contrasting scenarios involving situs inversus.

Case 1: Situs Inversus with Kartagener's Syndrome and Suspected Pulmonary Tuberculosis

A 46-year-old male presented with recurrent upper respiratory tract infections, chronic productive cough, generalized weakness, and suspected hemoptysis. He exhibited low blood pressure (90/70 mmHg), a pulse of 76/min, reduced oxygen saturation (unspecified), and was noted to have situs inversus with suspected bronchiectasis. Imaging via chest HRCT and abdominal ultrasound confirmed situs inversus. Based on clinical findings, Kartagener's syndrome and pulmonary tuberculosis were suspected. He was prescribed antibiotics (Moxclav 625), antihistamines (Bilasure M), and hemostatic agents (Pause 500). This case reflects the classic presentation of Kartagener's syndrome with a rare co-occurrence of TB, posing diagnostic and therapeutic challenges.

Case 2: Isolated Situs Inversus with Congenital Heart Defect

A 34-year-old male was incidentally found to have dextrocardia and situs inversus during echocardiographic evaluation for a cardiac murmur. He was asymptomatic at the time of examination. Cardiovascular exam showed a pansystolic murmur; echocardiography revealed dextrocardia, situs inversus, a small perimembranous ventricular septal defect (VSD), a dilated left atrium, and a preserved ejection fraction (66%). Ultrasound confirmed situs inversus. Blood tests revealed metabolic syndrome (TG = 290 mg/dL, FBS = 106 mg/dL, PPBS = 187 mg/dL, uric acid = 7.6 mg/dL). The patient was treated with oral hypoglycemics and lipid-lowering agents. This case highlights

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the often benign and incidental nature of situs inversus, though associated congenital and metabolic abnormalities require long-term monitoring.

Discussion:-

Situs inversus totalis is a rare congenital condition occurring in approximately 1 in 8,000 to 1 in 25,000 live births, characterized by mirror-image reversal of thoracic and abdominal organs. It may occur as an isolated anomaly or as part of a syndrome such as Kartagener's syndrome or other forms of primary ciliary dyskinesia (PCD).

Case 1 illustrates Kartagener's syndrome, a subtype of PCD, which typically presents with the classic triad of situs inversus, chronic sinusitis, and bronchiectasis. The syndrome arises from autosomal recessive mutations affecting motile cilia function, leading to defective mucociliary clearance and recurrent respiratory tract infections. This chronic inflammation and poor clearance predispose individuals to secondary infections, including pulmonary tuberculosis (TB).

Although TB remains prevalent globally, especially in developing countries, its co-occurrence with Kartagener's syndrome is seldom reported in the literature. Patients with Kartagener's are potentially more susceptible to TB due to persistent lower respiratory tract infections, impaired mucociliary function, and possible structural lung changes. A 2020 case study by Singh et al. emphasized the diagnostic challenge of TB in the context of PCD, where radiological findings may overlap, and sputum analysis is often essential for confirmation.

On the contrary, Case 2 represents an incidental diagnosis of situs inversus totalis in an otherwise stable patient. The discovery was made during routine echocardiographic assessment for a pansystolic murmur. Imaging revealed a small perimembranous ventricular septal defect (VSD), dextrocardia, and a dilated left atrium—cardiac anomalies known to be occasionally associated with situs inversus, though most cases do not result in significant functional impairment. Bohun et al. (2007) reported that while dextrocardia is often associated with congenital cardiac malformations, many individuals remain asymptomatic or minimally symptomatic into adulthood.

The metabolic abnormalities in Case 2 (e.g., hypertriglyceridemia, elevated glucose, and uric acid levels) point toward an independent comorbidity: metabolic syndrome. This underscores the importance of comprehensive systemic evaluation in patients with congenital anatomical anomalies, as seemingly unrelated chronic conditions may coexist and impact long-term cardiovascular outcomes.

A comparative review reveals that while both patients shared the rare anatomical feature of situs inversus, their clinical trajectories diverged significantly—one aligned with the classic features of Kartagener's syndrome with possible TB, and the other with asymptomatic dextrocardia and early metabolic syndrome. This supports the existing literature suggesting that situs inversus may either be an isolated and benign anomaly or part of a more complex syndromic and pathological constellation.

Furthermore, these cases reinforce the clinical necessity for multidisciplinary collaboration involving pulmonologists, cardiologists, radiologists, and infectious disease specialists when evaluating patients with situs inversus. Clinicians should maintain a high index of suspicion for underlying syndromic associations and employ targeted investigations such as high-resolution CT, echocardiography, and genetic workup when appropriate.

Conclusion:-

These two cases illustrate the diverse clinical spectrum of situs inversus totalis. While it can be a benign anatomical variant, as observed in the second patient, it may also manifest as part of a syndromic condition such as Kartagener's syndrome, predisposing the individual to recurrent respiratory infections and complications like tuberculosis [1, 3]. Early identification, appropriate evaluation for associated anomalies, and multidisciplinary management are essential. These cases also underscore the significance of screening for concurrent conditions such as congenital heart defects and metabolic syndrome [2]. Recognizing and differentiating isolated situs inversus from syndromic associations can help guide prognosis and tailor patient care more effectively.

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