CASE REPORT

Dextrocardia and Situs Inversus in a Young Hypertensive Patient: Awareness of Future Diagnostic Dilemmas in Cardiac Events

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ABSTRACT

This case report discusses the incidental discovery of dextrocardia and situs inversus in a 35-year-old male with young-onset hypertension and obesity, who was evaluated for a prolonged cough and secondary hypertension during routine follow-up in a primary care clinic. Despite an unremarkable family history and no other significant clinical features suggestive of secondary hypertension, clinical examination, and imaging revealed incidental dextro-cardia with situs inversus. The patient's cough was attributed to angiotensin-converting enzyme inhibitors (ACEi) and resolved after switching to an angiotensin receptor blocker (ARB). The incidental cardiac finding and its implications were discussed with the patient, emphasising the importance of awareness in future healthcare encounters.
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INTRODUCTION

Dextrocardia is a rare congenital condition occurring in approximately 1 in 12,000 pregnancies(1). It involves the abnormal positioning of the heart in the right half of the chest. Dextrocardia may occur as an isolated anomaly or in conjunction with situs inversus, where other organs are also reversed. Despite its rarity, many individuals with dextrocardia lead asymptomatic lives and experience no significant disability(2). This case highlights an incidental finding of dextrocardia and situs inversus in a patient presenting with young-onset hypertension and an ACEi-induced cough, underscoring the importance of thorough clinical examination and imaging in identifying such congenital anomalies, even when they are unrelated to the presenting complaint.

CASE REPORT

This is a 35-year-old gentleman who was evaluated for a prolonged cough and secondary causes of hypertension during his follow-up for young hypertension. He had no family history of hypertension and no significant past medical history. His blood pressure readings ranged between 134/86 mmHg and 146/92 mmHg during initial evaluations. He was clinically obese, with a BMI of 31 kg/m2, but exhibited no other features suggestive of secondary hypertension. However, physical examination discovered right-sided heart sounds which raised the suspicion of dextrocardia. The radiography of the chest showed clear lung fields with the cardiac apex, aortic arch, and stomach bubble located on the right. There was no evidence of cardiomegaly (Fig. 1). A standard 12-lead Electrocardiogram (ECG) (Fig. 2) revealed a sinus rhythm, right axis deviation, and inverted P and T waves in lead I, with progressively decreasing R-wave amplitude from leads V1 to V6. The right-sided electrocardiogram demonstrated a normal pattern (Fig. 3). These findings confirmed dextrocardia with situs inversus. The patient's prolonged cough was diagnosed as ACEi-induced after ruling out other causes such as infection, GERD, and asthma. The ACEi was discontinued and replaced with an ARB. T. Amlodipine 10mg OD was continued. Following this change, the patient's cough resolved completely, and his blood pressure was well-controlled within the range of 120/78 mmHg to 130/84 mmHg. The incidental finding of dextrocardia was unexpected and was disclosed to the patient through a thorough explanation of its implications. He accepted the diagnosis of dextrocardia and expressed relief after understanding that dextrocardia would not significantly affect his overall health. He was educated about the importance of notifying healthcare providers of his diagnosis of dextrocardia to prevent potential misdiagnoses, especially in emergency settings.

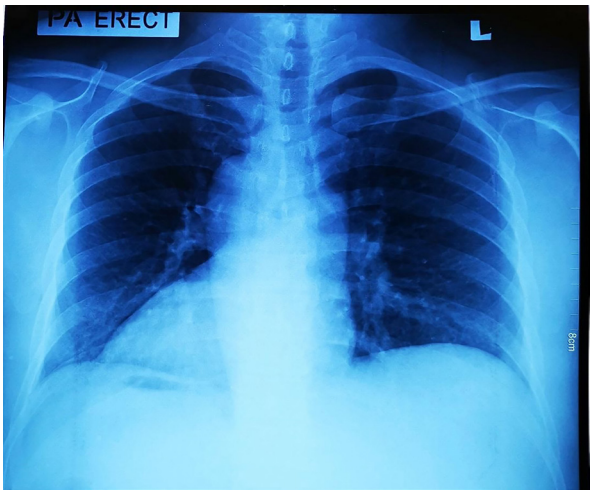

Fig. 1: Posteroanterior (PA) CXR showed clear lung fields with the cardiac apex, aortic arch, and stomach bubble located on the right

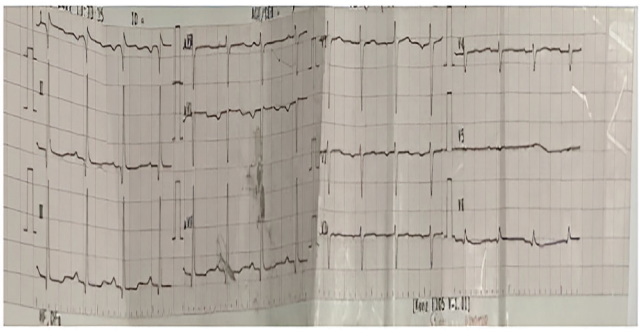

Fig. 2: Standard 12-lead ECG revealed a sinus rhythm, right axis deviation, and inverted P and T waves in lead I, with progressively decreasing R-wave amplitude from leads V1 to V6

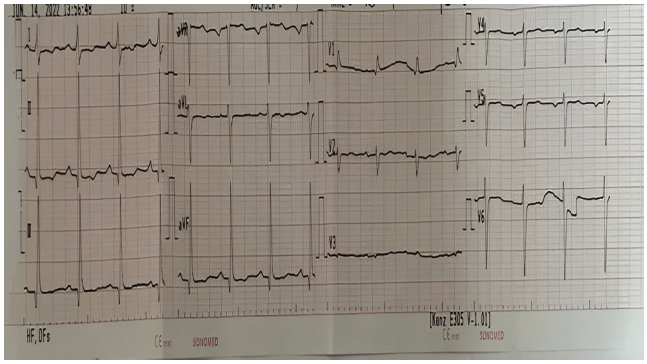

Fig. 3: Right-sided ECG demonstrated a normal pattern

DISCUSSION

Dextrocardia, although rare, and not directly associated with significant morbidity, is crucial to recognise in clinical practice due to its implications for imaging, diagnosis, and treatment strategies. Electrocardiographic interpretation, for example, requires awareness of the reversed orientation of cardiac structures, which can otherwise lead to misdiagnosis (3).

Understanding the prevalence, manifestations, and associated conditions of dextrocardia is crucial for effective patient care. Diagnosing this condition could be the key to screening for other disorders associated with dextrocardia, such as Kartagener's syndrome and other cardiac anomalies (2). Kartagener's syndrome, characterised by primary ciliary dyskinesia, often leads o recurrent lung infections (4). However, the patient's prolonged cough, which was thoroughly reviewed, investigated and resolved after discontinuing the ACEi, showed no recurrence, making Kartagener's syndrome less likely. Furthermore, the absence of chronic sinusitis, bronchiectasis, and otitis media reinforced this conclusion. The manifestations of cardiac anomalies were also absent in him.

Although evidence linking dextrocardia and ACEi-induced cough is lacking to date, the patient's prolonged cough prompted further investigations that led to the identification of dextrocardia with situs inversus. Similar encounters of incidental dextrocardia diagnosis in adults have been reported, often during evaluations for unrelated complaints (2-3). These findings emphasise the importance of routine diagnostic diligence and recognition of atypical presentations.

Advanced imaging, such as echocardiography or cardiac magnetic resonance imaging (MRI), was deferred due to the patient's preference, absence of cardiac symptoms, and lack of abnormal findings beyond dextrocardia. Additionally, in resource-limited local healthcare settings, ordering of echocardiography is restricted to certain specialities and prioritised for symptomatic or higher-risk patients, often resulting in long waiting lists. Although situs inversus can be associated with renal agenesis (3), renal tract ultrasound and Doppler studies which were performed to investigate the renovascular cause of young-onset hypertension, ruled out renal artery stenosis and, at the same time showed normal kidneys, effectively excluding renal agenesis in this patient.

While dextrocardia itself does not predispose individuals to hypertension, its incidental detection underscores the necessity for vigilance in evaluating cardiovascular risk factors in patients with anatomical variants. Previous case series highlighted that hypertension, obesity, and diabetes mellitus are the main risk factors contributing to sudden death in patients with dextrocardia(5). Therefore, optimising the control of cardiovascular risk factors, namely young hypertension, obesity, and dyslipidaemia, is particularly important in this patient. Although dextrocardia itself does not increase the risk of coronary artery disease, it is essential to be aware that acute coronary syndrome (ACS) can manifest as mirrored symptoms, including right-sided and rightward radiating chest pain. This highlighted the importance of reversed ECG lead placement for accurate diagnosis of ACS in patients with dextrocardia (5). Educating the patient about these atypical presentations and ensuring healthcare providers are informed of the diagnosis can prevent missed or delayed diagnoses.

Similarly, situs inversus, often accompanying

dextrocardia, can lead to atypical presentations of surgical conditions due to reversed anatomy. Systematic imaging approaches to analyse anatomical configurations in patients with situs inversus are vital to prevent surgical errors and ensure appropriate surgical planning (3,4). Similar consideration should also apply to patients with situs inversus who require organ transplantation, given the unique challenges anticipated. The role of the dextrocardia medical tag should also be discussed and recommended to ensure patients receive the right treatment at the right time in the case of an emergency.

CONCLUSION

While dextrocardia is rare, and asymptomatic dextrocardia with situs inversus often requires no specific intervention, recognition of this condition is essential for healthcare providers to prevent diagnostic and therapeutic errors. Comprehensive evaluation and patient education are vital, particularly in individuals with concurrent cardiovascular risk factors. A dextrocardia medical tag can alert healthcare providers to the patient's unique anatomy, enabling timely and accurate treatment. This case underscores the importance of diagnostic diligence and awareness of atypical presentations to improve patient care.

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