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CASE REPORT

A Case Report on successful Transradial Coronary Angiography in Patient with Dextrocardia and Situs Solitus.

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Abstract

Background: Dextrocardia with situs solitus is a rare congenital anomaly characterized by the mirror image positioning of the heart within the chest cavity. Coronary angiography, a common diagnostic procedure for coronary artery disease, presents unique challenges in patients with dextrocardia and situs solitus due to altered anatomy and technical considerations.

Case Presentation: We present the case of a 42-year-old female with dextrocardia and situs solitus who presented with exertional chest pain. Initial evaluations by multiple physicians resulted in non-cardiac diagnoses. However, further evaluation at our hospital revealed dextrocardia and situs solitus. The patient underwent coronary angiography, employing specific catheter selection and manipulation techniques to visualize both the right and left coronary systems.

Management and Result: Coronary angiography was successfully performed via the right radial artery without complications. Both the right and left coronary systems were found to be normal, and the patient was discharged with prescribed medications after 12 hours of observation in the cardiac care unit.

Conclusion: Patients with dextrocardia and situs solitus may present with cardiac symptoms similar to routine cardiac patients. With appropriate techniques and expertise, coronary angiography can be safely performed in these patients without the need for altering the screen views. Understanding the specific considerations and challenges associated with catheter selection and manipulation is crucial for successful coronary angiography in this unique population. Further research and experience are needed to optimize the management of cardiac conditions in patients with dextrocardia and situs solitus.

Keywords

Dextrocardia, Coronary Angiography, Situs Solitus, Transradial Approach.

Introduction

Dextrocardia with situs solitus is a rare congenital anomaly characterized by the mirror image positioning of the heart within the chest cavity. In this condition, the heart is located on the right side (dextrocardia) instead of the left, while the other organs within the abdomen and thorax maintain their usual anatomical arrangement (situs solitus). The incidence of dextrocardia with situs solitus is estimated to be approximately 1 in 12,000 individuals[1].

Embryologically, the development of dextrocardia with situs solitus involves a failure in the normal leftward rotation of the ventricles during early cardiac development. This failure, referred to as "dextroversion," results in the heart's abnormal positioning within the chest cavity[2]. It is important to note that dextrocardia is distinct from dextroversion, as it involves a failure of rotation rather than an incorrect rotation of the heart apex.

Patients with dextrocardia and situs solitus may present with a variety of cardiac symptoms and conditions similar to those observed in individuals with normal cardiac anatomy. However, managing these patients can pose unique challenges, particularly when invasive diagnostic procedures such as coronary angiography are required[3].

Coronary angiography is a widely utilized diagnostic tool for evaluating the extent and severity of coronary artery disease. It involves the insertion of a catheter into the coronary arteries to visualize the blood flow and detect any blockages or abnormalities. Performing coronary angiography in patients with dextrocardia and situs solitus requires special considerations due to the altered anatomy and the need to adapt traditional techniques to achieve optimal imaging[4].

In this context, it is essential to explore the feasibility and safety of coronary angiography in patients with dextrocardia and situs solitus. Understanding the specific challenges associated with catheter selection, manipulation, and visualization can contribute to improved management strategies for this unique patient population. Moreover, assessing the clinical outcomes and implications of coronary angiography in these patients will provide valuable insights into the effectiveness of this diagnostic modality in evaluating coronary artery disease.

Therefore, this study aims to present a case of dextrocardia and situs solitus in which coronary angiography was performed, highlighting the technical considerations, outcomes, and implications for the management of such patients. By addressing the limitations and challenges associated with coronary angiography in this unique population, this study contributes to the knowledge base and clinical understanding of dextrocardia and situs solitus.

Case Presentation

A 42-year-old female presented with exertional chest pain radiating to the shoulders and mid-scapular region, occurring intermittently over the past few months, with increased intensity during the winter season. The patient had no comorbidities such as hypertension, diabetes, or family history of cardiac illness. Despite visiting multiple physicians, she had previously received non-cardiac diagnoses. Seeking further evaluation, she presented to our hospital.

During the cardiovascular examination, a right-sided apex beat was detected. The electrocardiogram (ECG) revealed several findings, including right axis deviation, positive QRS complexes with upright P and T waves in AVR, inversion of all complexes in lead I (inverted P, negative QRS, inverted T wave), and absent R-wave progression in chest leads (dominant S waves throughout), suggestive of dextrocardia. However, no myocardial infarction-related changes were observed. Additional imaging modalities, such as echocardiography, abdominal ultrasound, and chest X-ray, confirmed situs solitus with dextrocardia.

Management & Result

The patient was subsequently transferred to the cardiac catheterization laboratory for coronary

angiography. Using a biplane Philips machine, the medical team accessed the right radial artery to perform the procedure. A 6Fr Tiger catheter was inserted, allowing visualization of the left main stem, left anterior descending artery, and circumflex artery in six primary projections (LAO CAUDAL, RAO CAUDAL, AP CAUDAL, LAO CRANIAL, RAO CRANIAL, AP CRANIAL), with the left system engaged in an AP caudal view. However, no significant disease was found in the left system. For the right system, a Judkin's catheter (4Fr size) was employed in a RAO view on the left side, and the main projections (Plane LAO AND RAO, AP CRANIAL, LAO CRANIAL) were obtained to assess for any abnormalities. The patient was found to have a dominant right system, and both the right and left systems showed normal findings. The angiography procedure was safely performed without complications, and the patient was subsequently monitored in the CCU for 12 hours, experiencing an uneventful stay. She was discharged with prescribed home medications.

Based on the report, microvascular angina was considered as the probable diagnosis. Therefore, guidelines-directed optimal medical therapy was recommended, as per the cor-angio report, with scheduled follow-up visits in the outpatient department (OPD).

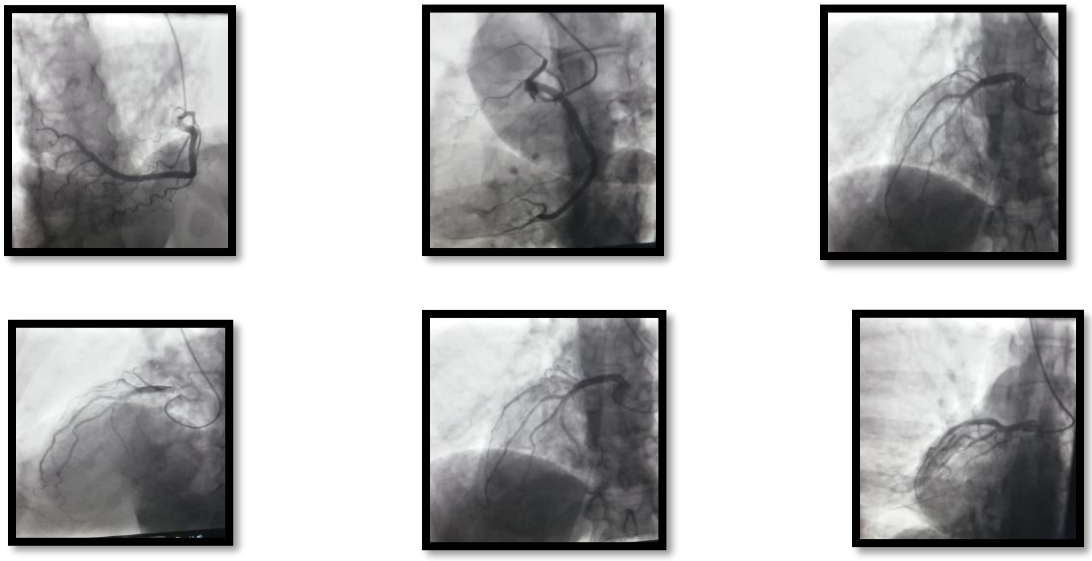

Figure 1: Imaging and Diagnostic Findings in a Patient with Dextrocardia and Situs Solitus

Discussion

Dextrocardia with situs solitus is a rare congenital disorder characterized by the mirror image positioning of the heart, with an estimated incidence of 1 in 12,000[1]. There are various types of dextrocardia, and in the presence of situs solitus, it can be associated with normally related great arteries or D- or L-transposition of the great arteries.[3] The underlying cause of dextrocardia with situs solitus is a failure in the final leftward shift of the ventricles during embryological development, known as "dextroversion." It's important to note that dextrocardia is caused by a failure of rotation rather than an aberrant rotation of the heart apex[4].

In this study, we present a case of a patient with dextrocardia and situs solitus who underwent coronary angiography. The procedure was performed via the right radial artery, although the manipulation required an approach opposite to that used in patients with levocardia. Engagement and visualization of both the right and left systems were achieved through specific catheter selection

and techniques. The left system was engaged using a 6Fr Tiger catheter with counterclockwise rotation, while the right system was engaged using a Judkin 4Fr catheter with clockwise rotation, employing a slight pulling technique to secure the catheter in the right cusp of the aorta. Our findings indicate that coronary angiography can be successfully and safely performed in patients with dextrocardia and situs solitus with the appropriate catheter selection and techniques.

It is noteworthy that data regarding cardiac problems and the use of coronary angiography to assess the extent of disease in patients with dextrocardia and situs solitus are scarce, particularly in the context of Pakistan. Therefore, our study contributes valuable information to the understanding of managing such cases.

Conclusion

In conclusion, our study demonstrates that patients with dextrocardia and situs solitus may present with cardiac symptoms similar to routine cardiac patients. Furthermore, with the application of proper techniques and expertise, coronary angiography can be safely performed in these individuals without the need to alter the screen views. This highlights the importance of accurate catheter selection and careful manipulation during the procedure. Further research and clinical experiences are warranted to enhance our understanding and management of cardiac conditions in patients with dextrocardia and situs solitus.

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