PCI - Double Vessel Stenting in a case of Situs Inversus Dextrocardia

JEYASINGH P PONNUPILLAI
Department of Cardiology,
MADURAI MEDICAL COLLEGE AND HOSPITAL

Abstract:
Diagnosing myocardial Infarction in Situs Inversus Dextrocardia patient and doing Coronary Angiogram (CAG) and Percutaneous coronary intervention (PCI) poses considerable Challenges. Recognizing mirror image cardio visceral relations is extremely important. Here we report a 50-year-male patient treated at a private hospital for acute ST Elevation myocardial infarction and referred to our centre for Coronary Angiogram. CAG revealed significant Two Vessel disease. Successful PCI to Left circumflex (LCX) and Left Anterior Descending artery (LAD) was done.

Keyword: Dextrocardia, Myocardial Infarction, Coronary angiogram, PCI

Introduction:
Situs inversus dextrocardia is a rare congenital malposition of heart and thoracoabdominal viscera. It is seen in approximately 1 in 10000. The incidence of Coronary artery disease is similar to that of general population. The chief complaint of chest pain is seen on the right side. It may pose difficulty in determining the cause of chest pain. The early diagnosis of Myocardial Infarction is easily missed. The Electrocardiogram (ECG) recognition of rightward and inferior p wave axis because of atrial inversion and AVR positivity and inverted ventricular voltage with poor R wave progression is crucial. Coronary Angiogram and Percutaneous intervention may be a technical Challenge because of the abnormal location of heart, aorta and the coronary arteries. The choice of catheters, engagement techniques and radiological orientation of anatomy, views, angles are of major concern before proceeding and should be meticulously planned. Few cases of situs inversus dextrocardia complicated with CAD were reported before. Here we report a case of situs inversus and dextrocardia presenting with acute inferolateral STEMI treated successfully by PCI with BareMetal Stent

CASE REPORT
A 50-year-old male was referred to our tertiary care hospital 3 days after his first episode of acute myocardial infarction. He was thrombolysed for that episode at the private hospital and the initial ECG taken at the time of presentation showed ST
Elevation in the inferior and lateral leads and findings suggesting mirror image dextrocardia.

Figure 1a: ECG showing marked right- axis deviation of the P wave (negative in aVL and lead I) and of the QRS complex, poor R wave progression in the precordial leads. Lead aVR is similar to the normal aVL in the normal ECG, ST elevation in Leads II, III, AVF, and V4 similar to V4R in normal right side ECG.

On further evaluation the Chest Xray confirmed the Situs Inversus Dextrocardia. Echocardiogram showed regional wall abnormality and the Left ventricular Ejection Fraction was 45% with mild mitral regurgitation. Baseline investigations were unremarkable. Aspirin 150mg/d and Clopidogrel 75mg/d were prescribed and the patient was subjected to coronary Angiogram two days later. Recognizing the mirror image Cardiovascular Relations the Coronary Angiogram (CAG) was performed which revealed significant two vessel Disease. Percutaneous Coronary intervention (PCI) was planned in Left Circumflex Artery (LCX) and Left Anterior Descending Artery (LAD). The Extra Backup (XB LAD) Guide catheter successfully engaged the Left Coronary Artery and the procedure was completed with baremetal Stenting to LCX and LAD. The patient had uneventful recovery. Discharged with dual antiplatelets after 4 days. He was free of symptoms at 14 days Follow up.

Figure 1b: Right sided ECG without limb Reversal

Figure 2: Chest X ray showing Situs Inversus Dextrocardia, Stomach gas bubble under right diaphragm, elevated Left side Diaphragm and Right sided Aortic knuckle

An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Medicine and Medical Sciences
**Figure 3a**: CAG: Figure 3b: After LCX stenting Anterior Posterior (AP) caudal view done with JL 3.5 showing Significant LCX lesion before stenting, the Catheter lie is in the Right sided Aortic Arch

**Figure 3c**: LAO 60 CAU 20 (similar to RAO Caudal in normal) showing significant lesion in Proximal LAD

**Figure 3d**: After LAD stenting the image has been horizontally swept reverse

**DISCUSSION:**

Dextrocardia usually termed as the location of the heart at the right side of chest and with the cardiac long axis directing to the right and inferiorly occurs rarely with a reported incidence approximately one in 10,000 patients [1]. Coronary angiography for dextrocardia was first reported in 1974 in a patient who underwent left ventricular aneurysmectomy. Coronary artery bypass surgery in a patient with dextrocardia was described in 1982. Percutaneous coronary intervention in a patient with dextrocardia and situs inversus was first reported in 1987. The atria, ventricles and great arteries are all inverted from their normal location and spatial relationship with persistent AtrioVentricular and VentriculoArterial concordance and the Aorta is left and posterior [8]. The Coronary Artery Disease occurs in similar frequency as in general population [2]. Because the disease itself is rare Coronary Artery Disease (CAD) is also uncommon [1]. The case reported here is of its first kind so far in our centre. We have highlighted the difficulties encountered during the procedure. In our cathlab we have right-left re-versal of the image on the monitor using the “horizontal sweep reverse” function during acquisition and a reversed RAO/LAO angle selection. The counter rotation of catheters usually allows the stenting procedure to be completed uncomplicated. [3] This approach of using standard catheters Judkin Left (JL), Judkin Right (JR) diagnostic was in support from previously published reports. [3,4] though Moreyra and colleagues [5] did not support the use of Judkins. The CAG was completed using JR 3.5 for Right Coronary Artery (RCA) and JL 3.5 for Left coronary system. The RCA cannulation during CAG was difficult probably due to different spatial positions of the RCA ostium [6]. The left lateral view was used in our case and with counterclockwise rotation opposite of normal technique the RCA was cannulated and found to be non dominant.
The left Coronary system was engaged with ease using a XBLAD 3.5 guide catheter manipulated to a mirror image of its normal position due to the presence of Right sided Aortic arch and right sided Left coronary system using standard image acquisition. Right to left image reversal was also done particularly during LAD stenting because we found it difficult using the standard image acquisition. We did not used the Double-inversion technique [7] for coronary angiography viewing in dextrocardia throughout our procedure.

CONCLUSION:
PCI in a patient with Situs inversus Dextrocardia can be accomplished without much difficulty using standard catheters if we recognize the mirror image cardiovascular relationship, the RAO/LAO reverse imaging and technics opposite of normal.

References:


3 Coronary stent deployment in situs inversus N Robinson, P Golledge, A Timmis-Heart 2001; 86:e15


5 Moreyra AE, Saviano GJ, Kostis JB. Percutaneous transluminal coronary angioplasty in


6 Percutaneous coronary intervention for acute myocardial infarction in a patient with dextrocardia Rajesh Vijayvergiya, Anil Grover World J Cardiol 2010 April 26; 2(4): 104-106
