

Case Report

Percutaneous Transluminal Coronary Angioplasty in a COVID-19 Positive Patient with Dextrocardia : A Case Report

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Percutaneous Transluminal Coronary Angioplasty (PTCA) is technically challenging in Dextrocardia patients due to inverted orientation of the coronary arteries. We report a case of acute Anterior Wall Myocardial Infarction (AWMI) in a 54 years old male patient with Dextrocardia with COVID-19 positive status, managed successfully with coronary angioplasty & stenting of Left Anterior Descending Artery (LAD) via right femoral route.

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Key words : Dextrocardia, Percutaneous Transluminal Coronary Angioplasty, Anterior Wall Myocardial Infarction, COVID-19.

Dextrocardia defined as anomalous position of the apex of heart to the right side¹ of the thorax with right sided base to apex cardiac axis. This is a very rare anomaly, accounting for 1 in 10000 live births¹, commonly associated with Situs Inversus Totalis. Usually having no other cardiac anomaly (excepting 3%)² and leads normal life. The incidence of Coronary Artery Disease (CAD) is same as that of general population in these patients. But Percutaneous Coronary Intervention (PCI) in such patients becomes challenging due to the inverted orientation of the coronary arteries. We report a case of mirror image Dextrocardia who presented with acute anterior wall myocardial infarction with COVID-19 positive status, underwent successful angioplasty & stenting of Left Anterior Descending Artery via right femoral approach using conventional hardware.

CASE REPORT

A 54 years non diabetic, non-hypertensive and chronic smoker male patient presented to our emergency with severe retrosternal and right sided chest pain of 10 hours duration. On admission, pulse was 90 bpm and BP was 110/70 mm Hg. Physical examination revealed right sided apex and first & second heart sound were better audible in the right side of chest. The ECG finding were inverted P&R-waves in leads I and aVL and prominent S-wave, with non-progression of R wave in the left precordial leads along with ST elevation in V1 and V2, suggestive of Dextrocardia & possible Acute Coronary Syndrome (ACS). Repeat ECG done with lead reversal;

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Editor's Comment :

- Dextrocardia with situs inversus totalis is a rare, relatively benign congenital anomaly.
- Acute Coronary Syndrome Including acute myocardial infarction can occur in these patients as in normal population. But it poses a diagnostic dilemma in the interpretation of ECG, as well as challenge in doing Percutaneous Coronary Intervention, due to mirror image disposition of coronary arteries. However, proper physical examination, and C-Xray & echocardiography will help the diagnosis.
- Good interventional knowledge and skill can overcome this interventional challenge.

unmask ST elevation in V1, V2, V3R and V4R. Troponin T test was positive. Echocardiography shows hypokinesia of anterior wall of left ventricle with moderate LV systolic dysfunction (LVEF-40%). The typical ECG changes, C-Xray, Echocardiography & positive Troponin T test confirm the diagnosis of Acute Anterior Wall Myocardial Infarction with mirror image Dextrocardia with Situs Inversus Totalis (Figs 1A & 1B).

Due to unknown Covid status, as per institutional protocol we adopted pharmaco-invasive strategy. Thrombolysis was done with Tenecteplase and initial standard conservative management was given. Next day patient was detected to be Covid-19 RTPCR positive & shifted to COVID CCU ward in a stable hemodynamic state with SpO₂ 98% and was conservatively managed as per Covid protocol along with optimal medical management of STEMI. On the 11th day Covid RTPCR was negative. Then the patient was transferred back to Cardiology Ward due to several episodes of rest angina and Coronary Angiography & Revascularisation was planned. Coronary Angiography done through traditional right femoral approach. The Left Main Coronary Artery (LMCA) arising from anatomically right sided left coronary sinus was engaged with 6F Judkins Left (JL) diagnostic catheter, using clockwise rotation. The Right Coronary Artery (RCA) arising from anatomically left sided right coronary sinus was engaged with great difficulty with 6F



Fig 1 — (A) ECG showing inverted P&R -waves in leads I and aVL, upright P-wave with prominent R-wave in aVR and prominent S-wave with non-progression of R wave in the left precordial leads along with ST elevation in V1 and V2. With reversed lead position unmasking ST elevation in V3R & V4R suggestive of dextrocardia with anterior wall myocardial infarction. (B) CXRAY showing heart in the right hemithorax.

Judkins Right (JR) diagnostic catheter giving counter clockwise rotation. Images were acquired in RAO & LAO mirror image angiographic angles. Angiography showed 95% critical ostio proximal lesion in LAD & 60% to 65% intermediate lesion in mid RCA. Angioplasty with stenting of LAD lesion (culprit artery) was decided. The LMCA was engaged with 6F JL guide catheter. The lesion was crossed with a Run-through Floppy PTCA wire. The lesion was pre-dilated with 2 X 10 mm balloon. Then a 3.5 x 24 mm Everolimus eluting Platinum Chromium stent (PROMUS ELEMENT) was deployed across the LAD lesion. The stent was post dilated with 4 x 10 mm non-compliant balloon with achievement of TIMI-III flow. Patient was haemodynamically stable during and after the procedure with relief of chest pain. The post procedure hospital stay of the patient was uneventful and the patient was discharged after 3 days and planned for FFR/ischemia guided PTCA of the residual intermediate lesion of RCA (Figs 2 & 3).

DISCUSSION

Dextrocardia with situs inversus is a very rare condition occurring in 1 in 10,000 population. The first cardiac catheterisation on a Dextrocardia patient was done in 1973³ and the first angioplasty was done in year 1987⁴. PTCA in such patients is very difficult and technically challenging due to inverted orientation of coronary arteries, difficulty in engagement of sinuses with standard catheters & difficulty in image acquisition in standard views. Initially multipurpose catheters were used but later on successful PTCA were performed using standard coronary catheters. To overcome these difficulties, technique of reverse torque for engagement of the catheters & image acquisition in the mirror image angles are being adopted. Goel *et al* have suggested double-inversion technique⁵, which involves right/left image reversal, to obtain normal angiographic images in patients with dextrocardia, thereby leading to easier

interpretation of images in such patients.

We did the successful PClusing standard diagnostic and guide catheters and adopting mirror image views via conventional right femoral approach. There are very few reports of successful PCI in dextrocardia patients in both Indian & world literature. Probably our case was done first in a post Covid status patient.

CONCLUSION

STEMI in situs inversus Dextrocardia poses diagnostic



Fig 2 — Coronary angiography in Right Anterior Oblique Caudal view showing osteo- proximal lesion in LAD



Fig 3 — Left Anterior Oblique Cranial view showing the final result post angioplasty and TIMI-III flow in LAD

challenges in initial ECG interpretation, as well as technical challenges for performing PCI due to abnormal anatomy. This can be overcome by reverse torque technique of catheter engagement and adopting any special image acquisition protocol.

Limitation of Study : Post Covid status of the patient deferred the scope of early intervention as per prevailing protocol.

Conflict of Interest Statement : All authors unanimously declare no conflict of interest.

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