PCI From The Radial Route In A Case Of Dual (TYPE IV) Left Anterior Descending Artery With Anomalous Origin Of The Left Circumflex Artery From Right Coronary Artery

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The Case

- **Presentation**: 60 year old hypertensive male
  - Crescendo angina X 10 days
  - One episode of prolonged rest pain with diaphoresis X 30 minutes.

- **EKG**: ST – segment elevation in the inferior leads.

- **ECHO**: LVEF -55%, Mild hypokinesia inferior wall.

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Left Coronary Angio in LAO cranial 60° showing Left Main, Small LAD, D1 and proximal LCx.

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RCA Angio in RAO cranial 30° view showing anomalous LAD (Dual Type IV) and critical disease of mid RCA origin of PDA and PDA

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RCA Angio in RAO cranial 30° view showing anomalous LAD (Dual Type IV) and critical disease of mid RCA origin of PDA and PDA.
RCA Angio in RAO cranial 30° view showing anomalous LAD (Dual Type VI) and anomalous LCx arising from the proximal RCA

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Diffuse long segment LCx disease
Selective Angio of the disease-free Type IV LAD
Dominant diseased RCA, anomalous LAD going between aorta RVOT and anomalous LCx with its retro aortic course.
CAG Findings

- A short diffusely diseased LAD originating from the LMA, which terminated at the proximal segment of the anterior interventricular groove after giving rise to a diagonal branch (D1).
- Both the circumflex (Cx) and the second LAD originated from RCA.
- The circumflex had a proximal to mid 75 – 80% tubular lesion with 75 – 80% diseased obtuse marginal branches.
- The RCA was ectatic with mid 95% disease. Further on, the PDA had an osteoproximal 90% lesion and a mid 95% lesion and the PLV had a proximal plaque.
Primary PCI of RCA

- Right radial artery 6F sheath.
- AR 1, 6F guiding catheter to hook the RCA.
- Lesion crossed with BMW 0.014 coronary wire.
Pre-dilatation of mid-RCA and PDA ostial/distal lesions with 2.5 X 15 mm sprinter semi-complaint balloon

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Post - Ballooning Angiogram showing residual stenosis in mid RCA, proximal and distal PDA

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Stenting of distal ostium of PDA

- Distal lesion stented with 2.5 X 28 mm Xience V DES.
- Post-dilatation with 2.75 mm non-complaint balloon at 20@atm.

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POBA of distal PDA stenosis beyond stent
Post-stent Angiogram showing good flow in PDA
Mid-RCA stenting

- 4 X 18 mm BMS Zeta deployed at nominal pressure in mid-RCA.
- Post-dilatation with 4 X 15 mm non-complaint balloon at 20@atm
RAO Cranial view: Post-stenting RCA angiogram showing TIMI 3 flow with no residual stenosis.

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Epicranial view: Post-stenting RCA angiogram showing TIMI 3 flow.
RAO Cranial view: Post-stenting Final RCA angiogram showing TIMI 3 flow.
Lateral view: Post-stenting Final RCA angiogram showing TIMI 3 flow.

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Figure 5. CT Angio VRT reconstruction showing dominant RCA, anomalous LAD and LCx from RCA and left main with diminutive LAD, D1 and Proximal LCx.
CT coronary angiography

- The LMA - normal in course and caliber - with diffuse plaques seen in the proximal part, gives rise to a short diffusely diseased LAD.
- Anomalous origin of the LAD from the RCA – courses inter-arterially between the RVOT and the root of aorta.
- Anomalous origin of the diffusely diseased LCx from the RCA – courses posterior to the aorta and reaches the left atrioventricular groove.
- The RCA - ectatic with patent stents seen in the proximal and the distal segments.
- Right radial artery 6F sheath.
- AR 1, 6F guiding catheter to hook the RCA.
- Lesion crossed with BMW 0.014 coronary wire.
Selective coronary angiography of LCx showing diffuse disease maximum 90\% stenosis.

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Pre-dilatation of the lesion with 2.5 X 15 mm sprinter semi-complaint balloon.
Post-balooning angiogram of the LCx
2 overlapping DES Xience V positioned – 2.5 X 38 mm distally and 2.75 X 33 mm proximally

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Post-Stent Angiogram

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Post-deployment dilatation

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RA Caudal View: Angiogram of LCx showing TIMI III Flow

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Right Coronary Artery in RAO 30° cranial view for stenting showing stented RCA and anomalous LCx.
Final Angiogram showing TIMI III flow in both circumflex and RCA

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Conclusion

- We describe for the first time multivessel PCI through the radial route in an extremely uncommon case of multiple coronary artery anomalies – Type IV dual LAD with anomalous origin of the left circumflex from the RCA.

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Coronary artery anomalies

observed in:

- 0.3 – 1.3% of the patients undergoing diagnostic coronary angiography.
- Around 1% of the routine autopsy examinations.
- In 4-15% of young people, who experience sudden cardiac death.
Classification of Dual LAD

TYPE 1 LAD

TYPE 2 LAD

TYPE 3 LAD

TYPE 4 LAD

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Conclusion

- Anomalous coronaries can be safely and successfully treated through the radial route after careful evaluation of the origin and course of the anomalous vessels.

- CT coronary angiography is extremely useful in delineating the vessel course and their relation to the great arteries.