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A brave decision: TAVI, Impella CP heart pump and rotational atherectomy

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Citation:
A 70-year-old man with a previous history of aortic stenosis (AS) was referred to our center with non-ST elevation acute coronary syndrome and cardiogenic shock. Critical AS and severe impairment of left ventricle ejection fraction (20%) were documented by transthoracic echocardiogram. An emergent coronary angiogram showed left dominance with the presence of a critical, heavily calcified stenosis in the proximal segment of the left anterior descending coronary artery (LAD, Figure 1A).

After urgent "heart team" discussion, the patient was scheduled for a high-risk percutaneous coronary intervention (PCI) with previous implantation of Impella CP left ventricular assist device (Abiomed, Massachusetts). However, because of the presence of a critical AS (established contraindication for the Impella device), transcatheter aortic valve implantation (TAVI) was performed before PCI.

In order to facilitate selective catheterization of left main after TAVI, a wire was placed in left circumflex coronary artery with a Judkings left guiding catheter, trough a left radial approach. TAVI procedure with an Evolut R 29 mm valve (Medtronic, Minn.) was performed trough a right femoral approach (Figure 1B), with good result and mild aortic residual regurgitation. The Impella CP device was then inserted across the leaflets of Evolut R valve under fluoroscopy and 3D-echo guidance. (Figures 1C, 1D). Finally, a new Judkings left guiding catheter was placed in the left main across the struts of the TAVI, trough a left femoral approach and a guiure was progressed into the LAD. The circumflex wire and the first Judkings left guiding catheter were removed and rotational atherectomy was then performed (Figure 1E) to the LAD lesion. Two overlapped everolimus-eluting stents were successfully implanted with good result (Figure 1F). Impella CP device was immediately removed after the procedure and the vascular access site was percutaneously closed.

We present the images of a challenging "step by step" procedure. To the best of our knowledge, this is the first report of an Impella CP device implantation across the leaflets of a TAVI, in order to support a complex PCI.
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