

# Single-staged transfemoral transcatheter aortic valve implantation and percutaneous coronary intervention with rotablation in complex coronary artery disease: a case report

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## Case summary

A 60-year-old woman presented with acute heart failure. First assessment revealed a severe aortic stenosis (AS), poor left ventricular ejection fraction (LVEF), double coronary occlusion without viability of left anterior descending (LAD), and right coronary artery (RCA), a severe calcified lesion of ostial left circumflex (LCX) artery extending to the left main artery, as well as end-stage renal failure. A combined procedure of percutaneous coronary intervention (PCI) with rotablation of the LCX lesion and transcatheter aortic valve implantation (TAVI) with standby hemodynamic support was performed successfully. This case illustrates that a simultaneous complex PCI and TAVI is feasible and may be considered in patients at high-risk of periprocedural haemodynamic shock, where standby haemodynamic support is judged necessary.

## Case description

A 60-year-old woman patient was admitted due to acute heart failure. Medical history revealed diabetes mellitus, hypercholesterolaemia, a late presentation myocardial infarction, occluded LAD, and reduced left ventricular (LV) function since 2009 for which she refused further treatment and outpatient clinics follow-up, as well as mamma-carcinoma treated with surgical resection and chemotherapy in 1983. During the current presentation, she was diagnosed with severe coronary disease: chronic occlusion of the LAD and RCA, and a severe ostial stenosis of the LCX (Figure 1A and see [Supplementary material online, Video S1](#)). Magnetic resonance

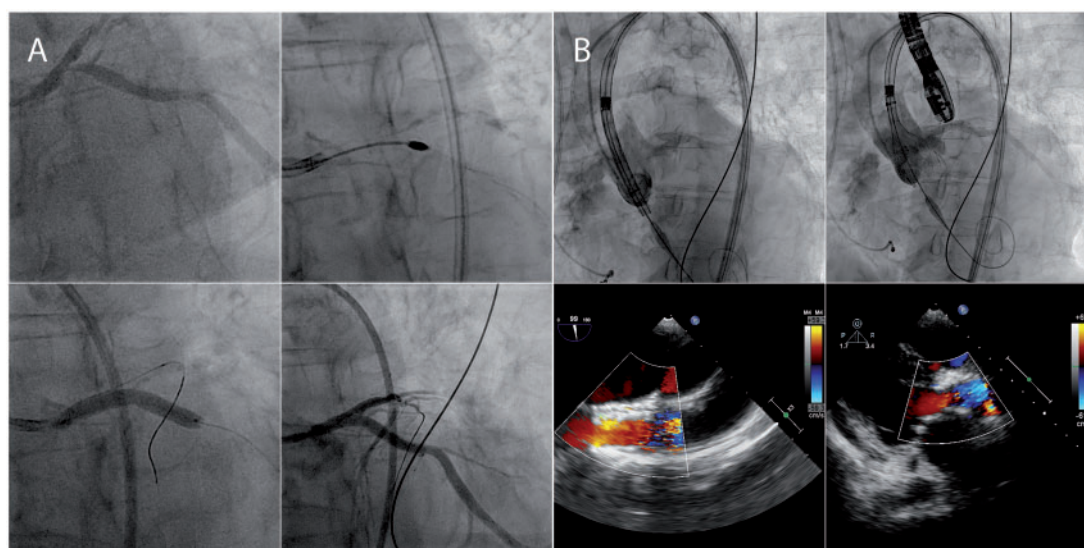
imaging showed a depressed LVEF (26%) with akinesia of the anterior, apex, and inferior wall with no signs of viability. Transthoracic echocardiography revealed a severe AS [aortic velocity ( $V_{max}$ ) was 3.17 m/s, aortic valve area was 0.7 mm<sup>2</sup>, velocity ratio was 0.23] as well as a moderate mitral insufficiency. Furthermore, an end-stage renal failure (estimated glomerular filtration rate of 23 ml/min/1.73 m<sup>2</sup>) was diagnosed.

Patient was discussed in the heart team. EuroSCORE and EuroSCORE II were 20 and 11.6, respectively. Porcelain aorta precluded conventional surgery. Absence of viability in the LAD and RCA lesions dictated revascularization only in the LCX lesion followed by a TAVI. A treatment with rotablator was judged necessary for the heavy calcified LCX lesion. Considering a complex procedure in a last remaining vessel with a high-risk of periprocedural complications in a patient with poor LV function as well as severe AS, standby veno-arterial extracorporeal membrane oxygenation (VA-ECMO, Cardiohelp, Maquet) backup was judged necessary. As both PCI with VA-ECMO and TAVI would require general anaesthesia, as well as large-sized arterial access, both procedures were performed during the same setting. After successful rotablation the lesion was stented with zotarolimus-eluting stent (Resolute Onyx), followed by implantation of a 26 mm Evolut R™ (Medtronic, Santa Rosa, CA, USA) prosthesis (subvalvular calcification was a contra-indication for a balloon-expandable valve) (Figure 1A and B and see [Supplementary material online, Videos S2–S6](#)). The entire procedure was performed with 70 cc contrast. Total radiation dose was 48 Gray·cm<sup>2</sup>. Veno-arterial extracorporeal membrane oxygenation support was not necessary during procedure. Post-procedural echocardiographic evaluation

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**Figure 1** (A) Top left: baseline angiography showing a severe calcified lesion of the left main-left circumflex artery. Top right: rotablator burr of 1.75 mm past several times through the lesion with 150 000 rpm. Bottom left: stent deployment of 3.5 × 30 mm Resolute Onyx stent at 18 atmosphere. Bottom right: final angiographic result shows a Thrombolysis in Myocardial Infarction 3 flow, no signs of dissection, good apposition, and good deployment of the placed stent on careful visual estimation. (B) Top left: positioning of the Evolut R 26 mm prosthesis about 3.0–4.0 mm under the valve level. Top right: deployed prosthesis before full release. Bottom left: transoesophageal echocardiography showing valve deployment and paravalvular leak (PVL) assessment after deployment of the prosthesis. Bottom right: transthoracic echocardiography follow-up at 6 months showing no remaining PVL.

revealed a minimal paravalvular leakage (aortic regurgitation index of 39.6), which was not visible at 30 days and 6 months follow-up (Figure 1B and see [Supplementary material online, Video S7](#)). Patient was discharged few days after procedure on triple therapy for 30 days followed by Vitamin K antagonist and Clopidogrel life-long.

A simultaneous complex PCI and TAVI is seldom described before,<sup>1–3</sup> however, this approach is feasible and may be considered in patients at high-risk of peri-procedural haemodynamic shock, where standby haemodynamic support is judged necessary.

## Supplementary material

[Supplementary material](#) is available at *European Heart Journal - Case Reports* online.

**Consent:** The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

**Conflict of interest:** none declared.

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