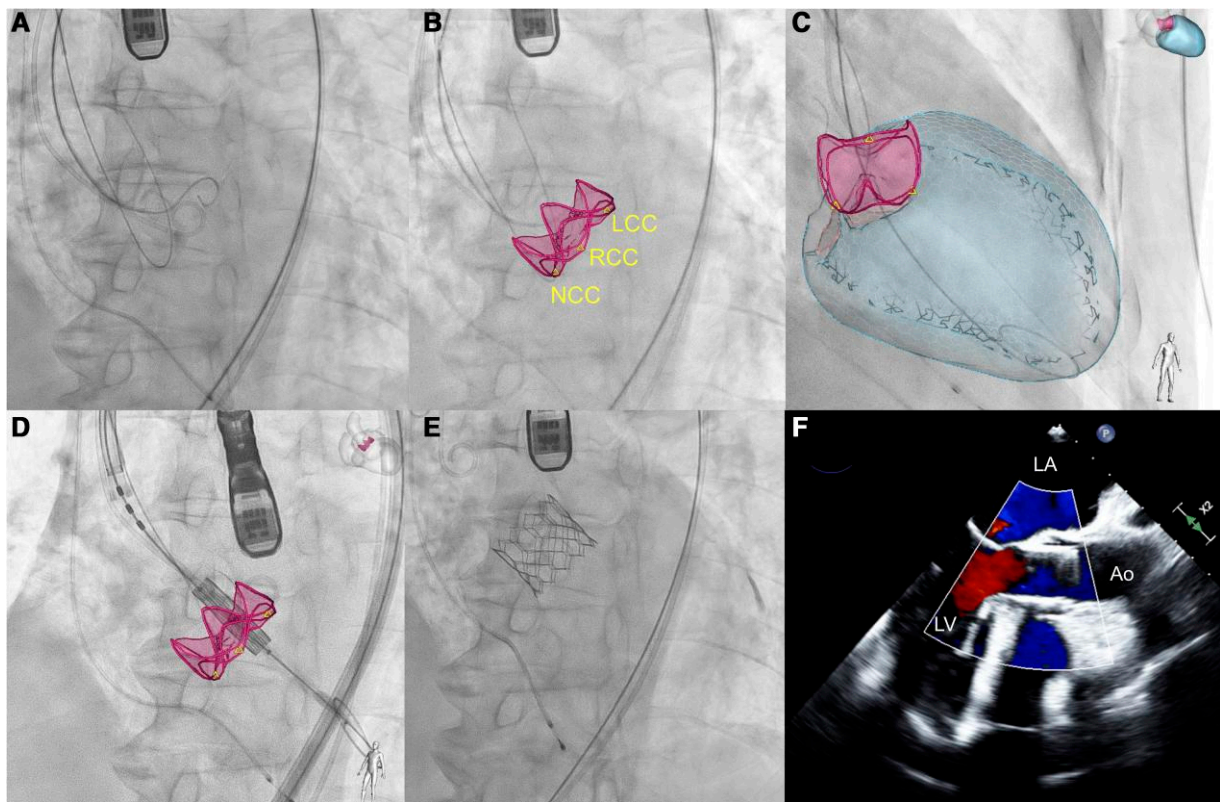


Three-dimensional echocardiography-fluoroscopy fusion imaging-guided zero-contrast transcatheter aortic valve implantation

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Real-time three-dimensional (3D) transoesophageal echocardiography (TEE) and X-ray fluoroscopy fusion imaging using the EchoNavigator (Philips Healthcare, Best, The Netherlands) is a recent innovation to structural heart intervention such as transcatheter edge-to-edge repair and left atrial appendage closure. However, zero-contrast transcatheter aortic valve implantation (TAVI) using 3D TEE-fluoroscopy fusion imaging has not been reported.

An 86-year-old male with a history of coronary artery disease was referred for TAVI because of dyspnoea on exertion. His estimated glomerular filtration rate (eGFR) was 21.9 mL/min. He underwent screening without contrast by magnetic resonance imaging and non-enhanced computed tomography, and echocardiography.

The zero-contrast TAVI procedure was performed under general anaesthesia and 3D TEE-fluoroscopy fusion imaging guidance. First, an additional wire was inserted via the left radial artery. A pigtail catheter was positioned in the right coronary cusp, and two wires were positioned in the non-coronary cusp and left coronary cusp, showing a perpendicular view without using contrast (*Panel A*). Subsequently, 3D TEE-fluoroscopy fusion imaging view of the aortic valve was produced, completely consistent with a perpendicular view (*Panel B*). Next, the wire position was confirmed using 3D TEE-fluoroscopy fusion imaging (*Panel C*). Finally, a 26 mm SAPIEN 3 Ultra RESILIA valve (Edwards Lifesciences, Irvine, CA, USA) was successfully deployed

under rapid pacing without contrast (*Panels D, E, and F*). The patient's periprocedural renal function did not deteriorate. At 5 days after TAVI, his eGFR was 21.8 mL/min.

We previously reported the usefulness of zero-contrast TAVI. While TAVI under local anaesthesia is being performed in many centres, patients with advanced chronic kidney disease may benefit from treatment under general anaesthesia with 3D TEE-fluoroscopy fusion imaging guidance.

Consent: The authors confirm that written consent for the submission and publication of this case, including images, was obtained from the patient in line with the Committee on Publication Ethics (COPE) guidelines.

Conflict of interest: M.I. is a consultant of Edwards Lifesciences and Abbott Medical Japan. All other authors declare no conflicts of interest.

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Data availability

Data sharing is not applicable to this report because no datasets were generated or analysed for this case.