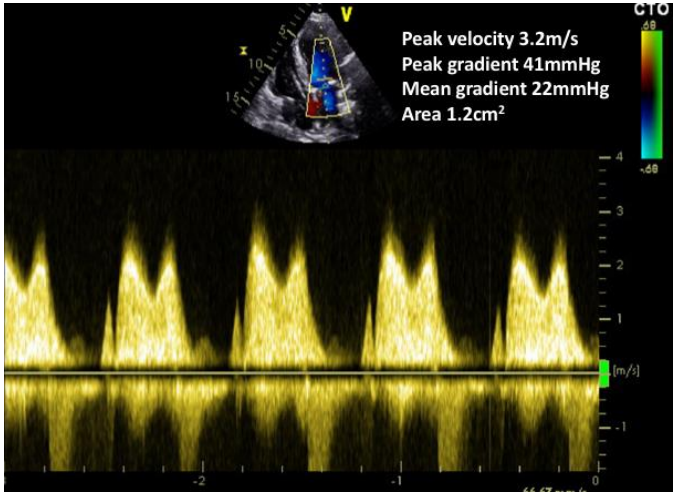
2021 euro PCR

Iatrogenic severe mitral stenosis after transcatheter aortic valve implantation

Case presentation

- 85 years-old male
- Calcified severe symptomatic aortic stenosis
- Rheumatic **mild mitral stenosis** with posterior annular calcification (**PAC**).
- June 2019:
  - Right transaxilary TAVR (CoreValve Evolut R 34mm)
  - Low position conditioning an **iatrogenic severe mitral stenosis** due to impingement of anterior mitral leaflet by the inflow portion of the prosthesis
  - Patient asymptomatic at discharge

TTE at discharge after TAVR

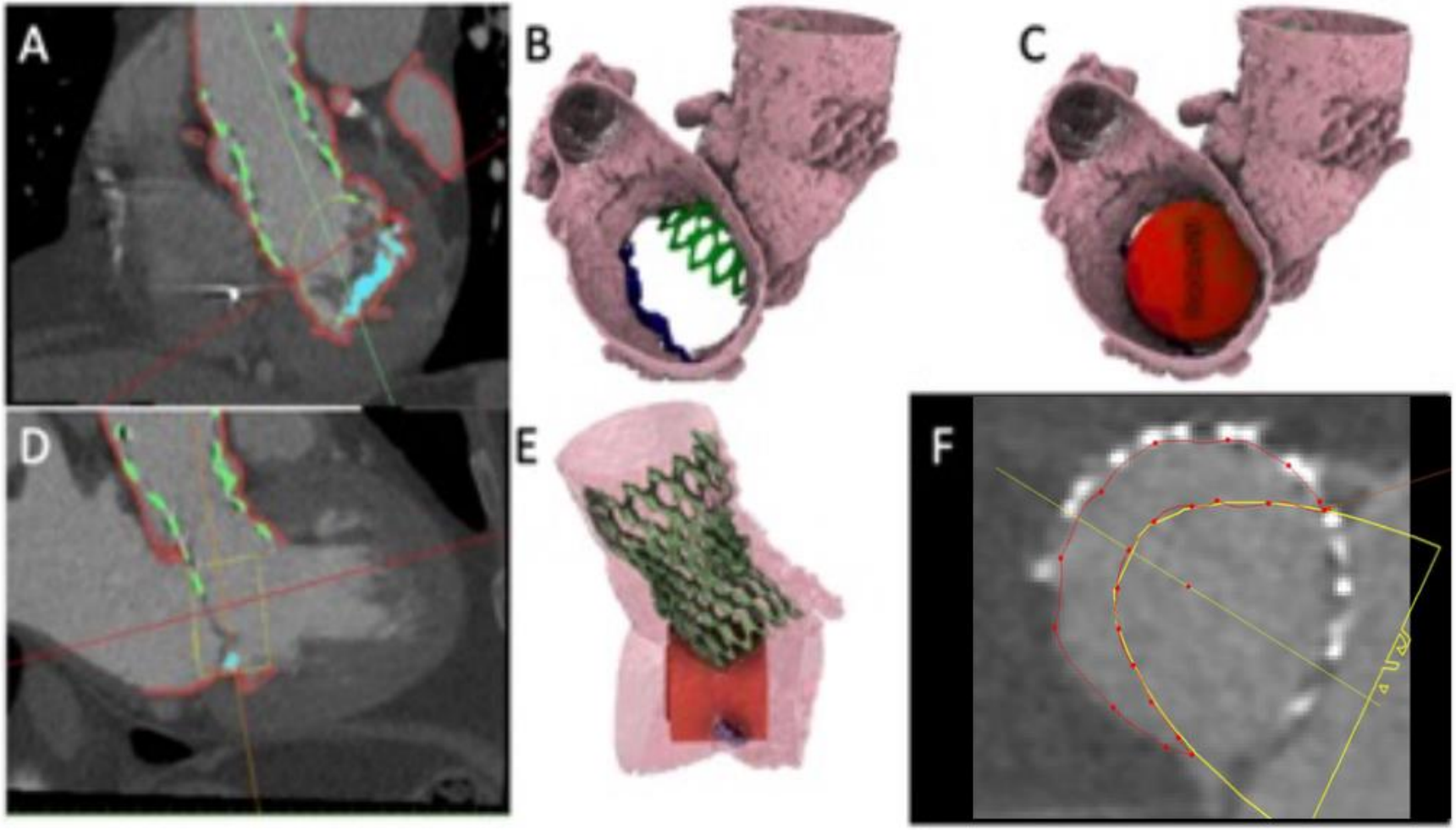


Clinical course

- July 2019: admission due to heart failure
- August 2019: admission due to acute pulmonary edema

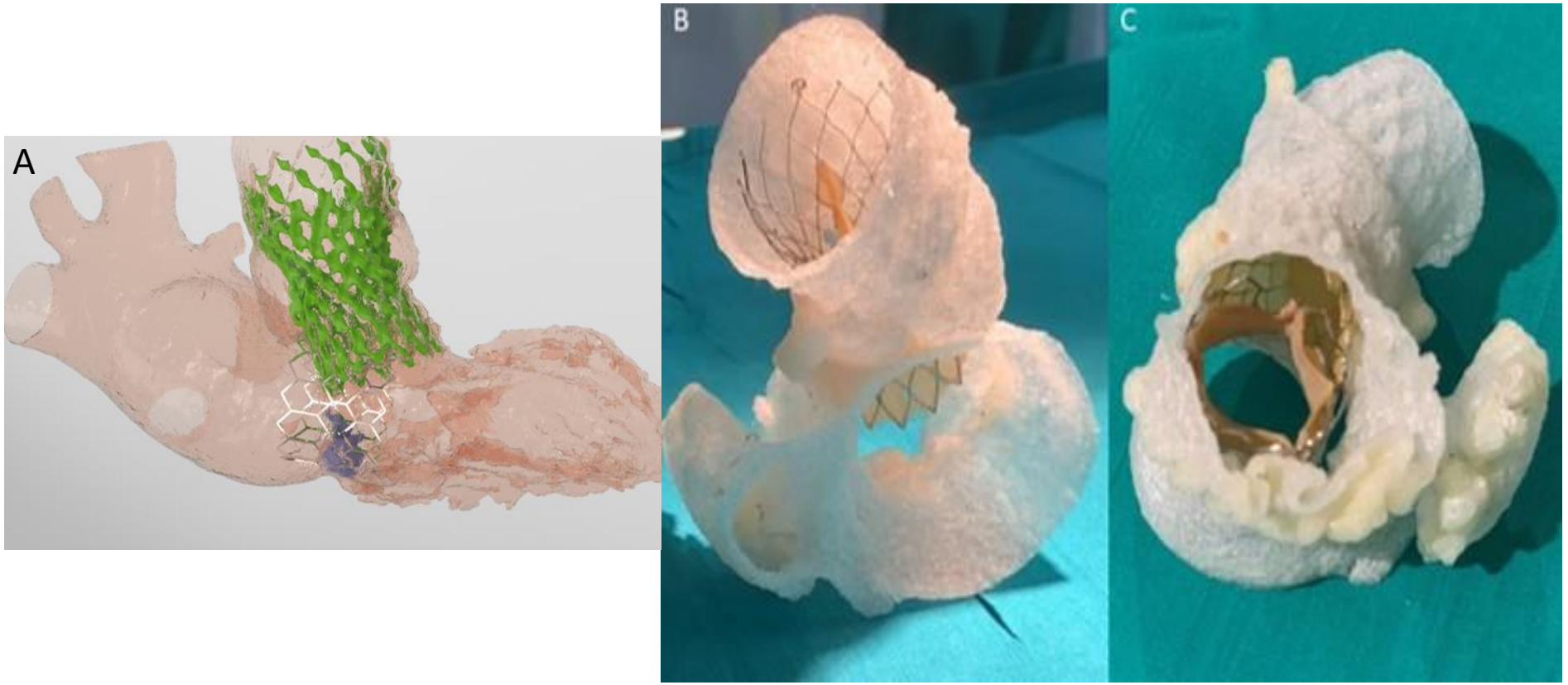
- September 2019: Heart Team discussion
  - **TMVR** using a balloon-expandable aortic transcatheter valve despite the **absence of a calcified structure sufficient for anchoring the mitral valve**
  - The main concerns for TMVR in this anatomical scenario were mitral annulus sizing, prediction of neo-left ventricle outflow tract obstruction, TMVR stability, and the interplay between TAVR and TMVR devices

TMVR planification based on CT



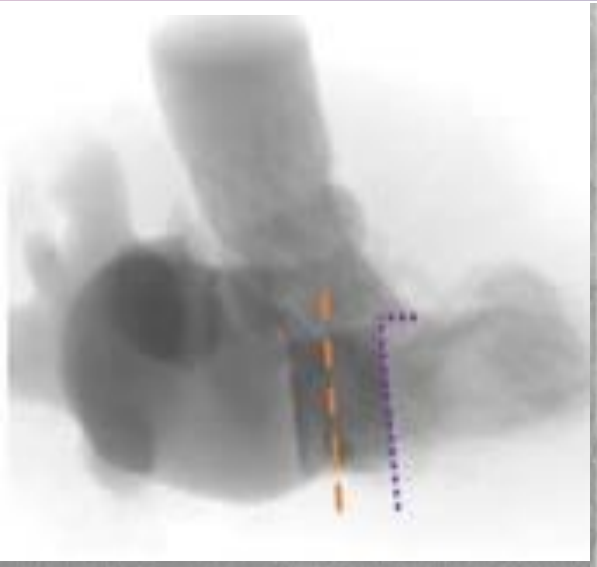
(A) Segmentation of mitral annulus following the D-shape method (predicted area 680mm^2). (B) Virtual implantation of SAPIEN 3 prosthesis in the landing zone according to the 3D model (C, E) and CT (D). (F) Virtual neo-left ventricle outflow tract (predicted area 1.9cm^2)

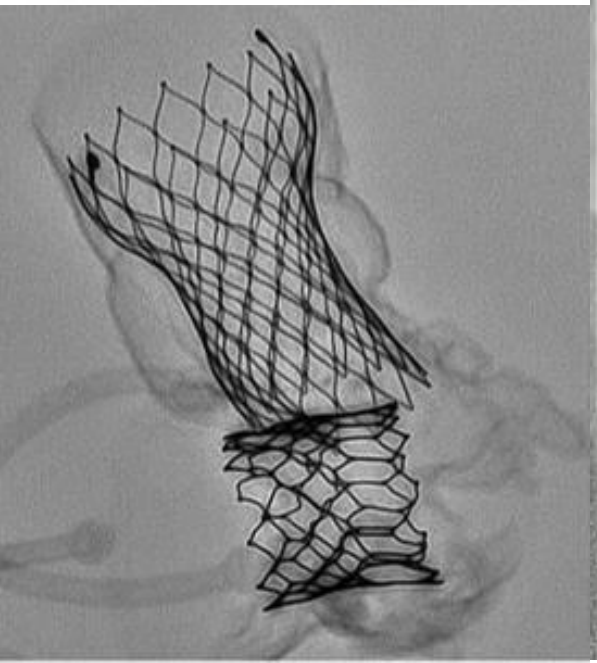
TMVR planification based on a 3D phantom

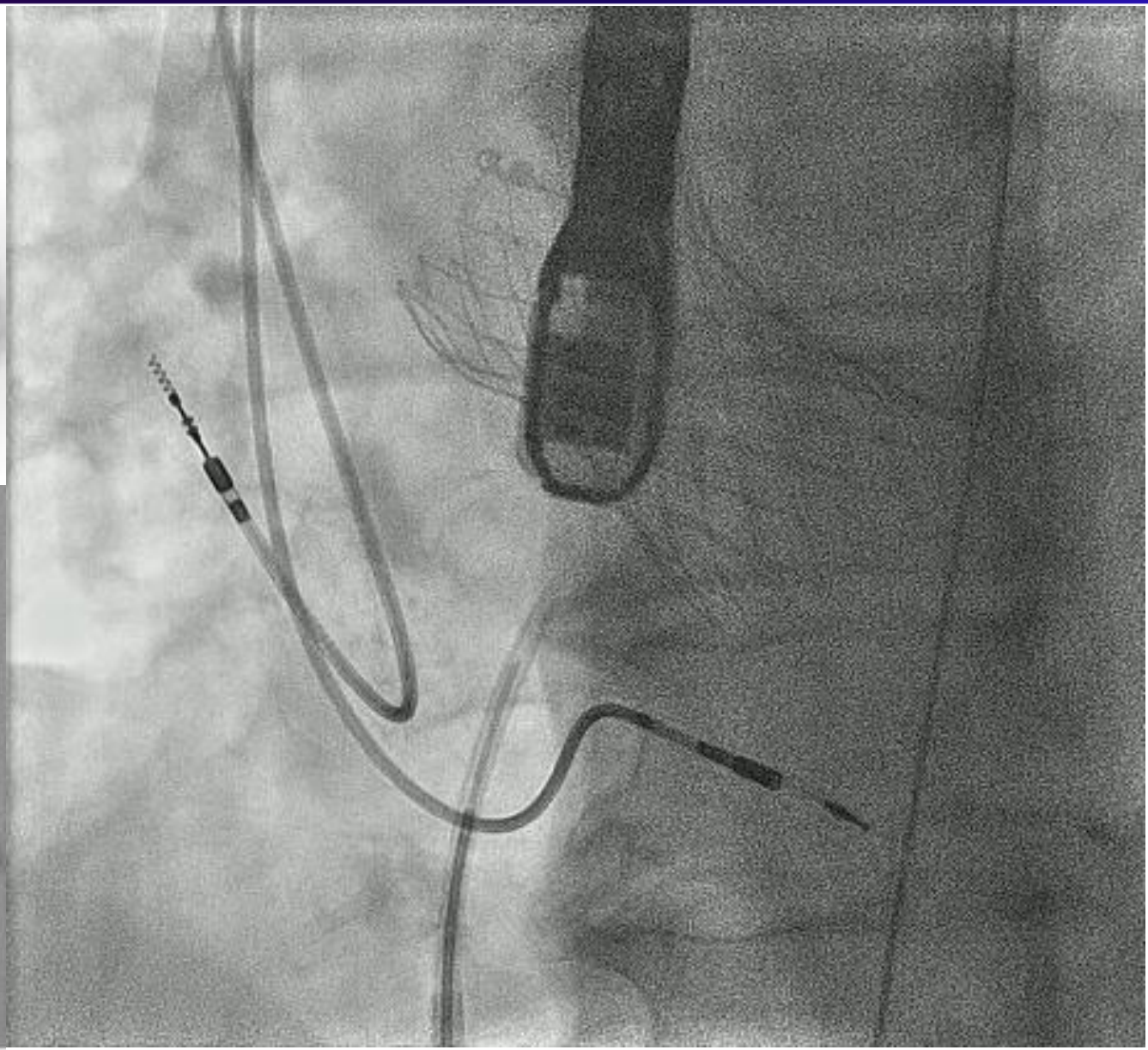


(A) Virtual simulation of the interplay between both prosthesis
(B and C) 3D phantom printed using the CT dataset.

29-mm Sapien 3 valve implantation







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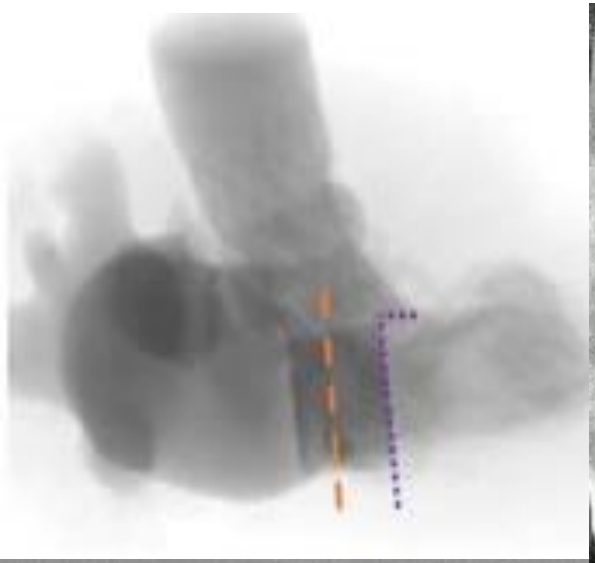
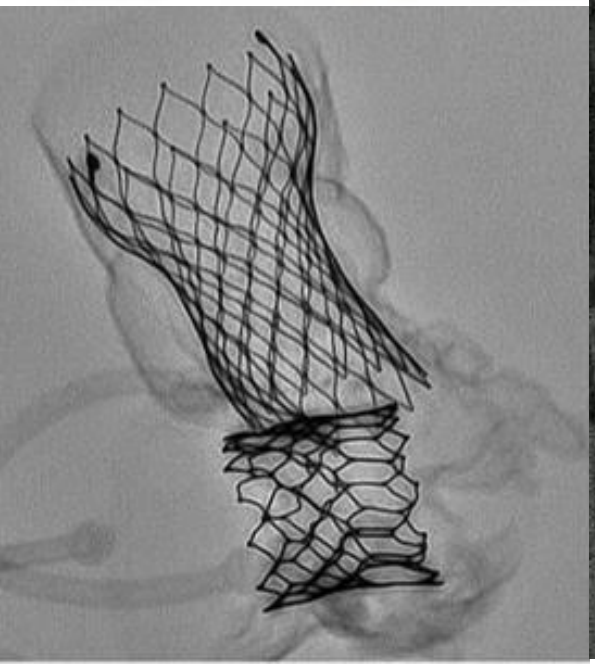
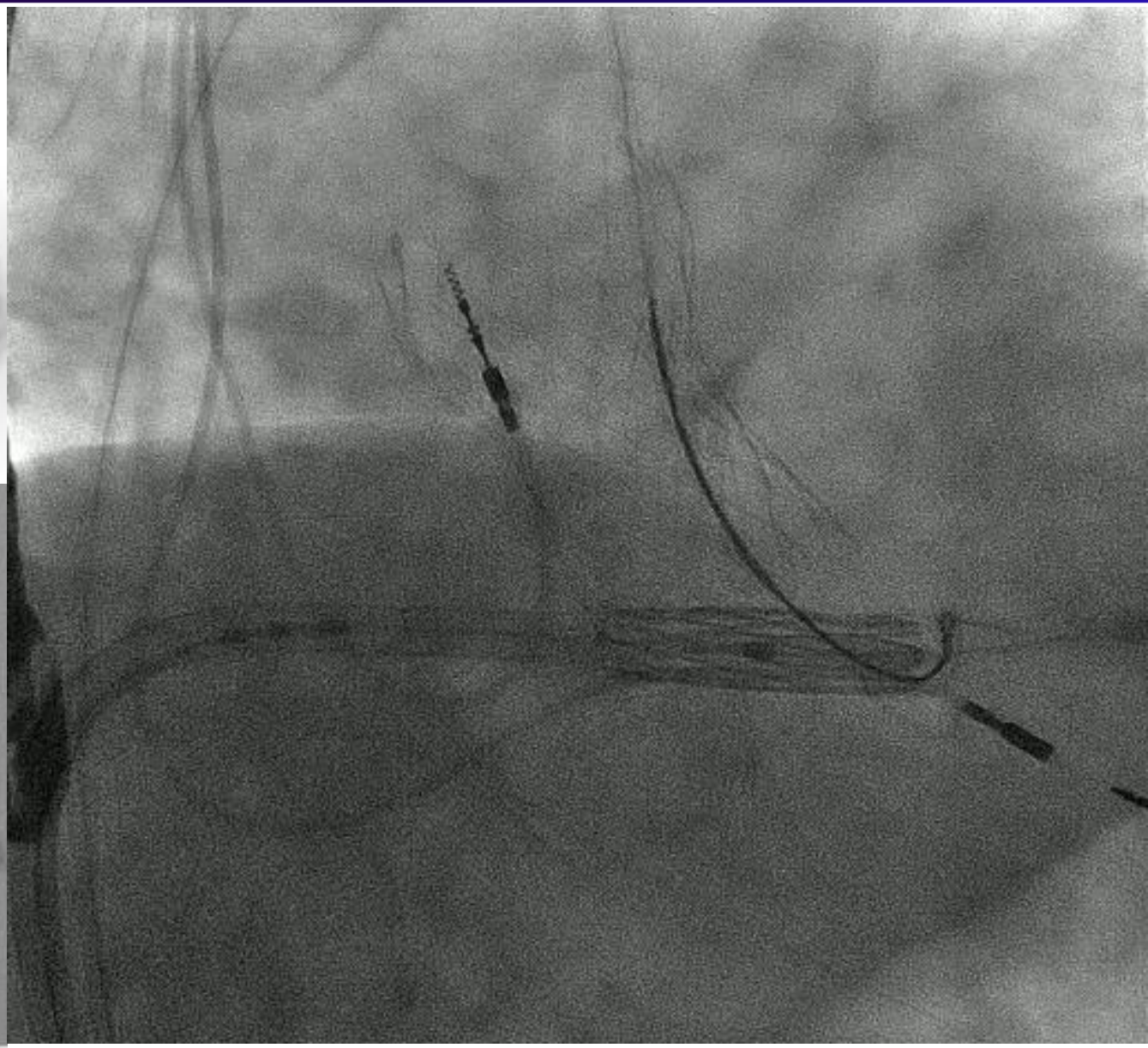
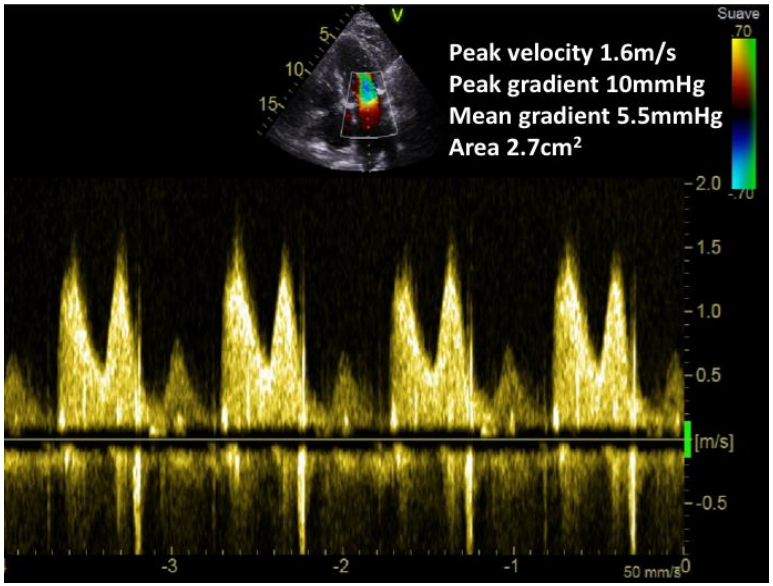
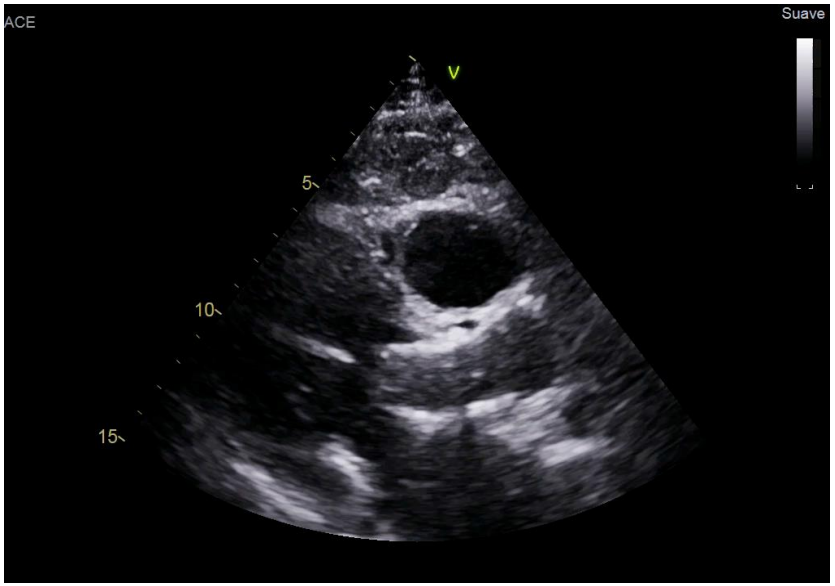


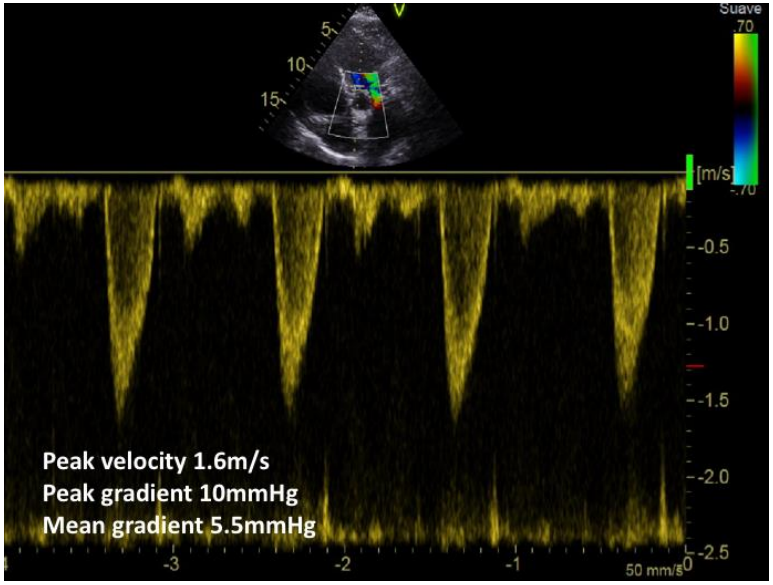


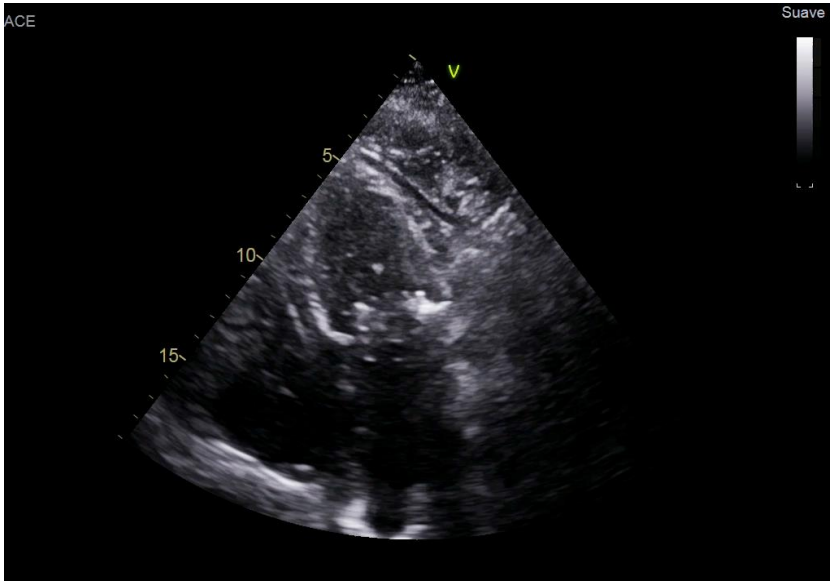


TTE at discharge









Outcomes

- The aortic bioprosthesis in mitral position was well anchored between the calcified posterior annulus and the previous TAVR
- The immediate hemodynamic and respiratory evolution was satisfactory, allowing extubation of patient in the Catheterization Laboratory
- At 1-month follow up the patient was in New York Heart Association functional class I

This is one of the first valve-in-PAC post-TAVR procedures successfully performed using virtual simulation based on CT and 3D printing models