

Case Study

Closure of Paravalvular Mitral Valve Leakage

supported by *syngo* DynaCT Cardiac, *syngo* InSpace 3D/3D Fusion and *syngo* iGuide Toolbox

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Closure of Paravalvular Mitral Valve Leakage

Courtesy of Samir Kapadia, MD, Heart and Vascular Institute, The Cleveland Clinic Foundation, Cleveland, OH, USA

Interventional Cardiology

Patient History

72-year-old, male patient with previously placed bioprosthetic mitral valve.

Diagnosis

Mitral regurgitation (grade 3+) due to periprosthetic leak (see movie **1**).

Treatment

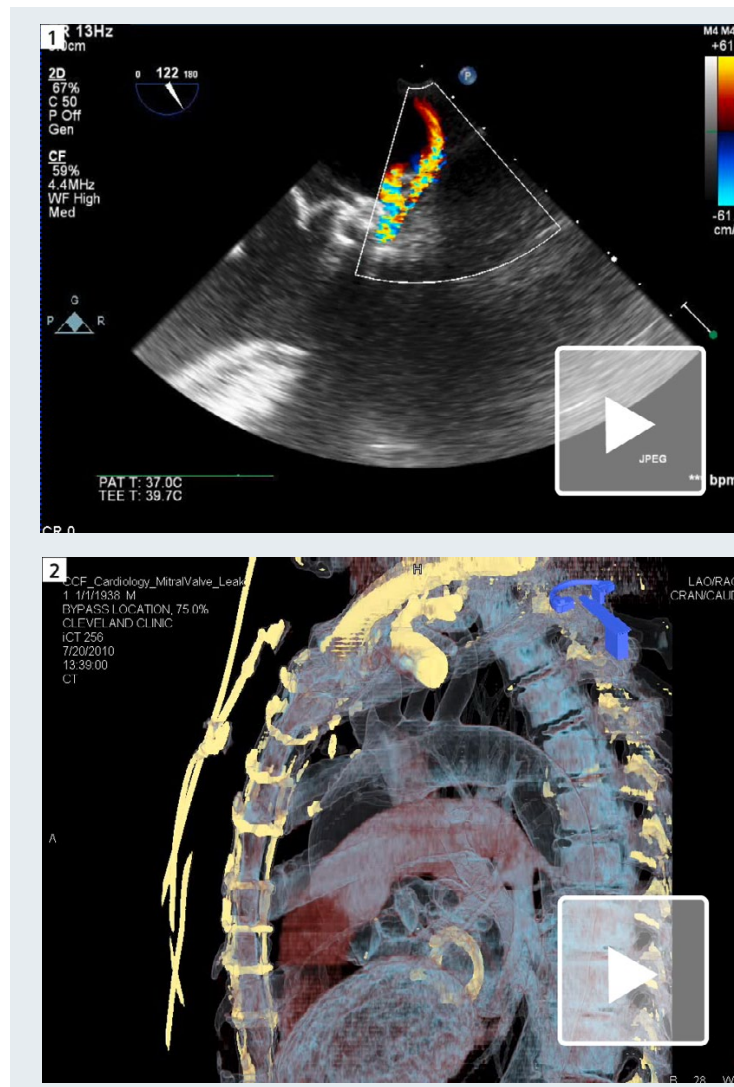
Closure of the paravalvular leak with an 8 mm VSD closure device under TEE (trans-esophageal echo) and fluoroscopic guidance. syngo iGuide Toolbox graphics were overlaid as additional guidance.

Comments

The case demonstrated that the overlay of 3D information on the live fluoroscopic images provided additional helpful information.

More detailed information can be found in the following publication:
Krishnaswamy A, Tuzcu EM, Kapadia S., Three-dimensional computed tomography in the cardiac catheterization laboratory, Catheter Cardiovasc Interv. 2010

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1 Diagnostic TEE showing the paravalvular leak

2 Pre-procedural cardiac CT

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Detailed workflow description

Pre-procedural cardiac CT data was retrieved from the PACS. (, see previous page)
The following structures were marked with *syngo* iGuide Toolbox graphics:

- Mitral valve plane
- Positions of the paravalvular leaks (based on the information of the diagnostic TEE **3**)
- Aortic valve plane **4**
- Area for transseptal puncture **5**

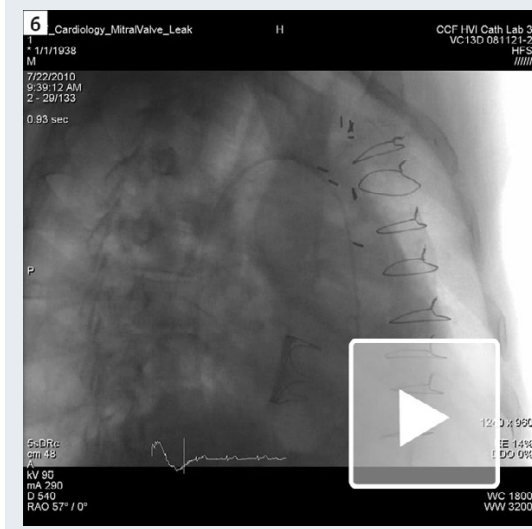
The patient was positioned on the table with arms up to match the patient's position during the pre-procedural cardiac CT. Arms were kept up during the whole procedure.

A 5-second *syngo* DynaCT Cardiac run was performed without contrast (**6**). During this rotational acquisition a pigtail catheter was positioned in the aortic root to visualize the position of the aorta and the aortic root as landmarks for the *syngo* InSpace 3D/3D registration. Patient was asked just to hold his breath, i.e., no deep inspiration or expiration in order to be in a similar breathing situation as during the remaining procedure. This helps increasing the overlay accuracy.

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syngo DynaCT Cardiac with
syngo iGuide Toolbox markers indicating

- 3** the positions of the paravalvular leaks from TEE
- 4** the plane of the aortic valve
- 5** the desired region of the transseptal puncture



6 5s *syngo* DynaCT Cardiac acquisition;
Protocol: 5sDRc

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3D/3D registration of *syngo* DynaCT Cardiac image and CT was performed in *syngo* InSpace with the pigtail catheter and the mitral valve serving as landmarks. (7).

The overlaid 3D markers helped as additional guidance during the procedure for:

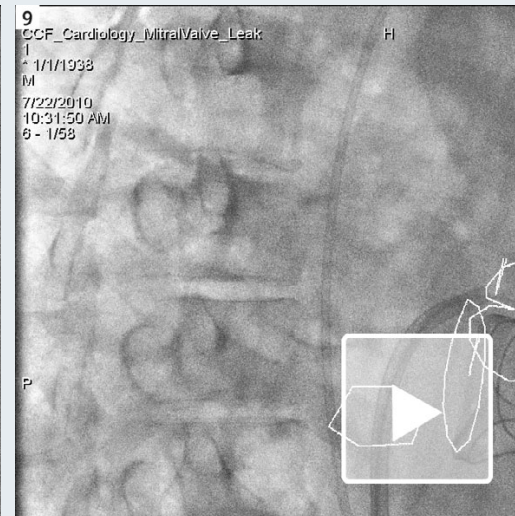
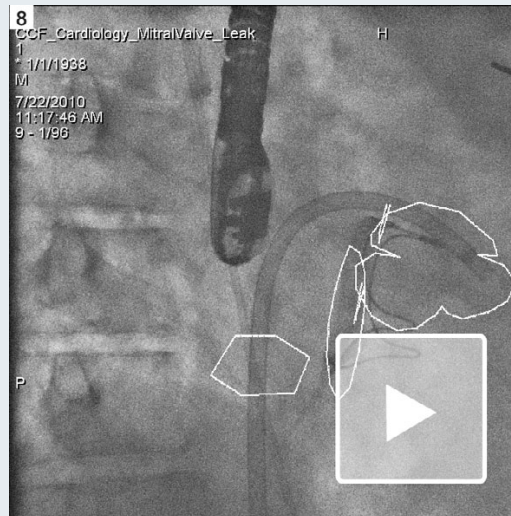
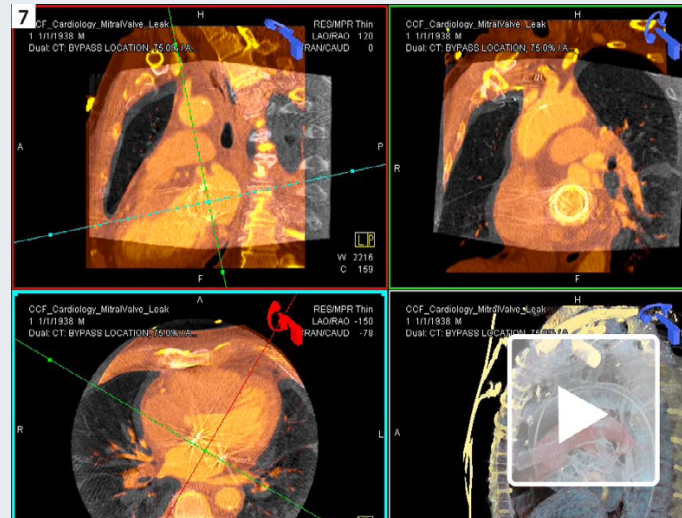
- a) the puncture of the atrial septum
- b) the progression of a guidewire through a leak (8)
- c) the adjustment of the closure devices (9)

7 3D/3D registration of cardiac CT and *syngo* DynaCT Cardiac.

8+9 Live fluoroscopic image with overlaid *syngo* iGuide Toolbox graphics.

Video 8 shows the alignment of a closure device (two radiopaque markers).

Video 9 shows the guidewire through a leak.



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