

Case Study

Atrial Fibrillation Ablation

supported by *syngo* DynaCT Cardiac

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Atrial Fibrillation Ablation

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Electrophysiology

Patient History

66-year-old man with symptomatic atrial fibrillation.

Diagnosis

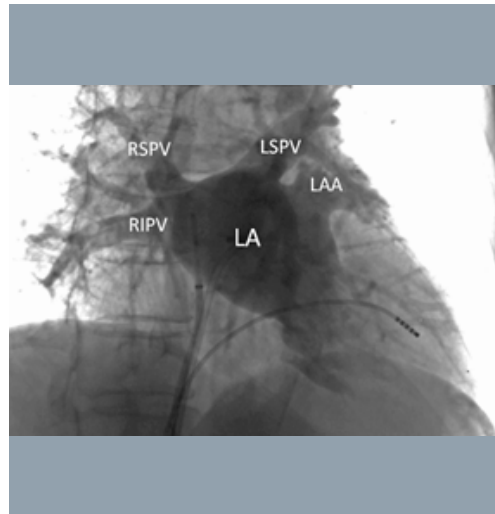
Paroxysmal atrial fibrillation, refractory to medical treatment.

Treatment

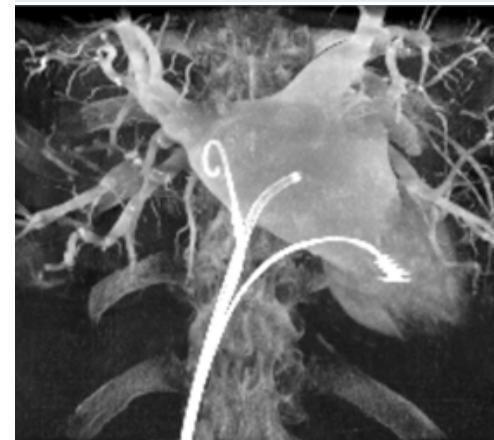
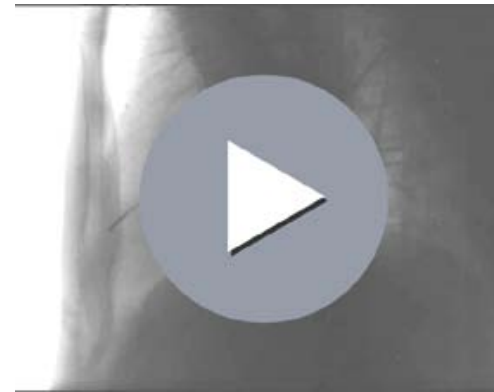
Radiofrequency catheter ablation to obtain electrical isolation of the pulmonary veins. A 6 French pigtail catheter was positioned in the left atrium for contrast injection during *syngo* DynaCT Cardiac acquisition (Fig. 1). The resulting rotational projection images were automatically transferred to the Siemens *syngo* Workplace and reconstructed into two-dimensional CT-like images, which were used for further processing into a 3D model of the left atrium (Fig. 2, Fig. 3)

Protocol

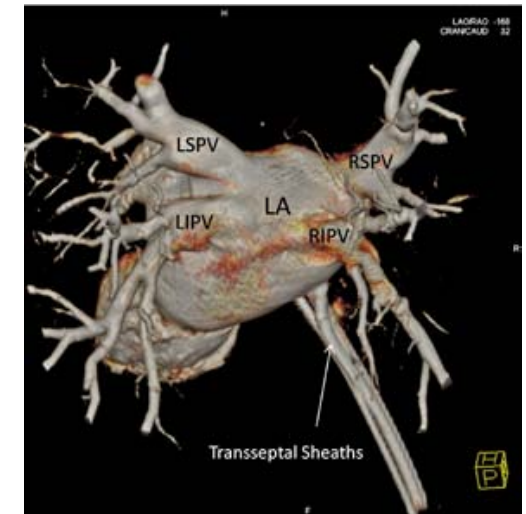
2D projection at a rate of 60 f/s during a single 5 s C-arm rotation over 200°. Contrast agent (60 ml) diluted with saline to 140 cc (approximately 1:2 dilution) and injected at 20 cc/s during ventricular asystole.



- 1 Injection of diluted contrast agent in the left atrium during adenosine-induced ventricular asystole allows a homogeneous contrast opacification of the left atrium and pulmonary veins (RSPV: right superior pulmonary vein, RIPV: right inferior pulmonary vein, LSPV: left superior pulmonary vein, LA: left atrium, LAA: left atrial appendage)



- 2a+b *syngo* DynaCT Cardiac allows reconstruction of rotational projection images into a detailed 3D volumetric dataset demonstrating the 3D anatomy of the left atrium and pulmonary veins.



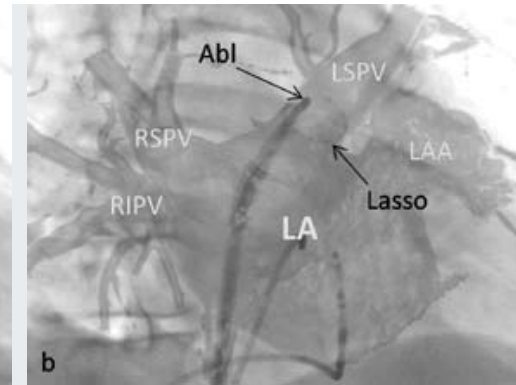
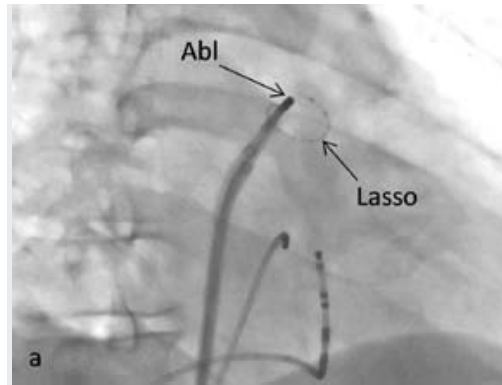
- 3 Posterior view of the left atrium visualized using the *syngo* InSpace 3D direct volume rendering. Ungated *syngo* DynaCT Cardiac during ventricular asystole resulted (in a diagnostic) 3D image of the left atrium, which was used for guiding the ablation procedure. (LA: left atrium, LSPV: left superior pulmonary vein, LIPV: left inferior pulmonary vein, RSPV: right superior pulmonary vein, RIPV: right inferior pulmonary vein)

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Comments

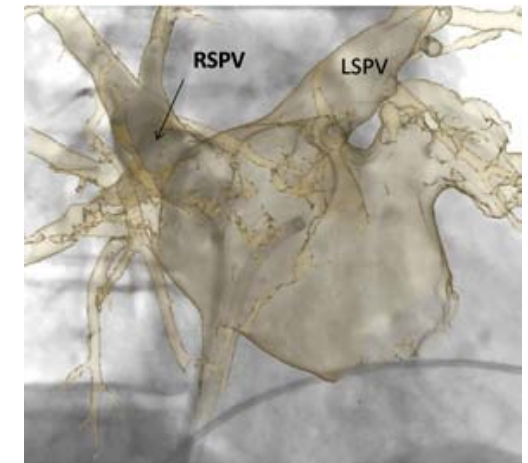
A significant advantage of *syngo* DynaCT Cardiac is the automatic integration of 3D and fluoroscopic images during the procedure. Patient position is identical during *syngo* DynaCT Cardiac acquisition and fluoroscopic imaging. With *syngo* iPilot the location of the reconstructed 3D model relative to the fluoroscopic imaging geometry is identical, and allows for a fully automatic calibration and registration of the acquired 3D model to the fluoroscopy images (Fig. 5) in the primary plane.



4a+b Integration of *syngo* DynaCT Cardiac-based 3D model of the left atrium with fluoroscopy using *syngo* iPilot.

4a Fluoroscopic image in the right anterior oblique view showing the ablation catheter (Abl) and circumferential mapping catheter (Lasso).

4b After *syngo* iPilot image integration with the *syngo* DynaCT Cardiac-based 3D model, the position of the ablation and mapping catheters at the ostium of the left superior pulmonary vein can be accurately determined. (Abl: ablation catheter, Lasso: circumferential mapping catheter, LA: left atrium, RSPV: right superior pulmonary vein, RIPV: right inferior pulmonary vein, LSPV: left superior pulmonary vein, LAA: left atrial appendage)



5 Selective angiographic injection in the right superior pulmonary vein, confirming accurate automatic *syngo* iPilot integration of the left atrial 3D model acquired with *syngo* DynaCT Cardiac. (RSPV: right superior pulmonary vein, LSPV: left superior pulmonary vein)

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