‘Two-by-two’ pulmonary vein isolation in the presence of a complete situs inversus and dextrocardia: use of magnetic navigation and 3D mapping with image integration

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Interventions in patients with ‘abnormal’ anatomy are a challenge for every invasive cardiologist. Understanding of the underlying geometry by 3D reconstruction of a pre-acquired image is facilitating the orientation of the operator. The report describes how to perform catheter ablation of atrial fibrillation in a patient with complete situs inversus using the magnetic navigation system in conjunction to electroanatomical mapping.

Case report

We report on a 34-year-old female patient with complete situs inversus who underwent catheter ablation of paroxysmal atrial fibrillation using magnetically remote-controlled catheter ablation. Double-transseptal access was achieved from the left femoral vein using an inverted fluoroscopy image (Figure 1).

Mapping and ablation were performed in conjunction with the 3D electroanatomical mapping system and pre-acquired 3D computer tomography (CT) (Figure 2). After selective pulmonary vein (PV) angiography, the 3D reconstruction of the left atrium and the PV were performed completely by remote control using the magnetic navigation system (Niobe, Stereotaxis Inc.). Isolation of both ipsilateral PVS was achieved using point-by-point ablation via an 8 mm magnetic ablation catheter (Figure 3). Careful registration using a previously acquired CT scan and superimposition of the 3D maps on the reference fluoroscopy limited the radiation exposure.

Figure 1 Direct contrast injection in the lateral superior pulmonary vein (PV): lower panel with left anterior oblique (LAO) and right anterior oblique (RAO) projections in correct fluoroscopy projection, upper panel with ‘inverted’ imaging.
to the patient during LA mapping and ablation to <7 min. During the follow-up of >12 months, the patient remained in stable sinus rhythm.

**Conflict of interest:** S.E. is a consultant for Stereotaxis Inc.