

CLINICAL VIGNETTE

Hybrid ablation in a patient with persistent, long-standing atrial fibrillation after left-sided pneumonectomy

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We present a case of a 68-year-old man with symptomatic (EHRA class III) atrial fibrillation (AF). Despite using various antiarrhythmic drugs and multiple electrical cardioversions, it was impossible to achieve a satisfactory rhythm/rate control. The patient had undergone left-sided pneumonectomy 17 years ago due to carcinoma planoepitheliale and remained in remission since then. Transthoracic echocardiography revealed normal left and right ventricular functions, no valve dysfunction, and left atrial (LA) diameter and area of 54 mm and 28 cm², respectively. Computed tomography (CT) and subsequent three-dimensional reconstruction visualised modified chest anatomy (Fig. 1B, C). Surgical procedure was carried out initially. A small midline abdominal incision below the xyphoid was made, through which a laparoscopic port was inserted into the pericardium. Afterwards, an irrigated, unipolar radiofrequency ablation catheter (AtriCure INC) was passed through the cannula. Linear lesions were then created under fluoroscopic guidance (90 s each, 30 W). Endocardial ablation was performed four weeks after the surgical procedure. Before the ablation, a thrombus in the LA appendage was excluded by transoesophageal echocardiography (TEE). Transseptal puncture with an Agilis™ NxT steerable sheath (St. Jude Medical Inc., St. Paul, MN, USA) was performed under TEE guidance. After electrical cardioversion electroanatomical mapping and ablation were performed using Carto 3 combined with a Thermocool SmartTouch™ catheter (Biosense Webster Inc., Diamond Bar, CA, USA). Circumferential lesions around the right pulmonary veins (PVs) were created. Subsequently, according to the voltage map, arrhythmogenic substrate in LA was modified with an additional linear lesion (between the right superior PV and the stump of the left veins) (Fig. 1A). Fluoroscopy and procedure times were 11 and 240 min, respectively. No AF recurrence was observed during six-month follow-up (seven-day Holter monitoring at third and sixth month, clinical interview). The association between AF and cancer is not clear. AF is more frequent in patients with malignancy [1]. Previous thoracic operations, including pneumonectomy, can increase AF risk [2]. Anatomical relations in the chest can substantially change after pneumonectomy [3]. In the presented case, due to heart rotation observed in CT and after placing intracardiac electrodes, transseptal puncture was performed with TEE assist to avoid severe complications such as puncture of the aorta or cardiac free wall. Previous operations can cause pleural adhesions and make transthoracic epicardial access difficult to use. In such situations transabdominal access, which is independent of lung function, proves to be feasible and effective [4]. Previous data showed that PV stumps can be a source of electrical activity responsible for AF and should be checked during ablation [5]. In the presented case, electroanatomical mapping showed no electrical activity in PV stumps and left part of the LA. Thus, ablation was performed only at the ostia of right PVs with subsequent LA substrate modification.

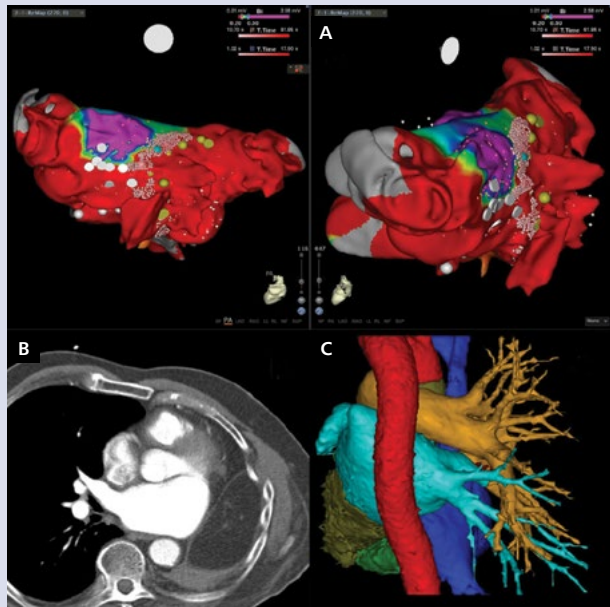


Figure 1. A. Bipolar electroanatomical map in posteroanterior and left posterior oblique projections. The scar is represented in red, and the healthy muscle in magenta. Colours in between show low-amplitude regions of the arrhythmogenic substrate. Dots represent the radiofrequency ablation applications; B. Computed tomography presenting the anatomical relations after left-sided pneumonectomy; C. Three-dimensional reconstruction of the heart in the posteroanterior projection showing the rotation of the heart and the absence of left pulmonary veins

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Conflict of interest: Michał Zembala — consultant for Abbott, Boston Scientific, AtriCure Inc.

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