Successful Radiofrequency Pulmonary Vein Isolation In A Patient With Pneumonectomy

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Abstract

Catheter ablation of Atrial fibrillation (AF) is challenging procedure among invasive electrophysiologic studies. Isolation of all pulmonary veins is a cornerstone of the treatment. The procedure is associated with serious complications like pulmonary vein (PV) stenosis. Herein, we present a technically challenging case of PV isolation in a patient who held left-sided pneumonectomy due to lung cancer.

A 72-year-old man suffered from AF for 2 years was recommended AF ablation because of recurrent symptomatic AF attacks despite antiarrhythmic treatment. An echocardiogram revealed normal left ventricular systolic functions (ejection fraction of 65%) and enlarged left atrium (LA of 44 mm). His medical history was remarkable with chronic obstructive pulmonary disease, hypertension, chronic renal failure, coronary artery disease, ulcerative colitis, and left-sided pneumonectomy for lung cancer ten years ago. He was taking antihypertensive and antiarrhythmic agents. Because of high risk of thromboembolism (CHADS2 score > 2) warfarin was administered. Ten years ago, complete left-sided pneumonectomy was performed for resection of tumor. Three-dimensional image of the left atrium and pulmonary veins showed PV-stumps in the left-superior PV and left-inferior PV via 64-slice computed tomography (Figure 1).

Because of unusual post-operative cardiac rotation, only one transseptal puncture could be performed. EnSite NavX system (St.Jude Medical, St Paul, MN, USA) was used for three-dimensional mapping and catheter navigation. Three-dimensional left atrial anatomy was reconstructed (Figure 2). Lasso catheter was inserted into PVs and recorded PV signals in all PVs including PV stumps. Circumferential radiofrequency ablation of ipsilateral PVs was done (30-35 W, 17 mL/min) with irrigated catheter (Sprinklr, Medtronic, Minneapolis, USA) and both, entrance and exit blocks were achieved after the ablation. Interestingly, both left PV stumps were electrically active before the ablation and complete isolation was obtained following RFA. Fluoroscopy and procedure times were 21 min and 125 min respectively. No recurrence of AF was detected during 6 months follow-up period. He had a follow-up CT scan at sixth month and there was no PV stenosis.

Logically, it would be clear that PV ligation following the pneumonectomy could decrease or minimize the risk of AF. As a matter of this fact, previous report demonstrated that PV ligation would eliminate and decrease the sources of AF (1). However, in a report of Konstantinidou and colleagues (2) and as a result of very recent multicenter study remnant PV stumps after pneumonectomy (15 patients) were found electrically active and are frequently the sites of active firing or triggering (3). All PV stumps were electrically active PV potentials and most of them had triggered activity. In addition, they did not observe any PV stenosis following the ablation. In our patient, we also observed that all PVs were electrically active despite PV interruptions.

In conclusion, though AF ablation in patients with pneumonectomy is technically challenging, it is feasible and safe procedure. Besides, PV “stump” is electrically active and should be isolated to maintain long-term sinus rhythm.
References

