

# Isolation of an arrhythmogenic roof vein with the guide of a circular mapping catheter in a case with paroxysmal atrial fibrillation



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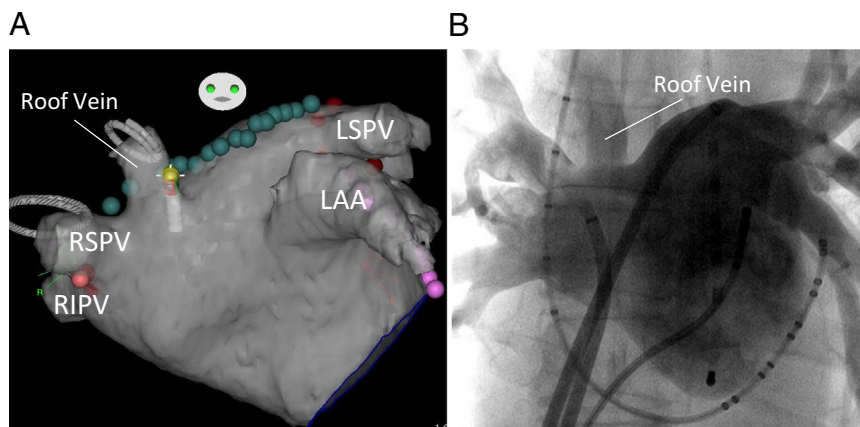
## Introduction

Left atrial roof vein has been shown as a rare anatomical variant without muscle sleeve. We report a case with a large-size roof vein with arrhythmogenicity which was successfully isolated by radiofrequency application.

## Case presentation

A 61-year-old man with a 3-year history of paroxysmal atrial fibrillation underwent a second procedure of catheter ablation treatment. Left atrium (LA) angiography and a 3-dimensional image of the pulmonary veins (PVs), as constructed by contrast-enhanced, multidetector computed tomography, revealed the presence of a vertical anomalous top vein on the right-sided roof

of the left atrium (LA) from the right upper lung lobe (roof vein, Figure 1A, B). After reisolation of reconnected PVs (left superior, right superior, and left inferior PVs) and completion of making a roof line (posteriorly to the roof vein), a Lasso catheter (measuring 15 mm in diameter) was placed inside the roof vein (Figure 1B), which showed both passively activated circumferential potentials and nonconducted blocked firings (Figure 2A). Frequent short-coupling atrial premature complexes with conduction to the LA were also documented. A single radiofrequency (RF) energy application (23 W) with an irrigation system at the earliest activation site successfully eliminated the circumferential potentials at the ostium of the roof vein (Figure 2B). During 5 months of follow-up, the patient has been free from atrial fibrillation recurrence.



**Figure 1** A: Three-dimensional electroanatomic mapping revealed a roof vein on the right-sided roof of the left atrium. A circular mapping catheter was placed at the ostium of the roof vein. The roof vein was successfully isolated by a single radiofrequency energy application (yellow tag). Red, green, and pink tags represent ablation sites of the pulmonary vein isolation, the roof line, and the mitral isthmus line, respectively. B: Left atrial angiography demonstrates the roof vein, which fed into the left atrium. LAA = left atrial appendage; PV = pulmonary vein; LS = left superior; RS = right superior; RI = right inferior.

**KEYWORDS** Atrial fibrillation; Ablation; Pulmonary vein; Roof vein; Isolation (Heart Rhythm Case Reports 2016;2:202–204)

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## Discussion

A roof vein (or top vein) is known as one of the rare variants of PVs.<sup>1–4</sup> Although its morphologic characteristics and arrhythmogenicity have been previously reported,<sup>5</sup> there

**KEY TEACHING POINTS**

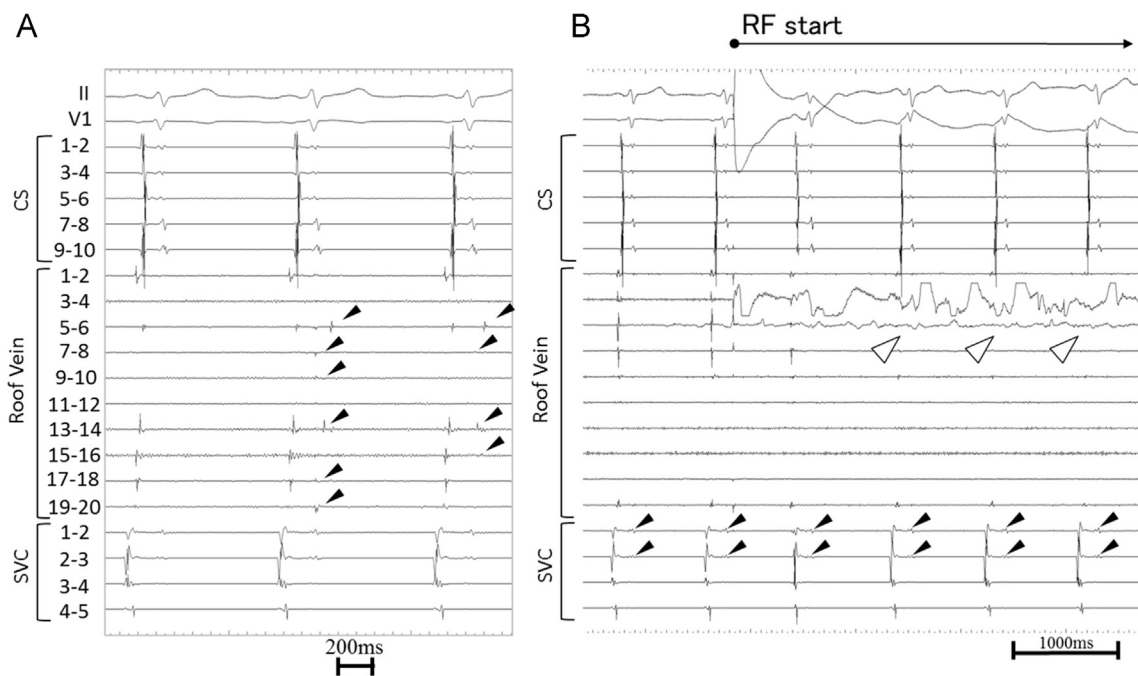
- A roof vein (or top vein) is a rare anatomic variant of pulmonary vein.
- Arrhythmogenicity of the roof vein has not been reported before.
- Electrical isolation of the roof vein by a localized radiofrequency application is the most unique feature of this case.

have been no reports demonstrating the electrical isolation of an arrhythmogenic roof vein by a localized RF application. Since roof veins are generally smaller than the main trunks of the PV, anatomic RF applications at all circumferences of their ostia may lead to a risk of venous stenosis. An

electrogram-guided approach with a circumferential catheter is thus considered to be a suitable approach for the isolation of arrhythmogenic roof veins.

**References**

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**Figure 2** **A:** An intracardiac electrogram of the roof vein demonstrated 2 components of the potentials: the first component was passively activated circumferential potentials and the second component was local firings without conduction to the left atrium (blocked firings, *arrowheads*). **B:** A single radiofrequency energy application eliminated the circumferential potentials in the roof vein. White arrowheads demonstrate the disappearance of the roof vein potentials during ablation, and black arrowheads indicate the continuously observed far-field electrograms in the superior vena cava.