

# Cardioneuroablation for managing recurrent syncope: a case report

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**Introduction:** Recurrent syncope episodes associated with cardioinhibitory responses during vagal stimulation pose a challenge for diagnosis and therapy. This case report provides a detailed description of the successful application of cardioneuroablation (CNA) using radiofrequency ablation (RFA) to prevent recurrent symptomatic episodes in a patient with a history of recurrent syncope.<sup>1-3</sup> The procedure involved inducing vagal reflexes and sinus bradycardia using pulse field ablation (PFA) technology before RFA application.

**Case report:** The patient initially had a sinus rhythm of approximately 75 beats per minute (BPM). The standard left atrial (LA) access procedure for ablation in the LA was performed, creating a 3D anatomical map of the left atrium and pulmonary vein ostia using mapping system. Subsequently, an irrigated ablation catheter was introduced into the left atrium. First, focal PFA (25A/30 pulses) was applied to the anterosuperior aspect of the right superior pulmonary vein ostium to induce vagal reflexes and provoke sinus bradycardia. Vagal reflexes and sinus bradycardia were induced using PFA technology. Following this, RFA with a targeted ablation index (ABI) up to 550 was applied in the described segment, progressing more ostial and antral towards the interatrial septum. During RFA, the sinus rate increased to approximately 85 BPM, reducing vagal response during focal PFA at the same position. Subsequently, RFA was performed on the right atrium (RA) with the introduction of an ablation catheter into the right atrium. Ablation with a targeted ABI of 550 in the anatomically adjacent left set of lesions resulted in a significant increase in heart rate to approximately 110 BPM after six right-sided lesions. Following this, focal PFA was performed on the right side and finally on the left side at the same position as at the beginning, without inducing bradycardia, indicating an acute endpoint and suggesting complete ablation of the superior right vagal nucleus. Sinus rate remained stable during ten minutes of observation. Additional ablation was not considered necessary, and the entire procedure was performed under continuous deep sedation with fentanyl, midazolam, and propofol. The procedure was completed without complications. In this case report of cardioneuroablation (CNA) with radiofrequency ablation therapy for a patient with recurrent syncope, the following results were achieved:

- initial sinus bradycardia: the initial heart rate was around 75 BPM
- focal pulmonary vein isolation (PVI): induction of vagal reflexes and sinus bradycardia using PFA technology
- radiofrequency ablation (RFA) in the left atrium (LA): increase in heart rate to approximately 85 BPM during RFA
- RFA in the right atrium (RA): significant increase in heart rate to approximately 110 BPM after six right-sided lesions.
- complete ablation of the superior right vagal nucleus: achieved acute endpoint without bradycardia induction, suggesting complete ablation
- no complications: the procedure was performed under analgesedation without complications.

These results indicate successful therapy in preventing syncope and increasing heart rate in the patient.

**Conclusion:** This case report suggests that CNA using PFA testing followed RFA may successfully treat recurrent syncope associated with vagal stimulation. The procedure involved focal isolation of the pulmonary veins and targeted ablation of the superior right vagal nucleus, resulting in syncope prevention. This case report illustrates the successful application of CNA in preventing syncope episodes in a patient and underscores the importance of targeted ablation of the superior right vagal nucleus as a promising therapeutic option for this clinical scenario.

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## LITERATURE

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