



Case Report

Comparative efficacy of stellate ganglion block with bupivacaine vs pulsed radiofrequency in a patient with refractory ventricular arrhythmias



Justin Hayase MD (Internal Medicine Resident)^{a,b},
Stephen Vampola MD (Cardiology Fellow)^c,
Farshad Ahadian MD (Professor of Anesthesiology)^{a,b},
Sanjiv M. Narayan MD, PhD (Professor of Medicine)^d,
David E. Krummen MD (Associate Professor of Medicine)^{a,b,*}

^aUniversity of California San Diego, San Diego, CA

^bVeterans Affairs San Diego Healthcare System, San Diego, CA

^cUniversity of California Los Angeles, Los Angeles, CA

^dStanford University, Palo Alto, CA

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Abstract There is increasing interest in interventional therapies targeting the cardiac sympathetic nervous system to suppress ventricular arrhythmias. In this case report, we describe an 80-year-old patient with ischemic cardiomyopathy and multiple implantable cardioverter-defibrillator shocks due to refractory ventricular tachycardia and ventricular fibrillation who was unable to continue biweekly stellate ganglion block procedures using bupivacaine 0.25% for suppression of his arrhythmias. He had previously failed antiarrhythmic drug therapy with amiodarone, catheter ablation, and attempted surgical autonomic denervation. He underwent pulsed radiofrequency treatment (3 lesions, 2 minutes each, temperature 42°C, 2-Hz frequency, 20-millisecond pulse width) of the left stellate ganglion resulting in persistent arrhythmia suppression for more than 12 months duration. This represents the first report of a pulsed radiofrequency stellate ganglion lesion providing long-term suppression of ventricular arrhythmias. Further study of this technique in patients with refractory ventricular tachycardia or ventricular fibrillation is warranted.

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1. Introduction

There has been increasing interest in interventional therapies targeting the cardiac sympathetic innervation to

suppress ventricular arrhythmias. Successful management of electrical storm with stellate ganglion block (SGB) has been previously reported [1]. Surgical sympathectomy has also demonstrated promising results [2,3].

We previously reported a case of suppression of refractory ventricular arrhythmias with repeated SGB in a patient where surgical sympathectomy was not feasible [4]. This patient has since undergone a single, pulsed radiofrequency (PRF) lesion of the left stellate ganglion resulting in arrhythmia suppression for greater than 12 months.

* Correspondence: David E. Krummen, MD, 3350 La Jolla Village Drive, Cardiology Section 111A, San Diego CA 92161. Tel.: +1 858 642 3889(Office); fax: +1 858 552 7490.

E-mail address: dkrummen@ucsd.edu (D.E. Krummen).

1.1. Case report

An 80-year-old man with ischemic cardiomyopathy and ejection fraction of 30% presented to the emergency department after multiple implantable cardioverter defibrillator (ICD) shocks. History included coronary artery bypass grafting 15 years earlier and biventricular ICD placement 8 years ago. The patient had undergone an index endocardial ventricular tachycardia (VT) ablation procedure 11 months prior followed by a repeat endocardial with epicardial ablation 8 months ago. On presentation, his medications included sotalol 120 mg twice daily, mexiletine 200 mg 3 times daily, and carvedilol 25 mg twice daily. He was not able to tolerate amiodarone 3 months previously due to adverse effects. Interrogation of his ICD demonstrated 84 episodes of VT and ventricular fibrillation (VF) treated with 65 episodes of antitachycardia pacing and 10 ICD shocks over the preceding 3 days (Fig. 1).

After admission, video-assisted thoracoscopic sympathectomy was attempted. However, the procedure was aborted due to dense pleural adhesions. Postoperative care was further complicated by a hemothorax requiring chest tube placement.

As a last resort, SGB was performed by administration of 5 mL bupivacaine 0.25% at the left T1 vertebral level using fluoroscopic guidance. This resulted in elimination of sustained VT/VF, but the patient continued to have symptomatic nonsustained VT. Two weeks later, SGB was performed on the right side, this time leading to complete suppression of symptomatic ventricular arrhythmias. He was then discharged home on sotalol, mexiletine, and maximum dose carvedilol. He was subsequently managed as an outpatient with biweekly, alternating, left and right SGB for approximately 1 year.

This 1-year period of SGB treatment was, however, notable for an 8-week interruption in care where SGB was not performed. During this period, symptomatic, nonsustained VT and 1 episode of VT requiring antitachycardia pacing was noted within 8 weeks without SGB. Biweekly SGB was promptly resumed, again with suppression of ventricular arrhythmias. The patient then went on to successfully discontinue mexiletine over the subsequent weeks.

The subsequent year, due to logistical reasons, performance of repeated SGB was no longer feasible. As an alternative, a

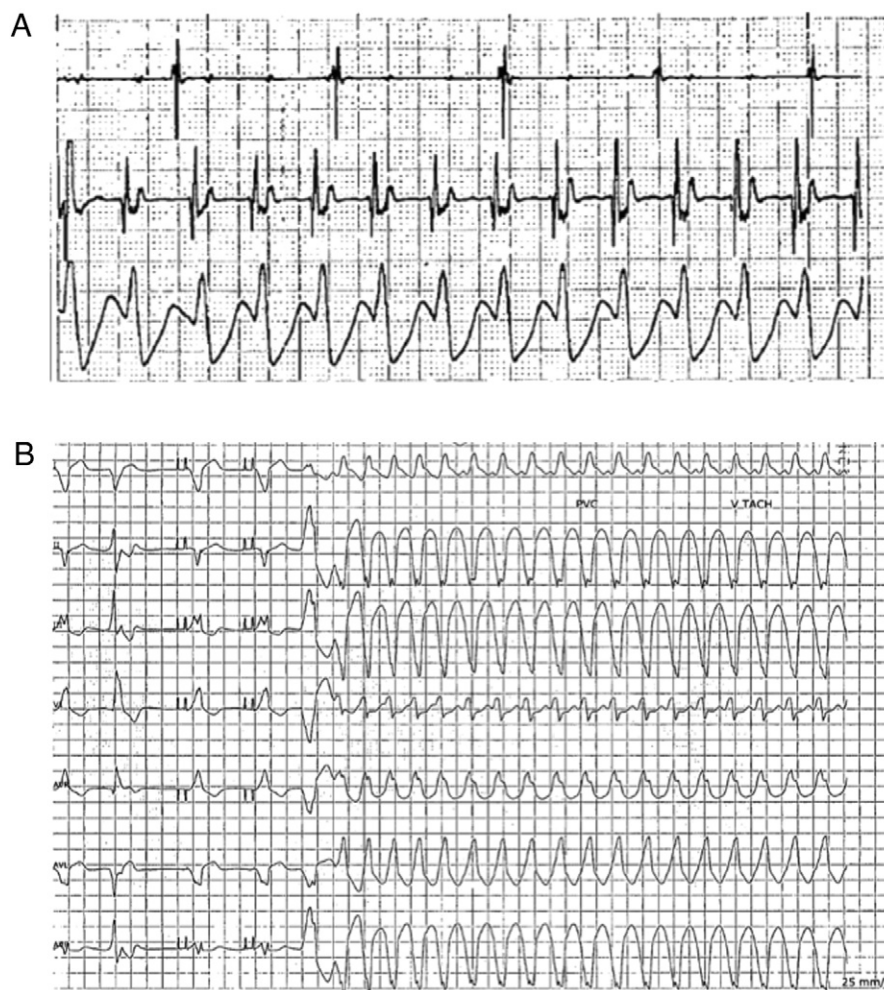


Fig. 1 A, Intracardiac atrial (top) and biventricular (bottom) electrograms of VT from biventricular ICD interrogation at patient presentation. B, Electrocardiogram of spontaneous monomorphic VT induced during electrophysiology study and ablation.

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