

The Use of Continuous Stellate Ganglion Blockade to Treat Sustained Ventricular Arrhythmias After Cardiac Surgery

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INTRODUCTION

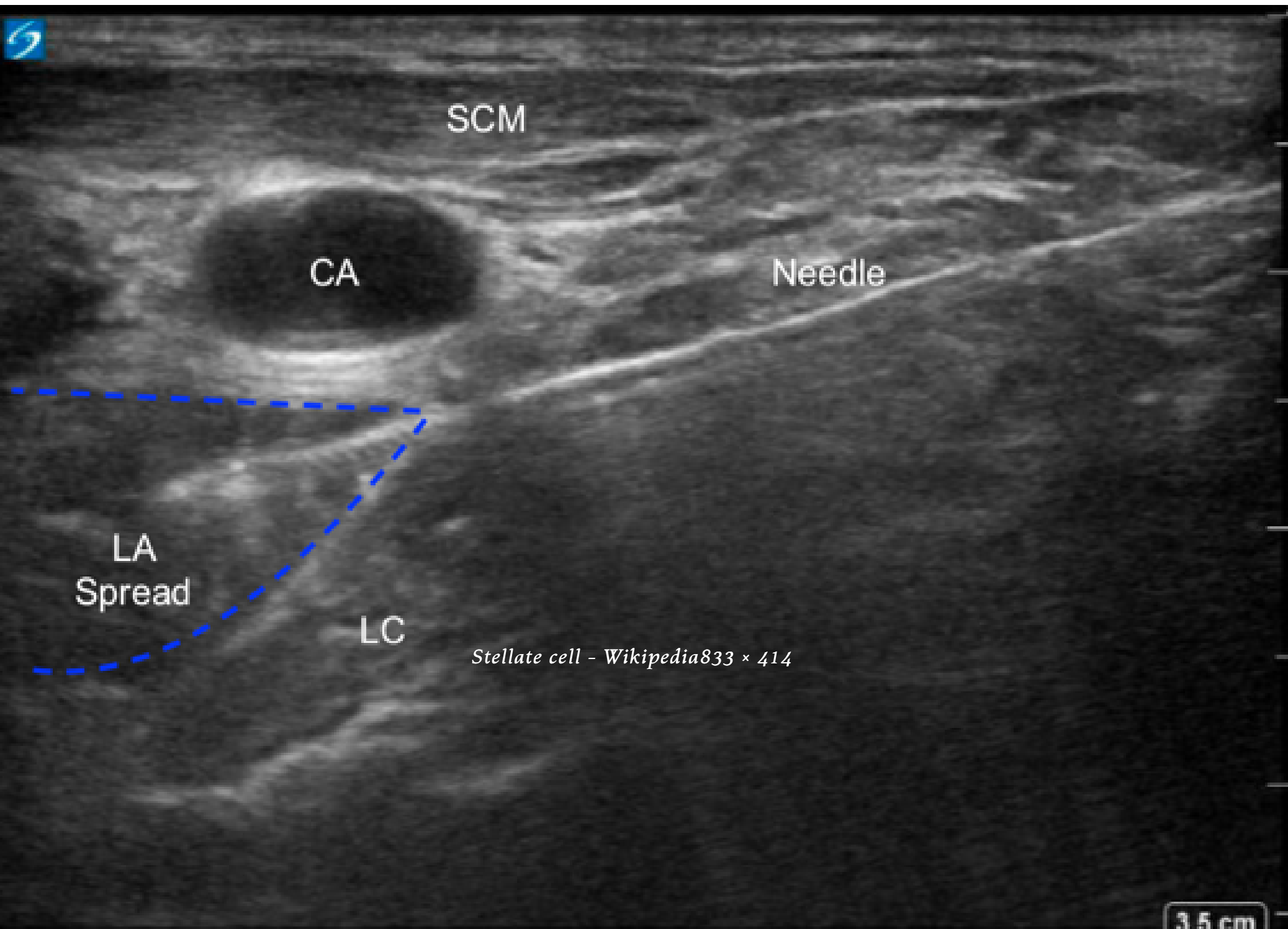
Postoperative arrhythmias after cardiac surgery are common and the sympathetic nervous system plays a key role in the induction of ventricular arrhythmias (1). The stellate ganglion block (SGB) has been shown to decrease cardiac sympathetic drive in refractory arrhythmias and is now emerging as an adjunct to pharmacologic therapies (2). We report a patient who developed sustained ventricular fibrillation (VF) after cardiac surgery and was treated with a continuous left SGB.

CASE REPORT

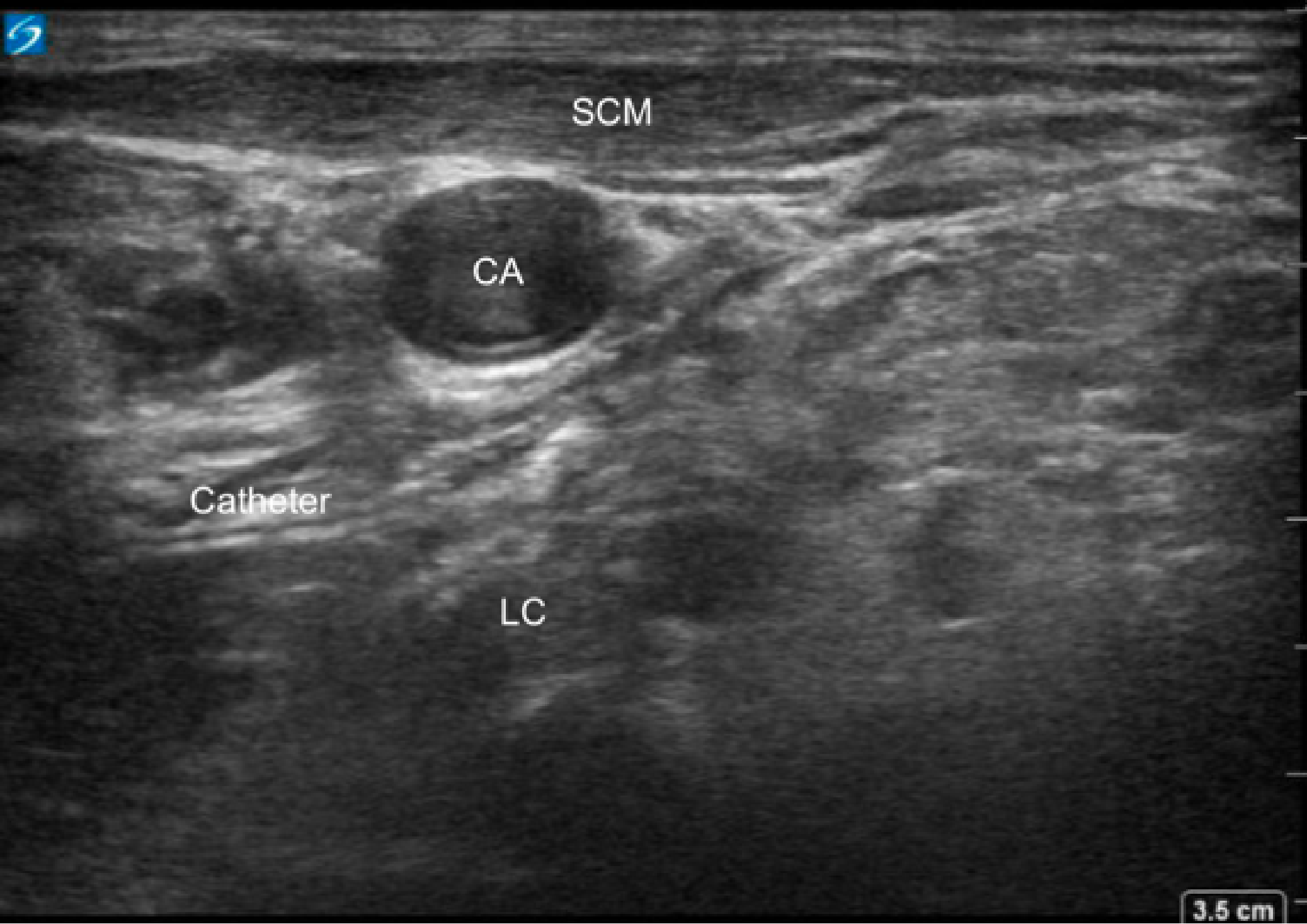
A male in his mid 70s with history of atrial flutter, aortic valve replacement (AVR), mitral valve repair, ascending aortic aneurysm repair, colon and prostate cancer was admitted with infective endocarditis and severe aortic regurgitation. He underwent revision AVR and aortic root replacement, which was complicated by biventricular dysfunction requiring two-vessel coronary artery bypass graft, intra-aortic balloon pump (IABP) placement, and temporary chest closure. Amiodarone and lidocaine infusions were also started for frequent ventricular arrhythmias. He was then transferred to the Cardiac Surgery Intensive Care Unit intubated and sedated.

Postoperatively, he had sustained VF arrests provoked by movement requiring chest compressions and four defibrillations. The Acute Pain Service was consulted on postoperative day (POD) 1 for left SGB. 6mL of 0.25% ropivacaine was used for ultrasound-guided SGB with Braun catheter placement. Unilateral miosis confirmed successful block. Bupivacaine 0.125% was infused at 4mL/hr without further VF. His chest was closed on POD3 and IABP removed on POD4. Antiarrhythmic infusions were discontinued prior to extubation on POD5. The SGB catheter was discontinued once he was weaned off epinephrine support with removal on POD8. He did not require an implantable cardioverter-defibrillator at hospital discharge.

STELLATE GANGLION BLOCK



Ultrasound image of the anterolateral neck at the level of C6 with needle inserted using an in-plane lateral approach. SCM = sternocleidomastoid muscle; LC = longus colli muscle; CA = carotid artery; LA = local anesthetic.



Ultrasound image of the anterolateral neck at the level of C6 with catheter in-view. Of note, catheter was withdrawn approximately 1-2cm prior to securement. SCM = sternocleidomastoid muscle; LC = longus colli muscle; CA = carotid artery.

DISCUSSION

Our case demonstrates that continuous SGB is an effective intervention for terminating sustained ventricular arrhythmias after cardiac surgery. Surgical inflammation and myocardial trauma creates a heightened catecholamine state that acts as an arrhythmogenic substrate (3). By modulating the sympathetic and inflammatory pathways in the critical perioperative period, the SGB can reduce postoperative arrhythmia incidence in cardiac (4) and non-cardiac thoracic surgeries (5). Further studies should evaluate the role of prophylactic SGB in preventing arrhythmias in high-risk surgical populations.

CONCLUSION

Continuous SGB can suppress the sympathetic hyperactivity underlying ventricular arrhythmias and may be a valuable treatment therapy. In our case report, a continuous SGB provided immediate efficacy in treating sustained VF in the acute postoperative period after cardiac surgery.

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