

Resolution of COVID induced Autonomic Dysfunction Following Stellate Ganglion Blocks

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INTRODUCTION

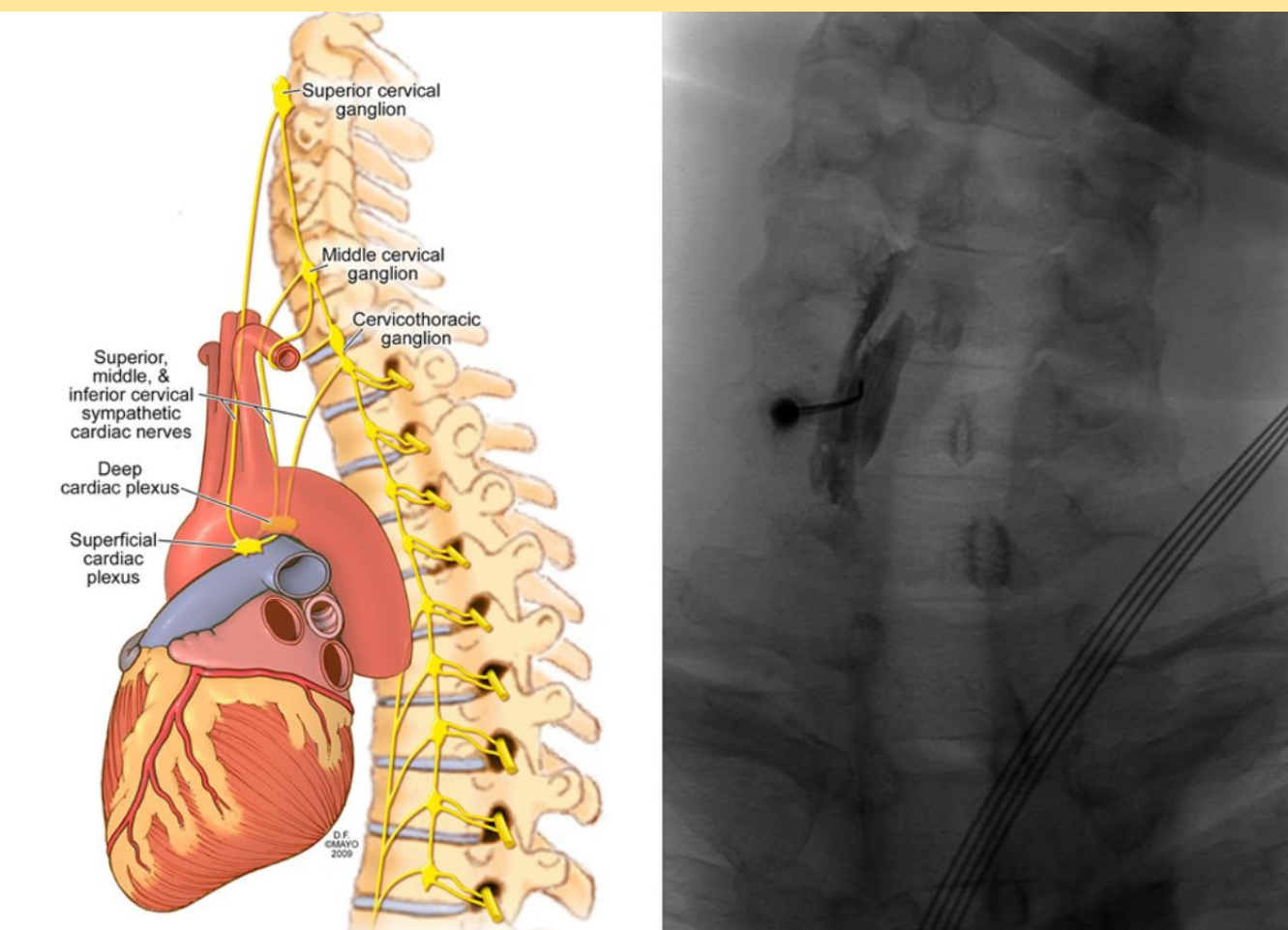
Postural orthostatic tachycardia syndrome (POTS) is a chronic, autonomic disorder characterized by a dramatic heart rate increase upon standing, accompanied by orthostatic intolerance. Although this condition is relatively rare, affecting less than 1-2% of the developed population, effective therapies are limited, and available treatments provide modest relief to patients (1). The etiology of POTS has not been well documented in the literature, however, many factors may precipitate its onset such as trauma, pregnancy and viral infection. The debilitating nature of the symptoms handicaps patients, impairing their functional activities and drastically decreasing their quality of life (2). In the wake of the COVID-19 pandemic, survivors of COVID-19 may have a higher likelihood of developing POTS, highlighting the virus’s potential role in triggering long-term autonomic dysfunction (3). This case report highlights a unique presentation of post-COVID-19 POTS in a patient with recurrent COVID-19 infections and explores the promising therapeutic potential of stellate ganglion blocks (SGB) in managing the debilitating symptoms of this complex condition.

CASE REPORT

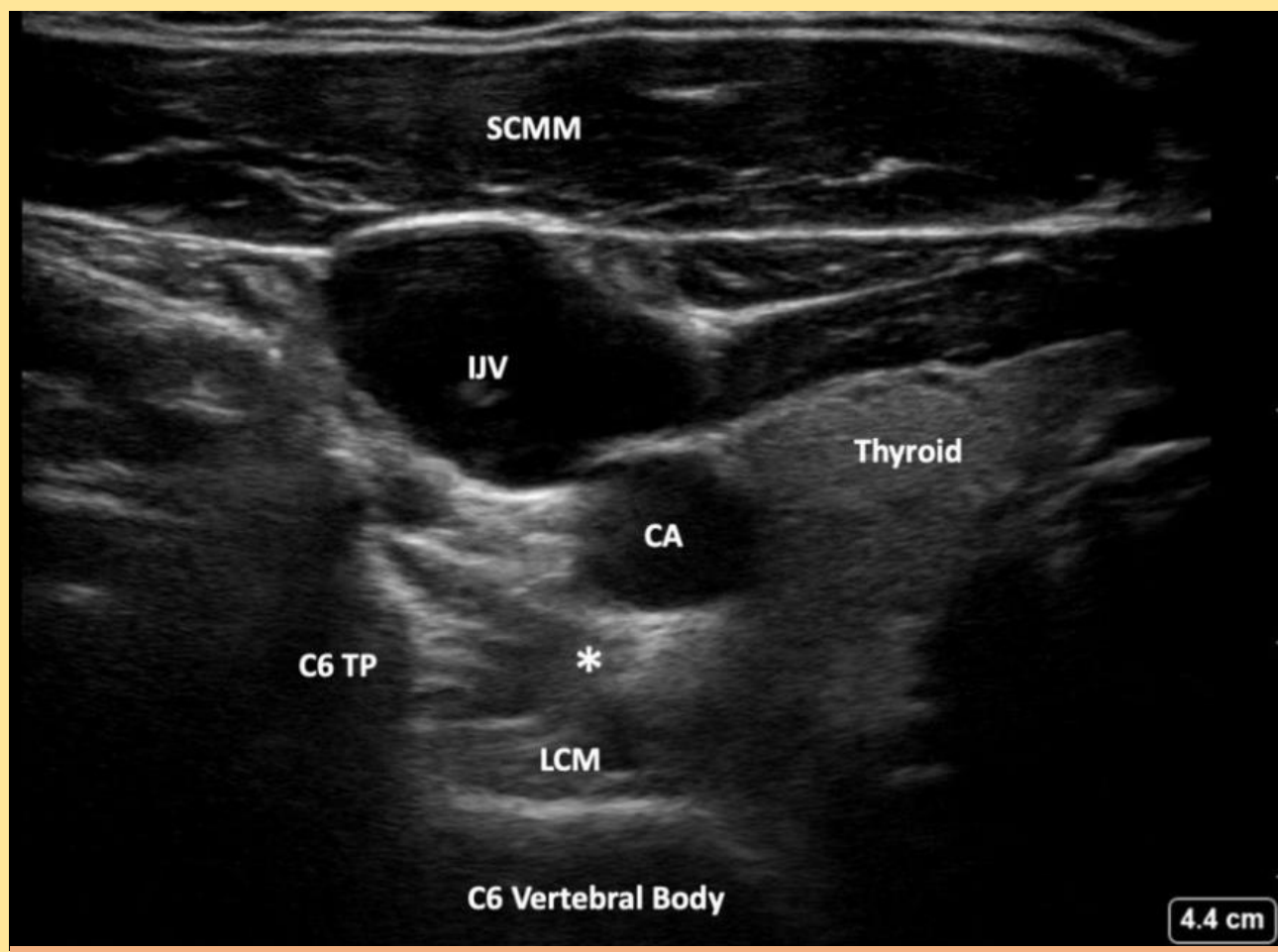
An eighteen-year-old female developed persistent symptoms including postural tachycardia, exercise intolerance, chronic fatigue, brain fog, and sleep disturbance following a mild COVID-19 infection when she was thirteen. She underwent extensive workup including a tilt-table test and sleep studies, both of which were unrevealing. Despite treatment trials with nortriptyline, venlafaxine, Adderall, Concerta, steroids, and compression garments, her symptoms persisted. Given her refractory status, she was referred by her PCP to a chronic pain clinic for further interventional management of her POTS symptoms.

METHODS

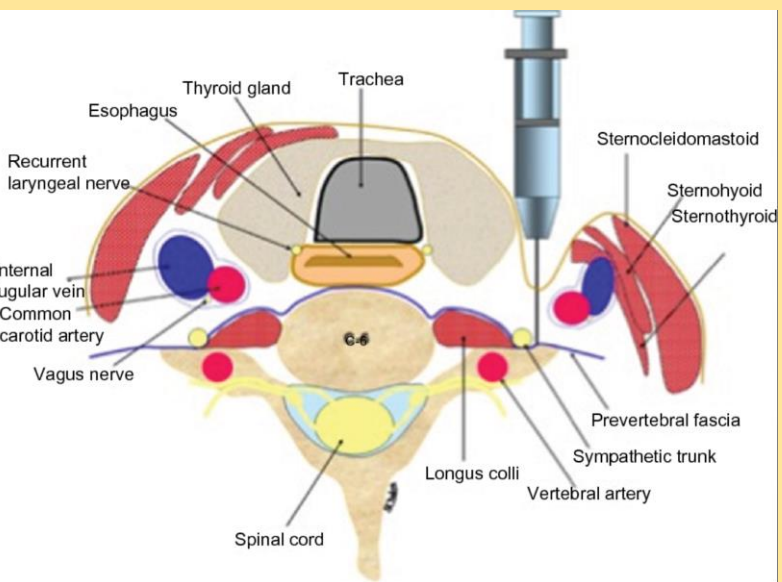
For these procedures the following steps were taken: an intravenous line was placed, and the patient was transported to the procedure room, where heart rate, blood pressure, and oxygen saturation were continuously monitored. After positioning the patient supine with the neck extended to the left, fluoroscopy and ultrasound were used to identify the transverse process of C6, the sympathetic chain, and surrounding anatomy, followed by sterile preparation with chlorhexidine and infiltration of the needle entry point with 1% lidocaine. Using an in-plane ultrasound-guided technique, a 25-gauge spinal needle was advanced anterior to the longus colli muscle, and after negative aspiration, a solution containing 7 mL of 0.5% bupivacaine, 2 mL of 1% lidocaine, and 1 mL 10mg/mL of dexamethasone was injected without complications. These exact sequence of steps were followed for one right-sided SGB and a subsequent left-sided SGB one day after.



Fluoroscopic view of C6 target from an anterior perspective with a needle trajectory aimed slightly medial to avoid the carotid artery and trachea.



Typical ultrasonographic view of major blood vessels and landmarks when performing a SGB. The * denotes the location of the stellate ganglion below the carotid artery (CA). (IJV- internal jugular vein, LCM- longus colli muscle, TP- transverse process, SCMM- sternocleidomastoid muscle)



Cross section of stellate ganglion block at the level of C6, with major landmarks and blood vessels denoted.

RESULTS

Following the bilateral SGBs, the patient reported complete resolution of her cognitive dysfunction, improved ability to tolerate physical activity, and a significant decrease in the frequency and severity of tachycardia episodes. Post-exertional fatigue, which previously necessitated days of bed rest, was significantly reduced in duration and severity. She also noted improvements in school performance, work productivity, and a reduction in chronic headaches. These improvements were sustained at 3 month follow-up.. This case underscores the potential therapeutic role of stellate ganglion blocks in managing POTS, particularly in the context of post-COVID-19 dysautonomia.

DISCUSSION

POTS, which is characterized by autonomic dysfunction, can significantly impact quality of life, and its association with long COVID has brought increased attention to the need for effective treatments. Stellate ganglion blocks have traditionally been used for conditions such as complex regional pain syndrome and chronic pain. There are few indications for SGB outside of pain related sequelae, but the literature shown SGB’s utility in modulating sympathetic overactivity, which may play a role in POTS pathophysiology (4). There is sparse evidence of SGB’s in treating POTS symptoms in long COVID patients although their efficacy has been documented in recent years (5). In this patient, who developed POTS after multiple COVID-19 infections, SGB led to an improvement in symptoms, suggesting a potential pathway for symptom relief in similar cases. While the precise mechanisms remain under investigation, this case adds to the growing body of evidence supporting the use of SGB as a novel intervention for autonomic disorders associated with long COVID. Further studies are needed to establish the long-term efficacy and safety of SGB in this patient population.

References

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