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## A Case of Intractable Hyperhidrosis in Spinal Cord Injury: Role of Stellate Ganglion Block

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# A Case of Intractable Hyperhidrosis in Spinal Cord Injury: Role of Stellate Ganglion Block

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## Abstract

### Objective:

Autonomic dysreflexia (AD) in spinal cord injury (SCI) can present as hyperhidrosis due to sudomotor dysfunction. Hyperhidrosis can also occur without an identifiable etiology. There are no standard treatment guidelines for refractory hyperhidrosis in the setting of persistent noxious stimulation. Stellate ganglion blockade may prevent hyperhidrosis by inhibiting profound sympathetic surge and vasoconstriction.

### Case:

58-year-old female with C7 ASIA-A quadriplegia was admitted to the hospital for episodes of profuse sweating in the setting of autonomic dysreflexia secondary to underlying T7-8 discitis. Despite conservative treatment of discitis, patient continued experience 50-60 episodes of profuse sweating daily. Stellate ganglion block was performed under ultrasound guidance to reduce sympathetic surge. Patient underwent serial stellate ganglion blocks under ultrasound guidance with >75% improvement in her hyperhidrosis episodes.

### Discussion:

Stellate ganglion block is a safe interventional which can be considered for sympathetically mediated refractory hyperhidrosis. It may also be used as a treatment alternative in certain cases of refractory AD in SCI patients.

## Keywords

stellate ganglion block, autonomic dysreflexia, hyperhidrosis, spinal cord injury

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## Conflict of Interest Statement

Hemant Kalia MD MPH FIPP: Consultant Abbott, Omnia Medical, Averitas Pharmaceuticals

## CASE REPORT

# A Case of Intractable Hyperhidrosis in Spinal Cord Injury: Role of Stellate Ganglion Block

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## Abstract

**Objective:** Autonomic dysreflexia (AD) in spinal cord injury (SCI) can present as hyperhidrosis due to sudomotor dysfunction. Hyperhidrosis can also occur without an identifiable etiology. There are no standard treatment guidelines for refractory hyperhidrosis in the setting of persistent noxious stimulation. Stellate ganglion blockade may prevent hyperhidrosis by inhibiting profound sympathetic surge and vasoconstriction.

**Case:** 58-year-old female with C7 ASIA-A quadriplegia was admitted to the hospital for episodes of profuse sweating in the setting of autonomic dysreflexia secondary to underlying T7-8 discitis. Despite conservative treatment of discitis, patient continued experience 50–60 episodes of profuse sweating daily. Stellate ganglion block was performed under ultrasound guidance to reduce sympathetic surge. Patient underwent serial stellate ganglion blocks under ultrasound guidance with >75% improvement in her hyperhidrosis episodes.

**Discussion:** Stellate ganglion block is a safe interventional which can be considered for sympathetically mediated refractory hyperhidrosis. It may also be used as a treatment alternative in certain cases of refractory AD in SCI patients.

**Keywords:** Stellate ganglion block, Autonomic dysreflexia, Hyperhidrosis

## 1. Introduction

Patients with spinal cord injury (SCI), specifically with injuries at T6 or higher, lack descending sympathetic control, resulting in denervation hypersensitivity of the adrenergic receptors below the lesion.<sup>1</sup> Therefore, a noxious stimulus originating below the level of the injury can trigger an exaggerated sympathetic response which can result in a potentially life-threatening hypertensive crisis known as autonomic dysreflexia (AD).<sup>2,3</sup> It is often accompanied by other symptoms including hyperhidrosis, usually above the injury, from the exaggerated sympathetic innervation of the eccrine glands.<sup>4</sup> Hyperhidrosis may also manifest on its own and present exclusively below the injury or diffusely, although the exact pathophysiology remains unclear.<sup>2,4</sup>

Although hyperhidrosis in SCI is often insidious and self-limiting, it can also be idiopathic or intractable in the setting of an underlying stimulus that is

difficulty to identify or control.<sup>5</sup> There is also a lack of standard treatment guideline for hyperhidrosis in patients with SCI. We describe a case of successful use of stellate ganglion blocks for intractable hyperhidrosis in a patient with complete cervical SCI presenting with acute thoracic discitis.

## 2. Case description

A 58-year-old female with history of C7 ASIA A (American Spinal Injury Association classification) SCI from a traumatic C6–C7 spinal fracture in 1974 presented to the hospital with profuse sweating episodes without reported antecedent illness, trauma, or other new signs and symptoms. All vital signs were within normal ranges, and she did not report any pain. Further work-up revealed T7-T8 discitis and osteomyelitis (Fig. 1). There was no indication for a neurosurgical intervention and the patient was managed conservatively with a prolonged course of

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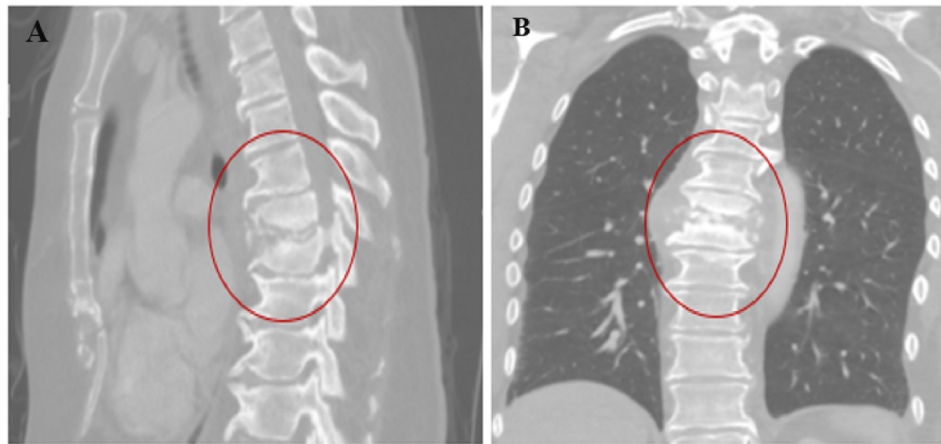


Fig. 1. Sagittal (A) and coronal (B) views of the spine demonstrating T7-T8 discitis.

antibiotics. However, patient continued to experience multiple disabling diffuse hyperhidrosis, up to 50 episodes daily. Patient was no longer able to self-transfer to her power wheelchair or perform self-care. After failing multiple medications including propranolol, tizanidine, and clonidine patch, patient underwent a stellate ganglion block under ultrasound guidance.

A high frequency ultrasound probe was placed at C6, important structures including carotid artery, transverse process of C6, internal jugular vein, inferior thyroid artery, and longus coli muscle were clearly identified. Color flow and doppler function as used to identify the vascular structures. A 22G 3.5inch echogenic needle was used using in plane technique to target the prevertebral fascia between carotid artery and the tip of C6 anterior tubercle (Fig. 2). A total of 5 ml of preservative-free 0.25% bupivacaine was injected with greater than 75%

reduction in the intensity and frequency of her symptoms. She was then able to participate in her rehabilitation therapies and discharged home at her prior level of function. Patient continued to report relief for 3 months after discharge and underwent repeat stellate ganglion blocks with continued relief for up to 3 months with each procedure. We alternated between left and right with equal relief.

### 3. Discussion

This case presents a unique treatment approach for intractable hyperhidrosis in patients with SCI. Stellate ganglion is a collection of inferior cervical and first thoracic sympathetic ganglions found anterior to the neck of the first rib.<sup>6</sup> Stellate ganglion block (SGB) has been safely used for many conditions. Although the exact underlying mechanism by which SGB modulates hyperhidrosis is unclear, it is thought to involve vasodilation and central sympathetic blockade regardless of the laterality.<sup>7,8</sup> SGB may also modulate nerve growth factor and norepinephrine levels, decreasing sympathetic nerve sprouting.<sup>7,9</sup>

The procedure can be performed under ultrasound or fluoroscopic, in oblique or anterior parat-racheal approach, guidance. A local anesthetic of choice can be injected at the C6 level. An injection below the C6 level is not recommended due to higher risks of vascular puncture of the unprotected vertebral artery.<sup>10</sup> A transient, post-injection Horner syndrome can confirm the successful sympathetic blockade.

In this case, we successfully managed intractable hyperhidrosis secondary to acute thoracic discitis below the level of injury in a complete cervical SCI patient. SGB provides a safe sympathetic blockade for the treatment of hyperhidrosis while also offering a potential role in the treatment of certain sympathetically mediated autonomic dysfunctions in SCI patients.

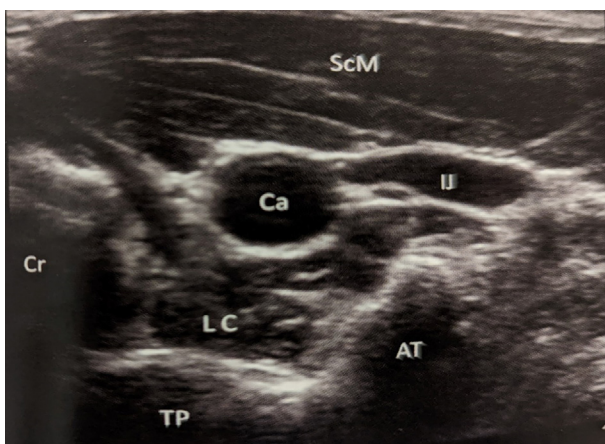


Fig. 2. Ultrasound image of stellate ganglion at C6. Ca: Carotid artery, TP: Transverse Process, LC: Longus coli, IJ: Internal jugular vein, AT: Anterior tubercle, Cr: Cricoids, ScM: Sternocleidomastoid muscle.

## Conflict of interest

Hemant Kalia MD, MPH, FIPP: Consultant Abbott, Omnia Medical, Averitas Pharmaceuticals.

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