Stellate Ganglion Block for Long COVID: A Critical Review of Current Evidence

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Background & Rationale

- Long COVID: A multisystem condition that can persist for months or years following SARS-CoV-2 infection.[1]
- Common manifestations: Persistent fatigue, brain fog, dysautonomia, anosmia/parosmia, headache, dyspnea, and sleep disturbances.[2]
- Emerging evidence: Long COVID may involve persistent immune activation, neuroinflammation, endothelial dysfunction, autonomic nervous system dysregulation, and impaired cerebral perfusion.[3]
- Persistent sympathetic activation and autonomic dysfunction may contribute to symptoms.
- SGB modulates sympathetic outflow through the cervicothoracic sympathetic chain.
- **Proposed effects include autonomic "reset," reduced neuroinflammation, and improved cerebral perfusion.**

Methods

- Narrative review of published evidence evaluating SGB for Long COVID symptoms.
- Included randomized controlled trials, retrospective cohorts, pilot studies, case series, and case reports.
- Evaluated patient populations, symptoms, SGB technique/injectate, clinical outcomes, and safety.
- Compared findings across studies and assessed methodologic limitations and quality of evidence.
- Emphasis placed on the highest-quality randomized placebo-controlled evidence.

Current Evidence

- Early case reports and series described improvement in fatigue, cognition, smell/taste, dyspnea, malaise, and headache after SGB.
- **Pearson 2023: 41 patients; 86% reported symptom reduction.[4]**
- Levey 2024: 17-patient pilot; improved fatigue severity and reduced heart rate.[5]
- Chiang 2025: 52-patient cohort; improvements in fatigue, dizziness, headache, and brain fog.[6]
- Most studies were uncontrolled and lacked standardized follow-up and objective outcome measures.

Observational Evidence at a Glance

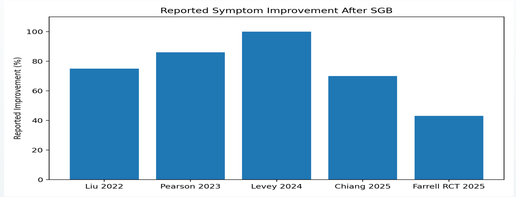


Figure 1. Reported symptom improvement following SGB across observational studies

- Observational evidence : Symptom improvement following SGB across multiple Long COVID domains, including fatigue, cognitive dysfunction, dysautonomia, headache, and dyspnea.
- Reported benefits: Neurologic, autonomic, and systemic symptoms (potential effects of SGB may extend beyond a single symptom phenotype).
- Findings: Hypothesis-generating rather than confirmatory - current evidence is largely based on observational studies and case reports without placebo-controlled comparison groups.
- Substantial heterogeneity in patient selection, SGB technique, injectate composition, and outcome measures limits cross-study comparability and the ability to draw definitive conclusions.
- Available evidence supports the need for larger, controlled, prospective trials to systematically evaluate the safety, efficacy, durability, and potential mechanisms of SGB in Long COVID.

Mechanism, Procedure, & Safety

- Potential mechanisms: Reduced sympathetic hyperactivity, improved autonomic balance, modulation of inflammatory signaling, and improved cerebral perfusion.
- Mechanistic data remains speculative and unproven.
- SGB is typically performed at C6 under ultrasound or fluoroscopic guidance using local anesthetic.
- Adverse effects are generally mild and transient, including hoarseness, dysphagia, and injection-site discomfort.

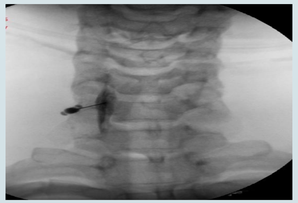


Figure 2. Right stellate ganglion block under fluoroscopic guidance.

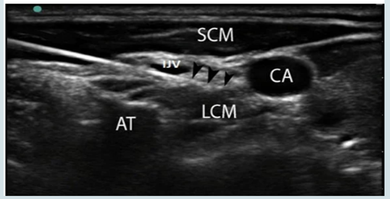


Figure 3. Ultrasound-guided stellate ganglion block.

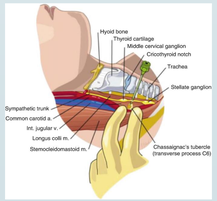


Figure 4. Anatomical target for stellate ganglion blockade.

Critical Appraisal & Clinical Implications

- Current evidence: Largely derived from uncontrolled observational studies, limiting the ability to establish a causal treatment effect.
- Key limitations: Placebo and expectancy effects, regression to the mean, heterogeneous patient populations and SGB techniques, limited objective biomarkers, and short-term follow-up.
- Highest-quality randomized evidence available to date did not demonstrate a significant treatment benefit, underscoring the uncertainty surrounding SGB efficacy.
- SGB may provide symptomatic relief in selected patients, particularly those with dysautonomia-like manifestations of Long COVID, but the characteristics of patients most likely to benefit remain unclear.
- Current evidence: Insufficient to support routine SGB as a standard-of-care treatment for Long COVID.
- Careful patient selection, transparent discussion of the evidence and uncertainties, and shared decision-making are essential when considering SGB.

Conclusion & Future Directions

- **SGB shows encouraging observational signals, but current evidence does not support routine use for Long COVID.**
- Large multicenter randomized placebo-controlled trials are needed.
- Future studies should define Long COVID phenotypes, incorporate objective autonomic biomarkers, determine optimal laterality/number of blocks, and assess durability of response.

References

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