Breaking the Sympathetic Cycle: Bedside Left Stellate Ganglion Block for Medication-Refractory Vasospastic (Prinzmetal) Angina

Sounak Roy MD, David McEnerney DO

Department of Anesthesiology University of Florida Health Jacksonville



Introduction

- Clinical Presentation: Vasospastic (Prinzmetal) angina causes transient epicardial or microvascular coronary constriction, rest pain, dynamic ST-segment elevation, infarction, or malignant arrhythmia despite nonobstructive coronary arteries [1, 2].
- First-Line Therapy: Calcium-channel blockers and nitrates are foundational, but severe symptoms may persist despite multidrug therapy [1, 2].
- Sympathetic Contribution: Sympathetic signaling may augment coronary vasoconstriction, oxygen demand, and ischemic nociception, providing a rationale for stellate ganglion block (SGB) [1, 3, 4].
- Guideline Position: SGB carries a Class IIb, Level C designation for refractory or severe disease, with limited supporting evidence [1, 3].

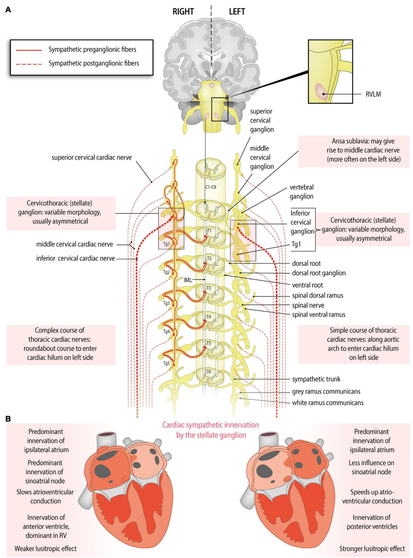
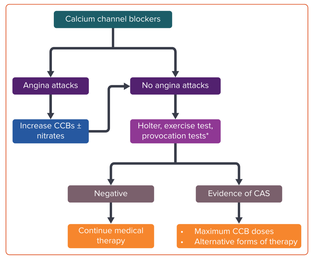


Figure 1. Stellate ganglia and cardiac sympathetic pathways. Reproduced from Zandstra et al. [12], Fig. 1 (CC BY 4.0).

Figure 2: General Approach to the Treatment of Patients with Variant/Vasospastic Angina

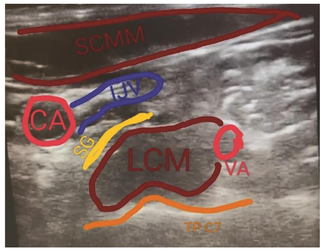


*Provocation tests are necessary for diagnosis in patients with suspected vasospastic angina but infrequent angina episodes and/or no typical ST-segment changes during angina attacks.
CAS = coronary artery spasm; CCB = calcium channel blocker.

Figure 2. Treatment escalation in vasospastic angina. Published algorithm: Lanza and Shimokawa [11], CC BY-NC 4.0. SGB endpoint added from JCS guidance [1].

Case Description

- Patient Profile: 54-year-old woman with documented severe left coronary vasospasm and mild nonobstructive coronary artery disease.
- Acute Presentation: STEMI alert for crushing chest pain despite home nitroglycerin.
- Ischemic Findings: Inferior ST-segment elevation with reciprocal changes and serial troponin rise from 7 to 284.
- Nitrate Response: Additional nitroglycerin resolved chest pain and ECG abnormalities.
- Coronary Evaluation: Prior-week angiography for similar symptoms showed mild nonobstructive disease. Repeat catheterization was deferred.
- Refractory Regimen: Episodes persisted despite diltiazem 360 mg twice daily, nifedipine 60 mg/day, isosorbide mononitrate 120 mg/day, ranolazine 1,000 mg twice daily, and cilostazol.
- Pain Consultation: After exhausting medication options, the Cardiac ICU consulted inpatient pain management.
- Bedside Intervention: Ultrasound-guided single-shot left SGB under standard monitoring using 5 mL 0.5% ropivacaine plus 5 mg preservative-free dexamethasone.
- Response at 2.5 Hours: Another reported vasospastic episode caused mild pressure without sharp chest pain, with significant relief compared with the preceding night.
- Next-Morning Reassessment: The latest episode remained limited to minimal substernal pressure, permitting discharge planning.
- Follow-Up: Repeated procedure once more within ten days which led to >2 months symptom-free while obtaining psychological evaluation and clearance for SCS.



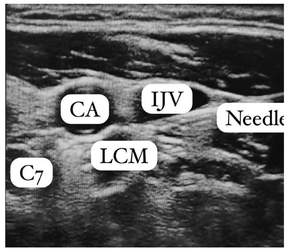


Figure 3. Published ultrasound anatomy (left) and SGB needle approach (right). Technique: 25-G, 3.5-inch needle. CA, carotid artery; IJV, jugular vein; LCM, longus colli; VA, vertebral artery. Thabet and Khedr [13], Figs. 2, 4 (CC BY-NC 4.0).

Discussion

- **Extended Follow-Up:** The patient remains symptom-free more than 2 months after single-shot left SGB, extending the initial bedside response.
- **Bridge to SCS:** The current plan is to bridge from SGB to spinal cord stimulation. Psychological evaluation and all required pre-SCS clearances are complete. SCS remains planned for longer-term neuromodulation.
- **Evidence and Prior Use:** SGB has been studied for VT/VF electrical storm [9]. Prior SGB use in refractory vasospastic angina is also reported [10]. VSA-specific evidence remains limited.
- **Controlled Angina Evidence:** A 65-patient saline-controlled trial found no superiority over placebo [6]. A 2025 meta-analysis of six randomized trials involving 373 patients rated evidence mostly low or very low [7].
- **Interpretation:** Symptom freedom does not establish suppression of coronary spasm. Objective post-block ischemia testing was unavailable in the initial report. This uncontrolled case cannot establish efficacy or exclude medication, neuromodulatory, or placebo effects.
- **Role of Neuromodulation:** SCS aims to modulate anginal symptoms rather than treat underlying coronary disease. Refractory-angina studies remain small and inconsistent [3].
- **Safety and Clinical Implications:** Imaging guidance, monitoring, and resuscitation readiness remain essential [8]. SGB may bridge to neuromodulation in selected patients, but efficacy, duration of benefit, and patient selection require prospective study.

References

1. Hokimoto S, et al. JCS/CVIT/JCC 2023 vasospastic angina guideline update. Circ J. 2023;87:879-936.
2. Vrints C, et al. 2024 ESC chronic coronary syndromes guidelines. Eur Heart J. 2024;45:3415-3537.
3. de Silva R, et al. Refractory angina: mechanisms and stratified treatment. Eur Heart J. 2025;46:3738-3757.
4. Gallone G, et al. Refractory angina: pathophysiology and nonpharmacological technologies. JACC Cardiovasc Interv. 2020;13:1-19.
5. Lo JCC, et al. Stellate ganglion block for refractory angina pectoris. Proc (Bayl Univ Med Cent). 2018;31:370-371.
6. Denby C, et al. Temporary sympathectomy in chronic refractory angina: placebo-controlled trial. Br J Pain. 2015;9:142-148.
7. Wei Y, et al. Stellate ganglion block for angina: systematic review and meta-analysis. Cardiovasc Ther. 2025;2025:7134878.
8. Goel V, et al. Complications associated with stellate ganglion nerve block: systematic review. Reg Anesth Pain Med. 2019.
9. Savastano S, et al. Electrical storm treatment by percutaneous stellate ganglion block: STAR study. Eur Heart J. 2024;45:823-833.
10. Yoshida K, et al. Endoscopic thoracic sympathectomy for refractory vasospastic angina. J Cardiol. 2008;52:49-52.
11. Lanza GA, Shimokawa H. Management of coronary artery spasm. Eur Cardiol. 2023;18:e38.
12. Zandstra TE, et al. Cardiac autonomic innervation and function. Front Physiol. 2021;12:665298.
13. Thabet TS, Khedr SA. Stellate ganglion destruction for post-mastectomy pain: randomized trial. Pain Physician. 2024;27:E231-E238.