

1 **Spontaneous Cervical Internal Carotid Artery Vasospasm (SCICAV): It's Unique**

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3 Taylor Dool¹, Gagan Dhall², Clare Enriquez², Aviraj Deshmukh³, Howard Meng⁴, Leodante da
4 Costa², Christine Hawkes²

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6 ¹ Western University Schulich School of Medicine & Dentistry, Physiology and Pharmacology,
7 London, ON

8 ² Division of Neurosurgery, Sunnybrook Health Sciences Center, Toronto, ON

9 ³ Department of Neurology, Health Sciences North South Tower, Sudbury, ON

10 ⁴ Department of Anesthesia, Sunnybrook Health Sciences Center, Toronto, ON

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12 **Corresponding author:** Taylor Dool, BMSc Honours Specialization Physiology and
13 Pharmacology, Western University Ontario, 2025, dooltaylor@gmail.com, 289-214-2349

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29 A 66-year-old male with previous history of multiple vascular risk factors, including previous
30 strokes in 2022 and 2023, hypertension, dyslipidemia, obesity, prior smoking, coronary artery
31 disease, left bundle branch block, and dilated ischemic cardiomyopathy with implantable
32 cardioverter-defibrillator was admitted with recurring episodes of right monocular vision loss
33 accompanied by transient right-sided facial and arm weakness.

34
35 In May 2022, the patient had presented to a different stroke centre with aphasia and right-sided
36 weakness. Imaging revealed an acute left capsular stroke with 60% stenosis of the left internal
37 carotid artery (ICA). He was managed medically and recovered significantly, with residual mild
38 right-sided weakness. Six months later, he presented again with blurred vision in the left eye and
39 right leg weakness. CTA demonstrated worsening left ICA stenosis, and given his cardiac
40 history, carotid artery stenting was recommended. During the procedure, selective left ICA
41 angiography showed no stenosis. There was a suspicion of a carotid web with contrast stasis.
42 Based on these findings and the clinical history of left hemispheric strokes, the left ICA was
43 stented (Figure 1).

44
45 During the most recent admission, the CTA demonstrated patency of the left ICA stent with
46 severe (greater than 70%) stenosis of the right mid-cervical ICA. Due to the unclear clinical
47 history and the right facial droop, a diagnostic angiogram was performed. Surprisingly, again,
48 the right ICA runs showed no stenosis. No further endovascular intervention was performed
49 (Figure 2).

50
51 Based on the previous documentation of reversible left ICA stenosis and evidence of the
52 resolution of right ICA stenosis on the angiogram, this led to the diagnosis of Spontaneous
53 Cervical Internal Carotid Artery Vasospasm (SCICAV). This is a rare cause of stroke, and the
54 underlying pathophysiology remains poorly understood but may relate to vascular endothelial
55 dysfunction or genetic factors influencing smooth muscle autoregulation [1]. It has been
56 associated with trauma, mechanical manipulation, vasoconstricting medications, and migraines
57 [2]. There is no standardized treatment algorithm for this condition. A review of reported clinical
58 cases of idiopathic extracranial internal carotid artery vasospasm found that oral medications
59 (such as anticoagulants and calcium channel blockers) and endovascular interventions have been

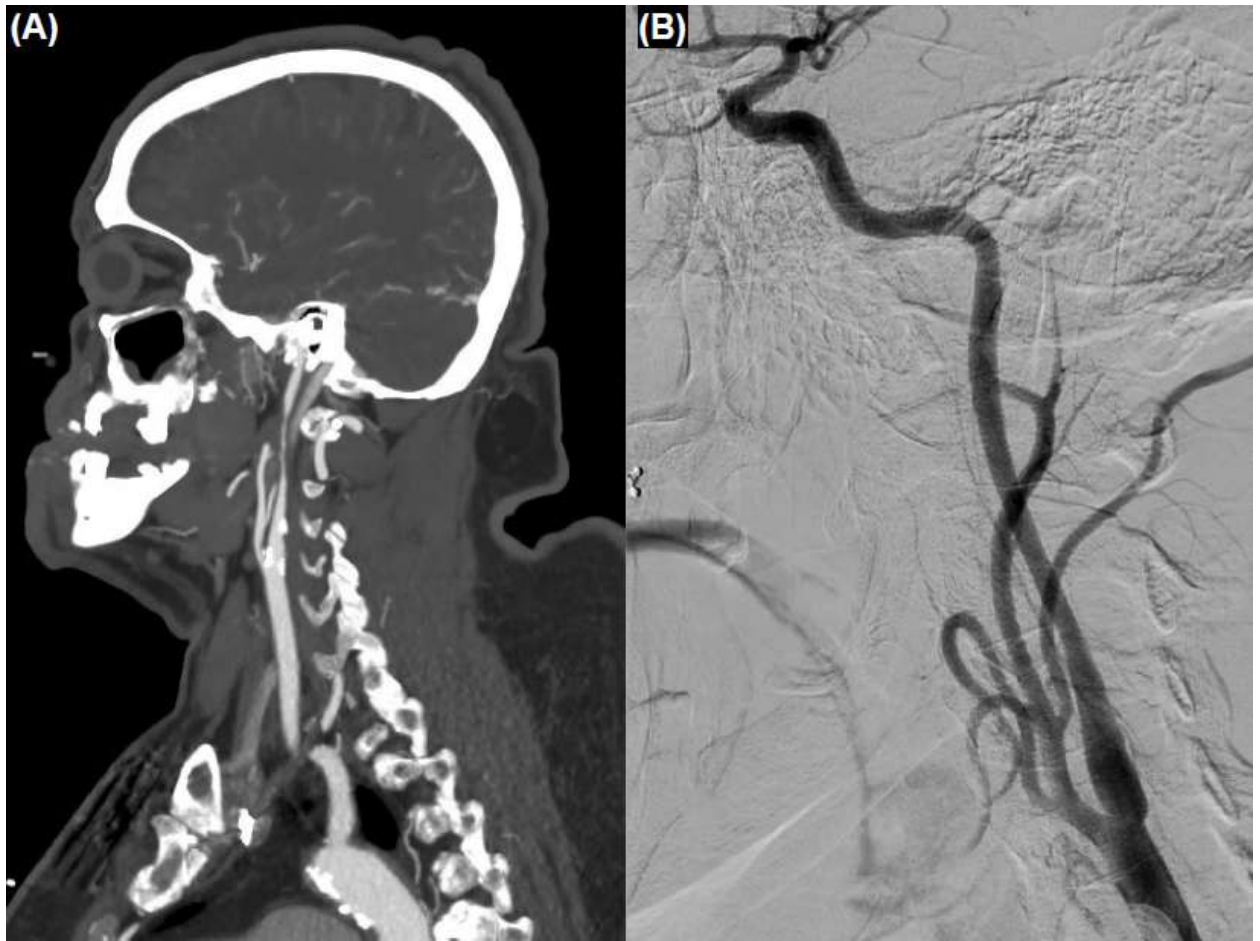
60 used, with all patients showing improvement and no recurrences after carotid artery stenting [3].
61 Stellate ganglion blockade is another potential treatment, particularly in medically challenging
62 patients, but the long-term efficacy of these treatments remains uncertain.

63
64 In our patient, we did not identify any obvious trigger or reversible factor. Due to the patient's
65 significant cardiac dysfunction, CCBs were not administered. As an alternative, he underwent a
66 trial of ultrasound-guided right-sided stellate ganglion blockade with 5 ml of 1% Ropivacaine.
67 There is limited literature on the efficacy of various medications, their optimal doses, and the
68 effects of stellate ganglion blockade on extracranial and cranial vasculature, but some evidence
69 suggests it can reverse submandibular ICA spasms [4]. The patient's transient right hemiparesis
70 has since resolved, and no reported additional symptoms since his discharge from hospital. This
71 case highlights a rare and dynamic condition that should be recognized by treating physicians.

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73 References –

- 74 1. Graham E, Orjuela K, Poisson S, Biller J. Treatment challenges in idiopathic extracranial
75 ICA vasospasm case report and review of the literature. *eNeurologicalSci*. 2021;22. doi:
76 10.1016/j.ensci.2020.100304
- 77 2. Huisa BN, Roy G. Spontaneous cervical internal carotid artery vasospasm. *Neurology*
78 *Clinical Practice*. 2014;4:461–464. doi: 10.1212/CPJ.0000000000000067
- 79 3. Kaneko M, Tateoka T, Kanemaru K, et al. Recurring cervical internal carotid artery
80 vasospasm elicited by head rotation: illustrative case. *Journal of Neurosurgery: Case*
81 *Lessons*. 2022;4. doi: 10.3171/CASE22254
- 82 4. Yokoyama H, Yoneda M, Abe M, et al. Internal carotid artery vasospasm syndrome:
83 demonstration by neuroimaging. *J Neurol Neurosurg Psychiatry*. 2006;77:888-9. doi:
84 10.1136/jnnp.2005.079798



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Figure 1



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Figure 2