

Anesthetic Management of a Patient with Reversible Cerebral Vasoconstriction undergoing Spine Surgery

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Introduction:

- ❖ **Reversible cerebral vasoconstriction syndrome (RCVS)** is an uncommon disease presentation, typically seen in female adults, characterized by transient cerebral blood vessel narrowing.^{1,2}
- ❖ Certain anesthetic pain management drugs are contraindicated in patients with a history of RCVS due to their potential to worsen symptoms. Gaps remain in anesthetic management as no standardized pain management protocols exist for patients with a history of RCVS.³

- ❖ We herein report the unique case of a female patient with a history of RCVS complicated by multi-focal acute ischemic stroke and subarachnoid hemorrhage, who underwent lumbar microdiscectomy surgery. Her presentation required a carefully tailored perioperative anesthetic and pain regimen to avoid triggering her RCVS and reduce the risk of perioperative complications, including compromised cerebral perfusion.

Discussion:

- ❖ The literature review highlights various previous treatment plans used for RCVS, which can aid in understanding how to tailor medications in both anesthetic and pain management. Exploring trends in the care of RCVS patients is crucial for preparing future medical teams in caring for RCVS patients whilst protecting them from RCVS-related complications.

- ❖ The successful outcome of the anesthetic plan, avoiding and minimizing RCVS triggering agents and using alternative pain treatments, provides valuable insight for developing future perioperative regimens where RCVS is a concurrent concern. This case report further adds to the literature due to its potential application to broader patient populations where opioid sparing techniques are priority.

Case Study:

A 60-year-old female with a history of reversible cerebral vasoconstriction, with a remote history of multi-focal ischemic stroke and subarachnoid hemorrhage, presenting with lumbosacral radiculopathy for lumbar microdiscectomy surgery. A perioperative pain management plan was formulated to address pain whilst preventing triggering her RCVS (Figure 1).

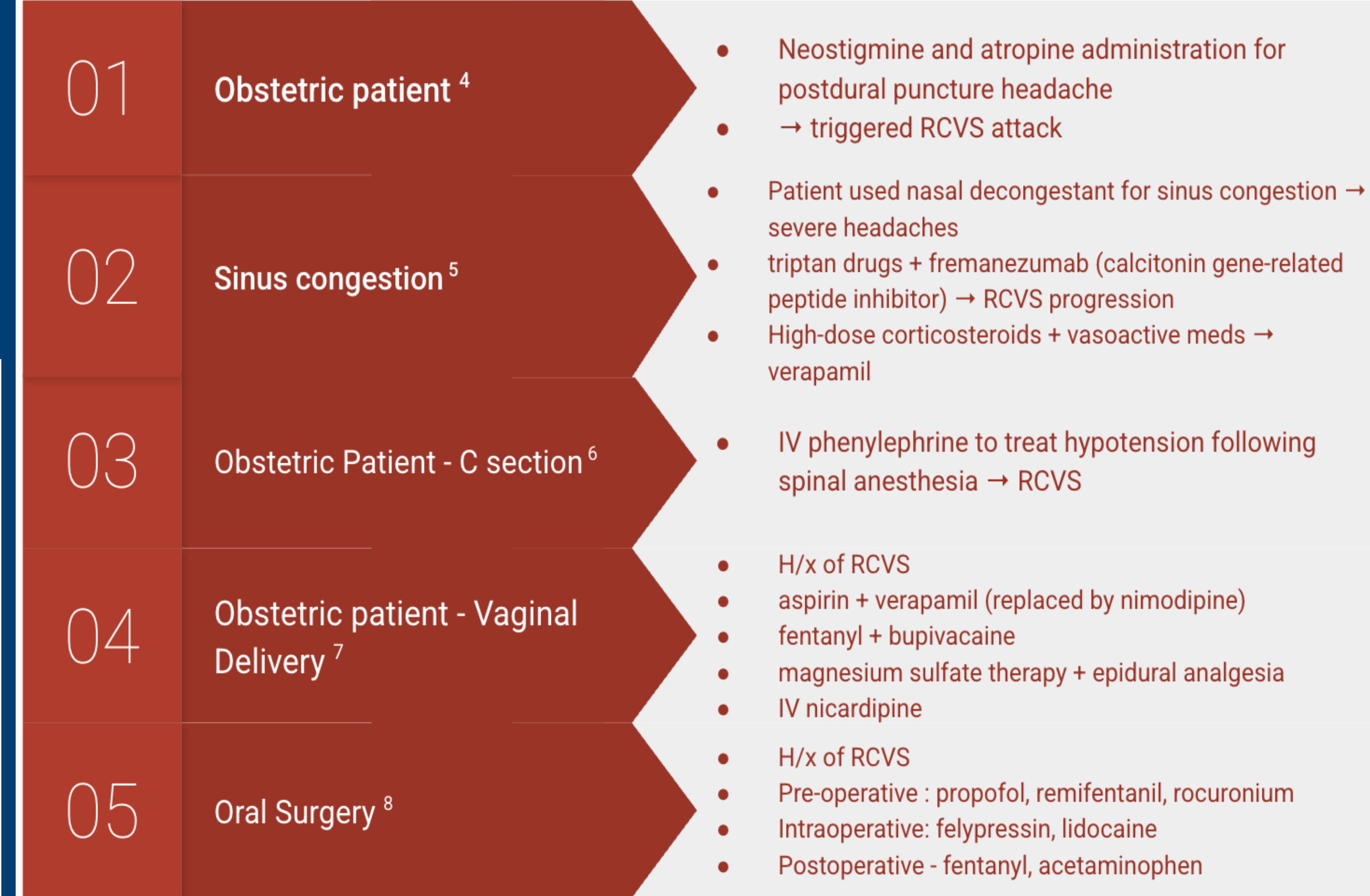
Preoperative	Intraoperative	Postoperative
❖ Avoid TCAs, benzodiazepines ❖ Limit the use of opioids, steroids ❖ Use PO gabapentin & acetaminophen	❖ IV Ketamine bolus + infusion ❖ IV dexmedetomidine infusion ❖ IV Ketorolac bolus ❖ Local infiltration of Exparel (a liposomal bupivacaine suspension) by surgeon	❖ PO Gabapentin ❖ PO Acetaminophen ❖ PO Methocarbamol ❖ Celecoxib (Celebrex) or IV Ketorolac ❖ PACU: fentanyl for breakthrough pain

[Figure 1] Perioperative Pain Management Plan

Patient underwent lumbosacral microdiscectomy with above regimen which successfully controlled for pain while avoiding triggering RCVS.

Literature Review:

A literature review was done, using Google Scholar and PubMed, to further investigate other anesthetic management courses utilized in cases where RCVS was of concern in patients (Figure 2).



[Figure 2] Systematic Review of Cases involving Anesthesia in RCVS patients

References:

1. Ducros A, Boukobza M, Porcher R, Sarov M, Valade D, Bousser M. The clinical and radiological spectrum of reversible cerebral vasoconstriction syndrome. A prospective series of 67 patients. *Brain*. 2007;130(12):3091–3101. <https://api.istex.fr/ark:/67375/HXZ-RF7KCMZZ-6/fulltext.pdf>. doi: 10.1093/brain/awm256.
2. CALABRESE LH, DODICK DW, SCHWEDT TJ, SINGHAL AB. Narrative review: Reversible cerebral vasoconstriction syndromes. *Annals of internal medicine*. 2007;146(1):34–44. <https://www.ncbi.nlm.nih.gov/pubmed/17200220>. doi: 10.7326/0003-4819-146-1-200701020-00007.
3. Ribas MZ, Patıcı GF, de Medeiros SDP, de Oliveira Veras A, Noleto FM, dos Santos JCC. Reversible cerebral vasoconstriction syndrome: Literature review. *Egypt J Neurol Psychiatry Neurosurg*. 2023;59(1):5. <https://link.springer.com/article/10.1186/s41983-023-00607-9>. doi: 10.1186/s41983-023-00607-9.
4. Ayoub N, Rocher L, Talamon C, Mercier FJ, Soued M. Reversible cerebral vasoconstriction syndrome after neostigmine and atropine administration for postdural puncture headache. *British journal of anaesthesia* : *BJA*. 2023;131(6):e183–e185. <https://dx.doi.org/10.1016/j.bja.2023.09.003>. doi: 10.1016/j.bja.2023.09.003.
5. Zhao M, Kaiser E, Cucchiara B, Zuflacht J. Reversible cerebral vasoconstriction syndrome exacerbation after calcitonin Gene–Related peptide inhibitor administration. *Neurohospitalist*. 2023;13(4):415–418. <https://journals.sagepub.com/doi/full/10.1177/19418744231173832>. doi: 10.1177/19418744231173832.
6. Safran SL, Balmer C, Savoldelli G. Reversible cerebral vasoconstriction syndrome during caesarean section. *BMJ case reports*. 2019;12(12):e230606. <http://dx.doi.org/10.1136/bcr-2019-230606>. doi: 10.1136/bcr-2019-230606.
7. Peace JM, Bhat AD, Peralta FM. Anesthetic management of reversible cerebral vasoconstriction syndrome during vaginal delivery: A case report. *A&A Practice*. 2020;14(11):e01298–e01298. <https://www.ncbi.nlm.nih.gov/pubmed/32889814>. doi: 10.1213/xxa.0000000000001298.
8. Hoshijima, Hiroshi, D.D.S., Ph.D, Itoh, Naoki, D.D.S., Ph.D, Iwase, Yoshinori, M.D., Ph.D, Nagasaka, Hiroshi, M.D., Ph.D. Anesthetic management of reversible cerebral vasoconstriction syndrome: A case report. *Journal of oral and maxillofacial surgery*. 2017;75(10):2092.e1–2092.e5. <https://www.clinicalkey.es/playcontent/1-s2.0-S0278239117306274>. doi: 10.1016/j.joms.2017.06.011.