



Opioid-free anesthesia for Arnold Chiari malformation I

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Medically Challenging Case

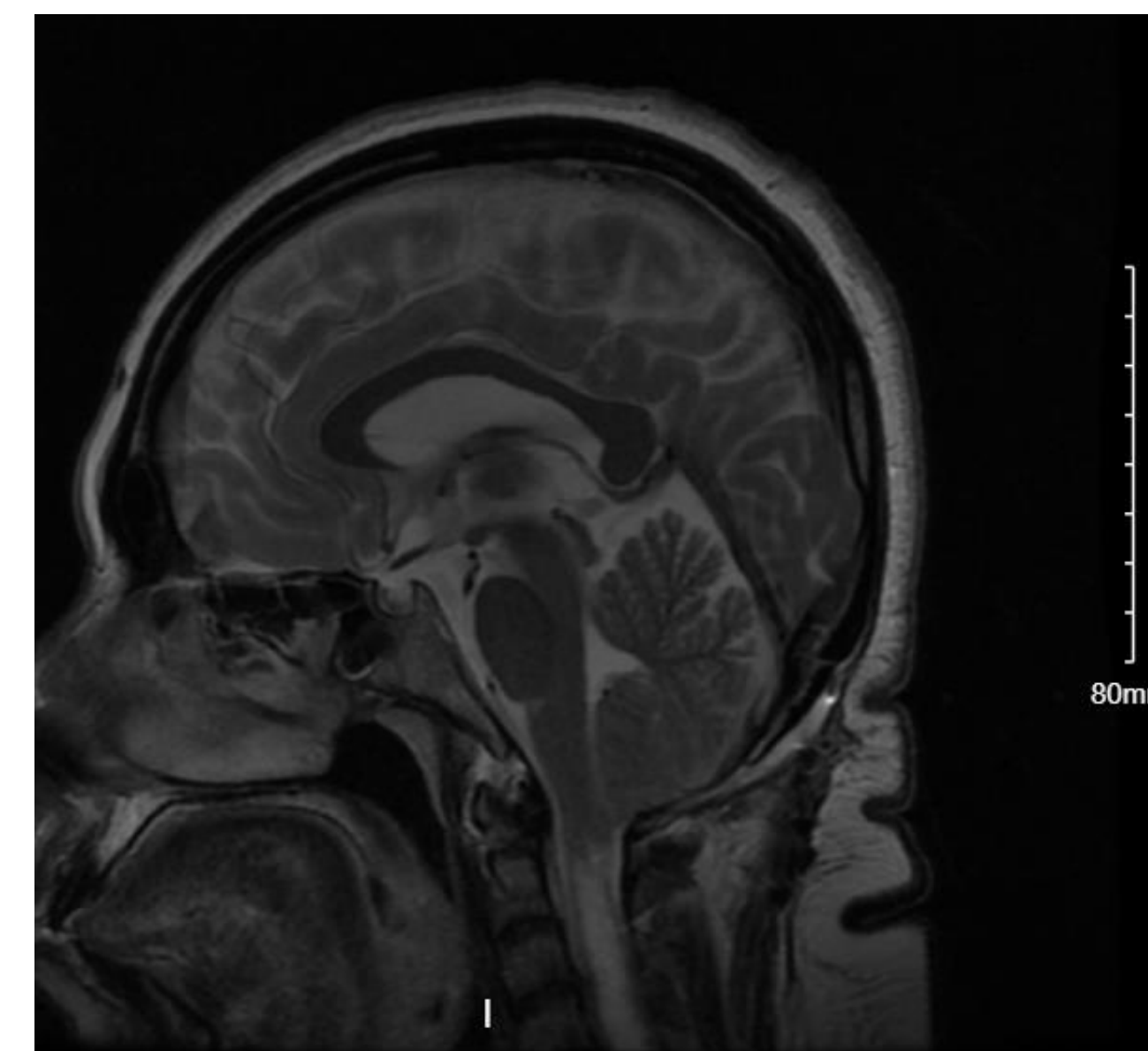


Case description

- A 45-year-old female with a PMH of obesity and OSA presented to her PCP due to chronic headaches. MRI revealed Chiari malformation I with descended cerebellum in foramen magnum for 2-3 cm and C2-C6 syrinx.
Note: Previously, the patient had a c-section and hemorrhoidectomy under spinal anesthesia.
- Procedure:** Suboccipital Craniectomy/partial craniotomy, partial c1 laminectomy, and duraplasty.
- During the surgery:**
 - ✓ Standard ASA monitoring was applied with A-Line, SSEP and evoked auditory potentials.
 - ✓ Induction was provided with midazolam, propofol, and rocuronium.
 - ✓ Maintenance of anesthesia was achieved with sevoflurane MAC <0.5, propofol 50-100 mcg/kg/min, and ketamine 10 mcg/kg/min infusion.
 - ✓ Norepinephrine drip was used to maintain a MAP of 85 during the case.
 - ✓ Clevidipine drip and labetalol boluses were used to control blood pressure during emergence.
- After surgery:** the patient woke up, followed commands, was safely extubated, and was transferred to PACU with continuous etCO2 monitoring for hypoventilation.



MRI pre op



MRI post op

Discussion

- Arnold Chiari malformation 1 is a rare congenital syndrome that requires surgical correction.
- Well-known complications such as autonomic dysfunction, difficult airways due to anatomical specifics, elevated intracranial pressure, and sensitivity to neuromuscular agents were addressed with video laryngoscopy, invasive blood pressure monitoring, use of vasopressors during the maintenance phase, and antihypertensive medications during emergence.
- The high prevalence of central apnea, obstructive sleep apnea, obesity, and edema after positioning were also challenging.
- We used a combination of propofol and ketamine infusion with <0.5 MAC sevoflurane and acetaminophen with rapid emergence from anesthesia for neurological examination and avoidance of perioperative opioids in patients at risk for central and obstructive apnea with an excellent result for our patient.

Conclusions

Opioid-free anesthesia (OFA) and nonopioid analgesia (NOMA) used postoperatively for this patient due to decreased risks of apnea, both central and obstructive, the necessity of frequent neurological checks in the postoperative period, and long context time due to the use of opioids, hypersensitivity syndrome and possible risk of addiction in addition to decrease gastrointestinal disturbances and PONV.

References

- Mago V, Chakole V, Nisal R, Umate R. A Case of Anesthetic Management of Arnold-Chiari Malformation I: A Contest to Anesthesiologists. Cureus. 2023 Jan 16;15(1):e33848.
- Bohringer C, Astorga C, Liu H. The Benefits of Opioid Free Anesthesia and the Precautions Necessary When Employing It. Transl Perioper Pain Med. 2020;7(1):152-157.
- Coviello A, Golino L, Posillipo C, Marra A, Tognù A, Servillo G. Anesthetic management in a patient with Arnold-Chiari malformation type 1,5: A case report. Clin Case Rep. 2022 Feb 4;10(2):e05194.

THE OPIOID EPIDEMIC BY THE NUMBERS



70,630
people died from drug overdose in 2019¹



10.1 million
people misused prescription opioids in the past year¹



1.6 million
people misused prescription pain relievers for the first time¹



14,480
deaths attributed to overdosing on heroin (in 12-month period ending June 2020)³

SOURCES

- 2019 National Survey on Drug Use and Health, 2020.
- NCHS Data Brief No. 394, December 2020.
- NCHS, National Vital Statistics System. Provisional drug overdose death counts.

NHS.GOV/OPIOIDS



1.6 million
people had an opioid use disorder in the past year¹



2 million
people used methamphetamine in the past year¹



48,006
deaths attributed to overdosing on synthetic opioids other than methadone (in 12-month period ending June 2020)³



745,000
people used heroin in the past year¹



50,000
people used heroin for the first time¹