

& right > -2.0 (anosmia). Gustatory testing: Propylthiouracil Disc Taste test: 10 (normogeusia). Taste Testing Threshold: normogeusia to NaCl, Sucrose, HCl, Urea, and PTC. Other: DOPAPET: positive for Parkinson disease. Upper endoscopy: normal. **Conclusions:** Investigation for the presence of parkinsonian features in those with phantogeusia is warranted and chemosensory dysfunction including phantogeusia in those who presents with Parkinson's disease is worthy of exploration.

OTHER NEUROSURGERY (ADULT AND PAEDIATRIC)

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Orbital lymphaticovenous malformation with intradural extension: a rare case

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Orbital lymphaticovenous malformations (LVM) are congenital vascular lesions that are typically infiltrative in nature. There have been reports of orbital LVMs extending intracranially through orbital fissures, but there have been no reports of intradural extension that we are aware of. We present the case of an otherwise healthy 25-year-old female with an orbital LVM extending intradurally. Imaging revealed an intraorbital lesion extending through a bony defect in the medial orbital roof to the orbitofrontal cortex. A modified orbitozygomatic approach was used to obliterate this lesion. A durotomy was created to examine the intradural extension of the lesion, which appeared as a lobulated red vascular structure emanating from the dura along the roof of the orbit. This was gradually and comprehensively bipolar coagulated and subsequently obliterated. Neurosurgical and ophthalmological collaboration was used in the surgical management of this case. In summary, we report the first case of an orbital LVM extending intradurally, and provide pre and post-operative imaging as well as images captured through the intraoperative microscope. Through this case we highlight the importance of an interdisciplinary approach when managing orbital LVMs, as both ophthalmological and neurosurgical expertise were critical in the success of the surgery.

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A systematic review on opioid free analgesic techniques for supratentorial craniotomies

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Background: Post-craniotomy pain can be severe and under-managed. While opioids are the mainstay treatment, they have the potential to interfere with neurological monitoring. The objectives of this review are: 1) to identify measures to provide opioid-free analgesia 2) to compare the effectiveness of non-opioid to opioid analgesia in post-craniotomy pain. **Methods:** A comprehensive search

of EMBASE, MEDLINE, and the Cochrane Central Registry of Controlled Trials (CENTRAL) databases was conducted for RCTs evaluating the effect of opioid vs non-opioid pain control strategies in patients undergoing supratentorial craniotomy. **Results:** The literature search yielded 462 citations, 5 RCTs that met the inclusion criteria for a total of 250 patients. Scalp infiltration/block was found to provide equivalent analgesia to morphine¹ and fentanyl.² Morphine was associated with slightly higher postoperative nausea and vomiting. Paracetamol was less likely to induce nausea and vomiting.^{3,4} but provided inadequate pain relief compared to nalbuphine,³ tramadol,³ morphine⁴ and sufentanil.⁴ Dexmedetomidine⁵ provided similar analgesia to remifentanyl but did delay the time to first dose of rescue analgesia with similar side effects. **Conclusions:** Based on the limited number of RCTs comparing opioid to non-opioid techniques, no definite recommendations can be made with regards to the optimal management of post-craniotomy pain. Considerations should be made for use of multimodal analgesia-including adjuvant analgesics.

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Trigemino-cardiac reflex: a case report of intra-operative asystole in response to manipulation of the temporalis muscle

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Background: The trigemino-cardiac reflex (TCR) is a sudden onset of bradycardia, hypotension, apnea or gastric hypermotility during stimulation of the trigeminal nerve. **Methods:** We conducted a MEDLINE search for surgical cases of TCR and herein describe a case seen recently at our institution. **Results:** A 60 year-old female underwent a left orbitozygomatic craniotomy for resection of a skull-base tumor. Pre-operative anesthesia evaluation was unremarkable and negative for a history of cardiovascular disease. Intra-operatively, retraction with moderate force of the temporalis muscle consistently produced asystole. Cessation of retraction resulted in immediate return of sinus rhythm. Otherwise, intra-operative heart rate was 60-90 BPM. Post-operatively, vital signs and clinical course were unremarkable. The patient experienced a similar phenomenon during an operation 6 years earlier, when manipulation of tumor near cranial nerves IX/X resulted in bradycardia. TCR is the result of a polysynaptic brainstem network involving the afferent trigeminal sensory nucleus, the reticular formation, and the efferent vagal motor nucleus. **Conclusions:** This is a case of exaggerated vagal response following manipulation of the temporalis muscle. Our report emphasizes the importance for neurosurgeons and anesthesiologists alike to be wary of TCR in order to avoid deleterious consequences when operating on structures associated with the trigeminal nerve.

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Industry relationships with neurological surgery in the 2015 Open Payments Database

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Background: The 2013 Physician Payments Sunshine Act mandates that all US drug and device manufacturers disclose payments to physicians annually in the Open Payments Database (OPD).