PURPOSE: The gold-standard treatment for metopic craniosynostosis is open cranial vault reconstruction (OCVR) with fronto-orbital advancement. A recent alternative is minimally invasive strip craniectomy with orthotic helmet therapy (SCOT), which has perioperative outcomes superior to those of OCVR, though its long-term efficacy remains poorly defined. We sought to compare the long-term morphologic outcomes, patient satisfaction, and subjective appearance in patients with metopic synostosis who underwent OCVR versus SCOT.

METHODS: Patients who underwent OCVR or SCOT between 2000 and 2017 for isolated metopic synostosis were identified at our institution. Inclusion criteria included (1) preoperative CT or laser scan imaging, (2) postoperative 3D photos, and (2) at least 3 years of follow-up. Interfrontal angle and interzygomaticofrontal distance measurements were taken from preoperative scans to assess baseline severity. Frontal width and intercanthal width, normalized by age and sex, and glabellar angle measurements were made on 3D photos at the latest follow up. Independent adolescents and craniofacial surgeons, blinded to the treatment of each patient, rated the appearance of postoperative photos. All patients’ parents completed satisfaction surveys at the latest follow up.

RESULTS: Thirty-five patients were included (15 SCOT and 20 OCVR). Mean follow-up time was similar for both groups (SCOT 7.9 ± 3.2 years versus OCVR 9.2 ± 4.1 years, P = 0.33). Baseline severity between groups was similar in both interfrontal angle (SCOT 116.6 degrees ± 8.8 degrees versus OCVR 110.5 degrees ± 10.1 degrees, P = 0.07) and interzygomaticofrontal distance (SCOT 67.5 ± 6.8 mm versus OCVR 66.5 ± 8.6 mm, P = 0.75). Postoperatively, the glabellar angle was equal between groups (SCOT 122.2 degrees ± 4.2 degrees versus OCVR 123.9 degrees ± 6.0 degrees, P = 0.16), as were age- and sex-adjusted frontal width (SCOT Z-score −0.8 ± 1.5 versus OCVR −1.7 ± 1.5, P = 0.09) and intercanthal width (SCOT Z-score 1.2 ± 1.2 versus OCVR 0.5 ± 1.1, P = 0.11). Independent laypersons rated the overall appearance of SCOT patients as equal to that of normal controls (P = 0.31) and better than that of OCVR patients (P = 0.04). Craniofacial surgeons assigned Whittaker class I to a greater proportion of SCOT patients (75.6% ± 6.4%) compared with OCVR patients (43.3% ± 9.5%, P = 0.02), particularly among patients with moderate-severe synostosis (SCOT 72.2% ± 5.6% versus OCVR 33.3% ± 9.2%, P = 0.02). Parents of patients who underwent SCOT and OCVR reported equivalent levels of satisfaction with the appearance of their child’s forehead (93% versus 95%, P > 0.99). Likewise, parents of children who underwent MISC were no more likely to report bullying (7% versus 15%, P = 0.82) or social exclusion (0% versus 15%, P = 0.34) due to their child’s appearance.

CONCLUSION: Minimally invasive strip craniectomy with orthotic helmet therapy was associated with equivalent long-term morphologic outcomes and patient satisfaction, and superior subjective appearance, compared with open cranial vault reconstruction among patients with metopic craniosynostosis.

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Are Two Veins Better than One in Free Flap Head and Neck Reconstruction?

Presenter: Daniel Boczar, MD

Co-Authors: Ricardo Rodriguez Colon, BS, Bachar F. Chaya, MD, Jorge Trilles, BS, Lavinia Anzai, MD, David A. Daar, MD, MBA, Jamie P. Levine, MD, Adam S. Jacobson, MD

Affiliation: NYU Langone Health, New York, NY

PURPOSE: The most common postoperative complication in microvascular free flap reconstruction is venous congestion, accounting for more than 50% of flap failures. Given the lack of consensus on the use of single versus dual venous outflow, we present data from our institutional experience with one versus two vein anastomosis in microvascular free flap reconstruction.

METHODS: We conducted a retrospective review of patients undergoing fibular free flaps for maxillomandibular reconstruction at our institution between October 2008 and December 2020. Patients were grouped according to the number of venous anastomosis performed (single versus double). Data related to patient demographic, surgical characteristics, and clinical outcomes were
collected. We defined venous complications as any sign of flap congestion or venous thrombosis. Demographics, flap characteristics, and outcomes were compared using Chi-square and student t-tests. We performed a multivariate analyses to assess complication rates adjusting for flap type and age.

**RESULTS:** Included in this study were 279 patients: 168 (60.2%) underwent FFF, 59 ALT (21.1%), and 52 RFFF (18.6%). The majority of flaps were performed with a single venous anastomosis (82.4%). Univariate analysis of postoperative outcomes demonstrated nonsignificant differences on overall complications ($P = 0.788$), flap failure ($P = 0.522$), return to the OR ($P = 0.389$), length of hospital stay ($P = 0.712$), and venous congestion ($P = 0.254$). Multivariate regression adjusted for age and flap type showed that the number of venous anastomoses was not predictive of venous complications ($P = 0.254$).

**CONCLUSIONS:** Dual-venous outflow demonstrated no difference in flap-related complication rates in patients who underwent fibula flap reconstruction for maxillomandibular defects. Our data suggest single venous outflow may be sufficient for fibula flaps performed in the head and neck.

**Decreasing Inpatient Opioid Use following Orthognathic Surgery**

**Presenter: Martin Carney, MD**

**Co-Authors:** Sarah Phillips, BS, Connor J. Peck, BS, Navid Pourtaheri, MD, PhD, Alvaro Reategui, BA, Jacob Dinis, BS, Kitae E. Park, BA, Seija Maniskas, MS, Joseph Lopez, MD, MBA, Derek M. Steinbacher, MD, DMD

**Affiliation:** Yale University School of Medicine, New Haven, CT

**PURPOSE:** Strategies to decrease postoperative opioid use are important for mitigating the immediate and long-term risks associated with their use. We aimed to investigate the impact of perioperative various factors on inpatient opioid needs for patients undergoing orthognathic surgery.

**METHODS:** This was a retrospective cohort study of all patients who underwent orthognathic surgery performed by the senior author from 2012 through 2018. Patients were grouped into intravenous (IV) acetaminophen and no-IV acetaminophen cohorts. Opioid medications received by patients during hospital stay were converted to mean morphine equivalents (MME) for comparison. Additional factors that influenced opioid consumption, such as Transexamic Acid (TXA) and postoperative nausea and vomiting, were identified using univariate analysis. Factors found to have statistical significance were added to a multivariate linear regression model.

**RESULTS:** In total, 319 patients were included in this study, of which 57 (17.9%) received perioperative IV acetaminophen. Those who received IV acetaminophen had lower rates of total opioid use (57.3 versus 74.8 MME; $P = 0.002$) and postoperative opioid use (24.0 versus 37.7 MME; $P < 0.001$). Perioperative prothrombotic agents, such as TXA, were associated with lower total (63.2 compared with 76.4, $P = 0.005$) and postoperative MME (28.2 compared with 39.1, $P = 0.001$). Multivariate regression analysis showed that increased postoperative nausea and vomiting resulted in increased postoperative opioid use, while perioperative acetaminophen lowered total and postoperative quantities.

**CONCLUSIONS:** Perioperative IV acetaminophen is an effective method for decreasing inpatient opioid analgesia after orthognathic surgery. IV TXA and postoperative nausea and vomiting control may provide additional benefit to decreasing inpatient opioid consumption. More research as to the mechanisms and ideal clinical applications for both IV acetaminophen and TXA are warranted.

**Evolution of Perioperative Pathways in Cranial Vault Remodeling**

**Presenter: Meghan Brown, MD**

**Co-Authors:** Rebecca Knackstedt, MD, PhD, Ananth S. Murthy, MD, Niyant V. Patel, MD

**Affiliation:** Akron Children’s Hospital Craniofacial Center/Summa Health System, Akron, OH

**INTRODUCTION:** Craniosynostosis occurs in approximately 1 in 2000 live births and, if uncorrected, can lead to neurologic sequelae. Historically cranial vault remodeling was a high morbidity procedure, but improvements have transformed this into a routine craniofacial procedure. Our institution has focused on increasing the safety of cranial