CONCLUSION: Based on this model, peripheral nerve decompression surgery is the more cost-effective option for treating refractory migraine headaches requiring treatment beyond 6.75 years. The model reveals that peripheral nerve decompression surgery is more effective and less costly than long-term, targeted BoNTA over the course of a patient’s lifetime.

Analysis of Narcotic Use in Isolated Facial Fractures: Potential Targets for a Narcotic Reduction Protocol

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PURPOSE: Isolated facial fractures pose a challenge to the craniofacial surgeon. We hypothesize that isolated facial fractures have high narcotic requirements. In the midst of opioid misuse and rising rates of opioid overdose-related deaths, the surgeon must identify strategies to reduce opioid consumption. The purpose of this study was to characterize rates of narcotic usage following hospital admission for isolated traumatic facial fractures and to evaluate if previous substance use or the use of non-narcotic adjuncts may affect narcotic consumption.

METHODS: A retrospective chart review was conducted to assess narcotic use in patients with isolated craniofacial fractures undergoing intervention between 2015 and 2018 at a level I trauma center. Data were collected on patient demographics, mechanism of injury, injury severity score, recent alcohol and recreational drug use, narcotic use, and non-narcotic analgesic use. Analysis of narcotic usage variance (controlled for sex and race) was conducted across these variables. A linear regression model was constructed to examine the impact of non-narcotic analgesic use on narcotic usage in various settings.

RESULTS: Thirty-six patients met eligibility criteria (mean age, 40.5 years). Study participants were predominantly male (83.3%), white (36.1%), and remained hospitalized for an average of 3.3 days. The average morphine milligram equivalent (MME) use during inpatient stay was 997.0. Total narcotic use across inpatient, intraoperative, and outpatient settings was 1,266.9 MME. Race and gender were not predictive of amount of narcotic use. Significant variations in rates of narcotic use in the inpatient setting were found based on mechanism of injury ($P < 0.0001$), operative intervention ($P = 0.04$), injury severity score ($P = 0.013$), and during the 24-hour postoperative period ($P = 0.005$). Recent alcohol use, as defined by serum levels $>11$ mg/dl at admission, was also associated with increased narcotic use in the inpatient setting ($P = 0.002$). Recent use of other recreational substances and history of drug abuse did not seem to impact narcotic usage rates. For those patients who received gabapentin ($N = 4$), mean narcotic usage was 578.1 MME less in the inpatient setting and 141.9 MME less in the outpatient setting compared to patients who did not receive gabapentin ($N = 32$). Due to small sample size, evaluation of the significance of this difference was not possible. Use of other non-narcotic analgesics, including acetaminophen and lidocaine, was not predictive of amount of narcotic use in the perioperative setting.

CONCLUSIONS: Recent alcohol use seems to influence the rate of narcotic use following isolated traumatic facial fractures. Recent use of other recreational substances and history of drug abuse did not seem to impact narcotic usage rates. Non-narcotic adjuncts trended toward reduction in narcotic use; however, the study lacked power for statistical significance. Further study with prospective implementation of a narcotic reduction protocol will follow at this institution.

Evaluating the Success of Facial Feminization Surgery Through Artificial and Human Intelligence

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PURPOSE: Male-to-female transgender patients desire to be identified as female, not only with their partners but also in public settings. Facial feminization surgery (FFS) entails highly visible changes in the facial hard and soft tissues which may affect such social first impressions. No study to date has evaluated the impact of FFS on how patients are gender-typed. To study the effectiveness of FFS, we investigated preoperative/postoperative gender typing using both (1) neural networks trained on facial features (artificial intelligence) and (2) a large public online survey (crowd sourcing).
METHODS: For both studies, standardized frontal and lateral view preoperative and postoperative images of 20 patients who completed staged FFS (combinations of frontal sinus wall setback, supraorbital recontouring, mandibular angle reduction, genioplasty, upper lip shortening, septrhinoplasty, tracheolaryngeoplasty) were used; in addition, 10 male and 10 female unoperated control patients were included. (1) For the first study, the images were analyzed by 4 public neural networks trained to identify gender. Preliminary results led us to (2) a second study, using an online crowdsourcing platform. Respondents identified the gender of the same images, randomized, with a confidence rating (1: not confident; 10: highly confident). Age and smoking status were recorded as distractants. All results were recorded and analyzed for statistical significance.

RESULTS: (1) For the “neural network study,” all 4 programs provided a gender; 2 also provided a confidence score. The networks correctly identified male and female controls 98.6% and 91.2% of the time. Preoperative FFS patients were recognized as female only 54.5% of the time, whereas postoperatively this improved to 93.7%. Confidence scores (ranging from −1: confidently masculine to 1: confidently feminine) also significantly improved from 0.27 (preoperative) to 0.87 (postoperative) (P < 0.0001), with controls of −0.91 (male) and 0.89 (female). (2) For the “crowdsourcing study,” 802 people completed the survey. Control male and female images were correctly gender-identified 99.0% and 99.4% of the time with confidence 8.9 and 9.0, respectively. Preoperative FFS patients were identified as female only 57.3% of the time; by contrast, postoperatively 94.3% were identified as female, a statistically significant improvement of 37% (P < 0.0001). The confidence rating also improved from 1.41 to 7.78 (P < 0.0001).

CONCLUSION: The success of FFS (patients more likely to be identified as female) was demonstrated by both artificial and human intelligence methods. This is the first study of its kind evaluating how machine learning and the public gender type FFS patients.

Internal Cranial Expansion for Treatment of Refractory Intracranial Hypertension in an Adult Population

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BACKGROUND: Idiopathic intracranial hypertension (IIH) is a disease process attributed to increased intracranial pressure (ICP) that often presents with headaches, visual deterioration, and papilledema. Severe cases are often refractory to medical treatment, lumbar punctures, and cerebrospinal fluid shunts. Internal cranial expansion (ICE) donor site morbidity and increased time under anesthesia. As irradiated homologous costal cartilage (IHCCs) grafts may have a similar complication profile as AC but without the donor site morbidity, they may be an effective alternative in patients with cleft nasal deformity.

METHODS: A retrospective study was performed on pediatric and adult patients with a history of cleft lip who underwent rhinoplasty for cleft nasal deformity at Johns Hopkins Hospital between 2009 and 2018. Patients were excluded if their rhinoplasty did not involve placement of an AC or IHCC graft.

RESULTS: A total of 165 cleft rhinoplasties (age 2–72 years, 73%; age <18 years, 52% female) were performed, using a mean of 3 cartilage grafts. Thirty percentage of these procedures were revision surgeries. Mean follow-up time was 407 days. Ninety-six (58%) procedures used IHCC, with the remaining utilizing AC. Complications resulted from 18 (11%) procedures: 7 (10%) involving AC and 11 (12%) involving IHCC grafts. Six of 7 AC complications (86%) required operative intervention, compared to 7 out of 11 (64%) for IHCC. The most common complications for IHCC and AC, respectively, were infection (n = 5) and collapse (n = 2). One AC procedure resulted in hypertrophic donor site scarring, 1 graft resorbed, and 1 warped; 1 IHCC graft extruded, none resorbed, and 2 warped. There was no difference between groups regarding complication rate or complications requiring operative intervention (P = 0.3, P = 0.5).

CONCLUSIONS: IHCC grafts are equally safe and effective as AC for use in rhinoplasty for cleft nasal deformity. These grafts are readily available and eliminate donor site morbidity.