whereas in multisuture synostosis, >50% demonstrated fusion of the sagittal and bilateral coronal sutures. Of note, the presence of SRC was not documented in virtually all official CT reports.

CONCLUSION: The results of this study demonstrate that nearly 50% of patients who underwent VP shunt placement for a diagnosis of hydrocephalus in infancy developed SRC. This secondary fusion is often overlooked on routine CT interpretation, and accurate diagnosis requires a high level of suspicion. Our findings support the important role that proper dural stimulation and expansion plays in maintaining cranial sutural patency. Disruption of these normal processes may be a significant factor in the development of nonsyndromic craniosynostosis, with the sagittal suture being most vulnerable to early secondary fusion.

Perioperative Morbidity of Repeat Posterior Cranial Vault Distraction Osteogenesis: A Single-center Experience

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INTRODUCTION: Posterior cranial vault distraction osteogenesis (PVDO) has become the preferred modality in many centers for cranial expansion in syndromic and multisuture craniosynostosis patients. The low morbidity profile and large degree of volumetric expansion have propelled its use. The purpose of this study was to evaluate the perioperative morbidity of repeat PVDO in pediatric patients.

METHODS: A retrospective review of all patients who underwent PVDO was performed from 2015 to 2018. Individual demographics, perioperative data, distraction parameters, and complications were reviewed, and repeat PVDO patients were identified.

RESULTS: A total of 16 patients underwent primary PVDO (16.48 ± 15.44 months old at the time of surgery) in the selected time period. Five of these patients had repeat PVDO performed (30.49 ± 15.32 months old at the time of surgery), with 1 patient requiring a third distraction. Indications for repeat distraction were symptomatic intracranial pressure elevation and halted cranial growth. When comparing primary PVDO to repeat PVDO, operative time (168 ± 55 versus 207 ± 47 minutes; *P* = 0.14), reported EBL (16.7 ± 9.0 versus 11.3 ± 6.6ml/kg; *P* = 0.20), red blood cell transfusion (25.9 ± 15.1 versus 25.2 ± 10.6ml/kg; *P* = 0.91), length of intensive care unit stay (3.3 ± 4.3 versus 4.0 ± 4.4 days; *P* = 0.72), and length of hospital stay (8.4 ± 9.5 versus 5.8 ± 4.0 days; *P* = 0.53) were not significantly different. Additionally, there was no increased incidence of postoperative complications (37.5% versus 33.3%; *P* = 0.86).

CONCLUSIONS: Repeat PVDO is comparable in perioperative morbidity to primary PVDO in patients with syndromic or multisuture craniosynostosis. Use of PVDO provides excellent cranial expansion and relief of elevated intracranial pressure while delaying the use of frontal advancement or monobloc procedures.

Cost-Effectiveness of Long-term, Targeted Onabotulinumtoxina Versus Peripheral Nerve Decompression Surgery for the Treatment of Migraine Headaches

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BACKGROUND: Chronic migraines affect approximately 2% of the US population and cost an estimated $17 billion per year. OnabotulinumtoxinA (botulinum toxin type A [BoNT-A]) is an Food and Drug Administration-approved prophylactic medication for chronic migraine headaches and is best injected in a targeted fashion into specific trigger sites. The purpose of this study is to determine the cost-effectiveness of long-term, targeted BoNT-A versus peripheral nerve decompression surgery for the treatment of migraine headaches.

METHODS: A Markov model was constructed to examine long-term, targeted BoNT-A versus peripheral nerve decompression surgery. Costs, utilities, and other model inputs were identified from the literature. One-way and probabilistic sensitivity analyses were performed. An incremental cost-effectiveness ratio under $50,000 per quality adjusted life year was considered cost-effective.

RESULTS: The mean cost of peripheral nerve decompression surgery was $10,303 with an effectiveness of 7.06, whereas the mean cost of long-term, targeted BoNT-A was $36,071 with an effectiveness of 6.34. Decompression surgery is more effective and less costly over the time horizon of the model. One-way sensitivity analysis revealed that surgery is the most cost-effective treatment in patients requiring treatment for >6.75 years.
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).