physical dependency with the use of narcotics. Enhanced Recovery after Surgery (ERAS) protocols using multimodal therapy for pain control have seen adoption in numerous surgical sub-specialties since their inception in the 1990s. Recent publications have demonstrated decreased narcotic usage and hospital length of stay after palatoplasty with the use of ERAS protocols. This study aims to assess clinical outcomes before and after ERAS implementation to evaluate for a differential effect among Veau Classifications and identify significant predictors of narcotic medication prescription at discharge.

METHODS: A single center study of patients undergoing primary palatoplasty examined two cohorts: a retrospective review (2014–2016) of patients treated prior to ERAS implementation and a prospective trial (2016–2018) in which palatoplasty patients were managed with an ERAS protocol. Data regarding postoperative pain scores, oral intake, morphine milligram equivalents (MMEs) administered, narcotic medication prescription at discharge, and length of stay for retrospective and prospective cohorts were compiled (Excel, Microsoft Corporation). Pain scores were measured using the Faces, Legs, Activity, Cry, and Consolability scale. All data were analyzed using R Software (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS: A total of 113 patients (56 Pre-ERAS, 57 ERAS) were included in this study. ERAS patients were found to have significantly longer operative times when compared with Pre-ERAS [167min (121–191) versus 131min (114.75–157)] as well as a significantly higher rate of Furlow repair (63.2% versus 33.9%, \( P = 0.002 \)). The ERAS group was found to have a significant decrease in total MMEs administered when compared with Pre-ERAS (5.29 ± 4.61 versus 11.83 ± 7.13, \( P < 0.001 \)).

Comparison of clinical outcomes within Veau classifications by their respective cohorts yielded no significant differences. Comparison of clinical outcomes among Veau classification between cohorts revealed significant decreases in the ERAS group for total MMEs administered in Veau class II (8.87 ± 5.97 versus 4.38 ± 3.43, \( p = 0.015 \)), III (12.42 ± 7.05 versus 6.25 ± 5.39, \( P = 0.001 \)), and IV (16.54 ± 6.39 versus 4.54 ± 4.45, \( P = 0.003 \)). A multivariate generalized linear model using significant univariate variables as well as Cohort and Veau Classification data demonstrated that total MMEs administered was a significant predictor with a \( P \) value of 0.041 and an odds ratio of 1.10 (CI 1.01–1.21).

CONCLUSIONS: Our ERAS protocol for primary palatoplasty led to decreased pain scores and improved oral intake. Significant reductions in total MMEs administered to patients with Veau II–IV cleft palates were observed, which was associated with 10% increased odds for discharge narcotics per MME administered. There was variability in outcomes based on Veau classification, though larger studies may demonstrate a more reproducible effect. Our results illustrate the potential benefit that standardized ERAS protocols may have in this patient population, and merit further study.

Newly Identified Developmental Delays in a Large Population of Children with Nonsyndromic Cleft Lip and/or Palate

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PURPOSE: Nonsyndromic cleft lip and/or palate (NSCLP) is the most common congenital craniofacial anomaly. Early recognition of any associated developmental delay is critical to counseling families and developing individualized treatment plans. Here we sought to identify developmental delays associated with NSCLP in a large population of children in order to begin identifying etiology and improve multidisciplinary management.

METHODS: This is an IRB-approved, single-center retrospective analysis of all patients with a diagnosis of cleft lip and/or cleft palate between 5 and 21 years of age. Demographic and clinical variables were collected from this patient population as well as from children comprising the 2018 National Survey of Children’s Health database.

RESULTS: All children with an identified or suspected genetic syndrome were excluded (160 in our cohort and 1383 in the National Survey of Children’s Health database). Subsequently, 619 children in our cohort and 29,147 in the National Survey of Children’s Health database were identified with NSCLP and included in our analysis. The mean birth weight amongst NSCLP children was lower than that in the national cohort (108.5 ± 24.8 oz versus 117.8 ± 19.1 oz; \( P < 0.0001 \)). Nearly one-fourth (25.8%) of children with NSCLP were admitted to the NICU at birth. The distribution of cleft lip/palate diagnoses in the NSCLP cohort is
shown. Compared with the national cohort, children with isolated cleft palate had significantly higher rates of intellectual disability (3.2% versus 0.5%, \( P < 0.00001 \)), speech delay (70.8% versus 7.1%, \( P < 0.00001 \)), global developmental delay (15.7% versus 5.8%, \( P < 0.00001 \)), cerebral palsy (2.2% versus 0.3%, \( P < 0.00001 \)), and hearing loss (25.9% versus 1.0%, \( P < 0.00001 \)). Rates of learning disability (7.0% versus 5.9%, \( P = 0.529 \)), behavioral delay (7.6% versus 11.4%, \( P = 0.1038 \)), ADD/ADHD (2.7% versus 2.3%, \( P = 0.7032 \)), autism (4.3% versus 5.5%, \( P = 0.5005 \)), and vision loss (1.6% versus 1.2%, \( P = 0.5764 \)) were comparable between those with isolated cleft palate and the national cohort. Children with cleft lip (with or without cleft palate) had significantly higher rates of ADD/ADHD compared with the normative national cohort: isolated cleft lip (7.7% versus 2.3%, \( P = 0.0092 \)), unilateral cleft lip and palate (4.6% versus 2.3%, \( P = 0.0088 \)), bilateral cleft lip & palate (5.9% versus 2.3%, \( P = 0.0153 \)).

CONCLUSIONS: Our study demonstrates, for the first time, higher rates of various developmental delays in children with NSCLP compared with the general pediatric population. This includes increased rates of intellectual disability, global delay, and cerebral palsy in children with nonsyndromic isolated cleft palate and increased ADD/ADHD in children with cleft lip (with or without cleft palate). The association of NSCLP diagnoses with developmental delays highlights the importance of proper risk assessment of patients, appropriate family counseling, and multi-disciplinary team management.

Minimizing Duration of Headframe Wear for Le Fort I Maxillary Advancement with Distraction Osteogenesis Using Rigid External Distraction Devices

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**PURPOSE:** The Le Fort I (LFI) osteotomy is commonly employed for correction of midface deformities such as class III malocclusion, though it is often used to correct vertical maxillary excess and midface hypoplasia. Distraction osteogenesis (DO) allows for advancement of the maxilla in patients who require advancements in excess of 10 mm. Maxillary DO can be performed with internal or external distraction devices. The advantage of rigid external distraction (RED) devices is that they allow for adjustment of the distraction vector. However, RED headframes are not well-tolerated by patients. The decision on how much to distract depends on the distance the maxilla is to be advanced. Traditional treatment with distraction devices has patients maintain the device for at least twice the amount of time they are distracted in order for the newly formed bone to heal. Some surgeons leave the headframe on for even longer in order to avoid relapse. In an effort to minimize the length of RED headframe wear-time, which is the main disadvantage of the DO technique that we have used for LFI procedures in the past, we have begun to employ a new protocol for LFI distraction. Our approach to LFI distraction minimizing headframe wear is as follows: (1) LFI and RED device; (2) Distact to Class II occlusion; (3) Remove RED device, put in IMF, plate and bone graft anterior maxilla; (4) Remove IMF after 2 weeks. This protocol obviates the need for long wear of the RED headframe and gives a fuller, more stable maxilla. The purpose of this study was to evaluate the safety and efficacy of our new protocol for LFI advancement and to retrospectively review outcomes of 21-years of LFI procedures performed by a single surgeon in order to provide clinical insight on different LFI protocols.

**METHODS AND MATERIALS:** Patients who underwent LFI advancement as performed by the senior author between 2000 and 2021 were identified via a retrospective chart review. Parameters, including diagnosis, age, follow-up time, use and type of distraction technique, use of intermaxillary fixation, re-operations, and complications, were recorded.

**RESULTS:** Records were reviewed for 55 patients who met inclusion criteria. Mean follow-up time was 2.14 ± 2.5 years (range: 0.01–9.93 years). In total, 75% of patients underwent LFI without distraction, 20% underwent LFI with distraction with the traditional approach, and 5.5% underwent LFI with distraction with the new approach. Mean age at surgery was 17.7 ± 6.4 years. Mean distraction distance was 7.2 ± 3.8 in the LFI without DO group, 16 ± 3.4 mm in the LFI with traditional DO protocol group, and 22.5 ± 3.4 mm in the LF I with the new DO protocol group. Mean duration of headframe usage was reduced from 11.6 ± 5.5 weeks for the traditional approach, and 5.5% underwent LFI without distraction, 20% underwent LFI with distraction with the traditional approach, and 5.5% underwent LFI with distraction with the new approach. Mean IMF duration with the new DO protocol was 2.3 ± 1.0 weeks. No patients experienced relapse with the new protocol.

**CONCLUSIONS:** Our new protocol for LFI advancement with distraction effectively minimizes head frame wear and gives a fuller, more stable maxilla. The purpose of this study was to evaluate the safety and efficacy of our new protocol for LFI advancement and to retrospectively review outcomes of 21-years of LFI procedures performed by a single surgeon in order to provide clinical insight on different LFI protocols.