hour without significant oxygen desaturations were given the option of CPAP-only treatment; patients with more severe disease generally underwent MDO. Study subjects received baseline and follow-up polysomnography (PSG) examinations. Linear mixed-effect models were used to assess longitudinal predictors of tongue-based airway obstruction, including baseline PSG, age, cleft palate (CP) status, MDO status, and presence of other airway anomalies.

RESULTS: One hundred thirty-four patients were treated during the study period: 56 who underwent MDO and 23 who received CPAP-only treatment met inclusion criteria and had 147 and 78 follow-up PSGs, respectively. Median ages at first PSG were 24 days (Q1–Q3 = 9–98 days) and 5 months (1–70 months) for MDO and CPAP-only groups, respectively (P = 0.009). Baseline OAHI was significantly higher in the MDO group (̅x = 32.9 [20.1–49.1]) compared with CPAP-only group (̅x = 16.9 [7.4–25.9]; P = 0.002). Baseline maximum ETCO₂, SpO₂ nadir, mean SpO₂, and sleep efficiency did not significantly differ between the 2 groups (P > 0.2). Follow-up OAHI was significantly greater in the MDO compared with the CPAP-only group (Δlog₁P = 0.34 [0.03–0.65]; P = 0.031). In the MDO group, patients with repaired and unrepaired CP had significantly higher OAHI after MDO compared with non-CP patients (Δlog₁P = 3.22 [0.87–5.57]; adj-P = 0.008; Δlog₁P = 1.42 [0.06–2.79]; adj-P = 0.042, respectively). Presence of other airway anomalies was also linked with higher longitudinal OAHI in MDO patients (Δlog₁P = 0.48 [0.14–0.81]; adj-P = 0.006). Older age did not lower OAHI longitudinally (adj-P > 0.05). For CPAP-only patients, no longitudinal predictors of OAHI severity were significant (P > 0.05). Follow-up maxETCO₂ was not significantly different between MDO and CPAP-only patients (P = 0.217). Patients with higher baseline maxETCO₂ demonstrated greater decreases in maxETCO₂ after MDO compared with those with lower baseline values (Δ = −0.39 [−0.59, −0.18]; adj-P < 0.001). Patients with repaired CP had higher post-MDO maxETCO₂ than non-cleft patients (Δ = 3.77 [0.04–7.54]; adj-P = 0.049). Follow-up SpO₂ nadir was not significantly different between MDO and CPAP-only patients (P = 0.132). Older age and other airway anomalies were, respectively, associated with higher and lower SpO₂ nadir (adj-P = 0.044; 0.041). Patients with repaired and unrepaired CP had higher SpO₂ nadir compared with non-cleft patients (adj-P = 0.002; 0.001). MDO status did not influence SpO₂ nadir longitudinally (adj-P = 0.808). Similar trends were observed for mean SpO₂ over time. Longitudinally, sleep efficiency did not differ between MDO and CPAP-only patients (P = 0.94) and had no significant predictors (adj-P > 0.05).

CONCLUSIONS: After controlling for potential confounders, MDO effectively improves OAHI and maxETCO₂ longitudinally in patients with Pierre Robin sequence; this benefit is more pronounced in noncleft than in CP patients. Our analysis does not detect any significant predictor of PSG outcomes over time in CPAP-only patients. Additional analyses are warranted to further assess longitudinal outcomes of CPAP-only treatment for the selected group of patients with milder disease.

Predicting Velopharyngeal Insufficiency in Patients With Cleft Palate

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BACKGROUND: Velopharyngeal insufficiency (VPI) after primary palatoplasty has been associated with various patient and surgical factors, including cleft size, genetic conditions and fistula formation. Despite this information, a predictive risk stratification tool has not been developed for factors associated with VPI development. Although VPI affects the speech of up to 50% of patients undergoing primary palatoplasty, diagnosis requires long-term follow-up after speech development. We reviewed over 15 years of primary cleft repairs to examine predictive factors for VPI.

METHODS: A retrospective review of patients who underwent primary palatoplasty from 1999 to 2014 was performed. Inclusion required follow-up past age 5 and speech production. Patient demographics, Veau class, medical history, surgical details, and follow-up information were collected. The primary outcome was VPI, defined as revision palatoplasty or recommendation for surgery by a speech-language pathologist. Genetic diagnosis was defined as positive genetic testing for a craniofacial syndrome. Univariate analysis was performed, and variables with a P < 0.20 were included in a multivariate regression analysis.

RESULTS: Of 274 patients included, 158 (57%) were males. Median age at primary repair was 1 year (0.9, 1.1) with a median age of 8.1 at last follow-up. One hundred four (38%) patients developed VPI at a median age of 4.9 years (3.8, 6.5). Eleven percent of Black non-Hispanic patients...
developed VPI, compared with 39% of Hispanic patients and 45% of white non-Hispanic patients ($P < 0.05$). VPI was 65% in patients who developed posterior fistula (Pittsburgh 1–4) compared to 13% in those without ($P < 0.01$). VPI was lower following Furlow (7%, $n = 14$) than straight-line repairs (40%; $n = 260$; $P < 0.05$). VPI in patients with Pierre-Robin was higher (55%; $n = 38$) than those without (35%; $n = 236$; $P < 0.05$). Following a bidirectional stepwise selection for a linear model, factors remaining associated with VPI were African-American race (odds ratio, [OR], 0.18; 0.04–0.66), posterior fistula (OR 12.2; 6.6–23.6), and genetic diagnoses (OR 3.2; 1.2–9.3). There were no differences associated with demographic factors, birth complications, or cardiac issues.

CONCLUSIONS: VPI following palatoplasty is a known complication. Development of a posterior palatal fistula was associated with increased odds of revision surgery, likely due to persistent nasal regurgitation refractory to speech therapy. While limited in number, lower rates of VPI among patients receiving Furlow palatoplasty are promising for improved outcomes, warranting further investigation into follow-up and implementation rates. Lower rates of VPI in African-American patients and higher rates in patients with a genetic diagnosis may suggest a genetic component.

Combined Symphyseal and Condylar Fractures: Considerations for Treatment in Pediatric Patients

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BACKGROUND: Combined symphyseal-condylar mandible fractures represent a unique, unstable injury pattern that can cause significant morbidity in pediatric patients. However, this particular mandibular injury pattern has not been well characterized in children. Given the complex biomechanics of the mandibular symphysis and the importance of the condyles in long-term mandibular growth and occlusal development, focused study of pediatric symphyseal-condylar fractures is important. This study investigated the etiology and management of symphyseal-condylar fractures in pediatric patients, in order to provide treatment recommendations to improve long-term outcomes.

METHODS: This was a retrospective cohort study of pediatric patients with symphyseal-condylar mandibular fractures both at our institution between 1990 and 2019 and nationwide (identified in the Healthcare Cost and Utilization Project Kid Inpatient Database) between 2000 and 2016. Two-tailed Mann–Whitney $U$ and Fischer’s exact analyses were used to compare demographic and clinical factors as well as incidence of complications between patients in each dentition stage in our institutional dataset. Also, multiple logistic regression with forward stepwise selection of predictor variables was used to generate adjusted odds ratios for complications, and a treatment algorithm was proposed. National data on pediatric symphyseal/condyalar fractures between 2012 and 2016 abstracted from Healthcare Cost and Utilization Project Kid Inpatient Database were used to confirm recommendations in the proposed treatment algorithm using chi square analyses. Additionally, a logistic regression model was used to evaluate the proposed treatment algorithm, by predicting odds of complications based on adherence or nonadherence to the algorithm for patients in each dentition stage. Concordance statistics were used to evaluate model robustness.

RESULTS: Twenty-one patients at our institution and 1,708 national database patients met inclusion criteria. At our institution, 26.7% of deciduous dentition patients underwent ORIF, 40% underwent closed treatment (MMF), and 33.3% were treated with soft diet. All mixed dentition patients underwent either ORIF or closed treatment (MMF); all permanent dentition patients underwent ORIF. In the national cohort, most permanent dentition patients (88.7%) underwent ORIF, while most mixed dentition patients (79.2%) underwent closed treatment. Among deciduous dentition patients in the national cohort, 53.5% patients were treated with soft-diet and 38% with closed treatment. At our institution, the overall post-treatment complication rate was 62.5% among ORIF patients, 14.3% among closed treatment patients, and 16.7% among patients treated with soft diet. The most common complications were temporomandibular joint dysfunction (50%) and malocclusion (37.5%). A treatment algorithm was developed using study data; algorithm adherence significantly decreased odds of complications (odds ratio, 0.03; 95% CI, 0.001–0.6; $P = 0.03$).

CONCLUSIONS: Symphyseal-condylar fractures were associated with substantial morbidity in children. Using the data from both our institution as well as from review of a national database, we proposed a treatment algorithm,