Purpose: Velopharyngeal insufficiency (VPI) occurs in approximately 11-50% of patients born with cleft palate (CP). Correction of VPI with pharyngoplasty decreases the size of the nasopharyngeal airway, increasing the risk of obstructive sleep apnea (OSA) symptoms, which leads to port-revision in 2-3% of cases. While previous studies have examined the short-term effect of pharyngoplasty on OSA symptoms within a five-year postoperative period, the long-term impact of pharyngoplasty is unknown. Polysomnograms are the gold standard for diagnosis of OSA, but they are not cost-effective and are resource-limited for screening. Thus, we aimed to utilize validated patient-reported outcomes measures (PROMs) to examine the effect of pharyngoplasty on long-term OSA symptoms among patients with CP who are over the age of 14 years.

Methods: Patients over the age of 14 years with cleft palate were enrolled from the craniofacial clinics at the University of California, Los Angeles and the Cleft Palate Program at the Orthopaedic Institute for Children. 53 patients were prospectively administered the Patient Reported Outcomes Measurement Information Systems (PROMIS) pediatric version 1.0, sleep-related impairment short form 4a. Retrospective chart review was conducted to collect patient demographic, surgical, and past medical data. PROMIS measures were compared between patients with and without sphincter pharyngoplasty and other potential medical or surgical risk factors of sleep-related impairment, using independent sample t tests. Correlation between PROMIS measures and patient demographics was measured using Pearson’s correlation coefficient.

Results: Overall, 53 CP patients (mean age: 21.1 ± 4.5 years, 26 males) over the age of 14 were administered the PROMIS short form. 26 patients (49.1%) were diagnosed with VPI and 20 patients (37.7%) underwent pharyngoplasty. CP patients with history of pharyngoplasty showed significantly increased levels of sleep-related impairment compared to patients who had not undergone pharyngoplasty (p = 0.01). No significant differences were found between patients with and without other potential surgical risk factors, including distraction, hyoid advancement, Le Fort advancement, or septorhinoplasty. Similarly, PROMIS measures did not significantly differ among patients with or without other potential contributing medical risk factors, including preterm birth, congenital cardiac condition, reactive airways disease, or depression. In addition, PROMIS measures did not significantly correlate with BMI values.

Conclusions: Pharyngoplasty among patients with CP is associated with increased sleep-related impairment, even after the age of 14 years. While pharyngoplasty cannot be considered causal of long-term OSA, our current study suggests that increased vigilance in long-term validated, quantitative sleep screening may be necessary for patients who have undergone pharyngoplasty with potential considerations for intervention.

Developing The Psychosocial Growth Chart: Prospective Longitudinal Psychosocial Functioning Of Children With Craniofacial Anomalies

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Background: While improvement in quality of life has long been the ultimate goal in the care of children born with craniofacial anomalies, the intersection between surgical care and psychosocial functioning has not been well understood. A major reason for this discrepancy is the lack of consistent, systematic, validated, and quantitative assessments of psychosocial functioning incorporated as standard of care. Traditional screening within multi-disciplinary teams has relied upon qualitative evaluations by pediatricians, social workers, and psychologists. However, qualitative exams do not allow for the comparison of psychosocial outcomes accurately over time. One of the first steps in establishing psychosocial functioning as a measured health outcome in children with craniofacial anomalies is to chart their typical psychosocial development longitudinally. Our group
Previously reported that children with craniofacial anomalies are at increased risk for psychosocial dysfunction from ages 8-10 in a cross-sectional analysis. In this work, we evaluate the longitudinal changes over 5 years of the original cohort of children between ages 8-10 as an initial pilot study to develop a psychosocial growth chart for children with craniofacial anomalies.

**Methods:** From 2015 to 2020, children with craniofacial anomalies from the University of California Los Angeles were prospectively evaluated using the Pediatric Patient-Reported Outcomes Measurement Information System to assess anger, anxiety, depression, and peer relationships. Demographics and patient characteristics were also recorded. Changes in psychosocial functioning from ages 8-14 were evaluated using linear regression analyses, and responses at ages 8-10 were compared to responses at ages 11-14 using paired samples $t$ tests.

**Results:** Overall, 29 patients were assessed longitudinally yielding a total of 97 data points (3.34 ± 1.45 per patient), of which 23 patients were surveyed at both ages 8-10 and ages 11-14 yielding 87 data points (3.78 ± 1.24 per patient). Primary diagnosis included cleft lip and/or palate (n = 13), microsomia (n = 6), and others (n = 10). There was a decreasing linear trend from ages 8-14 for anger, anxiety, and depression among all 29 patients. In particular, increasing age was a significant negative predictor of anger ($\beta = -0.25$, $p = 0.01$). Psychosocial functioning improved overall when comparing the responses from ages 8-10 to ages 11-14 among the 23 patients, as characterized by trends of decreased anger, anxiety, and depression and improved peer relationships. In subset analysis, children with cleft lip and/or palate reported significantly higher anxiety symptoms at ages 8-10 (52.1 ± 9.7) than at ages 11-14 (47.1 ± 9.5, $p = 0.02$). No differences in psychosocial functioning were found when patients were stratified by insurance type, family language, ethnicity, or sex.

**Conclusions:** The current longitudinal study of psychosocial functioning in children with craniofacial anomalies demonstrates age-related changes in concordance with our previous cross-sectional work. The current study serves as the initial pilot study for developing a psychosocial growth chart for children with craniofacial anomalies that may be incorporated as standard of clinical care. Future directions include expansion of longitudinal analyses with potential stratification based on diagnostic subgroups and evaluation of children without medical diagnoses for comparison.

**QS9**

**Decellularization Of Vascularized Composite Allografts In The Rat**

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**Purpose:** The decellularization of Vascularized Composite Allografts (VCA) represents a first step in circumventing the need for immunosuppression by depleting donor cells from VCAs. Here we present a model of decellularization of VCAs in rats.

**Methods:** Rat hind limbs based upon the common femoral artery were harvested and perfused through the vascular pedicle at 1ml/min through with 1% sodium dodecyl sulfate (SDS) (group 1) or 0.2% SDS (group 2) or were immersed in SDS 1% (group 3), followed by perfusion (group 1 and 2) or immersion (group 3) in 1% Triton X-100. The degree of decellularization was assessed quantitatively by determining DNA content and qualitatively by histology in all groups at the same locations. The group