ultrasounds to determine if specific facial measurements could predict PRS diagnosis and disease severity.

**Methods:** A retrospective case control study of 40 patients with PRS and 40 gender-matched controls (24 male, 16 female in each cohort) between January 2014 and May 2019 was performed. Respiratory and surgical interventions were recorded and scored for severity. Mid-sagittal profile images of the ultrasounds were reviewed and measured for 3 parameters to assess micrognathia: facial nasomental angle (FNMA), facial-maxillary angle (FMA), and alveolar overjet. FMA <66° and FNMA <136° signify micrognathia. A one-tailed t-test was calculated and the mean ± standard deviation was reported.

**Results:** Patients with PRS demonstrated significantly smaller FNMA compared to the control group (129.6 ± 9 vs. 137.9 ± 2.8, respectively; p<.001). FMA was significantly smaller in the PRS group compared to the control group (64.1 ± 9.3 vs. 75.3 ± 6.5; p<.001). The PRS group also demonstrated significantly larger overjet compared to the control group (3.7 ± 1.3 vs. 2.3 ± 0.8, respectively; p<.001). In the PRS cases, 38% did not require external respiratory support (n=15), 43% needed supplemental oxygen by nasal cannula or CPAP (n=17), and 20% were intubated (n=8). As respiratory support needs increased, median FMA decreased and alveolar overjet increased. In the control group, 93% required no external respiratory support (n=37) and 7% needed supplemental oxygen by CPAP (n=3). In the PRS cases, 45% received mandibular distraction or tongue-lip adhesion (n=18), 15% underwent supraglottoplasty only (n=6), 8% required tracheostomy (n=3) and 32% did not require surgical intervention (n=13). Surgical patients tended to have smaller FNMA and greater overjet compared to nonsurgical patients; median FNMA was 127° versus 132°, and median overjet was 2.8 versus 4.15 mm, respectively, however this was not significant. None of the control patients underwent surgical intervention.

**Conclusions:** Mandibular features on 20-week anatomy ultrasound can be measured to predict PRS prenatally and prepare for respiratory intervention at delivery to minimize hypoxia at birth. Alveolar overjet, previously not described in prenatal ultrasound literature but routinely assessed on neonatal clinical evaluation, is measurable and has utility in prenatal diagnosis, as do FMA and FNMA.

**QUICK SHOTS**

**QS1**

**Nasopharyngeal Airway and Subcranial Space Analysis in Pfeiffer Syndrome**

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**Background:** Tracheotomy in infancy helps patients with Pfeiffer syndrome survive by preventing respiratory crisis, however, difficulty in decannulation consequently may be a challenge. This study attempts to investigate the regional abnormalities of the nasopharyngeal airway in Pfeiffer syndrome, to provide an anatomic basis for the upper airway surgical treatment and decannulation.

**Method:** Seventy-two preoperative CT scans (Pfeiffer syndrome, n=30; control, n=42) were included in this study. The airway volume, cross-sectional area, and cephalometrics, were measured using Materialise software.

**Results:** Patients with Pfeiffer syndrome developed a 50% (p<0.001) reduction of nasal airway volume, and a 44% (p=0.003) restriction in pharyngeal airway volume. The cross-sectional area of Pfeiffer patients at the choana, was only half that of normals’ (p<0.001). The posterior width of nasal airway in Pfeiffer syndrome was shortened by 13% (p=0.003), and the height was reduced by 21% (p<0.001). The cross-sectional areas at condylion and gonion levels, indicating the caliber of pharyngeal airway at entrance and midsection, were reduced by 67% (p<0.001) and 47% (p<0.001), respectively, when compared with normals.

**Conclusion:** Nasal airway volume in Pfeiffer syndrome is significantly restricted, in length, height and width, along with the choanal stenosis in all cases in this cohort. The reduced anteroposterior length of nasal airway contributes to the shortened maxilla, more than the anteroposterior

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position. The limited nasal pathway height and width results from the hypoplastic sphenoid. Mediolateral and anteroposterior restricted dimensions are evident across the entire course of pharyngeal airway. Therefore, mediolateral maxillary expansion likely benefits Pfeiffer syndrome patients, in addition to maxillomandibular advancement.

QS2

The Underreporting Of Traumatic Brain Injuries In Pediatric Craniomaxillofacial Trauma - A 20 Year Retrospective Cohort Study

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Purpose: Despite clinical concerns associated with traumatic brain injuries (TBIs), they remain grossly underreported: 46% of TBIs in adult craniomaxillofacial (CMF) trauma patients remained unrecorded at discharge. This has not been studied in the pediatric CMF trauma population. Consequently, this is the first retrospective study to characterize concomitant pediatric TBI and CMF trauma patients, including incidence, presentation, documentation, and outcomes. The authors hypothesize that TBI in pediatric CMF trauma is associated with worse prognosis and remains under-recorded.

Methods: An IRB-approved retrospective cohort study was performed to identify all pediatric patients presenting with CMF fractures at a high volume, tertiary trauma center between January 1st, 1990 to December 31st, 2010. Patients were included if they were (1) age younger than 15 years and (2) confirmed presence of CMF injury by means of imaging, radiology report, and physical examination. Patient charts were reviewed for demographic information, dentition stage, CMF fracture patterns, mechanism of injury, presentation, need for operative management, length of stay, and mortality at 2 years. Charts were reviewed to identify concomitant TBIs, defined as intracranial injury, cerebral hemorrhage, brain concussion, epilepsy or seizures (post-traumatic), and traumatic brain injury (documented). Data was analyzed using two-tailed Student’s t-tests and chi-square analysis. Point-biserial correlation coefficients were calculated between a continuous and dichotomous variable; Pearson correlation coefficients were calculated between continuous variables. A P value ≤ 0.05 was considered statistically significant.

Results: Of the 2966 pediatric CMF trauma patients identified and included for analysis (mean age of 7 +/- 4.7 years old, predominantly white, 59.8%, and male, 64.0%), 809 had concomitant TBI (frequency of 27.3%). Only 13 of the 809 TBI cases were documented in charts (1.6%). Concomitant TBI with CMF trauma patients were more likely to be male (69.1% vs 62%, P < 0.05), and be caused by blunt injury (98.9% vs. 95.5%, P < 0.05), compared to CMF trauma patients without TBI. TBI patients had a higher mortality rate at two years (8.0% vs 4.8%, P < 0.05). Mortality at two years, length of stay in hospital, and time to follow up significantly increased from mild to severe TBIs. Concomitant TBI and CMF trauma patients were also more likely to present with skull & upper third fractures than CMF trauma without TBI (81.8% vs 61.1%, P < 0.05).

Conclusion: In this 20-year retrospective review, concomitant TBI injuries were present in a significant number of pediatric CMF trauma cases (27.3%) but was not documented for most cases. Given the importance of initial management and long-term care in TBI patients, it is critical for clinicians to remain vigilant for and manage TBIs in pediatric CMF trauma patients in collaboration with appropriate neurology and/or neurosurgery teams. Future prospective studies are necessary to better characterize TBI patient injury patterns and outcomes to generate practice guiding recommendations for this patient population.

QS3

Influence Of Nonsyndromic Bicoronal Synostosis And Syndromic Influences On And Periorbital Malformation

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