were comparable to those reported in the literature. Facial growth analysis at facial maturity revealed no significant difference when compared with Eurocleft centers other than ANB ($P = 0.005$). These data suggest that NAM does not inhibit midface growth. Furthermore, ABG was avoided in 56% of patients who underwent GPP; lip and nose revision was avoided in 51%; and ABG, OGS, and any soft tissue revision surgery was avoided in 17%.

**Break the Mold: A Ten-Year Evolution of Ear Molding Techniques**

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**BACKGROUND:** Congenital ear anomalies occur in one-third of the population, and less than one-third of these self-correct without treatment. In the senior author’s practice, nonoperative ear molding has surpassed surgery as the preferred method of treatment, sparing operative morbidity and allowing for significantly earlier intervention. There are standardized approaches to molding the ear, but as the senior author’s practice has evolved, a more refined, customized approach was developed and applied to specific types of deformities. The purpose of this study is to discuss the modifications we apply to various types of deformities.

**METHODS:** A retrospective review from January 2010 through December 2019 was performed of infants who underwent ear molding by a single surgeon. The procedure report for each case was reviewed to categorize auricular anatomy using a standardized subclassification of external ear anomalies. The surgeon’s approach to each subtype of auricular anomaly was used to develop step-wise customization protocols for existing EarWell and Infant Ear systems.

**RESULTS:** Two hundred forty-six patients underwent ear molding. The anomalies were subclassified into Stahl’s ear, lidding/lop, cupping, helical rim, prominent, conchal crus, and mixed. Of a total of 385 ears, 58.2% of ears exhibited a single anomaly and 37.4% exhibited a combination of at least 2 anomalies. Customization protocols describe use of modifications such as dermal glue, cotton tip applicators (CTA), scaphal wire, dental impression material, and customized stents. Modifications were anomaly specific: CTA/setting material (Stahl’s ear), custom dental compound mold (lidding/lop and cupping), scaphal wire (helical rim), CTA/protrusion excision (prominent), and custom dental compound mold/stent (conchal crus).

**CONCLUSIONS:** Presentation of auricular anomaly is heterogeneous with a substantial volume of patients exhibiting mixed malformations. Although ear molding is traditionally performed with prefabricated systems, this 10-year experience demonstrates that the process should be dynamic and customized, using techniques beyond those listed in system manuals. The described techniques allow treatment to be modified to complement and improve outcomes for each unique ear.

**REFERENCE:**
1. Chan S, Lim G, Por Y, et al. Efficacy of ear molding in infants using EarWell infant correction system and factors affecting outcome. *Plast Reconstr Surg*. 2019;144:648–658.

**Feeding Outcomes Following Mandibular Distraction Osteogenesis in Pierre Robin Sequence**

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**INTRODUCTION:** Neonatal feeding difficulties are commonly associated with Pierre Robin Sequence (PRS). Mandibular distraction osteogenesis (MDO) is effective at relieving airway obstruction, but fewer data are available regarding feeding and growth outcomes after MDO. The purpose of this study is to evaluate short and long-term feeding outcomes after MDO.

**METHODS:** PRS patients undergoing bilateral MDO before 9 months of age between May 2002 and June 2019 were included. Demographic variables, perioperative data, and long-term feeding outcomes and weight percentiles through 2 years of age were collected. Primary outcome of interest was weight percentile at 2-year follow-up. Secondary outcomes include need for gastrostomy tube (GT)
placement, presence of tube feeding at discharge, and days to full oral feeds.

RESULTS: Forty patients met the inclusion criteria. Eighteen (45.0%) patients carried a syndromic diagnosis. Thirty-one (77.5%) patients had cleft palate (CP). Thirteen (32.5%) patients had associated cardiac pathology. Nine (22.5%) patients were preterm. Preoperative laryngoscopy identified 8 (20.0%) patients with concomitant abnormal lower airway findings. Three (7.5%) patients required tracheostomy after MDO. Fourteen patients (35%) had a GT; 3 placed preoperatively and 11 placed postoperatively. Preoperative oral feeding ranged from those with no oral feeds (all feeds via NG/OG/GT) in 15 (37.5%), some oral feeds (combination of PO and NG/OG/GT) in 10 (25.0%), or full oral feeds in 15 (37.5%). At hospital discharge (mean 23.8 days after MDO), 20 (50%) patients were on full oral feeds. By 3 months postoperatively, 27 (67.5%) were on full oral feeds. Mean weight percentile decreased from birth to the perioperative period but subsequently increased by 2-year follow-up ($P = 0.002$). Patients with CP had higher birth weight, pre-op weight, and 2-year follow-up weight percentiles compared with patients without ($P = 0.040, 0.017, and 0.006$). Patients with cardiac pathology had a lower weight percentile at 2-year follow-up ($P = 0.035$). Preterm infants had lower weight percentiles at all time points including at 2-year follow-up ($P = 0.016$), with a 1.7 times increased risk of g-tube placement ($P = 0.032$). Compared with patient without preoperative oral feeding, patients with some preoperative oral feeds had higher weight percentiles preoperative, at discharge, and at hardware removal surgery ($P = 0.001, 0.001, and 0.018$). Compared with some preoperative oral feeds, the full oral feeding which is frequently used in pediatric craniofacial reconstruction. Although solid β-TCP can be absorbed over time, a relatively slow degradation rate predisposes this product to exposure, infection, and fracture. Our tissue engineering laboratory has successfully leveraged three-dimensional (3D) printers to manufacture 3D-printed bioactive ceramic scaffolds composed of β-TCP in an architecture that optimizes the needs of rigidity with efficient vascular ingrowth, osteogenesis, and degradation kinetics, which are further optimized when using the osteogenic agent dipyridamole. This long-term animal study of immature rabbits through the time of facial maturity reports on the new degradation kinetics profile achievable through this novel manufacturing and tissue engineering protocol.

CONCLUSIONS: After MDO, 67.5% of PRS patients are on full oral feeds by 3 months compared with 37.5% preoperatively. Thirt-five percent of patients underwent GT placement, with an increased risk in preterm patients or those who required tracheostomy. Predictors of improved weight percentile at 2 years included presence of CP and absence of cardiac pathology. A combination of oral feeds and enteral feeds via NG/OG/GT during the preoperative period correlated with higher weight percentiles in the perioperative period; however, no weight differences were seen long term.

Accelerating the Degradation Profile of β-Tricalcium Phosphate Bone Replacement through Three-dimensional Printing

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INTRODUCTION: β-tricalcium phosphate (β-TCP), one of the most common synthetic bone replacement products, is frequently used in pediatric craniofacial reconstruction. Although solid β-TCP can be absorbed over time, a relatively slow degradation rate predisposes this product to exposure, infection, and fracture. Our tissue engineering laboratory has successfully leveraged three-dimensional (3D) printers to manufacture 3D-printed bioactive ceramic scaffolds composed of β-TCP in an architecture that optimizes the needs of rigidity with efficient vascular ingrowth, osteogenesis, and degradation kinetics, which are further optimized when using the osteogenic agent dipyridamole. This long-term animal study of immature rabbits through the time of facial maturity reports on the new degradation kinetics profile achievable through this novel manufacturing and tissue engineering protocol.

METHODS: Twenty-two 1-month-old (immature) New Zealand White rabbits underwent creation of unilateral 10-mm calvarial defects with ipsilateral 3.5 × 3.5 mm alveolar defects. Each defect was repaired with 3D-printed bioactive ceramic scaffolds composed of 100% β-TCP and coated with 1,000 μM dipyridamole. Rabbits were sacrificed at 2 months (n = 6), 6 months (n = 8), and 18 months (n = 8). Bone regeneration and scaffold degradation were calculated using micro-CT images reconstructed in Amira software. Bone density and mechanical properties at 18 months was compared with native uninjured bone using Amira software and nanoindentation, respectively. Cranial and maxillary suture patency and bone growth were qualitatively analyzed using histology.

RESULTS: Results of 3D reconstruction are reported as a percentage of volumetric space occupied by either scaffold or bone. When comparing time points 2, 6, and 18 months, scaffolds showed significantly decreased in vivo defect