an additional nonsyndromic patient underwent mandibular distraction prior to palatoplasty. None underwent tracheostomy. Most received gastrostomy to insure optimal nutrition.

RESULTS: Of the 13 nonsyndromic patients managed with TLA as definitive treatment, the mean preop apnea-hypopnea index (AHI) was 37.5 (range 21.0–71.8); the mean initial postop AHI improved to 7.7 (range 0.9–31.0). Of the four syndromic patients, the mean preop AHI was 65.5 and improved to 23.1 postop, with one failing TLA and subsequently treated with mandibular distraction and a post-distraction AHI of 1.0. By approximately six months of age the AHI among both syndromic and nonsyndromic patients had improved further to a mean of 1.8 (range 0–5.3) with the addition of oxygen in patients with initial postop AHI>10. Of those treated with oxygen in addition to TLA, all showed improvement in AHI, and all were weaned prior to palatoplasty. Overall growth was essentially normal. “Catch-up” mandibular AP growth was clinically variable, with followup varying from ten months to 11 years.

CONCLUSION: TLA provides a less-invasive and reliable treatment option for the majority of cases of PRS, including syndromic forms; mandibular distraction remains an essential surgical option but is necessary only in select cases. Furthermore, the clinical successes and failures of this protocol provide new insight in the pathophysiology of the airway problem in Robin sequence, and substantiates the theory that in most cases of newborn retrognathia functional recovery will occur with time and growth.

Mandibular Distraction and Long-Term Dental Morbidity

Presenter: Wendy Chen, MD, MS

Co-Authors: Jack Brooker, MB BChir; Joshua M. Barnett, BS; Justine S. Kim, MD; Jesse Goldstein, MD; Joseph E. Losee, MD; Lindsay Schuster, DMD, MS

Affiliation: University of Pittsburgh, Pittsburgh, PA

Mandibular distraction osteogenesis (MDO) has become a popular intervention since it was described for correcting hypoplastic mandibles 25 years ago. However, it remains a relatively recent tool, and long-term complications are unclear. This study reports dental morbidities and mandibular morphological findings in patients who have undergone MDO.

METHODS: This is a retrospective review of patients at our institution who have undergone MDO. Inclusion criteria involved patients with radiographs and orthodontic evaluation at early mixed and early permanent dental development. Data included demographic information, medical and surgical details, complications, and dental information, i.e. morphologic anomalies, missing teeth, aberrant anatomical locations, and buccal soft tissue redundancy. These findings are compared to normative controls.

RESULTS: Twenty-two patients met inclusion criteria: 19 Caucasian (86.4%); 1 Hispanic, 2 African American), 13 male (59.1%), 12 patients with diagnosed syndromes (54.5%), and 9 patients with hemifacial microsomia (40.9%). On average, age at first MDO was 7.95 years; 9 patients required ≥1 distraction, 10 patients required tracheostomy. Average age at last follow up was 15.1 years. On evaluation at early mixed dentition, only two patients had undergone MDO as an infant (<1yo) and had an image available for review. 3rd molars could not be visualized on either patient, but this is within age-appropriate dental development. Overall, of 22 mandibles at this age, all patients had some dental anomaly: there were a total of 8 missing molars (1st molar =2, 2nd molar =6; third molars not accounted for due to developmental stage), one impacted 1st molar, four ectopic 2nd molars, one ectopic 1st molar, five dysplastic molars (1st molar =4, 2nd molar =1), two missing 2nd premolars, two impacted premolars (1st premolar =1, 2nd premolar =1); one impacted canine and one impacted lateral incisor. Two patients had a V-shaped sigmoid notch. Two patients had unfavorable buccal mucosal scarring; 3 patients had anterior open bites described in their history; none had facial nerve complications reported.
CONCLUSION: At age 13, the most common anomaly was a missing tooth, most likely the 3rd molar (38%), though this is also the most commonly missing tooth in the general population. Other teeth, such as other molars and premolars, were also commonly missing. Molars were also observed to be impacted, ectopic, dysplastic, or ankylositic.

**Prophylactic Use of Buccal Fat Flaps to Improve Oral Mucosal Healing Following Furlow Palatoplasty**

*Presenter: Cecil S. Qiu, BA*

*Co-Authors: Megan Fracol, MD; Hanah Bae, BS; Arun K. Gosain, MD*

*Affiliation: Northwestern University Feinberg School of Medicine, Chicago, IL*

**BACKGROUND:** Furlow palatoplasty (FP) is increasingly used both for primary palatoplasty and secondary correction of VPI. While FP offers the advantage of lengthening the palate, the most tenuous component of the oral mucosal repair is anterior transposition of the oral mucosal z-plasty flap. When a secondary FP was done to correct VPI following primary FP, the senior author found oral mucosal separation in 53% of cases. To mitigate this problem, we prophylactically placed pedicled buccal fat pad flaps to provide an additional vascular layer to promote healing of the overlying oral mucosal z-plasty flap.

**METHODS:** A retrospective chart review identified patients who underwent pedicled buccal fat pad flaps with FP performed by the senior author (A.G.). Cleft palate diagnosis, Veau classification, primary and secondary palate repair surgeries, surgical technique and post-operative complications were extracted. The need for buccal fat flap augmentation was determined if the oral mucosal z-plasty flap showed duskiness during transposition or was under tension at the time of closure. Unilateral versus bilateral buccal fat flaps were chosen based on expected areas of tension in the final repair. On the buccal mucosa, a longitudinal incision just lateral to the most posterior aspect of the alveolar ridge was made, from which buccal fat was gently teased out. This was tunneled submucosally to the palatal repair site, where it was secured just posterior to the hard palate and anterior to the transposed levator veli palatine muscle. The oral side of the Furlow palatoplasty was then brought together over these pedicled buccal fat flaps.

**RESULTS:** We identified six patients who underwent FP with buccal fat flap augmentation. Two patients (33%) were primary FP while four patients (67%) were secondary FP. Three patients had unilateral cleft lip and palate, two had submucosal cleft palate and one had cleft palate only. The youngest patient was 11 months old, and the oldest was 7 years and 9 months. Half of the procedures used bilateral buccal fat pad flaps while the remainder were unilateral. All patients were seen at two weeks postoperatively and followed up regularly, with average follow-up time of 21 months (range 8–41 months). Post-operatively, one patient demonstrated a 1 cm area of mucosal dehiscence at the tip of the posterior triangular flap, which healed uneventfully. There were no other post-operative complications observed, including donor-site complications, complications relating to the buccal fat pad flap. No patient developed an oronasal fistula.

**DISCUSSION:** Our experience suggests that the buccal fat pad flap may minimize vascular compromise and dehiscence of the oral mucosal z-plasty following FP. This separation rate decreased from 8/15 (53%) patients in our prior series of secondary FP procedures to 1/4 (25%) patients undergoing secondary FP with buccal fat flaps. Cleft palate surgeons should consider adding this low-risk technique to their repertoire, as it provides an additional vascular layer beneath the most tenuous part of the oral mucosal closure in a FP, and may improve vascularity to the overlying oral mucosa so as to minimize dehiscence at this closure.

**Square Root Palatoplasty: A New Modification of Double Opposing (Furlow) Palatoplasty**

*Presenter: Fatma Betul Tuncer, MD*

*Co-Authors: Shoichiro Alberto Tanaka, MD, MPH; Patricia Keenan, MA, CCC-SLP; Ananth Murthy, MD*

*Affiliation: Cleveland Clinic, Cleveland, OH*

**INTRODUCTION:** Double opposing palatoplasty has gained a wide popularity for primary palatoplasty in the US since its first description by Dr. Furlow in 1976. The advantages of Furlow palatoplasty are better repositioning of levator muscle (and formation of functional levator sling), palatal lengthening, tighter nasopharyngeal sphincter and decreased risk of longitudinal scar contracture. However,