An Anthropometric Assessment of Mandibular Growth in Pierre Robin Sequence

Andrew S. Newman, MD; Christopher Derderian, MD; Michael N. Mirzabeigi, BS; River M. Elliott, MD; Oksana Jackson, MD; Nancy Minugh-Purvis, PhD; Scott P. Bartlett, MD; Jesse A. Taylor, MD

Abstract

Background
While data regarding short-term efficacy of various treatment modalities in relieving tongue-based airway obstruction in the neonatal period is available[1,2], there is a paucity of data about long-term growth potential in the Pierre Robin population. The purpose of this study is to evaluate long-term mandibular growth via anthropometry in children with PRS, comparing those treated with prone positioning alone to those treated with tongue-lip adhesion.

Methods
All patients with isolated PRS assessed by anthropometry at Children's Hospital of Philadelphia from 1983 to 2010 were included in the study. Of the 135, 89 were treated with prone positioning alone and 46 with tongue-lip adhesion. Standard anthropomorphic measurements were taken at each clinic visit beginning at age 2, and were compared by method of treatment. To gain perspective, age-matched historical control data (Farkas norms)[3], as well as age-matched isolated cleft palate patients, were used for comparison.

Results
There was no significant difference in mandibular length between the TLA and positioning groups, but both groups were significantly shorter than Farkas controls ($p < 0.01$) (Figure 1). The ratio of lower facial height to total facial height averaged 50% in all PRS patients and 60% in Farkas's controls. These groups were statistically distinct across all age groups ($p < 0.006$) (Figure 2).

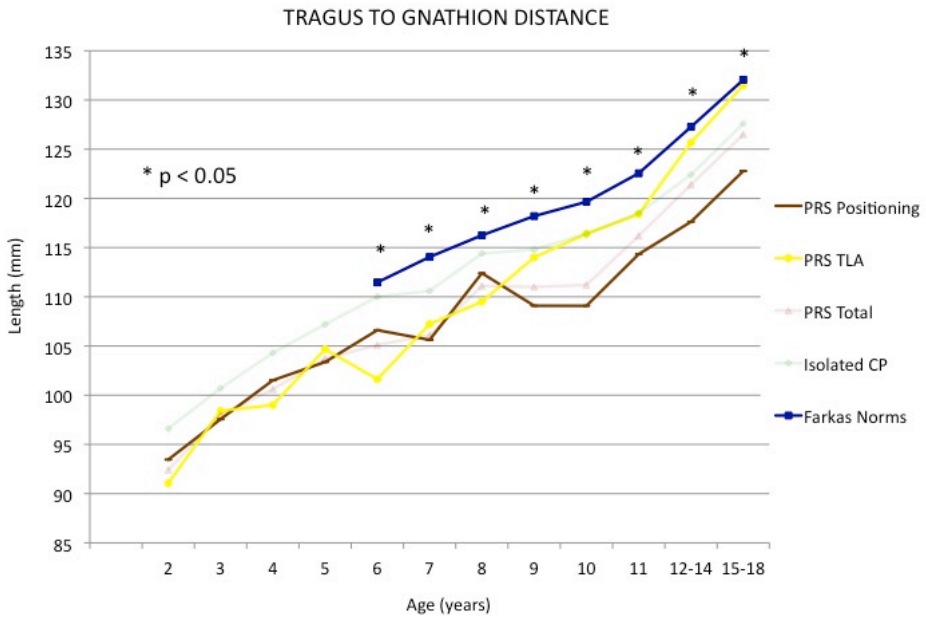

Figure 1. Mandibular length

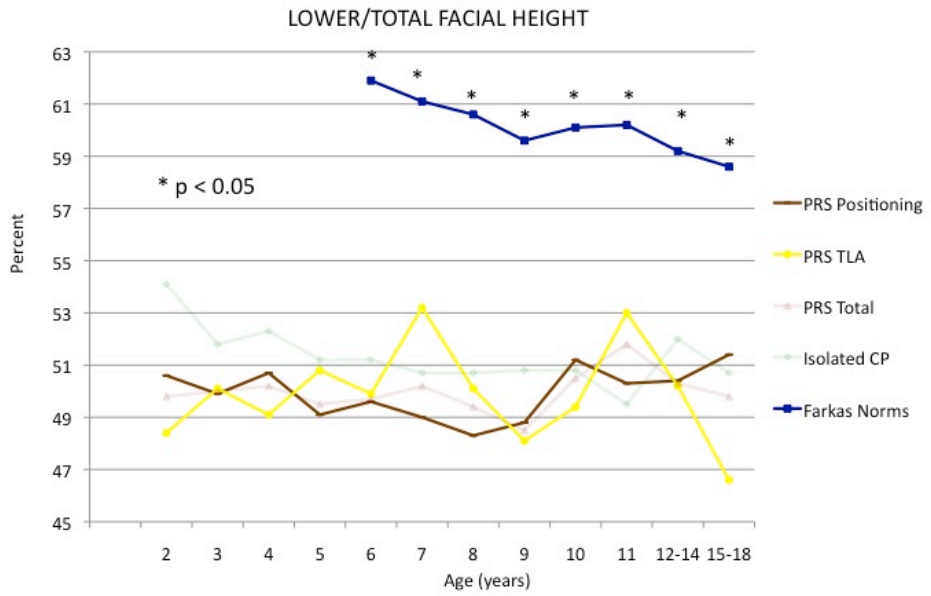

Figure 2. Lower to total facial height

Discussion

These data represent the largest quantitative series of growth measurements in PRS patients. They support the concept of mandibular "catch up" growth to some extent for both those treated with prone positioning alone and those treated with TLA. While the PRS mandible does not reach the dimensions of Farkas's controls, and with respect to lower facial height remains statistically significantly shorter through skeletal maturity, these measurements provide a level of comfort with the use of temporizing measures in the neonatal period at least where mandibular length is concerned.

References

1. Daskalogiannakis J., Ross R., Tompson B. The mandibular catch-up growth controversy in Pierre Robin sequence. *Am J Orthod Dentofacial Orthop* 120: 280-285, 2001.
2. Figueroa A., Glupker T., Fitz M,, BeGole E. Mandible, tongue and airway in Pierre Robin sequence: a longitudinal cephalometric study. *Cleft Palate J* 28: 425-434, 1991.
3. Farkas, L. (Ed.), *Anthropometry of the head and face in medicine*, 1st Ed. New York, NY: Elsevier, 1981.