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Maxillary Protraction to Treat Pediatric Obstructive Sleep Apnea and Maxillary Retrusion: A Preliminary Report

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Abstract

Introduction: Midface retrusion creates a size deficiency problem in the upper airway that has been improved in children using surgical midface advancement and orthopedic protraction of the maxilla. The results of these treatments have been mostly promising at enlarging the pharyngeal airway. Recently introduced bone anchored maxillary protraction (BAMP) uses implant inserted devices in the jaws to pull the maxilla forward against a backward pressure to the lower jaw. This is a pilot study that examines the use of BAMP as a strategy to treat maxillary retrusion, malocclusion and children with obstructive sleep apnea.

Methods: 15 children, ages 9-16 years with maxillary retrusion creating a skeletal malocclusion were treated with bone anchored maxillary protraction (BAMP) and the results were compared against an untreated control group. 8 children in the treatment group also had sleep disordered breathing/obstructive sleep apnea. All subjects had lateral cephalograms before and after BAMP therapy. The OSA cohort completed the pediatric sleep questionnaire (PSQ) and polysomnography prior to and at the end of BAMP.

Results: The majority of the OSA children (n = 5) showed improvement in their apnea-hypopnea index (AHI) and OSA symptoms after BAMP. Preliminary results of BAMP therapy show improvement in respiratory and airway parameters in OSA children with a highly significant change in the forward position of the upper jaw and enlargement in the nasopharyngeal to oropharyngeal junction as compared to an age and sex matched untreated control group. The outcomes were dependent on the age of treatment initiation and patient compliance.

Conclusions: This preliminary work suggests that bone anchored maxillary protraction may be considered as an adjunctive treatment option in adolescents for improving midface retrusion and sleep apnea, but further work is needed to explore this therapy.

Keywords: Bone anchored maxillary protraction; Maxillary retrusion; Midface hypoplasia; Orthodontics; Pediatrics; Sleep apnea.

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