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Commentary

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Stability of Anterior Openbite Treated with Crib Therapy

Greg J. Huang, Roberto Justus, David Kennedy, and Vincent Kokich.

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Reviewer: Marvin Hanson, Ph.D.

I think it is safe to say that more high quality, published research on relationships between tongue and lip functions and occlusion has been produced at the University of Washington Dental School than at any other dental school in the United States. This article by Huang, Justus, Kennedy and Kokich is another such report. The research was carefully carried out and reported, and represents an important contribution to our knowledge, in this case relating crib therapy to openbite closure.

The Research

Records on 33 patients were collected and examined. All had had an anterior openbite and all had a sucking or tongue pattern that had been treated using cribs, most of which had sharp spurs. Of the 33, 26 were "growing" patients (mean age, 9-7, when crib was introduced); the other seven were "nongrowing" (mean age, 20-10). The 26 growing patients were divided into two groups. In the first group were 14 patients who had complete orthodontic appliances in addition to cribs. The other 12 had only palatal expanders and/or headgear. All seven in the nongrowing group received complete orthodontic treatment.

Cephalometric radiographs were taken prior to crib placement (T1), immediately following their removal (T2), and at least one year later (T3). T-tests and a nonparametric test, the Wilcoxan rank sum, were applied to data from the measurements to determine significance of changes in openbite from T1 to T2, and from T2 to T3. Also tested statistically were differences between effects of crib treatment on patients who received complete orthodontic treatment and those who did not.

Results

Between the two groups of growing patients, no significant differences were found at any of the three measurement times. The amount of closure of openbite following treatment and after maintenance was essentially equal between the subgroups. Since age at crib placement, pretreatment cephalometric characteristics, and posttreatment time interval were also equal between these subgroups, the two groups of growing patients were treated statistically as a single group.

Prior to treatment, the mean openbite in the growing group was 2.88 mm; in the adult group, 2.71 mm. Following treatment, both groups had essentially normal anterior occlusion, with overbites of 1.8 mm and 1.5 mm, respectively. Mean vertical closure in both groups exceeded 4 mm. Altered occlusion essentially remained stable in both groups through the maintenance period. The justified conclusion of the investigators was that crib therapy was successful, with or without complete orthodontic treatment, in closing and maintaining anterior openbites in growing and in adult patients.

Critique

Information was clearly reported. Procedures were careful and appropriate. Results were positive and objectively reported. The use of non-parametric statistics was appropriate; the t-test seems inappropriate and superfluous, due to the small group and subgroup sizes and the dissimilarities in ages between major groups. Generally, results reported, and conclusions drawn from the results, were objective and credible.

My criticisms deal with what was *excluded* from the research, or at least not reported in the article.

Subjects. No explanation was given of the manner of selecting subjects. Were these all subjects seen by a single orthodontist, or by a group of orthodontists? How were the 33 patients selected? Were they all the patients treated at a given place over a given period of time, or did they represent a random selection? If a random selection, what per cent of a total population of treated patients were they?

Subjects were described as having received crib therapy for a tongue and/or thumb habit. How many in each of the groups had a tongue thrust? How many had a thumb habit? How many had both? Were all those described as having "tongue habits" tongue thrusters?

The authors cite a number of cross-sectional studies in the literature reporting various percentages of reduction of openbite as age increases. One such study, by Worms, Meskin, and Isaacson, reported an 80% decrease in simple openbites. The Huang, et al, study was unique in that it provided longitudinal, rather than cross-sectional, data. Nevertheless, a significant omission from the research is a control group. We don't know how many of these subjects would have experienced a reduction of openbite over time *without* any orthodontic treatment, or with partial orthodontic treatment with no crib, or with complete orthodontic treatment but no crib, or with no crib but with oral myofunctional therapy. The inclusion of some kind of control group would add considerably to the validity of the research.

Also cited were a pair of studies by Haryett and associates, reported in the American Journal of Orthodontics in 1967 and 1970, on the psychologic effectiveness of various methods of treatment of sucking

habits. Those studies found many instances of adverse behavioral changes resulting from the use of cribs, including speech problems, nightmares, and bedwetting. Huang and associates give no information about pre- and posttreatment characteristics of their subjects except for dental occlusion and existence of tongue or sucking habits. Neither do they mention how the habits were diagnosed, or by whom, nor whether they were reduced, altered, or eliminated during or following treatment. A more complete, more helpful study would examine the subjects' behaviors more holistically. Importantly, did the cribs alter speech patterns, and if so, in what manners and were the alterations temporary?

Procedures

The combining of the 14 subjects who had received complete orthodontic treatment with the 12 who had received partial treatment (headgear and/or arch expansion) was appropriate, since we can assume that both groups had received the amount and type of treatment that their occlusions warranted. Had one group received *no* orthodontic treatment, differences in the effectiveness of crib therapy might have been seen.

It would have been interesting to know whether the cribs were consistently placed in the maxillary arch, or at times in the mandibular arch. All but five of the 33 cribs were of the type with sharp spurs. I would like to know whether there were differences in psychological, speech, and occlusal effects between subjects who had sharp spurs and those who had smooth ones.

Washington is a state generally very accepting of oral myofunctional therapy. Presumably a large number of these subjects were diagnosed as tongue thrusters. If that is the case, were any of them told they were tongue thrusting? If so, were they given any instructions on where to place the tongue at rest, or any encouragement to keep the lips closed at rest? None of them received therapy for speech or for tongue thrust. Does this mean none of them had speech problems? Were they instructed *not* to pursue speech or myofunctional therapy?

Considerations

Orthodontics write more articles about relationships between tongue and lip patterns and openbites than about relationships between those patterns and overjets. Yet most of the patients referred to most orofacial myologists have overjets as the primary malocclusion. I would like to see a similar study, longitudinal in nature, prospective rather than retrospective, holistic, rather than just dental, carried out with groups of patients primarily presenting overjets, rather than openbites.

The authors are conservative in interpreting their results. Readers should follow their lead, remembering that these patients, collectively, had relatively small openbites, less than 3 mm. Results of crib therapy for patients with more severe anterior malocclusions may not be so positive.

Summary

Crib therapy was shown to be helpful in achieving and maintaining closure of anterior openbites in 26 children and youths, and in seven adults. The research was carefully conducted and objectively reported, but many important questions were not addressed, particularly questions dealing with extra-dental concerns.