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Clinical Perspective

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# Tooth Movement Associated with Oral Myofunctional Therapy: A Clinical Report

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The title warns the reader that this is not a report of controlled research. Instead, it is a description of posterior movement of maxillary incisors in a group of young patients with anterior overjets, all seen for oral myofunctional therapy prior to initiation of any orthodontic treatment. All were given therapy by the author. No efforts were made to control variables, or to make comparisons based on those variables, such as age, sex, Angle classification, or oral or nasal predominance in breathing. All overjet measurements were taken prior to orthodontic intervention.

## BACKGROUND

Orofacial myologists came into existence because of a felt need of orthodontists to have someone train their patients' tongues to stop exerting untoward pressures against their anterior teeth. Many orthodontists noted that the natural tendency of teeth, moved into favorable positions by braces and appliances, is to return to their pre-treatment relationships (or relapse) if facilitated by "tongue thrust swallowing." Research and clinical experience have justified the concerns of these orthodontists and those who have followed them, demonstrating that therapy does, indeed, discourage "relapse," a term that makes us all shudder.

Nearly all, but not all, orofacial myologists currently treating patients deny that the purpose of their therapy is to improve malocclusions. Instead, most affirm that the purpose is to provide an oral environment optimally conducive to stability or development of the dentition. In younger children, it is hoped that before anterior permanent teeth erupt, undesirable tongue and lip resting postures and movements will be eliminated, encouraging appropriate eruption pathways. In children in mixed dentition, efforts are made to prevent them from resting or pushing the tongue into the intra- or inter-arch spaces. In older children, young adults, and adults, a goal is to provide conditions helpful to the retention of corrected occlusion, or to provide postures and movements of tongue and lips that will facilitate orthodontic correction of malocclusions.

Nevertheless, over the three decades that have passed since therapy was first administered, a number of training courses, articles, books, and slide presentations have taught that many anterior malocclusions can be corrected with therapy alone, precluding any necessity for orthodontic work. All clinicians who work with large numbers of patients can put together a portfolio of cases with significant openbites and overjets that have yielded to normalized tongue and lip resting postures and movements. It is not to these extraordinary cases that the present article is addressed, rather to the generalizations suggested by clinicians, or assumed by their audiences, that therapy with most patients brings about dramatic changes in occlusion. A corollary misconception exists in the minds of many dental specialists and speech-language pathologists, and among a minority of orofacial myologists, that the **amount** of movement of teeth accompanying therapy is reflective of the effectiveness of the therapy. This writer has always welcomed positive changes in occlusion, and has suspected that therapy has had something to do with them, but has never postulated a linear relationship between those changes and the success of therapy, nor, conversely, deemed therapy unsuccessful if no improvement in occlusion occurred.

## PROCEDURES

*Subject selection.* With the help of a graduate student, data were gleaned from records of the most recently treated 214 patients initially seen for treatment between the ages of seven and seventeen years. Mean age was 10.1 years. All had anterior overjets of at least 1 mm at the first appointment. Subsequent measurements were taken at varying intervals. The practice is to measure at about three months, then at six months, then at one year, but a number of factors contribute to the scheduling of these follow-up measurements. Many patients were excluded from this study, such as those whose orthodontic work began before three months had passed, those with other types of anterior malocclusions, those already in appliances or braces when therapy began, and those who discontinued therapy before the maintenance phase began. Every patient who met the simple criteria was included in the examination of records.

*Measurements.* Over the past 25 years, the author has demonstrated, in controlled research projects, his reliability in measuring overjets to within 1/2 mm, following this procedure: the patient achieves what appears to be the most comfortable molar occlusion, and a tongue depressor is placed against the labial surfaces of the

mandibular incisors. The stick is then elevated against the edges of the maxillary incisors. A series of marks are made on the tongue depressor with a sharp pencil in the area of maximal overjet. The depressor is moved laterally until one of the marks lines up with the point of maximal overjet, along the posterior margin of the maxillary incisor at the point of greatest protrusion. The procedure is then repeated and the results compared. If the two measures differ more than 1/4 mm, the step is repeated. The measurement found in two attempts of the three is accepted. The precise location at which the measurement is taken is noted on the consultation record.

The initial measurement is taken during the consultation. Therapy routinely begins at this session, with rest posture assignments. Ordinarily the second measurement is taken at about three months following the first visit. At times, optimistic parents or patients, certain they have noted improvement in occlusion, insist on an earlier measurement, but rarely is there significant movement during those first two months. The third measurement is at about six months, but timing for that measurement varies a great deal; maintenance schedules depend on the progress of the patient. A fourth measurement is taken at approximately one year, and an occasional fifth measurement a year later. Almost never has a significant change in occlusion been noted between the first and second years.

There is a great deal of variability in timing and in number of measurements taken. Many receive their braces soon after the three-month measurement, but others wait six months, a year, or longer, before getting braces. A few go several years before orthodontic treatment begins. Some patients discontinue therapy, then resume it months or years later. Those of you who provide therapy know the many patterns. For these and other reasons there is considerable variation in numbers of patients reported at each time interval.

Data from the patients' records were organized in the following manner:

1. The measurement taken at the consultation.
2. Measurements from three to five months (listed as three months).
3. Measurements from six to eleven months (listed as six months).
4. Measurements after one year or more (listed as one year).

## FINDINGS

Changes in overjet occurring prior to the beginning of orthodontic treatment in the 214 patients are listed in Table 1.

The greatest movement measured in a single patient was, at one year following the initial visit, 6 mm. At the three-month visit, the greatest movement was 3 mm; at six months, 4 mm.

| | 3 Months | 6 Months | One Year |
|---|---|---|---|
| Number of Patients | 99 | 111 | 59 |
| Total Reduction in Overjet | 52.75 mm | 68.75 mm | 59.25 mm |
| Mean Reduction | .53 mm | .62 mm | 1.00 mm |
| Number of Patients with No Measurable Change in Overjet | 32 | 26 | 13 |
| Number of Patients with Overjet Reduction | 65 | 75 | 44 |
| Number of Patients with Overjet Increase | 2 | 10 | 2 |

Table 1. Changes in overjet accompanying therapy for tongue thrust in 214 patients from one practice. Number of months refers to time lapsing between measurement at initial consultation and subsequent measurements.

After three months of therapy, 65 of the 99 patients on whom measurements were taken (65.7%) showed some decrease in overjet. Thirty-two (32.3%) showed no change in overjet, and two (2%) showed an increase in overjet.

After six months of therapy, 75 of the 111 patients measured (67.6%) showed some decrease in overjet. Twenty-six (23.4%) showed no change in overjet, and ten (9.0%) showed an increase in overjet.

At one year post-initiation of therapy, 44 of 59 patients measured (74.6%) showed some decrease in overjet. Thirteen (22.0%) showed no change, and two (3.4%) showed an increase in overjet.

## DISCUSSION

1. In this group of 214 subjects, even after a year of therapy and maintenance, the mean posterior movement of maxillary incisors was only 1.00. This finding gives a realistic perspective of therapists as movers of teeth.

2. It is possible, and perhaps likely, that clinicians whose avowed purpose was to move teeth rather than to create an optimal environment in which the dentition might develop or remain, might achieve greater movement toward normal occlusion in their patients than has this practitioner. It is also very possible that someone with the same objectives as those of this writer might simply, through more effective therapy, produce more tooth movement. This report is presented with the hope that others might "dig" into their records and compare their results with mine, or, better yet, conduct a controlled experiment on this subject.

3. The therapy administered by the author has been proven effective in retaining orthodontically-cor-

rected anterior overjets (Andrianopoulos & Hanson, 1987). In that study, a group of 17 patients with Class II, Division 1 occlusion, all at least a year out of retention, and all of whom had successfully completed training for elimination of tongue thrust, was compared with a matched group who had not received therapy for tongue thrust. Three of the 17 therapy subjects (17.6%) and 12 of the non-therapy subjects (70.6%) were found to be currently tongue-thrusting, in a double-blind study.

Andrianopoulous & Hanson (1987) found that the mean relapse in overjet since removal of appliances was 0.56 mm for the therapy group and 1.94 mm for those with no tongue thrust therapy. A mean overjet relapse of 1.0 mm was found in the three therapy group subjects who were currently tongue thrusting, and a relapse of 0.46 mm in the 14 who now swallowed without a tongue thrust. In the non-therapy subjects, the mean overjet relapse was 2.0 mm for the 12 now tongue thrusting, and 1.8 mm for the five with now normal swallows. The relationship between tongue thrust therapy and the amount of relapse was statistically significant: $r = .43$, $t = -2.71$, $p < .02$ (Andrianopoulous & Hanson, 1987).

With respect to the original need of orthodontists, and to the need most are still concerned about, that of stabilization of corrected occlusion, the therapy administered to this group of 214 subjects has been successful. Clinicians who have kept similar records on their patients are encouraged to report results of their computations as a follow-up to the present article. Of equal interest would be tallies on patients with anterior openbites.

4. Of much more value than this clinical report would be, of course, a controlled experiment, comparing, for example, the results of an approach devoting more attention to muscle *strengthening* than this writer, who rarely uses exercises designed to strengthen tongue or lip muscles. The present approach focuses almost exclusively on labial and lingual positions and movements. The rationale for this bias is that lips and tongues capable of maintaining proper resting postures, and capable of producing normal or near-normal articulation, are probably strong enough to accomplish optimal chewing and swallowing functions. Clinical and research evidences have shown this assumption to be valid.

5. One might postulate that the very minimal reductions in overjet preceding orthodontic treatment in this group of oral myofunctional patients might have occurred without any therapy whatsoever. A relatively greater anterior growth in the mandible, for example, than in the maxilla, might be occurring in some of the patients. The 1 mm average in overjet reduction in the 59 patients seen a year or more following the first visit might be attributable to such growth patterns. Unfortunately, the literature does not provide us with those normative data. We have to do some deducing and estimating to come up with that information. For example, Woodside and colleagues (1991) studied mandibular and maxillary growth after changing oral to nasal breathing in 38 patients who had undergone adenoidectomies. Their control group of 37 children provided data on mandibular and maxillary growth. Mean ages of children studied were 7.9 and 8.9 years for boys and girls, respectively, in this group. The period of time covered by the study was five years. This compares fairly closely with the mean age of 10.1 years of my patients when they initiated therapy.

Both groups of subjects in the Woodside study were seen five years after surgery. Mandibular and maxillary growth measurements were taken, as is typical in the orthodontic literature, in terms of angles and distances. The lines of measurement for distance are closer to the vertical than to the horizontal. A description of landmarks on lateral x-rays utilized by the investigators is provided in their article and will not be explained here. The relatively vertical growth lines measured for distance changes produce higher numbers than would horizontal anterior measures alone. A schematic follows (Figure I) that demonstrates relative distances between typical x-ray measures depicting the downward and forward growth patterns, and measures of overjet alone, such as those of the present report.

Angles in the schematic are identical to those in a typical case presented in the Woodside article. Actual growth distance is more than twice that of horizontal growth in both the maxilla and the mandible. The mean maxillary growth reported by Woodside over the five year period was 7.4 mm for boys and 6.8 mm for girls. Mean mandibular growth was 13.2 mm for boys and 11.0 mm for girls. Whereas we cannot assume that growth was equal during each of the five years, a rough estimate of expected horizontal maxillary and mandibular growth in subjects in the present study can be made by first dividing actual growth by two, to get horizontal growth expected in five years, then dividing by five to get a horizontal growth expectancy for one year. This results in the following rough estimates: In one year, girls' horizontal maxillary growth would be .68 mm and boys' .74. Expected horizontal mandibular growth would be approximately 1.1 mm for girls and 1.3 for boys. Expected horizontal mandibular growth would exceed expected horizontal maxillary growth. Therefore, it would be reasonable to assume that a slight decrease in maxillary overjet might be explained in terms of relative mandibular and maxillary growth during the one year. The mean reduction in overjet of 1 mm found in patients in the present report might be partially accounted for by growth alone.

The mean reduction in overjet of .53 mm three months after the onset of therapy would be slightly more meaningful than would be the 1 mm found after one year, in terms of expected effects of growth during that short period. At any rate, in this group of patients treated by an

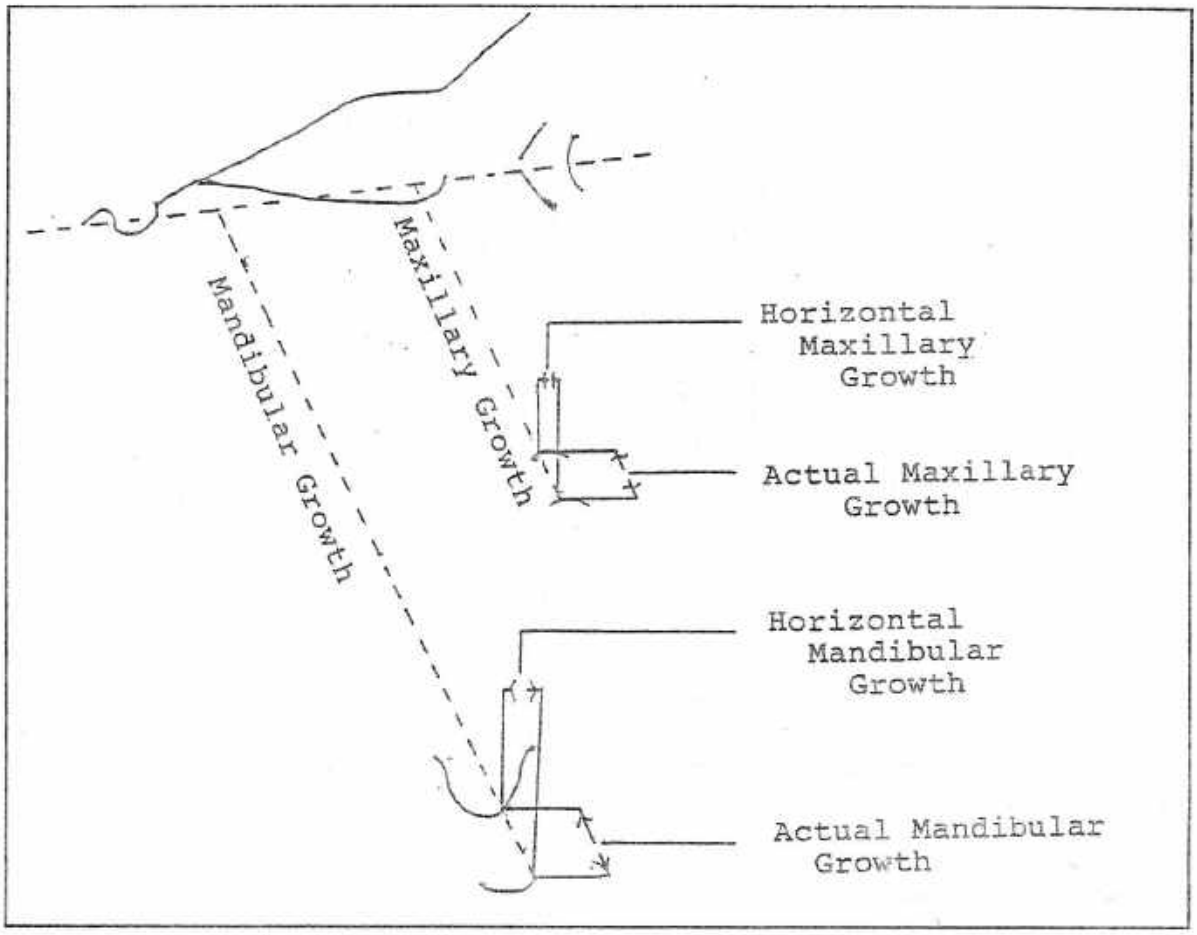


*Fig. 1: Schematic showing relationships between actual and horizontal maxillary and mandibular growth.*

approach that has proven to be helpful in stabilizing corrected occlusion, when growth factors are considered, the mean amount of reduction in overjet attributable to therapy alone would have to be well under 1 mm.

6. A more defensible manner of demonstrating effectiveness of oral myofunctional therapy than to show slides of teeth movement would seem to be to use those slides to portray cosmetic benefits, and to refer to the Andrianopoulos & Hanson research that provides data supporting the claim that therapy significantly helps maintain orthodontic results. Certainly a great deal of research needs yet to be done to objectify benefits of therapy.

## References

Andrianopoulos, M.V., & Hanson, M.L. (April, 1987). Tongue thrust and the stability of overjet correction. *Angle Orthodontist*, 57:(2), 121-135.

Woodside, D.G., Linder-Aronson, S., Lundstrom, A., & McWilliams, J. (July, 1991). Mandibular and maxillary growth after changed mode of breathing. *Am. J. Orthod. Dentofac. Ortho.*, 100:(1), 1-18.