

Case Report

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Joseph B. Zimmerman

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OROFACIAL MYOFUNCTIONAL THERAPY FOR BILATERAL TONGUE POSTURE AND TONGUE THRUST ASSOCIATED WITH OPEN BITE: A CASE REPORT

Joseph B. Zimmerman, M.Ed.

Certified Speech Pathologist

Certified Orofacial Myologist

This article discusses the significance of lateral and bilateral (posterior) tongue thrust and resting posture anomalies. A case study is presented with photographic documentation of results of the coordinated efforts of orthodontist, orofacial myologist, patient and family. A primary goal of this article is to describe the necessary cooperation between the orofacial myologist and the orthodontist to ensure ideal timing and coordination of intervention strategies. This case study supports the concept that orofacial myofunctional therapy can facilitate the task of the orthodontist, and contribute to orthodontic stability by creating a more favorable muscle environment for the dentition.

The majority of patients referred to this private practice for orofacial myofunctional therapy exhibit some type of anterior tongue thrust problem. Less than fifteen percent of referrals have unilateral or bilateral tongue posture and tongue thrust swallow patterns. However, these patients can present significant clinical problems for the orthodontist and orofacial myologist.

Apart from a lower incidence, other factors may lead to this low level of referral for patients with bilateral tongue patterns. Since most patients seek orthodontic treatment to enhance appearance (Case, 1988; Zimmerman, 1988), it seems possible that more individuals with problems affecting the anterior segments of the dentition will seek orthodontic treatment. Moreover, problems of anterior tongue posture and thrust are more apparent and easily diagnosed. When there is lip incompetency, the tongue may be visible as it rests against or between the anterior teeth. It is also easier to break the lip seal anteriorly to observe the tongue during deglutition (Pierce, 1988). It is considerably more difficult to break the seal at the corners of the mouth. Finally, when an open bite does not close, it is tempting to suspect that the patient has not been following orthodontic instructions (which may also be true!). Slow treatment response is likely to lead to discouragement and subsequent reduced cooperation even if initial motivation was high.

In some patients it appears that correcting the open bite by orthodontic mechanics is sufficient to "persuade" the tongue to adopt a new resting posture. Unfortunately, some patients (possibly those with airway problems or with good "muscle memory") persist in resting the tongue between the teeth. The presence of lingual muscle between the teeth at rest and during swallowing would seem a likely cause of delayed or lack of appropriate response to vertical elastics used to close the open bite. In less severe cases of muscle interference,

the orthodontic treatment progresses satisfactorily, but some degree of open bite may still recur in the retention phase of orthodontics. These outcomes are naturally a source of frustration for both patient and orthodontist.

REPORT OF A CASE

The patient, a female, age 13-4 was evaluated for orofacial myofunctional disorder in early December, 1981. She had been referred by her orthodontist for examination of a tongue thrust problem. The orthodontist planned to delay starting the second phase of orthodontic treatment until the patient had made sufficient progress in therapy to suggest a successful outcome. At the time of the evaluation, she was in retention following completion of the first phase of orthodontic treatment (palatal expansion and headgear). She was wearing a retainer that had been in place for approximately one year since the removal of the Phase I appliances. The retainer featured lingual spurs, placed anteriorly to discourage a forward placement of the tongue (Figure 1).

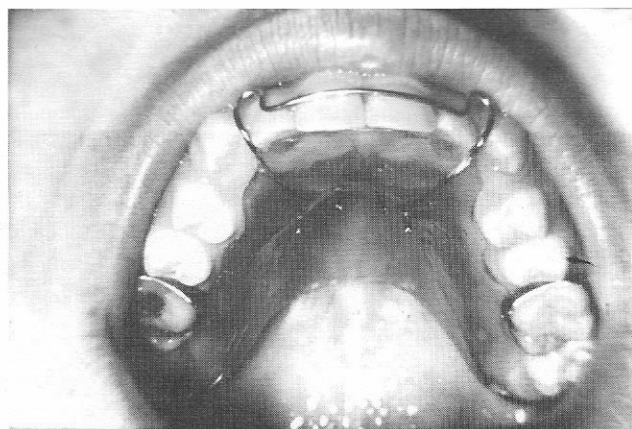


Figure 1

Phase I orthodontic retainer with lingual spurs.

She reported a history of mild nasal congestion each Spring, a suspected "hay fever" type allergy. This problem was apparently more severe in early childhood. A minor thumb sucking habit through age 18 months was reported.

The swallow pattern was diagnosed as a bilateral tongue thrust with an anterior component. During deglutition, the tongue was thrust forward with the tip braced against the anterior teeth, while the lateral borders of the tongue spread interdentally in the cuspid/bicuspid

regions. This swallowing pattern was consistent with or without the retainer in place. Swallowing was accompanied by a marked contraction of the perioral musculature. The corners of the mouth were pulled posteriorly with pursing of the orbicularis oris during deglutition. The same movement patterns were observed for swallowing of saliva, liquids and food.

The tongue was observed to rest in a low and forward posture, with or without the retainer in place. The tip of the tongue rested against the lower anterior teeth with the lateral borders spreading against and between the dentition in the cuspid/bicuspid areas of open bite. Lip closure could be achieved without difficulty (Figures 2A and 2B). The patient reported that she breathed easily through her nose, although her lips were not always closed. A tendency to posture the lips apart was noted during the evaluation. The open lips resting posture encouraged a low forward resting tongue posture. It is the author's opinion that this tongue resting posture promotes and maintains a tongue thrust swallowing pattern.



Figure 2A

Open lips resting posture noted at initial evaluation.



Figure 2B

Lip closure could be achieved without difficulty.

Visual examination indicated that the palatal vault appeared adequate to accommodate the tongue. Sharply defined palatal rugae were noted, suggesting little

tongue-to-palate contact. Orofacial muscle coordination was judged to be within normal limits. Tongue size, mobility and symmetry were also normal. No abnormalities of masseter strength or function were apparent.

During speech, the tongue was observed to spread between the teeth in the cuspid/bicuspid regions for production of the /s/ and /z/ sounds. Psychoacoustic perception of these sounds was "thick" (slightly distorted) but would probably not be noticed by an untrained, casual listener. However, the interdental production of these sounds was easily visible and might be visually distracting to a listener. This problem could be described as a cosmetic or aesthetic, bilateral interdental lisp with a mild acoustic component.

The patient was in the later stages of mixed dentition. All the deciduous teeth, except the mandibular right molar, had exfoliated. Only the mandibular right secondary bicuspid and third molars had yet to erupt. When she occluded her teeth, only the first and second molars made contact (Figures 3A, 3B, 3C). At the time of the evaluation her molar relationship appeared to be Class I. Oral hygiene seemed to be satisfactory.

It seems likely that the patient developed this atypical lingual rest posture as an adaptation to airway problems in childhood. It is typically observed that if the tongue rests between the teeth it tends, by economy of effort, to also posture there for speech and swallowing. The narrow palatal arch may also have contributed to the low tongue rest posture.

Prognostic indicators for a successful therapy outcome were positive. At age 13, the patient understood the reasons for therapy. Her attention span was good. Motivation to correct the problems seemed high. She was cooperative during the evaluation. Her muscle control appeared adequate. She exhibited no anatomical restriction to normal oral posture or function. She had shown good cooperation during the first phase of orthodontic treatment. She evidenced no current airway problems. Both parents attended the evaluation and supported the therapy program. She practiced an acceptable routine of oral hygiene. She reported no parafunctional habits that could interfere with therapy response (sucking habits, lip habits, etc.). She responded quickly to the suggestion that it was advisable to rest the lips together.

Therapy began on December 7, 1981, one week after the evaluation. The goals of the therapy program were to establish and habituate appropriate tongue and lip resting posture and movement during speech and swallowing. The patient's mother was present during therapy sessions to ensure support for the home practice program. Initially, therapy focused on increasing awareness of the orofacial musculature and gradually establishing a tongue up, lips together oral rest posture. Then, new neuromuscular movement patterns for gathering and swallowing of foods, liquids and saliva were developed on a conscious level. Later, therapy activities were assigned to transfer these new motor skills to an automatic, habitual level. Practice assignments and strategies were changed frequently to minimize boredom (Zimmerman, 1988).

The patient attended sessions once weekly for five

weeks and then at biweekly intervals. After four months of therapy, the patient was referred back to the orthodontist, with a positive progress report. He decided that she was ready to commence the second phase of her orthodontic treatment. The orthodontic fixed appliances

were placed in May, 1982 (Figures 4A, 4B, 4C). The orofacial myofunctional therapy assignments were reduced for several weeks to allow the patient time to adjust to the new appliances. Therapy then resumed on a biweekly basis.

Figures 3A-C
*Photographs taken at the initial evaluation
(12/2/81; Age 13-4).*

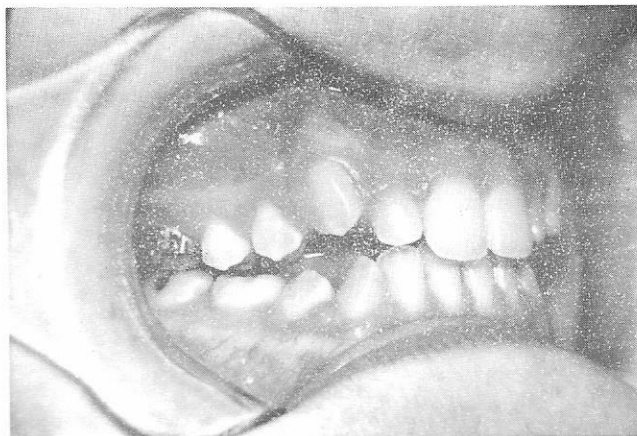


Figure 3A



Figure 3B



Figure 3C

Figures 4A-C
*Third day after installation of fixed orthodontic
appliances (5/7/82).*

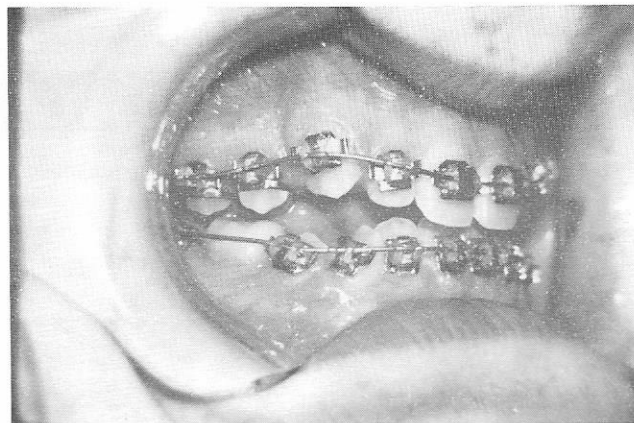


Figure 4A



Figure 4B

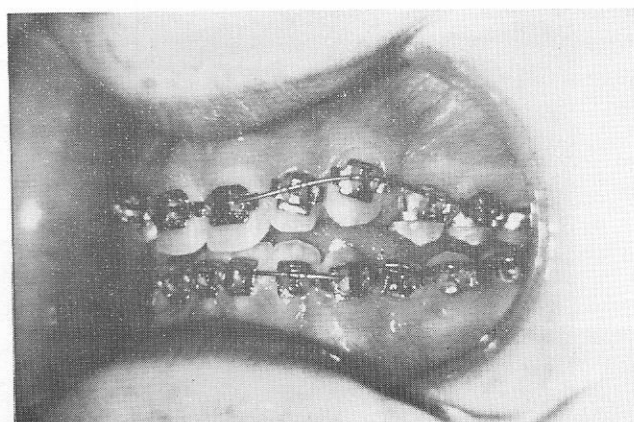


Figure 4C

In September, 1982, she began speech therapy activities to correct the interdental lisp, and continued to focus on habituation of correct oral/lingual posture and swallowing. In mid-November, after 23 active therapy sessions, the patient, parent and orofacial myologist made the decision to begin the recall phase of therapy. During this phase of therapy, no specific practice was assigned. The patient was encouraged to improvise her own practice program, and she was advised to contact orofacial myologist if she noticed any regression.

Figure 5A-C

Shortly after fixed appliance removal (4/24/84).



Figure 5A



Figure 5B

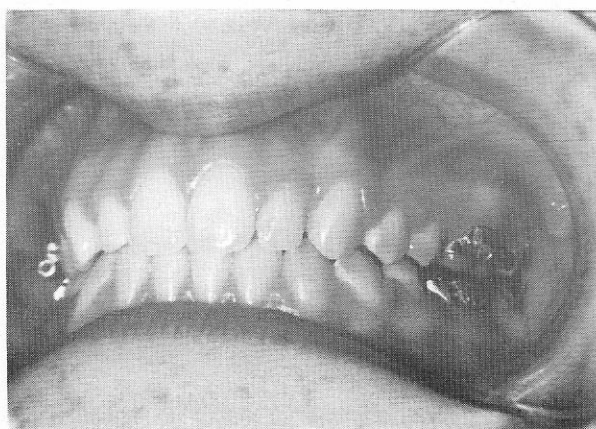


Figure 5C

She exhibited no problems at the one month recall visit. She retained appropriate oral postures and functions at the subsequent three month recall appointment. After a further three month break she showed some regression and was scheduled for four review sessions of therapy. She was then placed on a six month recall. In April, 1984, the orthodontist removed the fixed appliances (Figures 5A, 5B, 5C). He placed a Hawley retainer with lingual spurs in the anterior portion as a reminder. The patient

Figure 6A-C

*Seven months after fixed appliance removal (1/11/85).
Hawley to be worn at night only.*



Figure 6A

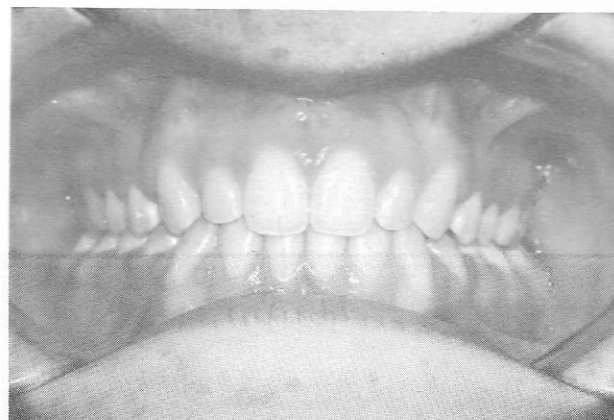


Figure 6B

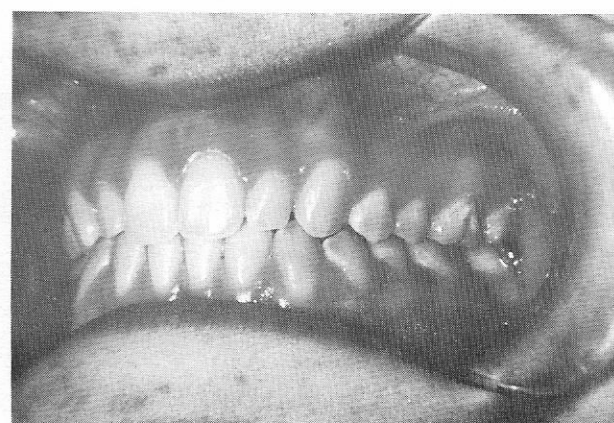


Figure 6C

completed a short review of therapy to ensure adaptation of function to the new landmarks created by the retainer. After this brief but important therapy review, the patient was placed again on a six month recall. On this recall visit, careful observation and testing indicated retention of the appropriate oral rest posture and function during speech and swallowing. The occlusion ap-

Figure 7A-C

Three years, three months after fixed appliance removal (7/15/87). Hawley to be worn at patient's discretion. Orthodontic results appear stable.



Figure 7A



Figure 7B



Figure 7C

peared stable. The orthodontist instructed the patient to wear her retainer at night only. (Figure 6A, 6B, 6C).

Therapy re-evaluation one year later, indicated stable functional and occlusal findings. At that time the patient had been instructed by her orthodontist to wear her retainer every other night. Recall one and one-half years later in July, 1987 showed stable functional and occlusal results (Figure 7A, 7B, 7C). Annual recall visits to monitor progress and evaluate long term results will be continued.

The case demonstrates that this difficult type of tongue thrust pattern can be treated successfully with patient cooperation and coordination of care by the orthodontist and orofacial myologist. It is suggested that the combined skills and effort of the orthodontist, the orofacial myologist, patient and family were essential to achieve this satisfactory and stable occlusal, esthetic and functional result.

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