Tongue Thrust Classification

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In recent years the tongue thrust problems and the resultant oral manifestations have come to the forefront of the progressive, clinical orthodontist's attention. Although the existence of the tongue thrust in atypical swallowing patterns has been recognized for some time,¹,² a view of the orthodontic literature reveals that until recently little research has been conducted in this area. Since this is a field of vast importance to the correction and maintenance of dentofacial deformities,³ it is hoped that accelerated research may provide answers to the many questions surrounding this problem. For example, do certain individuals have a greater tendency from birth to develop atypical swallowing patterns? What are the best preventive measures? What is the best procedure that will attain a high percentage of correction and remain stable?

In a recently completed survey⁴ to determine the incidence of tongue thrust in the primary and permanent dentition the authors and others⁵ found a need to group the various types of tongue thrusts observed. It was found that this grouping or classification was very useful for purposes of communication and description of the nature of the findings. It was decided that in order to be useful in the survey, the classification would have to be based upon the resulting deformity observed rather than on the etiology, since the latter was often obscure and the determination of all the etiological factors in any one case was difficult if not impossible. To this end a classification was devised and is presented below.

**TONGUE THRUST CLASSIFICATION**

**TYPE I — Nondeforming Tongue Thrust**

**TYPE II — Deforming Anterior Tongue Thrust**

Subgroup 1 — Anterior Open Bite
Subgroup 2 — Associated procumbency of Anterior Teeth
Subgroup 3 — Associated Posterior Crossbite

**TYPE III — Deforming Lateral Tongue Thrust**

Subgroup 1 — Posterior Open Bite
Subgroup 2 — Posterior Crossbite
Subgroup 3 — Deep Overbite

**TYPE IV — Deforming Anterior and Lateral Tongue Thrust**

Subgroup 1 — Anterior and Posterior Open Bite
Subgroup 2 — Associated procumbency of Anterior Teeth
Subgroup 3 — Associated Posterior Crossbite

**DISCUSSION**

Although some of the groupings in this classification will not be seen often, all of the types and subgroups were seen in an examination of a random sample of approximately two hundred grade school and junior high school students. Some of the examples below were obtained from this group and the remaining were obtained either from patients awaiting orthodontic treatment or from those who had just begun appliance therapy.

Before discussing the classification, it might be well to explain the criteria
that were used for determining the presence of tongue thrusting. If any movement occurred around the lips, an attempt was made to observe the tongue itself as the swallowing was commencing. If the tongue was observed thrusting between and the teeth did not close in centric occlusion during deglutition, it was specified that a tongue thrust was present. Many times it may be found difficult to observe the tongue thrust because the lips (particularly the mentalis and orbicularis oris muscles) play such an active part in the atypical swallowing pattern.

**Type I Nondeforming**

The term nondeforming does not imply that occlusions included under this heading were perfect with no jumbling and rotations, but simply means that the interdigititation of the teeth and the profile were acceptable and within the normal range.

From observations of the various samples, it would appear that there is a larger number of individuals in this category than would be expected. This type may not be recognized too often, because of its nondeforming nature (Figure 1). This tongue pattern apparently is nondeforming, either because the thrust is mild in nature, or because there is sufficient tonus of the lips and cheeks to prevent deforming changes. In fact, some orthodontists feel that this tongue thrust may be necessary to prevent collapse of the anterior segment. Periodic observation may show the development of a dental malocclusion in some of these cases.

**Type II — Deforming Anterior Tongue Thrust**

The deforming anterior tongue thrust is the most prevalent type of pernicious swallowing and may or may not result in an anterior open bite.

*Subgroup I — Anterior Open Bite*

When the term “anterior open bite” is used in this classification, it actually refers to the relationship of the anterior teeth to one another in the overbite relation. Actually this open bite should be considered a “pseudo” open bite, since the original term referred to the relationship of the jaws to one another in their over-all relation to the muscular balance. Higley feels that, “When upon occlusion of the posterior teeth the anterior teeth do not come together,
Fig. 2 Demonstrates this atypical tongue pattern in swallowing. It can readily be seen how such a pattern would maintain the anterior open bite in this individual. This deformity was classified as Type II, Subgroup 1 and 2.

but leave a space between them, the irregularity is known as an open-bite malocclusion." In this case all of the posterior teeth are in supraocclusion.

In this subgroup the tongue is usually thrust forcefully between the anterior teeth during swallowing. This results in the intrusion or lack of eruption of these teeth and the characteristic spacing through which the tongue can easily protrude (Figure 2).

Subgroup 2 — Associated Procumbency of the Anterior Teeth

Although the tongue habit may not have been the primary etiological factor involved in this deformity, it would appear that it is definitely an important detrimental component. The elimination of these undesirable forces is an adjunct in maintaining the correction of these protrusions. Depending on the superoinferior level of the thrust and postural position of the tongue, various types of deformities are seen in this subgroup.

When the tongue is thrust directly through an anterior opening created by allowing the mandible to open slightly during swallowing, a force is directed against these anterior teeth approxi-

Fig. 3 Demonstrates a tongue thrust with associated bimaxillary protrusion; it is classified as Type II, Subgroup 2. Although the tongue thrust may not be the primary etiology, it is quite possible to see the detrimental influence a tongue thrust of this nature would have in perpetuating this dentofacial deformity.

mately one to two times per minute. The associated deformity observed may be a bimaxillary protrusion with these anterior teeth usually in a rather high degree of angular protrusion (Figure 3). If, however, the tongue is directed primarily toward the maxilla the usual
result is procumbency of the maxillary anterior teeth. This pattern of atypical swallowing is generally seen in association with Class II, Division I malocclusions. Correction of this habit is vital in the treatment and maintenance of these cases.

Another phenomenon associated with this type of tongue thrust is the “reverse curl” (Figure 4). This “reverse curl” is produced when the tongue thrusts forward against the upper teeth and, upon withdrawal, exerts a lingual force on the lower anterior.

A somewhat less common pattern is seen in which the anterior vector of force is directed primarily toward the mandibular arch (Figure 5). In this situation there is usually an abnormally low postural position of the tongue which, together with the low tongue thrust habit, results in a wide mandibular arch form and often an undeveloped maxillary arch. As would be expected, anterior and posterior crossbites are common in this pattern of swallowing and tongue posture.

**Type III — Deforming Lateral Tongue Thrust**

The lateral tongue thrust, when limited to the posterior regions, is perhaps the least common of the major types seen. This lateral thrusting of the tongue during the swallowing is found

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**Fig. 4** The forward thrust of the tongue in this case has placed an abnormal pressure on the maxillary anterior region and has prevented the mandibular incisors from erupting to meet the palatal tissues. (This is a form of the “reverse curl” phenomenon.) Under this classification this tongue thrust is denoted as Type II, Subgroup 2.

**Fig. 5** Demonstrates a case in which there is an abnormally low postural position of the tongue and an associated narrow maxillary arch. In the act of deglutition the tongue of this patient first strikes the mandibular anterior and then forces itself up and over these teeth.
somewhat more often in conjunction with an anterior type thrust which is separately classified as Type IV. In this Type III tongue thrust pattern we see the tongue forced laterally between the posterior teeth with the resultant posterior open bite and often an associated posterior crossbite (Fig. 6).

The use here of "posterior open bite" refers to the lack of eruption or the intrusion of some of the teeth in the posterior segments with lack of intermaxillary contact when in centric occlusion. In considering the posterior open bite only, the anterior teeth should have a reasonably normal amount of overbite and overjet. In these cases the results of this atypical pattern can be quite severe.

**TYPE IV — DEFORMING ANTERIOR AND LATERAL TONGUE THRUST**

This type of tongue thrust pattern (Figure 9), like the others presented, can be either mild or quite devastating in nature. The most usual situation is to find that during swallowing the tongue comes up to and covers the occlusal and incisal surfaces of all the teeth (except perhaps the second molars).

This pattern is often found in conjunction with what appears to be a comparatively large tongue in relation to the oral environment in which it exists. Individuals with a decreased degree of control of their tongues such as cerebral palsy and other neuromuscular disease patients often fall into this category.

A cursory examination of this classifi-
cation will reveal that any particular tongue thrust can fall into only one Type (i.e., I, II, III or IV) but that there may and often will be several subgroups that can be applied.

It is equally apparent that other deformities may be influenced by a tongue thrust and are not specifically mentioned in this classification. In order that the classification could be used successfully, it was necessary to keep it relatively simple. In our research any other dentofacial deformities observed that might have been produced or encouraged by tongue habits were duly noted beside the type and subgroup assigned, e.g., unilateral deformities.

The tongue's particular pattern of movements in accomplishing the unawake act of deglutition in any given individual is determined by the "path of least resistance" and the inherited swallowing reflex. Whether we see a normal, anterior or lateral tongue habit pattern is dependent on many variables which may make it easier or more difficult to follow any one particular pattern. A list of some of these variables in addition to heredity which may influence the resistance encountered by the tongue should include:

1. Muscular habit patterns developed in infancy as the result of improper bottle feeding habits. This important factor has been forcefully brought to our attention through the work of Straub.7,8,31,12 When this habit pattern of deglutition has been developed (either correctly or incorrectly) and used for a period of time, the swallowing center and musculature involved become adjusted to this method of swallowing. This "blueprint," once outlined, will then offer less resistance to follow than a different one without a significant change in the oral and perioral structures or until a new neuromuscular pattern is learned.

2. Inflamed or hyperplastic tonsilar tissues which may offer excessive resistance to posterior tongue positions.13,14

3. Abnormally constricted oropharyngeal area which may prevent the normal swallowing neuromuscular pattern from being carried out.15

4. Ankyloglossia, an abnormally short lingual frenum, which may limit the scope of tongue movements.16

5. Macroglossia, an abnormally large tongue, which may alter the directions and increase resistance during tongue movements.13

6. Habits, such as thumb sucking, tongue sucking and other tongue habits which may create or help to produce an abnormal neuromuscular pattern. These habits could maintain the dentofacial deformities caused by the oral habits or further deform the dentofacial structures.12

Because the resistance that the tongue encounters in swallowing is different in most individuals, we would expect to see many types of swallowing patterns, hence the many variations in deformities seen with tongue thrust problems.

**SUMMARY**

In an effort to group and describe the various types of tongue thrusts observed, it was found helpful to classify these atypical swallowing patterns. The classification was based on the deformities observed, rather than on etiology, because of an inability to determine the nature and degree of all the etiologic factors. In any given individual it is felt that the tongue's particular pattern of movements to accomplish the act of deglutition is determined by the "path of least resistance" and by hereditary factors. Because the resistance the tongue encounters is different in most
individuals, we would expect to see the many different kinds of dentofacial deformities influenced by tongue thrust patterns. It is hoped that this classification will prove of some value in communication and notation concerning the tongue thrust problem.

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REFERENCES