

REVIEW ARTICLE



# Tongue thrusting habit: A review

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## Abstract

Oral habits are learned patterns of muscle contraction and have a very complex nature. They are associated with anger, hunger, sleep, tooth eruption and fear. Some children even display oral habits for release of mental tension. These habits might be non-nutritive sucking (thumb, finger, pacifier and/or tongue), lip biting and bruxism events. Tongue thrust is the most common of them, these habits can result in damage to dento-alveolar structure hence causes and its management plan is important to every clinician.

**Keywords:** Habits, oral habits, tongue thrust

## Introduction

Deleterious oral habits are the common problem of pediatricians, which affects the quality of life. Oral habits are repetitive behavior in the oral cavity that result in loss of tooth structure and they include digit sucking, pacifier sucking, lip sucking and biting, nail-biting, bruxism, self-injurious habits, mouth breathing and tongue thrusting.<sup>[1]</sup> Para functional habits are recognized as a major etiological factor for the development of dental malocclusion.<sup>[2]</sup> Thumb sucking and tongue thrusting is the common ones.<sup>[3]</sup>

Abnormal tongue function and posture have been long debated as a cause of malocclusion. Lefoulon, in 1839 quoted "prevention is better than cure." Understanding the etiology, effects and its management at early stages may be helpful to prevent future severe skeletal malocclusion. This review deals with these aspects of tongue thrusting habit.

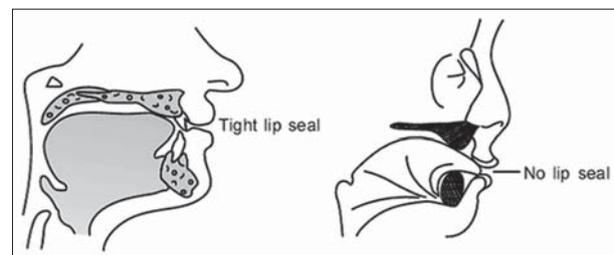
## Definition

Tulley<sup>[3]</sup> 1969 - states tongue thrust as the forward movement of the tongue tip between the teeth to meet the lower lip during deglutition and in sounds of speech, so that the tongue becomes interdental. Tongue thrust is an oral habit pattern related to the persistence of an infantile swallow pattern during childhood and adolescence and thereby produces an open bite and protrusion of the anterior tooth segment.

## Etiology<sup>[4-8]</sup> [Figure 1]

Fletcher has proposed the following factors as being the cause for tongue thrusting.

- Genetic or heredity factor: They are specific anatomic or neuromuscular variations in the orofacial region that can precipitate tongue thrust. E.g. Hypertonic orbicularis oris activity.



**Figure 1:** Etiology of tongue thrust habit - Retained infantile swallow.<sup>[8]</sup> Mature adult swallow: The tongue touches the anterior palate. The lips contact tightly, forming "lipseal" creating negative pressure inside the oral cavity. The mandible is stabilised by muscles of mastication. Infantile swallow: The tongue protrudes in between gumpads and contacts the lip. The lips are apart. The mandible is balanced by muscles of facial expression. This type of swallow matures once the teeth erupt and come into contact and when child starts taking solid food

- b. Learned behavior (habit): Tongue thrust can be acquired as a habit. The following are some of the predisposing factors that can lead to tongue thrusting:
1. Improper bottle feeding
  2. Prolonged thumb sucking
  3. Prolonged tonsillar and upper respiratory tract infections
  4. Prolonged duration of tenderness of gum or teeth can result in a change in swallowing pattern to avoid pressure on the tender zone.
- c. Infections: Upper respiratory tract infections such as mouth breathing, chronic tonsillitis, allergies, push the tongue forward due to pain and decrease in the amount of space which brings about a tongue thrust swallow  
It may also be present due to the physiological need to maintain an adequate airway.
- d. Feeding practices: Prolonged bottle feeding and improper swallowing pattern has been attributed as one of the etiological factors of tongue thrusting.

#### Maturation

- i. Retained infantile swallow - There is a considerable amount of evidence which suggests that tongue thrust is merely retention of the infantile suckling mechanism. The infantile swallow changes to a mature swallow once the posterior deciduous teeth start erupting. Sometimes the maturation is delayed and thus infantile swallow persists for a longer duration of time. The tongue thrust resulting from the retained infantile swallow has poorest prognosis [Figure 1]<sup>[8]</sup>
- ii. Functional adaptability: The tongue can protrude when the incisors are missing. Following the loss of deciduous teeth and prior to full eruption of the permanent incisors, there exists a natural opening for the tongue. The tip of the tongue may protrude into the open area during swallowing. This may disappear with the eruption of permanent central incisors. The same may happen in the posterior region during transition of deciduous to permanent dentition.

#### Mechanical restriction

- Macroglossia: Large tongue limits the space in oral cavity and forces a forward thrust
- Enlarged tonsils and adenoids: Reduces space available for tongue movement
- Constricted dental arches
- Neurological disturbances
- Hyposensitive palate
- Moderate motor disability and loss of precision in oral function
- Disruption of tactile sensory control and co-ordination
- Psychogenic factors.

Children who are forced to discontinue other oral habits like thumb sucking may develop tongue thrust.

The simplified way to understand the correlation different oral habits and its effects is seen in the above flow chart<sup>[8]</sup> [Figure 2].

#### Types of tongue thrust<sup>[8,9]</sup> [Figure 3]

1. Physiologic: This comprises of the normal tongue thrust swallow of infancy
2. Habitual: The tongue thrust swallow is present as a habit even after the correction of the malocclusion
3. Functional: When the tongue thrust mechanism is an adaptive behavior developed to achieve an oral seal, it can be grouped as functional
4. Anatomic tongue thrust: Persons having enlarged tongue can have an anterior tongue posture.

#### James Braner and Holt classification<sup>[8,9]</sup>

Type 1: Non-deforming tongue thrust

Type 2: Deforming anterior tongue thrust

Sub Group 1: Anterior open bite

Sub Group 2: Associated procumbency of anterior teeth

Sub Group 3: Associated posterior cross bite

Type 3: Deforming lateral tongue thrust

Sub Group 1: Posterior open bite

Sub Group 2: Posterior cross bite

Sub Group 3: Deep overbite

Type 4: Deforming anterior and lateral tongue thrust

Sub Group 1: Anterior and posterior open bite

Sub Group 2: Proclination of anterior teeth

Sub Group 3: Posterior cross bite

#### Moyers classification<sup>[8-10]</sup>

Simple tongue thrust	Complex tongue thrust	Retained infantile swallow
Here the tongue thrusting with teeth are together	Here teeth are apart	Persistence of the infantile swallow

#### Intra oral features<sup>[11-13]</sup>

1. Proclined, spaced and sometimes flared upper anterior resulting in increased over jet
2. Retroclined or proclined lower anterior depending upon the type of tongue thrust
3. Presence of an anterior open bite
4. Presence of posterior cross bites
5. The simple tongue thrust is characterized by abnormal tooth contact during the swallowing act. They exhibit good intercuspation of posterior teeth in contrast to complex tongue thrust
6. The tongue is thrust forward during swallowing to help establish an anterior lip.

#### Extra oral features

1. Usually dolichocephalic face
2. Increased lower anterior facial height
3. Incompetent lips
4. Expression less face as the mandible is stabilized by facial muscles instead of masticatory muscles during deglutition

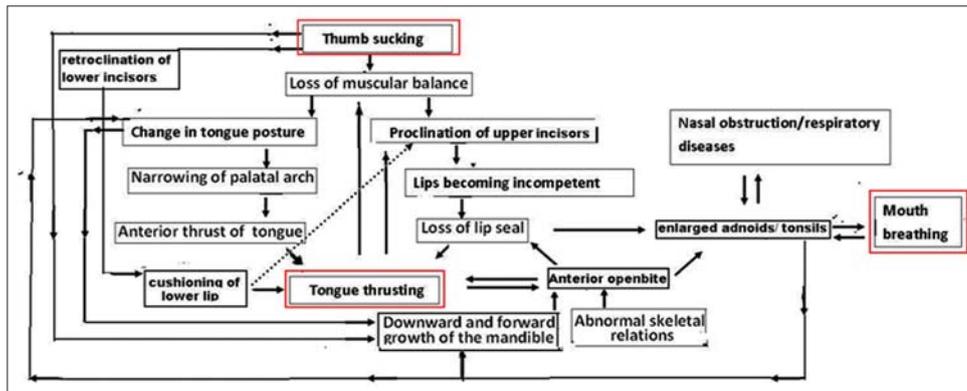


Figure 2: Correlation of various habits and its effects<sup>[8]</sup>



Figure 3: Different type of tongue thrust,<sup>[8]</sup> (a) Anterior tongue thrust, (b) posterior tongue thrust, (c) both anterior/posterior tongue thrust, (d) lateral tongue thrust due to delay in eruption of permanent posterior teeth, (e) unilateral tongue thrust – unilateral posterior open bite

5. Speech problems like sibilant distortions and lispings, etc. Abnormal mentalis muscle activity is seen.

### Diagnosis<sup>[11-13]</sup>

#### History

To rule out any upper respiratory tract infections, digit sucking habit, neuromuscular problems, swallow pattern in siblings and parents to check for the hereditary factor is done.

#### Examination

Tongue posture at rest using lateral cephalograms or by seating patient upright, here tongue assumes a lower posture at rest with the tip touching the cingulum/lingual fossae.

Tongue activity during swallowing – Whether tongue thrust is simple/complex, anterior or lateral.

### Management<sup>[13-22]</sup>

Different methods have been attempted to correct the tongue-thrust habit with variable success. The American Academy of

Pediatric Dentistry states that the management of the tongue-thrust may include “myofunctional therapy, simple habit control, habit-breaking appliances, orthodontics and possible surgery” (American Academy of Pediatric Dentistry Council on Clinical Affairs, 2005).

Training of correct swallow and posture of the tongue. These exercises help in toning up respective muscles thereby eliminating tongue thrust.

- Myofunctional exercises: The patient can be guided regarding the correct posture of the tongue during swallowing by various exercises. The child is asked to place the tip of the tongue in the rugae areas for 5 min and is asked to swallow
- Orthodontic elastics and sugarless fruit drop exercises
- 4S exercises: Spot, salivating, squeezing the spot and swallowing
- 2S exercise: It includes identifying - spot and squeeze
- Other exercise: Whistling, reciting the count from 60 to 69, gargling, yawning
- Orthodontic trainers: Tooth channels, labial bows, tongue guard, tongue tag, lip bumpers.



Figure 4: (a-f) Different tongue thrusting habit breaking hybrid appliance<sup>[22]</sup>

#### Appliance therapy [Figures 4a-f and 5]

- Using removable appliance that has an active component – bow as a remainder – tongue crib retentive components and acrylic base plate
- Nance palatal arch appliances which as acrylic button can be used to place the tongue in the correct position
- Oral screen for controlling abnormal muscle habits
- Using fixed orthodontic appliances with fixed rake or crib, hybrid habit breaking appliance.

#### Surgical assistance for management of tongue thrusting habit

Tongue thrusting due to excessive lymphoid tissue: Surgical reduction of lymphoid tissue will eliminate tongue thrusting.

#### Surgical management

The treatment of the retained infantile swallow behavior beyond adulthood is difficult and often leads to severe skeletal malocclusions. These malocclusions are treated with orthognathic surgical procedure in combination with orthodontic procedures.

#### Conclusion

Tongue thrusting is a human behavioral pattern in which the tongue protrudes through the anterior teeth during swallowing, speech and at rest.<sup>[14]</sup> Such habits are considered to be normal up to 4-5 years of age.<sup>[2]</sup> However, it can lead to deleterious effects in the oral cavity if these habits persist beyond the eruption of the permanent teeth. Elimination of the etiology is the primary and the most important step in the correction of the tongue thrusting habit. Prevention is always better than cure ... Identifying and treating tongue thrusting habit at an early age

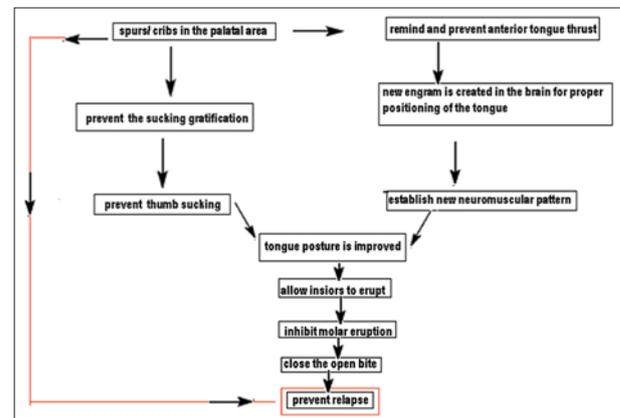


Figure 5: Flow chart showing mechanism of habit breaking appliance<sup>[8]</sup>

prevents the development of severe skeletal malocclusions in the future.

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