

Soft Tissue Dysfunction Syndrome Analysis

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The author has been looking at the effects of all tongue thrust, incorrect swallow and mouth breathing on tooth position for many years.

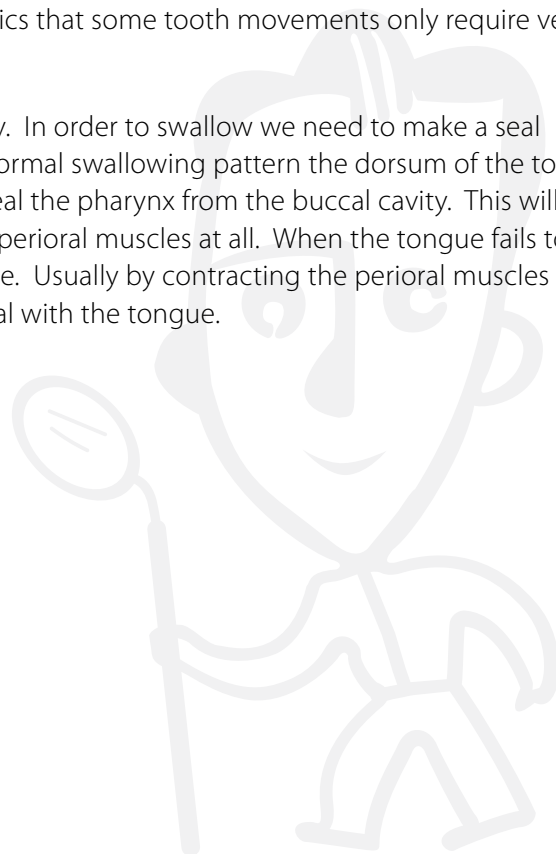
For the last one hundred years it has been recognized that the soft tissues have an influence on tooth position. Edward Angle in his 1907 edition noted that "the influence of the lips is an interesting study and almost every malocclusion has some manifestation of it" Since then soft tissue influence on tooth position has been well documented. Graber in particular has noted that soft tissue patterns can perpetuate malocclusion.

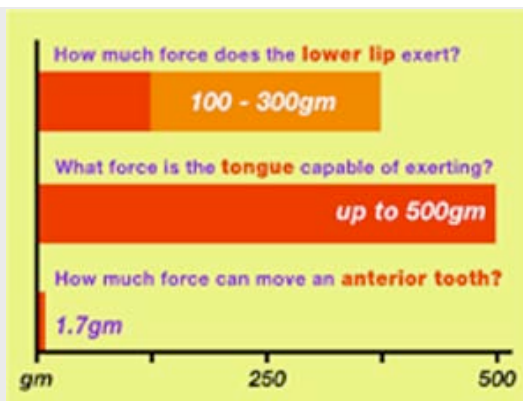
Studies have shown that large forces can be applied to the teeth by the tongue and lips in abnormal function.

In the aberrant swallowing pattern it has been estimated that the lower lip can apply a force of 100-300 grams and the tongue up to 500 grams against the teeth.

We know from the practice of orthodontics that some tooth movements only require very light forces.

We swallow several thousand times a day. In order to swallow we need to make a seal somewhere in the buccal cavity. In the normal swallowing pattern the dorsum of the tongue will be in contact with the hard palate and seal the pharynx from the buccal cavity. This will result in a swallow with no muscle activity of the perioral muscles at all. When the tongue fails to seal at the palate a seal must be made elsewhere. Usually by contracting the perioral muscles to bring the mucosa inside the lower lip into a seal with the tongue.





A graph showing relative forces applied to the teeth and the force needed to move teeth

This departure from this normal pattern allows the perioral muscles to exert forces on the teeth. We can see patterns emerge with particular abnormal muscle patterns producing particular malocclusions.

I have been taking video images of my patients faces at function and rest for many years. I have observed and recorded muscle activity, lip and jaw posture both before and after orthodontic treatment.

During a swallow the muscles act sequentially and the activity occurs so rapidly and briefly it is difficult to identify particular muscles at full speed.

However with individual frames from the video I can see which muscles are active muscles used during the aberrant swallow.

When I see a child in my practice for the first time seeking orthodontic treatment I watch them as they breath, swallow, talk and rest and by observing the muscle function, breathing pattern and rest posture I know what the teeth are going to look like before I look in the mouth.

The first question I ask is "Is this child a mouth breather or a nasal breather?" There is abundant evidence that there will be abnormal growth of the face and jaws in the chronic mouth-breathing child.

If the child is a chronic mouth breather the tongue will neither rest nor function in the palate and so I would expect to see a narrow, under-developed, retrognathic maxillae. Again this is supported in the literature. Very often this is associated with a tongue thrust resulting in an anterior open bite where the tongue can be clearly seen pushing forwards between the anterior teeth. Sometimes in the mouth breathing child the tongue will rest inside the lower anterior teeth producing a well developed lower arch with well aligned lower anteriors. These cases often show an anterior cross bite. When the tongue does not rest inside the lower anterior teeth but in between the teeth there will be crowded upper and lower incisors.

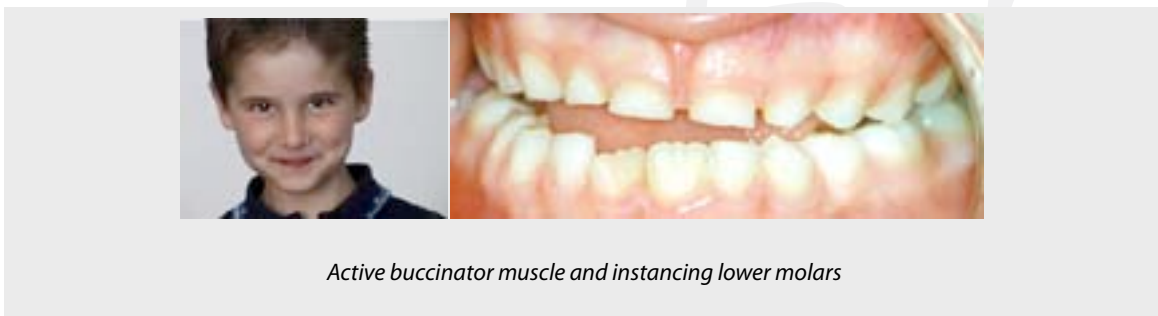




The next question I ask is "Are the lips together at rest?" Is the mentalis muscle active in order to bring the lips together? The mentalis muscle works only under conscious control so I know that the lips will be apart at rest and sleep in those children who use the mentalis muscle to bring the lips together.



If the lips are apart at rest then the tongue is unlikely to rest or function in the palate and again we will see a narrow, retrognathic upper arch. If the tongue does not rest or function in the palate, we need to study the muscle activity to determine where the tongue does rest and function. Very often it rests between the teeth. If so the buccinator muscle will be active on the swallow in order to make the mucosa inside the cheeks contact the tongue and produce the seal that is required to swallow. If the tongue rests between the posterior teeth only I would expect to see instancing lower molars. If the tongue rests and functions on top of the lower posterior teeth and inside the lower anteriors I would expect to see a deep Curve of Spee.



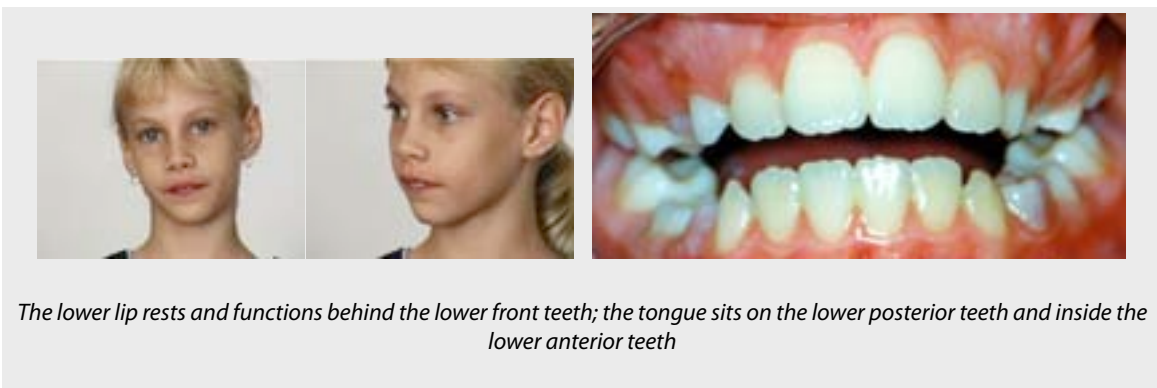
The next question I ask is "Are there any perioral muscle activity on the subconscious swallow?" When perioral muscles are active on the subconscious swallow they will place a force onto the lower incisors. If this force is balanced by pressure from the lip supporting the lower anterior teeth the teeth may be well aligned. More often the tongue does not rest and function inside the lower incisors and the lower anteriors are pushed lingually and are often crowded.





Active mentalis muscle with the lower teeth not supported by the tongue resulting in lingually placed lower incisors

The next question I ask is “Does the lower lip rest and function behind the upper anteriors?” If the lower lip rests behind the upper anterior teeth then it will be sucked in to contact the tongue on swallowing. The volume of the lower lip that rests and is sucked behind the upper incisors during the subconscious swallow is directly related to the size of the overjet.



The lower lip rests and functions behind the lower front teeth; the tongue sits on the lower posterior teeth and inside the lower anterior teeth

Having shown the direct myofunctional influence on dental patterns we then need to know if it is possible to modify muscle activity in growing children. If it is possible to influence myofunctional activity in growing children reliably and consistently then we need to incorporate this as part of our therapy.

It is much easier to demonstrate the myofunctional influence on the dental pattern using moving images than by viewing these still images. I have produced a DVD entitled “Myofunctional Influenced on Facial Growth and the Dentition”. On the DVD I demonstrate myofunctional effects on the dentition and also demonstrate what I do to influence myofunctional activity.

When we improve myofunctional activity in growing children we see an improvement in tooth position; jaw shape, size and relationship and facial appearance.

