TONGUE-THRUST CORRECTION APPLIANCE

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ABSTRACT

A tongue-thrust correction appliance positionable in a patient's mouth is provided having an upper-jaw engaging structure including two laterally spaced elements, and a shelf-like plate which is integrally molded with the laterally spaced elements for suspension across the interior of the mouth in spaced relationship to the roof of the mouth. Each of the laterally spaced elements are provided with surface conformations enhancing retentive engagement with the jaw and maintenance of the plate in suspended relationship for support of the endmost portion of the tongue on an upper surface of the plate and restricting movement of the tongue to a predetermined position against the roof of the mouth during swallowing.

6 Claims, 6 Drawing Figures
TONGUE-THRUST CORRECTION APPLIANCE

BACKGROUND OF THE INVENTION

A serious dental problem is created by many people as a consequence of incorrect swallowing techniques. Incorrect swallowing techniques with respect to the problem sought to be corrected is that resulting from “tongue thrust.” Tongue thrust is a term used to describe an incorrect swallowing pattern which causes anterior, unilateral and bilateral open bites where the teeth between the arches are forced apart by the tongue projecting between the upper and lower teeth. This incorrect swallowing pattern may be generally characterized as an involuntary forward projection of the tongue whereby the forward tip or end portion of the tongue is caused to extend between or against the teeth with substantial force. The resultant undesirable effect is that the tongue tends to either push the teeth apart, or keep them from eroding to a normal extent, thereby producing this open bite condition.

While it would appear that “tongue thrust” is only an intermittent condition of very short duration and therefore not of any substantial consequence, it will be recognized that swallowing is a relatively involuntary action, although controllable, which occurs a great number of times each day. It has been estimated that an individual swallows approximately 2,000 times each day at a rate of twice each minute while awake and once each minute while asleep. The cumulative effect is thus substantial, and tongue thrust does result in the problem of open bites.

This tongue thrust problem is most serious and most commonly encountered in children involuntary actions, such as swallowing, are easily and inadvertently developed during their habit formation years. Where the problem is recognized at an early age, treatment has primarily comprised therapy attempting to alter or modify the pre-existing swallowing pattern to a normal pattern. In a normal swallowing pattern, the tongue tip should be extended against the palate and not touching the teeth although in relatively close proximity. The therapeutic procedure heretofore utilized has comprised training exercise intended to affect control of the tongue movement. These training exercises are of repetitive short duration and have been effective in some cases. Therapeutic exercises of this nature are more effective in older patients but are relatively ineffective in young children when the correction is most imperative.

SUMMARY OF THE INVENTION

The objective of the tongue-thrust correction appliance provided by this invention is to eliminate and restrict the involuntary and incorrect swallowing technique in younger dental patients but is equally useful and adaptable to older individuals. The appliance is designed to be interfitted in fixed relationship to the patient’s upper jaw and is constructed to direct the tongue during swallowing to follow a preferred and desired pattern. In a preferred swallowing pattern, the tongue is normally caused to extend and press against the palate or roof of the mouth but not in engagement with the teeth. The palate counteracts the tongue thrust force that is normally applied, and that force application then has no effect on the teeth. Accordingly, this appliance is constructed to maintain the tongue in association with or directed toward the roof of the mouth during swallowing and thereby prevents extension against the teeth.

The structure of the appliance of this invention accordingly comprises a body structure that is engageable with the upper jaw and is retained in position relative thereto. Incorporated in the body structure is a shelf-like member that extends across the mouth cavity and supports the tongue at its extreme endmost portion during a swallowing operation. The function of this shelf-like projection is to prevent direct forward projection of the tongue and results in an upward deflection of the tongue toward the roof of the mouth in the preferred pattern. This function of the appliance thus reduces the effect that is encountered with incorrect swallowing techniques and also is particularly helpful in altering a patient’s reflexive, involuntary swallowing action to a more correct pattern. It enables the patient to place the tongue tip in the correct position for swallowing and, with the tongue thus held in the correct position, the patient is better able to correct his tongue thrust habit than is possible with therapeutic exercises unaided by this appliance.

These and other objects and advantages of this invention will be readily apparent from the following detailed description of an embodiment thereof and the accompanying drawings.

DESCRIPTION OF THE DRAWING FIGURES

FIG. 1 is a perspective view of a tongue-thrust correction appliance embodying this invention.

FIG. 2 is a tip plan view on an enlarged scale of the device.

FIG. 3 is a bottom plan view on an enlarged scale of the device.

FIG. 4 is an elevational view of the device as seen along line 4—4 of FIG. 2.

FIG. 5 is a medial vertical sectional view taken along a longitudinal vertical plane with the device inserted in a patient’s mouth.

FIG. 6 is a diagrammatic medial sectional view of an orthodontic model illustrating an incorrect swallowing pattern.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

A tongue-thrust correction appliance embodying this invention is shown perspective in FIG. 1. As shown in FIG. 1, the appliance is seen to comprise a molded body 10, having the general appearance of a mouth guard. The body itself may be readily fabricated and constructed utilizing well known conventional orthodontic techniques wherein a cast is made of the patient’s mouth, and the appliance or device is then reproduced in a suitable rubber-like material utilizing the cast. This fabrication technique results in the desired individual conformation of the appliance for proper and correct fit.

Referring specifically to the several views of the appliance, it will be seen that the illustrative embodiment of the appliance has an arcuate, generally U-shaped configuration. The molded body 10 is designed to engage the front and immediately adjacent lateral teeth with a total of eight teeth so engaged. In addition to being configured for close interengagement with the teeth, the cavities 11 formed in the upper portion of the molded body may be a depth to extend into close conformity with immediately adjacent portions of the jaw. While the upper surface of the molded body has the
several cavities 11 formed therein for engagement with the teeth, it will be seen in FIG. 3 that the lower surface 10a is substantially smooth to avoid interference with the teeth of the lower jaw. When applied to a patient's mouth, the device will thus be seen to be engageable only with the upper jaw with the wall section 13 of the body at the tooth line kept at a minimum to avoid maintaining the jaws in an uncomfortably open position. In this manner the device is relatively non-interfering with normal jaw movements for functions such as swallowing of liquids. Also, the illustrative embodiment is shown as being U-shaped with each of the legs or arms 12 extending rearwardly to engage two lateral teeth at each side of the six front teeth. It will be readily apparent that the length of the body and the number of teeth engaged is determined by each patient's particular condition, but limitation of the legs 12 to the minimum necessary for proper retention further reduces the possibility of the appliance from interfering with normal jaw positioning or functioning.

Formed integrally with the molded body is a shelflike web 14 that is joined with and extends between portions of the legs or arms 12. The web 14 is also joined with the forward portion of the U-shaped body. While the legs or arms of the U-shaped body, as well as the forward portion, have a substantial vertical dimension to encase and engage the respective teeth and associated adjacent portions of the jaw, the web 14 comprises a relatively thin structure that is substantially contiguous with the lower surface 10a of the molded body 10 and having an upper surface 15. With this construction, a recess is thus formed which is defined by vertical side walls 16 of the legs 12 as well as an upper surface 15 of the web 14.

Utilization and functioning of this tongue-thrust correction appliance is diagrammatically illustrated in FIG. 5. In that figure, an appliance 10 embodying this invention is positioned in operative relationship to a patient's mouth structure. In this medial longitudinal sectional view the upper and lower teeth at the center of the mouth are designated by the numerals 20 and 21. Additional teeth are seen with respect to the lower jaw while the view of additional teeth in the upper jaw is substantially blocked by the presence of the patient’s tongue indicated by the numeral 22. In this illustration, the patient's mouth is closed in a substantially normal position with only the relatively thin, bottom wall section 13 of the molded body 10, causing at the most, only a slight and inconsequential distortion of the normal, closed mouth configuration. The teeth 20 and 21, as between the upper and lower jaws, may thus be separated to a slightly greater extent than is normally encountered at the forward portion of the mouth. This does not affect or otherwise hinder the usefulness of this orthodontic appliance. Molding of the appliance to be closely conforming to tooth and jaw configuration results in retention of the appliance in relationship to the upper jaw thereby permitting the patient to move the lower jaw without disturbance of the appliance. This permits substantially normal lower jaw movement to enable the patient to readily utilize the appliance in correction of his swallowing pattern.

The tongue 22 is shown in full lines in a normal or relaxed position with the jaws closed. In this position, the extreme forward portion of the tongue is disposed above the web 14, and the teeth 21 of the lower jaw are in contacting engagement with the lower surface 10a of the body. The vertical elevation of the web relative to the patient's mouth does not normally interfere with nor is it abrasive to the tongue when so relaxed. Swallowing causes the tongue to involuntarily reflex as a consequence of muscle movement to arch upwardly and into engagement with the roof of the mouth indicated at 23 when the tongue tip is positioned on the upper surface 15 of the web 14. This flexed configuration of the tongue is indicated by broken lines and designated by the numeral 22a. In the case of a patient exhibiting the characteristic of improper swallowing technique, the tongue would not assume this broken line position but would attempt to project directly forward and exert a displacing force against the upper front teeth. This improper tongue thrust is diagrammatically shown in FIG. 6.

Utilization of the tongue thrust correction appliance of this invention greatly assists a patient in correction of an improper swallowing pattern in that the tongue is directed upwardly against the roof of the mouth by the web 14. The functioning of the web 14 is to direct the tongue in an upwardly directed arched configuration to more closely conform to the desired swallowing pattern. Thus, the thrust force exerted by the tongue is not directed forwardly to project the tongue between and against the teeth but, is transformed to a vertical force that is easily and readily resisted by the palate.

Utilization of this appliance will be in conjunction with a therapeutic exercise program to achieve the desired result of correcting an improper tongue-thrust habit. Accordingly, it is contemplated that the appliance will only be inserted and maintained in the mouth for predetermined periods of time. For example, a patient may utilize the appliance for 10–15 minute time periods, one or more such periods during the course of a day as may be convenient. During a period of utilization, the patient consciously places the tongue tip on the web 14 and then swallows to cause the tongue to extend and forcibly project against the palate. The tongue will be induced to thrust against the palate since the tongue tip is supported on the shelf-like web 14 and is restrained against strictly forward movement between the teeth. Drinking of liquids assists in inducing swallowing to increase the number of swallows that can occur during any time period. This procedure is continued over a period of time and results in correcting of the swallowing pattern.

It will be readily apparent that the appliance of this invention provides a novel means for directing or assisting in directing the tongue force in a correct manner during swallowing. The device does not interfere with normal jaw functions and may be readily utilized. It is conveniently removable at anytime but may be maintained in the mouth for extended periods of time for most effective performance.

It will be recognized that this appliance is most advantageously utilized in early stages of tooth and mouth development. The reason for such early utilization is that it is easier to correct the problem at that time than to, at a subsequent date, have to initially correct tooth formation or concurrently correct tooth formation while utilizing the appliance.

While the device is illustrated as comprising a continuous U-shaped molded body 10, it will be apparent that mouth configurations as between several patients may require modification of this basic structure. For example, it is contemplated that the structure may comprise
only the side arms or legs with the web being interconnected therebetween. This would be a particularly useful configuration where other orthodontic techniques are being employed in correction of front tooth formations.

Having thus described the invention, What is claimed is:

1. A tongue-thrust correction appliance comprising a body of molded material having at least two laterally spaced elements, each element thereof having an upper surface conformation of elongated, channel-form adapted to interfit with corresponding upper jaw portions in retained relationship therewith and a lower surface adapted to be contactingly engaged by lower jaw teeth, and an integrally formed, thin web extending transversely between said spaced elements, said web having an upper surface which is vertically disposed relative to said spaced elements to be in vertically spaced relationship to the roof of the mouth when the appliance is positioned therein and a transverse rear edge which terminates no further rearwardly relative to said spaced elements than a line extending transversely thereacross at a point coincident with the position of the second bicuspid teeth when the appliance is positioned in the mouth whereby the tongue may be positioned in overlying relationship to the upper surface of said web.

2. A tongue-thrust correction appliance according to claim 1 wherein said web is formed with a lower surface thereof in contiguous relationship with the lower surface of said spaced elements.

3. A tongue-thrust correction appliance according to claim 1 wherein said body is U-shaped including said spaced elements and a front portion integrally connecting said spaced elements.

4. A tongue-thrust correction appliance according to claim 3 wherein said web is integrally formed with said front portion.

5. A tongue-thrust correction appliance according to claim 3 wherein said front portion has a channel-form, upper surface conformation to interfit with a corresponding upper jaw portion.

6. A tongue-thrust correction appliance according to claim 5 wherein said front portion has a lower surface contiguous with the lower surfaces of said spaced elements and said web.