METHOD AND DEVICE FOR MASSAGING THE SOFT PALATE

Filed Aug. 10, 1966
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Filed Aug. 10, 1966, Ser. No. 571,598
Int. Cl. A61H 7/00

U.S. Cl. 128—64 10 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for exercising and muscually stretching tissue of the soft palate and posterior pharyngeal wall comprising an exerciser moveable between an expanded condition and a collapsed condition to be positioned in the mouth adjacent the soft palate tissue, a support for the exerciser to be positioned in the mouth for maintaining the exerciser in this position and means for alternately expanding and contracting whereby the exerciser in expanded condition presses against the tissues and is relieved from pressing said tissues when in collapsed condition. The functioning of the soft palate tissue particularly in preventing escape of air through the nose during speaking is improved by a method involving positioning an expandable contractable element preferably of the type described and claimed and alternately expanding and contracting the same so as to press the element in expanded condition against the tissues and to thereby stretch and exercise the same.

This invention relates to cleft palate speech, and a procedure and means for the treatment of that condition.

Cleft palate speech occurs when a person is unable to impound all the air from the breath stream within the mouth and therefore allows some of this air to escape through the nose. During the production of non-nasal sounds, the soft palate rises posteriorly and superiority and makes contact with the posterior and lateral walls of the pharynx, the air escapes through the nose and the result is referred to as cleft palate speech. This type of speech is noted in patients born with congenital pharyngo-palatal incompetence, and in children born with clefts of the palate. It is also evident in people who have had portions of the soft palate removed surgically following an accident or neoplasms. Children are born with clefts of the palate, usually have these palates surgically repaired during early childhood. However, due to the insufficient amount of soft palatal tissue that was originally present and/or due to the scarring which results from surgery, a large number of these repaired palates are insufficiently long or are non-functioning and are unable to produce proper closure of the pharynx, thus resulting in cleft palate speech. To date, the only means employed for correcting this situation, is by the insertion of a dental obturator to mechanically close off the oral pharynx from the nasal pharynx, or with a surgical procedure called a pharyngeal flap operation whereby the soft palate is attached to tissues from the posterior wall of the pharynx itself, in an attempt to produce a permanent blockage of the breath stream from escaping through the nose. While both of these procedures help many patients, they fail to produce satisfactory speech in a large number of others afflicted with the condition. The purpose of this invention is to provide another means in the armamentarium for treating these conditions. This invention is intended to increase the mobility (functioning), and length of soft palates, and to increase the functioning of the pharyngeal flaps, thus improving cleft palate speech.

An important factor influencing growth and development is organic function. It has long been known that both the size and the structure of organs can be modified or altered by both use and function. Individuals who constantly exercise their muscles beginning with early childhood, are definitely in possession of larger, stronger and healthier muscles than those who subject their muscles to lesser use. It has been found that by exercising the palates of patients with congenital pharyngo-palatal incompetence or patients with newly reconstructed palates and pharyngeal flaps, it is possible to develop them and significantly improve their functioning. Thus, according to the invention, there is provided a positive mechanical stimulation, stretching, and exercise of the soft palatal area.

The invention provides a method for improving functioning of soft palate tissue in order to prevent the escape of air through the nose. By "soft palate tissue," I mean either the soft palate itself or a pharyngeal flap. The method comprises the positioning of a foreign body, an inflatable bag, into the mouth adjacent to the soft palate tissue, and pressing the foreign body against the tissue to exercise and stretch the tissue. The foreign body can be alternately pressed against the tissue and relieved from pressing, a plurality of times. Employing an inflatable bag, the bag in collapsed condition can be positioned adjacent to the tissue, and a support for the bag holding it in said position can be placed in the mouth and held in place with the teeth. The pressing can then be effected by inflating the bag. Alternate pressing and relieving can be effected by alternately inflating and collapsing the bag.

The invention is further described in reference to the accompanying drawing, wherein:

FIG. 1 is a plan view of a device according to the invention;
FIG. 2 is an end elevation view of a portion of the device shown in FIG. 1, taken along line 2—2 in FIG. 1;
FIG. 3 is a side elevation of the portion of the device shown in FIG. 1, provided for placement in the mouth;
FIG. 4 is a cross-sectional view taken along line 4—4 in FIG. 1; and
FIG. 5 is a cross-sectional view taken along line 5—5 in FIG. 1.

The device provided by the invention comprises an exerciser which is movable between an expanded condition and a collapsed condition, and is fashioned for positioning in the posterior of the mouth adjacent to the soft palate tissue. A support is provided for the exerciser for placement in the mouth and supporting the exerciser during its use. Also, means are provided for alternately expanding and contracting the exerciser, to press against the tissue when in expanded condition and relieve it from the pressing, when in the collapsed condition.

Referring to the drawing, the device there shown comprises an inflatable rubber bag 11 (the dimensions of which can be approximately 18 mm. long by 15 mm. wide by 8 mm. high in the deflated condition), mounted on a support in the form of an acoustic bite block. Rubber tubing 13 is connected to the bag 11 and communicates via a flexible rubber tube 10 to a rubber pump bulb 14. The tubes 10, 13 comprise a conduit communicating with the pump bulb 14 and the inflatable rubber bag 11. The pumping action employed hereof is for blood pressure testing apparatus. A valve 26 is positioned between the bulb 14 and the tube 10 and by turning of the valve nut 27, the valve can be operated so that air passes to the bag 11 upon squeezing the bulb with the hand, or by opening the valve nut, air flows from the rubber bag into the bulb and outwardly flowing in the bulb's outer end 28. Thus, the rubber bag can be alternately expanded and contracted by coordinating the operation of the pump bulb 14 and the valve 26.
The acrylic bite block 12 has its upper surface 15 formed to extend over the surface of the hard palate, and the bite block is provided with side portions 16 formed with recesses 17 to receive the occlusal surfaces of the maxillary anterior and posterior teeth. The lower side of the side portions 16 is formed with recesses to receive the occlusal surfaces of the mandibular teeth. Thus, by the patient biting down upon the bite block, the appliance is stabilized, and when the bag is inflated, the soft palate is moved superiorly rather than the appliance moving inferiorly. Also, the bite block includes an extension 25 which serves as a support for the bottom of the bulb 11 and resists expansion of the bulb in a downward direction (see FIG. 3).

The rubber bag can be of any suitable form, but is preferably of the accordion form indicated in FIG. 3 and FIG. 5. Thus, in a preferred embodiment the bag is formed with a horizontally disposed peripheral recess 22.

The accordion construction is preferred because less effort is then required to inflate the bag. This is particularly significant since commonly the device is used by very young children.

The bag can be formed of hand-dipped latex rubber about °/mm. in wall thickness. If desired, the wall thickness can be varied so as to favor wall strength and prevent blowouts.

The bite block is positioned in the mouth with the upper surface of the bulb adjacent to and confronting the soft palate. When the bag is inflated by pumping the bulb, it moves superiorly and posteriorly, mechanically displacing the muscle complex of the soft palate tissue. A child biting upon the occlusal surface of the bite block resists the inferior displacement of the acrylic bite block and thus all the pressure of the expanded bulb is used to displace the soft palate.

The patient, for example a child, is instructed that the device is to be used a minimum of two times a day, inflating the bag approximately 25 times each session. The bag 11 is inflated to the point at which any further inflation of the bag would displace the device forcing the child to open his clenched jaws. Then the valve nut 27 of the hand bulb is turned and the air is released from the inflated bag. The valve nut is then turned in the opposite direction and the child inflates the bag. This sequence is performed 25 times. The exercise can be performed more than twice a day, and more than 25 times each session, if it is thought to be more advantageous for that particular patient to do so. It is used anywhere from 6 months to 2 years, or any length of time which is necessary in order to continue improving the condition of the patient.

Various speech exercises are given by a speech therapist for the child to do while the bulb is in an inflated position in the mouth. Thus, both isotonic and isometric exercising of the soft palate tissue can be effected with this exerciser.

While the invention has been described in respect to particular embodiments thereof, these embodiments are merely representative and do not serve to define the limits of the invention.

What is claimed is:

1. A method of improving function of soft palate tissue in preventing escape of air through the nose during speaking, which comprises positioning an expansible-contractible element in the mouth adjacent to soft palate tissue, said element being adapted to press against the tissue of the soft palate and the posterior pharyngeal wall in its expanded condition and alternately expanding and contracting said element to stretch and exercise the muscles of the soft palate adjacent to the posterior pharyngeal wall.

2. The method of claim 1, which comprises alternately expanding and contracting said element a plurality of times to effect corresponding alternate pressing and relief from pressing against said tissue.

3. The method of claim 1, wherein the expansible-contractible element is an inflatable bag, the bag in contracted condition is positioned adjacent to the soft palate tissue, a support for the bag holding it in said position is placed in the mouth and held in place with the teeth, and the pressing is effected by inflating the bag.

4. The method of claim 2, wherein the expansible-contractible element is an inflatable bag, the bag in contracted condition is positioned adjacent to the soft palate tissue, a support for the bag holding it in said position is placed in the mouth and held in place with the teeth, and the pressing and relief from pressing are effected by alternately inflating and collapsing the bag.

5. Apparatus for exercising the soft palate tissue comprising:

(a) an exerciser movable between an expanded condition and a collapsed condition, to be positioned in the mouth, adjacent to the soft palate tissue;
(b) a support for the exerciser to be positioned in the mouth, for supporting the exerciser in said position; and
(c) means for alternately expanding and contracting the exerciser to press the exerciser against the tissue when in the expanded condition and relieve the exerciser from said pressing when in the collapsed condition.

6. Apparatus according to claim 5, the exerciser being an inflatable bag, inflatable to said expanded condition and collapsible to said collapsed condition.

7. Apparatus according to claim 6, said support being a bite block having side portions for gripping by the teeth.

8. Apparatus according to claim 7, said expanding and contracting means comprising a hand air pump for expanding the bag by pumping air therein, conduit communicating the hand pump and the inflatable bag for delivery of air to the bag, a portion of the conduit extending through bite block, and means for releasing air from the bag to collapse the bag.

9. Apparatus according to claim 8, the bag being of accordion form.

10. Apparatus according to claim 9, the bag having a horizontally disposed peripheral recess on three sides, imparting said accordion form thereto.

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