Ankyloglossia (tongue-tie): A diagnostic and treatment quandary

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The tongue is an important oral structure that affects speech, the position of teeth, periodontal tissue, nutrition, swallowing, nursing, and certain social activities. Ankyloglossia (tongue-tie) limits the range of motion of the tongue, impairing its ability to fulfill its functions. In this article, diagnostic criteria needed to evaluate and treat ankyloglossia are suggested, and a method for classifying ankyloglossia is proposed.

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CLASSIFICATION OF ANKYLOGLOSSIA

The term free-tongue is defined as the length of tongue from the insertion of the lingual frenum into the base of the tongue to the tip of the tongue. Because the tongue is a muscle, which in young children is flexible and often difficult to stabilize, this measurement is determined by placing a dental instrument at the insertion point and approximating the tip of the tongue. A Boley gauge is then used to measure this distance.

A group of 322 children, ranging in age from 18 months to 14 years, were examined for the length of free tongue and then evaluated for clinical evidence of speech and oral problems. Assessment of these measurements resulted in the development of the following descriptions and categories of ankyloglossia (Figs 1a to 1e):

1. Clinically acceptable, normal range of free tongue: greater than 16 mm
2. Class I: Mild ankyloglossia: 12 to 16 mm
3. Class II: Moderate ankyloglossia: 8 to 11 mm
4. Class III: Severe ankyloglossia: 3 to 7 mm
5. Class IV: Complete ankyloglossia: less than 3 mm

Structural guidelines were developed to assist in determining if the lingual frenum required revision. A normal range of motion of the tongue is indicated by the following criteria:

1. The tip of the tongue should be able to protrude outside the mouth without clefting (Fig 2a).
2. The tip of the tongue should be able to sweep the upper and lower lips easily, without straining (Fig 2b).
3. When the tongue is retruded, it should not Blanch the tissue lingual to the anterior teeth (Fig 2c).
4. The tongue should not place excessive forces on the mandibular anterior teeth (Fig 2d).
5. The lingual frenum should allow a normal swallowing pattern (Fig 2c).
6. The lingual frenum should not create a diastema between the mandibular central incisors (Fig 2f).
7. In infants, the underside of the tongue should not exhibit abrasion (Fig 2g).
8. The frenum should not prevent an infant from attaching to the mother’s nipple during nursing.
9. Children should not exhibit speech difficulties associated with limitations of the movement of the tongue.

RECOMMENDATIONS

Lingual frenum in the complete (Class IV) tongue-tie category should be revised because they severely restrict the tongue’s movement. Many lingual frenum in the severe (Class III) category also benefit from revision. Children often adapt to the short attachment (Class III) with fatiguing efforts. Release of this frenum is often recommended. Children with moderate (Class II) and mild (Class I) ankyloglossia are the most difficult to evaluate. Most of these children appear to have normal speech patterns and are able to effortlessly fulfill most of the criteria listed above.

In addition to the guidelines cited, there are additional reasons for lingual frenum revisions. These in-
include abnormalities in tongue function during swallowing, difficulty in eating or drinking, difficulty in playing wind instruments, difficulty in licking ice cream cones, and, during the adult years, instability of dentures as well as impairment of certain social activities.

Flexibility of the floor of the mouth is also an important factor in determining the effect of ankyloglossia. Some of the children examined displayed normal mobility of the tongue in conjunction with a flexible floor of the mouth; others displayed restricted tongue movement, when the tension of the floor of the mouth exhibited little or no flexibility. The tension was associated with a pulling of the tissue behind the mandibular incisors or the development of a diastema between the mandibular central incisors. It also appeared that, in Class I and Class II ankyloglossia, a natural lengthening of the free tongue might occur as a child grows.
TREATMENT

Treatment is accomplished in the dental office after administration of a local anesthetic. General anesthesia or deep sedation is not usually necessary unless an extensive revision or a muscle reattachment procedure is required. Infants are treated with only a local anesthetic solution. Older children may be given a sedative such as chloral hydrate and hydroxyzine, in combination with nitrous oxide or other suitable regimens with appropriate monitoring.

The frenum is revised with the following surgical procedure:

1. A topical anesthetic is applied to the underside of the tongue.
2. A local anesthetic is infiltrated into the frenum area.
3. After the anesthesia is completed, a hemostat is used to clamp the frenum, and an electrosurgical instrument is used to release the frenum (Figs 3a and 3b).
4. The area is sutured with 4-0 gut suture (Fig 3c).
5. The patient is discharged with postoperative instructions to avoid juices and to treat discomfort with non-narcotic analgesics.

Parents are urged to encourage fluids. Postoperative complications are few. The most common postoperative problems are pain in front of the ear and dehydration in young children and infants.

CONCLUSION

There are a wide range of opinions about the diagnosis and treatment of ankyloglossia. This article establishes a protocol that can be used by pediatricians and pediatric dentists to classify the severity of a tongue restriction resulting from ankyloglossia and offers guidelines for diagnosis and treatment.

REFERENCES
