Ankyloglossia: Surgical Management and Functional Rehabilitation of Tongue

Abstract

Ankyloglossia or “tongue-tie” is a rare congenital anomaly characterized by an abnormally short, thick, fibrous lingual frenum which may cause restriction in function of tongue including limitation in tongue movement. The lingual frenum may be fibrous or muscular, and the tie may be complete or partial. Most often, ankyloglossia is seen as an isolated condition in an otherwise normal individual. This article reports the surgical management of a 20-year-old patient having ankyloglossia associated with restricted movement of tongue and difficulty in speech. The treatment involved is surgical removal of the lingual frenum followed by tongue training exercise and speech therapy to functionally rehabilitate the tongue. Six months postoperatively, the patient showed uneventful healing and was satisfied with the procedure.

Keywords: Adolescent, ankyloglossia, rehabilitation, speech, tongue-tie

Introduction

Tongue is a remarkable muscular organ of mouth having multiple functions such as swallowing breathing, tasting, feeding, and articulating speech. It is the only muscle in the body having one end attached and the other end free. But, what if this free end becomes tied? Obviously, it would limit the multifunctional ability of this superb organ. An abnormally tight lingual frenum often makes the tongue tied down to the floor of the mouth restricting the functions of tongue. Tongue-tie may cause problems which may exist since birth such as breastfeeding and swallowing to problems which may persist through lifetime such as dysarthria, mechanical problems, and social issues.

An abnormally low position of the tongue may cause mandibular prognathism with maxillary hypodevelopment due to an exaggerated anterior thrust leading to Class III malocclusion. Whereas, somewhat higher position of tongue in the mouth may lead to tongue thrust causing posterior or anterior open bite. Moreover, excessive forces while retraction of tongue by patient may cause blanching of tissues, gingival recession, and midline diastema in lower central incisors.

Ankyloglossia, or tongue-tie, can be observed in neonates, children, or adults. The prevalence of ankyloglossia is well established in newborn and is seen in approximately 4%–5% in the newborn population with a 3:1 male-to-female preponderance. As most of the studies have focused on infants and young children regarding ankyloglossia, there is a scarcity of literature in reflecting incidence of ankyloglossia in adolescent and adult. Nevertheless, it is believed by some to be rare in the older age group. In addition to functional limitations of tongue, older children and adults often face social embarrassment due to impaired tongue mobility which demands surgical intervention and correction of the condition.

Case Report

A 20-year-old male patient reported to the Department of Periodontics, with complaint of difficulty in speech and impaired tongue mobility. There was no contributory medical or family history. On intraoral examination, short lingual frenum and restricted tongue movements were observed [Figure 1]. He was unable to touch roof of his mouth with the tip of the tongue when the mouth was open. He was diagnosed with Class III ankyloglossia according to Kotlow’s classification [Table 1]. There was no

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recession in relation to mandibular incisors linguually. Surgical frenectomy of the lingual frenum was planned. The patient was informed about the treatment procedure, and informed consent was obtained.

**Case management**

The lingual frenectomy was undertaken under local anesthesia with 2% lignocaine and 1: 80,000 adrenaline. The tongue was retracted superiorly and stabilized with silk sutures placed at the tip of the tongue. As the frenum became prominent, a hemostat was used to clamp it. A narrow vertical incision was then made through the mucosa alongside of the frenulum, from beneath the tip of the tongue to just in front of the orifices of the submaxillary ducts. Blunt dissection was carried down to the floor of the mouth on both sides of the frenum facilitating its removal from lingual and alveolar insertions [Figure 2]. Closure of the wound was accomplished with a series of interrupted 4-0 silk sutures [Figure 3].

Tongue training exercise was advised to the patient for 3 or 4 weeks postoperatively. Thereby, the patient was referred to speech therapist for correction of speech defect.

**Clinical outcome**

One month postoperatively, the patient showed uneventful healing with no scar formation [Figure 4]. Six months postoperatively, improved tongue protrusion was seen, and the patient was extremely happy with normal speech [Figure 5].

**Discussion**

Attachment of tongue to the floor of the mouth often leads to speech problems due to limited mobility of the tongue.

**Table 1: Kotlow’s classification based on free tongue**

| Classification of ankyloglossia | Range of free tongue* |
|---------------------------------|-----------------------|
| Normal                          | >16 mm                |
| Class I: Mild ankyloglossia     | 12-16 mm              |
| Class II: Moderate              | 8-11 mm               |
| Class III: Severe               | 3-7 mm                |
| Class IV: Complete ankyloglossia| <3 mm                 |

*Free-tongue is measured from the insertion of the lingual frenum into the base of the tongue to the tip of the tongue
However, it should be recognized that a slight difference in pronunciation cannot always be diagnosed as a speech problem. There are various controversial beliefs regarding the causal relationship between ankyloglossia and speech defect. Many authors have disputed against the belief that tongue-tie affects speech. Certainly, children with ankyloglossia are often found to have no speech problems. It is therefore recommended that frenulectomy is only considered as part of the management of speech problems when speech is significantly and noticeably affected and consistent with tongue-tie.\[9\]

The difficulties in articulation are evident for consonants and sounds such as “s, z, t, d, n, l, j, zh, ch, th, dg,”\[3\] but most difficulty is found in production of lingual-alveolar sounds (particularly /l/) and interdental sounds (voiced and voiceless /th/) because the tongue tip needs to be maximally elevated (up to the alveolar ridge) for the production of /l/ and maximally protruded (up to the lingual surface of the maxillary incisors) for production of /th/.\[8\] Tongue-tie could be considered a contributing factor if one cannot produce these sounds in the presence of all other speech sounds being produced normally. Therefore, in evaluating the effect of ankyloglossia on speech, it is important to focus on lingual-alveolar sounds.

It is suspected by certain authors (but not substantiated) that tongue-tie may often resolve spontaneously by late childhood,\[9\] but in our case, the patient was 20-year-old male and tongue-tie was found to be persistent since birth. However, patient did not seek treatment until he started having social concerns regarding the condition. The patient was unable to articulate /l/, /th/, /d/ and /s/, /n/ and found difficulty to roll “r”.

A diagnostic examination of the patient was done beforehand for identifying swallowing pattern and tongue thrust. If tongue thrust is found and is due to abnormal muscle use, it can be corrected by tongue training. Whereas, if it is the result of an anatomic abnormality, as seen in this case, surgical intervention is needed followed by tongue training.\[10\] Moreover, swallowing pattern must be corrected first followed by speech correction. The patient was told to hold the candy on a spot pressed by clinician in the roof of the mouth. This exercise was advised to be done constantly for the next 3 or 4 days.

The muscles of the tongue are as readily trainable as muscles of any other muscle of the body. Hence, the training exercise must be started immediately after surgery. The following exercises were advised: (1) stretch the tongue up toward the nose, then down toward the chin and repeat, (2) open the mouth widely and touch the big front teeth with the tongue with mouth still open, and (3) close the mouth and poke the tongue into the left and right cheek to make a lump: for 3–5 min bursts, once or twice daily for 3 or 4 weeks postoperatively.\[11\] Post-operative exercises following tongue-tie surgery are intended to develop new muscle movements which were restricted before surgery and encourage tongue movements related to cleaning of the oral cavity.\[2\]

Conclusion

Mechanical (nonspeech-related) symptoms and social concerns due to impaired tongue mobility may not become apparent until late childhood. However, functional limitation of tongue and social embarrassment due to the condition warrant surgical intervention in adolescent followed by speech therapy for optimum and pleasing results.

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Conflicts of interest
There are no conflicts of interest.

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