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Management of ankyloglossia to correct speech abnormalities: A case report

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Abstract
The lingual frenectomy is often a case of controversy due to its varied classification and methods of treatment among different health care providers. Ankyloglossia or "tongue-tie" is a developmental anomaly which causes limitation in tongue mobility. This reduced mobility causes problems in articulation of speech, feeding issues, social, mechanical psychological problems in children seen with this abnormality. This is a case report of a child with posterior ankyloglossia having speech abnormalities and a simple, safe and effective way to treat it.

Keywords: ankyloglossia, speech abnormalities, feeding issues, social, mechanical psychological problems

Introduction
Etymologically, ''ankyloglossia'' originates from the Greek words ''Agkilos" (curved) and ''glossa" (tongue) [1]. Ankyloglossia is defined as a developmental anomaly of the tongue characterized by an abnormally short, thick lingual frenum resulting in limitation of tongue movement [2]. Before birth, a strong cord of tissue guides the development of oral frenulum which is positioned in the centre of the mouth. After birth, this lingual frenulum continues to guide the position of erupting teeth. As the child grows, it recedes and becomes thin. In some children, the frenulum is especially tight, or it fails to recede and may cause tongue immobility [3]. The phenotype varies from absence of clinical significance to rare complete ankyloglossia where the ventral part of the tongue is fused to the floor of the mouth [4]. Various studies using different diagnostic criteria found a prevalence of ankyloglossia between 4 and 10%. It is more common in males, with male to female ratio of 2.5:1 [5-6]. The abnormally short lingual frenulum may result in varying degree of decreased tongue mobility. Tongue-tie has been suggested to cause breast-feeding difficulties (sore nipples, poor infant weight gain, early weaning), speech disorders (impaired articulation), problems with deglutition and dentition, oral-motor dysfunction and social issues related to the limited function of the tongue [7]. Some authors have also claimed that some ankyloglossia cases can be associated with upward and forward displacement of the epiglottis and larynx, resulting in various degrees of dyspnoea [8-9]. Management of ankyloglossia is controversial. There is no consensus regarding the indications, timing or method of surgical repair for ankyloglossia. Ankyloglossia is classified on the basis of 'free tongue'. 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 [10]. Based on the length of free tongue, Kotlow has given the 5 categories. (Table-1). Due to restricted movements, patients exhibit speech difficulties in pronunciation of certain consonants and diphthongs [11]. Speech defects include defects in the letters t, d, n and l, in sounds and words such as ta, te, time, water and cat and general unintelligibility of speech [12]. Here, we present a case of a 7 year old boy seeking treatment for his impaired speech due to inadequate movement of tongue.

Table 1: Kotlow classification of ankyloglossia

Type	Description
Clinically acceptable	Normal: greater than 16mm
Class I	Mild Ankyloglossia: 12-16mm
Class II	Moderate ankyloglossia: 8-11mm
Class III	Severe ankyloglossia: 3-7mm
Class IV	Complete ankyloglossia: less than 3mm

Case Report
This paper reports surgical management of ankyloglossia in a 7 year old boy who had restriction of his tongue movements and was facing difficulties in speech.
A 7-year-old male patient reported to Department of Pedodontics and Preventive Dentistry with the chief complaint of improper speech, and his parents also reported that he was not able to chew solid foods. The patient's family and medical history were noncontributory. Patient's height and weight were appropriate for his age. Clinical examination revealed that patient had ankyloglossia with thick frenum, restricted tongue movements like protrusion. The case was assessed clinically by Kotlow a criterion (Table1) in which normal range of motion of the tongue was assessed. Upon diagnosis of an ankyloglossia, the patient's parents were informed about the nature of the lesion, its functional implications, and the variety of surgical approaches. Hematologic examination of the patient was within normal range. After obtaining informed consent from the patient's parents, the following procedure was carried out for correction of lingual frenum.

Clinical management
Frenum attachment was revised by conventional frenectomy. A topical anesthetic was applied to the underside of the tongue following which block anesthesia

was given. After achieving objective symptoms, a suture was passed at the middle of the tongue to control its movements, and two haemostat were used to clamp the frenum: one at the undersurface of the tongue and another at the floor of the mouth avoiding salivary gland duct. Incision was placed above and below the hemostats to release the complete frenum. The margins of the incision were sutured with 3-0 silk suture. The favorable outcome of the procedure was apparent immediately and the extent of release could be assessed during the intervention itself. Postsurgical instructions were given along with a course of nonsteroidal anti-inflammatory drugs for three days. The sutures were removed one week following the procedure along with betadine irrigation. The post-operative period was uneventful.

The following exercises were advised: i) Stretch the tongue up towards the nose, then down towards the chin and repeat, ii) Open the mouth widely and touch the big front teeth with the tongue with mouth still open, iii) Shut the mouth and poke it into left and right cheek to make a lump: for 3 to 5 minute bursts, once or twice daily for 3 or 4 weeks postoperatively. The routine follow up at 4 weeks showed an extremely happy patient with improved tongue protrusion and normal speech.

Fig 1: Pre-operative

Fig 2: Suture passed at the centre of the tip

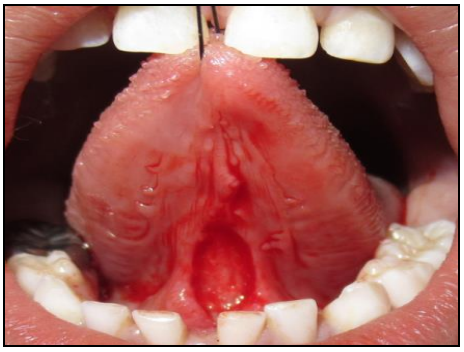

Fig 3: Tissue excision done

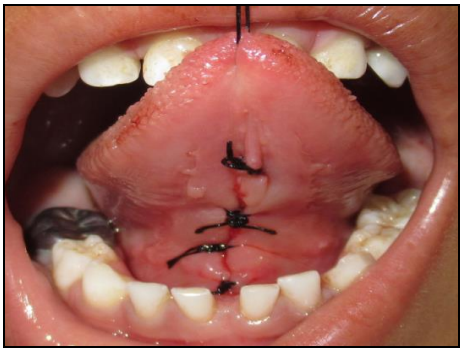

Fig 4: Sutures placed

Fig 5: After suture removal after 7 days

Fig 6: After 10 days post operatively

Fig 7: After 1 month post operatively

Discussion

Ankyloglossia is the result of a failure in cellular degeneration leading to a much longer anchor between the floor of the mouth and the tongue [13]. The pathogenesis of ankyloglossia is not known. Ankyloglossia can be a part of certain rare syndromes such as X-linked cleft palate (OMIM 303400) [14] and van der Woude syndrome (OMIM 119300) [15]. Most often ankyloglossia is seen as an isolated finding in an otherwise normal child. Maternal cocaine use is reported to increase the risk of ankyloglossia to more than threefold [16]. There is a wide difference of opinion regarding its clinical significance and optimal management. Parents should be educated about the possible long-term effects of tongue tie, so that they may make an informed choice regarding possible therapy. There are a number of consequences of not treating tongue-tie ranging from abnormal appearance of the tongue, improper chewing and swallowing of food could increase the gastric distress and bloating, and snoring to bed wetting at sleep are common among tongue tied children. It also affects children who want to participate in routine play which involves tongue movements, gestures, and speech. Dental caries could occur due to food debris not being removed by the tongue's action of sweeping the teeth and spreading of saliva. Malocclusion like open bite due to thrust created by being tongue tied, spreading of lower incisors with periodontitis, and tooth mobility due to long-term tongue thrust are associated problems [2].

The effect of ankyloglossia on speech has not been defined clearly. Although speech problems historically have been viewed as the hallmark manifestation of symptomatic tongue-tie, particularly among the lay public, others in the literature have vociferously denied that any such relationship exists. Speech sounds that may be affected by impaired tongue-tip mobility include lingual sounds and sibilants such as T, D, Z, S, TH, N, and L [17-19] The compensatory techniques used by children with ankyloglossia typically include restricted mouth opening while speaking, and alternate tongue placement for sounds requiring tongue-tip elevation. An excellent study by Fletcher and Meldrum [20] provided strong evidence regarding the relationship of tongue mobility to speech articulation. In this study, normal children, 11 to 12 years of age, underwent careful intraoral measurements of the relative lengths of the tongue and frenulum, to determine the ratio of ''free'' tongue to total tongue length. Participants were separated into ''limited lingual freedom'' and ''greater lingual freedom'' groups on this basis. These investigators found a highly significant increase in the number of articulation errors in the limited lingual freedom group as compared with the greater lingual freedom group, and concluded that these findings might be particularly pertinent to the entity of ankyloglossia. When present, the severity of the articulation problems in affected individuals may vary; problems may be so pronounced as to be evident at the single word level, or be mild enough so as to be noticeable only in connected speech. In our experience, up to one half of young children with ankyloglossia referred for otolaryngology evaluation will have articulation difficulties that may be detected in the context of a formal speech pathology consultation [21]. It is important to keep in mind that ankyloglossia is not a cause of speech delay. Children with ankyloglossia are expected to acquire speech and language at a normal rate, although some may experience articulation difficulties for certain speech sounds, as indicated above. Surgical techniques for the therapy of tongue-ties can be classified into three procedures. Frenotomy is a simple cutting of the frenulum (of neonates). Frenectomy is defined as complete excision, i.e., removal of the whole frenulum (at or after 6 months of age). Frenuloplasty involves various methods to release the tongue-tie and correct the anatomic situation. In addition to surgical intervention, revision of the frenum by LASER[22] without a general anesthetic and revision by electrocautery[23] using a local anesthetic have been described. The cases presented in this paper were treated with transverse-vertical release frenectomy. Post-operative exercises [24] following tongue-tie surgery were intended to: i) Develop new muscle movements, particularly those involving tongue-tip elevation and protrusion, inside and outside of the mouth, ii) Increase kinesthetic awareness of the full range of movements the tongue and lips can perform, iii) Encourage tongue movements related to cleaning the oral cavity, including sweeping the insides of the cheeks, fronts and backs of the teeth, and licking right around both lips.

Conclusion

Tongue is the most important articulator for speech production. Tongue provides amazing range of movements during speech, including tip-elevation, grooving, and protrusion. Relatively short at birth, the tongue grows longer, and thinner at the tip, as we get older. As well as having a speech function, the tongue is needed for sucking, chewing, swallowing, eating, drinking, tooth and gum health. Speech problems associated with ankyloglossia are mostly subjective in nature, and more studies are needed to evaluate the benefit of speech therapy alone or in combination with a surgical release of the tongue-tie. Parents should be informed about the possible elongation of the frenulum with growth and the aptitude of children to deal with limitations in tongue mobility. If a surgical intervention is required, the parents should receive detailed information, and a risk–benefit evaluation should be done by the treating dentist.

References

1. Suter VGA and Bornstein MM. Ankyloglossia: Facts and Myths in Diagnosis and Treatment. J Periodontol. 2009; 80:1204-1219.
2. Darshanand HE, Pavithra PM. Tonguetie: fromconfusion toclarity-areview, International Journal of Dental Clinics. 2011; 3:48-51.
3. Entnet.org [Internet] American Association of otolaryngologist: head and neck surgery: fact sheet, 2012, http://entnet.org/HealthInformation/Ankyloglossia.cfm.
4. Horton CE, Crawford HH, Adamson JE, Ashbell TS. Tongue-tie. Cleft Palate J. 1969; 6:8-23.
5. Segal LM, Stephenson R, Dawes M, Feldman P. Prevalence, diagnosis, and treatment of ankyloglossia: methodologic review, Canadian Family Physician. 2007; 53(6):1027-1033.
6. Saeid M, Mobin Y, Reza R, Ali AP, Mohsen G. Familial ankyloglossia (tongue-tie): acasereport Acta MedicaIranica. 2010; 48(2):123-124.
7. Lalakea ML, Messner AH. Ankyloglossia: does it matter? Pediatr Clin North Am. 2003; 50(2):381-97.
8. Mukai S, Mukai C, Asaoka K. Ankyloglossia with

deviation of the epiglottis and larynx. Ann Otol Rhino Laryngol. 1991; 153:3-20.
9. Mukai S, Mukai C, Asaoka K. congenital ankyloglossia with deviation of the epiglottis and larynx: symptoms and respiratory function in adults. Ann Otol Rhino Laryngol. 1993; 102:620-624.
10. Kotlow Akyloglossia L. (tongue-tie): A diagnostic and treatment quandary. Quintessence Int. 1999; 30:259-262.
11. Shafer W, Hine M, Levy BM, Tomich CE. Developmental disturbances of oral and paraoral structures. In: Shafer W *et al*. (eds). a textbook of Oral pathology, ed 4. Philadelphia: Saunders, 2003, 2-85.
12. Brightman V. diseases of tongue. In: Lynch M, Brightman V, Greenber M. (eds). Burket's Oral Medicine: Diagnosis and Treatment, e 9. Ontario: BC Decker, 2001, 240-298.
13. Morowati S, Yasini M, Ranjbar R, Peivandi AA, Ghadami M. Familial Ankyloglossia (Tongue-tie): A Case Report. Acta Medica Iranica. 2010; 48:123-124.
14. Moore GE, Ivens A, Chambers J, Farrall M, Williamson R, Page DC, *et al*. Linkage of an Xchromosome cleft palate gene. Nature. 1987; 326:91-92.
15. Burdick AB, Ma LA, Dai ZH, Gao NN. Van Der Woude syndrome in two families in China. J Craniofac Genet Dev Biol. 1987; 7:413-418.
16. Harris EF, Friend GW, Tolley EA. Enhanced prevalence of ankyloglossia with maternal cocaine use. Cleft Palate Craniofac J. 1992; 29:72-76.
17. Wallace AF. Tongue-tie. Lancet. 1963; 2:377-8.
18. Catlin FI, De Haan V. Tongue-tie. Arch Otolaryngol. 1971; 94:548-57.
19. Williams WN, Waldron CM. Assessment of lingual function when ankyloglossia (tongue-tie) is suspected. J Am Dent Assoc. 1985; 110:353-6.
20. Fletcher SG, Meldrum JR. Lingual function and relative length of the lingual frenulum. J Speech Lang Hear Res. 1968; 2:382-90.
21. Messner AH, Lalakea ML. The effect of ankyloglossia on speech in children. Otolaryngol Head Neck Surg. 2002; 127:539-45.
22. Kotlow LA. Using the Erbium: Yag Laser to correct an abnormal frenum attachment in newborns. The Journal of the academy of LASER Dentistry. 2004; 12:22-23.
23. Tuli A, Singh A. Monopolar diathermy used for correction of ankyloglossia. J Indian Soc Pedod Prev Dent. 2010; 28:130-133.
24. Bowen C. Tongue-tie, ankyloglossia or short fraenum. Retrieved, 2000, from http://www.speechlanguage therapy.com/tonguetie.html.