

Ankyloglossia [Tongue-tie]- A case report

Sakthivel.V. S¹, Sumithra.K², Manishaa.V², Dhanush Muthu. N², Gopi Krishnan.S²

Velss Dental Care, Chennai, India

Αγκυλογλωσσία. Αναφορά περίπτωσης

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SUMMARY: The tongue is a specialized organ whose presence is pivotal in speech, swallowing, nutrition, nursing, oral hygiene and position of teeth. Ankyloglossia or tongue tie is a condition that affects the range of movement of the tongue due to an abnormally short, thick lingual frenulum. The congenital anomaly can also hinder growth of the orofacial structures of the child. Due to its complications, Ankyloglossia demands proper and early surgical correction. This article describes a case of ankyloglossia that was surgically corrected by frenectomy, post which the patient was restored with normal functions.

KEY WORDS: Ankyloglossia, Tongue tie, frenectomy, frenuloplasty, children.

ΠΕΡΙΛΗΨΗ: Η γλώσσα είναι ένα εξειδικευμένο όργανο του οποίου η παρουσία είναι καθοριστική στην ομιλία, την κατάποση, τη διατροφή, τον αυτοκαθαρισμό, τη στοματική υγιεινή και τη θέση των δοντιών. Η αγκυλογλωσσία ή η «γλωσσοδέτης» είναι μια πάθηση που επηρεάζει το εύρος κίνησης της γλώσσας λόγω ενός ασυνήθιστα κοντού, παχύ γλωσσικού χαλινού. Η συγγενής αυτή ανωμαλία μπορεί επίσης να εμποδίσει την ανάπτυξη των δομών του στοματογναθικού στα παιδιά. Λόγω των επιπλοκών της, η αγκυλογλωσσία απαιτεί σωστή και έγκαιρη χειρουργική διόρθωση. Αυτό το άρθρο περιγράφει μια περίπτωση αγκυλογλωσσίας που διορθώθηκε χειρουργικά με φρενεκτομή, μετά την οποία ο ασθενής αποκαταστάθηκε σε φυσιολογική λειτουργία.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: Αγκυλογλωσσία, «Γλωσσοδέτης», φρενεκτομή, πλαστική χαλινού, παιδιά

¹ MDS OMFS

² BDS

INTRODUCTION

Tongue tie or ankyloglossia is a rare congenital anomaly that restricts tongue movement and thus has an impact on the functions of the tongue due to a short lingual frenulum [1]. In 1960, the term ankyloglossia was first used in the medical literature. The term “ankyloglossia” is derived from the Greek word “agkilos” that means curved and “glossa” meaning tongue. Wallace defined tongue-tie as “a condition in which the tip of the tongue cannot be protruded beyond the lower incisor teeth because of a short lingual frenum, often containing scar tissue” [2]. The incidence of ankyloglossia varies from 0.2%-5%, with a slight male child predilection. Patients and their parents should be aware about the possible complications of tongue-tie, so that they can consider the various treatment options [3,4].

Ankyloglossia can occur as a genetically transmissible but more research is required for the confirmation of cause and pathogenesis of ankyloglossia. Some studies suggest that ankyloglossia has a genetic etiology trait transmitted through mutations in the TBX22 [T box transcription factor] thereafter causing X-linked [heritable] ankyloglossia with or without cleft lip or cleft palate [6-9]. Ankyloglossia may occur in combination with other features in rare syndromes such as Kindler syndrome, X-linked cleft palate syndrome, Van der Woude syndrome and Opitz syndrome [10]. In some cases, this can also be observed as a separate entity in persons without any other diseases or congenital anomalies. Patients with ankyloglossia are always associated with speech problems due to the limited mobility of the tongue. The difficulties in phonation are evident for consonants and sounds like “z, s, t, d, j, l, zh, th, ch, d” and it is almost always difficult to roll an “r”. The diagnosis and treatment protocols for class III Kotlow's ankyloglossia [11] [Table 1] have been elaborated in this article, in order to highlight the importance of a timely diagnosis and treatment.

CASE REPORT

A 15-year-old male patient reported to Velss Dental Care, Redhills, Chennai with the chief complaint of malaligned teeth with difficulty in speech and swallowing from birth. On intraoral examination, the lingual frenulum was smaller in length, thick and fibrosed [Fig. 1]. Patient showed reduced tongue movements when asked to protrude his tongue, and was unable to touch the retro-incisal papilla on the palate with his tip of the tongue. There was also a reduction of sublingual space and formation of a heart shaped tongue during protrusion of the tongue. Since the tongue exerts tensile forces during speech and deglutition, there was an occurrence of space between central inferior incisors. The patient also showed difficulties while speaking. Based on the clinical features, a diagnosis of ankyloglossia [tongue tie]

Table 1

Kotlow's classification based of free tongue motion

Classification of Ankyloglossia		Range of free tongue
Clinically acceptable normal range of free tongue		> 16 mm
Class I	Mild Ankyloglossia	12-16 mm
Class II	Moderate Ankyloglossia	8-11 mm
Class III	Severe Ankyloglossia	3-7 mm
Class IV	Complete Ankyloglossia	<3 mm



Fig. 1: Preoperative intraoral photograph of ankyloglossia classified as Class III by Kotlow's classification.

was made and was classified as Class III with the help of Kotlow's classification. The ENT and general physical examination were normal.

In order to correct the malaligned teeth, orthodontic treatment was started and next, a frenectomy procedure by using a scalpel method under local anesthesia with 2% lignocaine hydrochloride and 1:80,000 adrenaline was planned to correct ankyloglossia. Initially, a curved hemostat was placed at the depth of the vestibule at the bottom of the lingual frenulum and clamped into position. Then, two incisions were given above and below i.e., superiorly and inferiorly of the hemostat. By this way, the intervening thick lingual frenum is removed and a diamond shaped wound is formed [Fig. 2]. Then we released the muscle fibres to prevent tension with the help of the same hemostat, and approximated the wound edges with (4-0) black braided silk sutures to



Fig. 2: Intraoperative photograph of the incision given through the mucosa showing the diamond shaped wound.



Fig. 3: Postoperative photograph showing good healing and normal tongue protrusion.

heal by primary intention. To prevent post-operative infection and pain, the patient was prescribed with an antibiotic Cap. phexin (500 mg) twice a day for 3 days and non-steroidal anti-inflammatory drug Tab. Signoflam twice a day for 3 days. There was no delayed hemorrhage. Sutures were removed after a week and the healing was uneventful with no scar tissue formation. The patient was referred to a Speech therapist for speech therapy sessions and was advised to do Tongue training exercises for a period of 3 to 4 weeks after the surgery. After a follow-up of 6 months, the tongue showed good healing and the patient had normal speech and protrusion of tongue beyond the lower lip [Fig. 3].

DISCUSSION

The tongue is known to be one of the strongest muscles

in the human body. Its strength and flexibility help in a variety of functions such as swallowing, breast-feeding, breathing, speech and phonation and in taste due to the presence of taste buds [12]. The uniqueness of the tongue as a muscle is that it has one attached end and another free end. In some children, the free end of the tongue gets ankylosed and leads to reduced functional capacity of the tongue [13]. Ankyloglossia is asymptomatic in the majority of the patients. In some cases, patients may adapt to the reduced lingual movements, while the rest of the patients require surgical correction in the form of frenotomy, frenectomy or frenuloplasty [14,15].

Among all the functions of the tongue, phonation is the most affected by ankyloglossia. The tongue has to be extended to the palatal aspect of maxillary incisors, in order to pronounce 'interdental sounds-th' and elevated upto the palate to pronounce 'linguo-alveolar sounds [16]'. A tongue tie hinders production of these sounds. In addition to these, there is also impairment in the phonation of consonants and sounds such as 's, z, t, d, n, j, ch, th'. However, other sounds are usually produced normally. Hence, speech analysis can play an important role in the diagnosis of ankyloglossia, especially with the help of linguo-alveolar sounds [16].

Before initiating any treatment, it is essential to evaluate the range of motion of the tongue. This is done with the help of Kotlow's criteria, which classifies tongue motion into four classes – Class I to IV [17]. A tongue with a sufficient range of motion, must allow its tip to be protruded out of the oral cavity and must contact and glide over the upper and lower lips comfortably. On retrusion, no blanching must be seen on the lingual aspect of the dentition [18]. The tongue must also not deliver unduly forces over the mandibular incisors.

Ankyloglossia can be surgically corrected by 3 different treatment approaches. Frenectomy refers to excision of the entire frenum, while Frenotomy is the relocation of repositioning of the frenum [19]. The third approach is Z-Frenuloplasty, wherein the anatomical position of the frenum is corrected. Z-Frenuloplasty is a safe and cost effective technique. It yields better functional and aesthetic results. An initial vertical incision is given in the centre of the frenum. Incisions are made to raise triangular flaps which are later repositioned in a 'Z-plasty' flap closure. Sutures are removed a week later. Z-Frenuloplasty helps to release scar contracture and relieve soft tissue tension. The appearance of a scar is also improved with this technique as it helps to both relax and re-align the tissues. This procedure can also be used to position a short frenulum more apically for better aesthetic and functional results. This procedure allows for tissue healing by primary intentions; increasing recovery and reducing the risk of tissue contractures. Depending upon the severity, the approach is decided. Irrespective of the

treatment approach, early diagnosis and surgical intervention reduce further impairment of essential functions and avoid long term complications [20]. So both the patient and their families must be well informed regarding the condition and its effects on normal functions, so that treatment is not delayed or deferred.

CONCLUSION

Tongue tie is a relatively common condition seen in the first few years of life. As the tongue plays an important role in several functions, incomplete or improper treatment of ankyloglossia can cause difficulties in speech, feeding and mastication. In addition to these, growth and

posture are also hindered due to a tongue tie. Hence, it is imperative that the parents are well informed of the condition and treatment options. This article highlights the need for a thorough clinical examination is necessary in order to arrive at an early diagnosis, so as to prevent further disabilities.

DECLARATION OF PATIENT CONSENT:

The authors certify that an appropriate consent form has been obtained from the patient. The patient has understood the purpose of usage of his images and clinical information and has agreed for its usage in the journal. It has been informed that the patient's name will not be published and his identity shall not be revealed.

REFERENCES

1. I, Jangid K, Alexander AJ, Jayakumar ND, Varghese S, Ramani P. Ankyloglossia with cleft lip: A rare case report. *Journal of Indian Society of Periodontology*. 2015 Nov-Dec;19(6):690-693. DOI: 10.4103/0972-124x.162207. PMID: 26941523; PMCID: PMC4753717.
2. Wallace AF. Tongue tie. *Lancet*. 1963;2:377-8.
3. Segal LM, Stephenson R, Dawes M, Feldman P. Prevalence, diagnosis, and treatment of ankyloglossia: methodologic review. *Canadian Family Physician* 2007; 53(6): 1027-1033.
4. Veyssiere A, Kun-Darbois JD, Paulus C, Chatellier A, Caillot A, Bénateau H. Veyssiere A. Diagnosis and management of ankyloglossia in young children *Rev Stomatol Chir Maxillofac Chir Orale*. 2015 Sep;116(4):215-20.
5. Jiang RS, Zhao X, Liu R. Non-syndromic cleft palate: analysis of TBX22 exon 5 gene mutation. *Arch Med Sci*. 2012 Jul 4;8(3):406-10. doi: 10.5114/aoms.2012.28812. PMID: 22851992; PMCID: PMC3400901.
6. Carinci F, Scapoli L, Palmieri A, Zollino I, Pezzetti F. Human genetic factors in nonsyndromic cleft lip and palate: an update. *Int J Pediatr Otorhinolaryngol*. 2007;71:1509-19.
7. Braybrook C, Doudney K, Marçano AC, et al. The T-box transcription factor gene TBX22 is mutated in X-linked cleft palate and ankyloglossia. *Nat Genet*. 2001;29:179-83.
8. Braybrook C, Ligo S, Doudney K, et al. Craniofacial expression of human and murine TBX22 correlates with the cleft palate and ankyloglossia phenotype observed in CPX patients. *Hum Mol Genet*. 2002;11:2793-804.
9. Marçano AC, Doudney K, Braybrook C, et al. TBX22 mutations are a frequent cause of cleft palate. *J Med Genet*. 2004;41:68-74.
10. Chaulbal TV, Dixit MB. Ankyloglossia and its management. *Journal of Indian Society of Periodontology*. 2011 Jul;15(3):270-272. DOI: 10.4103/0972-124x.85673. PMID: 22028516; PMCID: PMC3200025.
11. Hong P. Five things to know about...ankyloglossia (tongue-tie). *CMAJ*. 2013 Feb 5;185(2):E128. doi: 10.1503/cmaj.120785. Epub 2012 Oct 15. PMID: 23071373; PMCID: PMC3563913.
12. Verdine V A and Khan R. Management of ankyloglossia- Case reports. *IOSR Journal of Dental and Medical Sciences* 2013; 6(4): 31-33.
13. Kantaputra PN, Paramee M, Kaewkhampa A, Hoshino A, Lees M, McEntagart M, Masrouf N, Moore GE, Pauws E, Stanier P. Cleft lip with cleft palate, ankyloglossia, and hypodontia are associated with TBX22 mutations. *Journal of dental research*. 2011 Apr;90(4):450-5.
14. Junqueira MA, Cunha NN, Costa e Silva LL, Araújo LB, Moretti AB, Couto Filho CE, Sakai VT. Surgical techniques for the treatment of ankyloglossia in children: a case series. *J Appl Oral Sci*. 2014 Jun;22(3):241-8. doi: 10.1590/1678-775720130629. PMID: 25025566; PMCID: PMC4072276.
15. Lalakea ML, Messner AH. Ankyloglossia: The adolescent and adult perspective. *Otolaryngol Head Neck Surg* 2003;128:746-52.
16. Khan S, Sharma S, Sharma VK. Ankyloglossia: Surgical management and functional rehabilitation of tongue. *Indian J Dent Res* 2017;28:585-7.
17. Kotlow LA. Ankyloglossia (tongue-tie): a diagnostic and treatment quandary," *Quintessence International*, 1999; 30(4):259-262.
18. Reddy NR, Marudhappan Y, Devi R, Narang S. Clipping the (tongue) tie. *J Indian SocPeriodontol* 2014;18:395-8.
19. Whitman CL, Rankow RM. Diagnosis and management of ankyloglossia. *Am J Orthod* 1961;47:423-.
20. Babu HM. Surgical management of Ankyloglossia: A case report. *Int J Contemp Dent* 2010;1:58-61.

Address:

Dr. Sakthivel V.S. MDS OMFS

Velss Dental Care, Chennai, India

e-mail: sakthivs@yahoo.com