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Case Report

Frenectomy of Posterior Tongue Tie with Muscle Dissection: A Case Report

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Abstract

Ankyloglossia, or tongue-tie, refers to an abnormally short lingual frenulum, causing difficulty in speech articulation due to limitation in tongue movement. In this article, we report a case of a 16-year-old female with posterior anklyoglossia, and anterior mucosal covering, who complained of difficulty in speech. Following which she underwent frenectomy procedure under local anesthesia without any complications. Finally, she was given speech therapy sessions.

Keywords: Ankyloglossia, Muscle Dissection, Tongue Tie.

INTRODUCTION

Ankyloglossia, or tongue-tie, is a developmental anomaly, where the lingual frenulum is abnormally short and tight (posterior ankyloglossia) or abnormally attached anteriorly to the ventral surface of the tongue (anterior ankyloglossia), "tying" the tongue to the floor of the mouth [1]. In general, Heller et al defined it as a condition in which the tongue cannot make contact with the hard palate or cannot protrude more than 1–2 mm past the mandibular incisors [2]. The Academy of Breastfeeding Medicine Protocol defines ankyloglossia as 'a sublingual frenulum which changes the appearance and/or function of the infant's tongue because of its decreased length, lack of elasticity or attachment too distal beneath the tongue or too close to or into the gingival ridge' [3]. Ankyloglossia has an incidence of rate of 4-5%, and is more common in males, with male to female ratio of 2.5: 1.0 [4]. It has been reported to cause feeding difficulties, dyspnea from forward dislocation of the epiglottis and larynx; speech articulation problems involving lingual alveolar sounds /l/ and interdental sounds /th/; and social and mechanical problems [1]. Tongue tie can be classified based on Kotlow's classification (Table-1) [5]. For a quantitative assessment of ankyloglossia, Hazelbaker Assessment Tool for Lingual Frenulum (Table-1) [5] (HATLFF) was developed and has been proven to be highly reliable. The management of ankyloglossia requires an interdisciplinary approach concerning different health care providers such as oral surgeons, paediatricians, otolaryngologists and speech therapists. The surgical procedures are classified as frenotomy (simple cutting of the frenulum) frenectomy (complete excision of the frenum), and frenuloplasty which involves excision of the frenum along with correcting the anatomy [6].

Case Report

We report a rare case of posterior ankyloglossia in a 16-year-old female patient. She reported to the Department of Oral Surgery with difficulty in speech since birth. The ENT and general physical examination was conducted to rule out any abnormality. The patient's family and medical history were non-contributory. Initial intra oral examination did not reveal an obvious aberrant frenum, however on further palpation and retraction, a short and thick fibrous cord was noted posterior to the anterior mucosa of the tongue (Figure-1). Clinically, ankyloglossia was categorised as Class III ankyloglossia (Kotlow's criteria) as the tongue showed limited protrusion and elevation. Hazelbaker's assessment tool gave a functional score of 10 and appearance score of [7]. Also, patient's speech was analysed to identify

defective syllables in her speech. The difficulty in articulation was noted with consonants like s, r, z. As the patient wants to pursue her career in singing, accurate pronunciation of every syllable was of utmost important to her. After obtaining informed consent, conventional frenectomy procedure was done under local anaesthesia with 2% lignocaine hydrochloride and 1: 80,000 adrenalines. After achieving objective symptoms, a suture was passed at the middle of the tongue to control its movements (Figure-2), one hemostat was inserted at the under surface of the tongue and another at the floor of the mouth to clamp the frenum. Incision was placed above and below the hemostasis to remove the intervening frenum, leaving a diamond shaped wound (Figure-3). A combination of blunt and sharp dissection of the muscle fibers was carried out with the hemostat without disturbing the veins of either side of the frenum. The wound edges were approximated with 4-0 black braided silk simple interrupted sutures (Figure-4) to achieve primary closure and minimize scar tissue formation. The patient was discharged with post-operative instructions and was prescribed Cap Amoxicillin 500mg thrice a day for 3 days and tab ketorol DT 10mg thrice a day for 3 days. After 1 week, no complications were reported, sutures were removed and the patient was referred to the speech therapist.

Table-1:Kotlow's Classification

Type	Movment of the tongue
Clinically acceptable, normal range of free tongue movement	Greater than 16 mm
Class-I: Mild ankyloglossia	12 to 16 mm
Class-II: Moderate ankyloglossia	8 to 11 mm
Class-III: Severe ankyloglossia	3 to 7 mm
Class-IV: Complete ankyloglossia	Less than 3 mm

Table-2: Hazel baker's assessment tool for appearance and function of the tongue

Appearance	**Function**
Appearance of tongue when lifted	Lateralization
2: Round or Square 1: Slight deft in tip apparent 0: heart or V-shaped	2: Complete 1: Body or tongue but no tongue tip 0: None
Elasticity of frenulum	Lift of tongue
2: Very elastic 1: Moderately elastic 0: Little or no elasticity	2: Tip to mid-mouth 1: Only edges to mid-mouth 0: Tip stays at lower alveolar ridge or rises to mid-mouth only with jaw closure
Length of lingual frenulum when tongue lifted	Extension of tongue
2: >1 cm 1: 1 cm 0: <1 cm	2: Tip over lower lip 1: Tip over lower gum only 0: Neither of the above, or anterior or mid-tongue humps
Attachment of lingual frenulum of tongue	Spread of anterior tongue
2: Posterior or tip 1: At tip 0: Notched tip	2: Complete 1: Moderate of partial 0: Little or none
Attachment of lingual frenulum to inferior alveolar ridge	Cupping
2: Attached to floor of mouth or well below ridge 1: Attached just below ridge 0: Attached at ridge	2: Entire edges, firm cup 1: Slide edges only, moderate cup 0: Poor or no cup
	Peristalsis
	2: Complete, anterior or posterior 1: Partial, originating posterior or tip 0: None or reverse
14= perfect score, 11= acceptable if appearance item score is 10. Frenotomy is necessary function score is <11 and appearance score is <8.	

Fig-1: Pre Operative View of Posterior Ankyloglossia

Fig-2: Passing Suture through the Tip of the Tongue

Fig-3: Complete Excision of Fraenum

Fig-4: Sutures

DISCUSSION

The lingual frenulum is a short mucosal membrane with underlying connective tissue connecting the ventral surface of the tongue to the floor of the mouth. The etiopathogenesis of tongue-tie is unknown. The mucosa covering the anterior two-thirds of the tongue is derived from the first pharyngeal arch, and developmental anomaly with the same could result in abnormal frenulum length and attachment. Frenulum being a connective tissue structure, a developmental anamoly of collagen and connective tissue in the anterior portion of the tongue could lead to ankyloglossia. The condition could be detected in patients with Ehler -Danlos Syndrome (EDS) [7]. Posterior frenula is located posterior to the anterior mucosal covering of the ventral surface of the tongue and floor of the mouth, creating a mucosal covering. This poses as a diagnostic challenge, so the mucosa is retracted posteriorly to reveal the frenum. The frenulum is not a very vascular or sensitive structure; however, it is surrounded bilaterally by the lingual arteries and nerves that course on the ventral surface of the tongue and run deeper to the intrinsic musculature. These structures should be avoided to preserve the sensation to the tongue and prevent serious bleeding. Care must be taken to avoid damage to the genioglossus muscle and Wharton ducts which run inferior and superficial to this muscle respectively, as injury to the later could result in decreased salivation or stricture of the duct, leading to sialocele formation [8]. Limited movement of the tongue is the most common symptom of ankyloglossia and also most common indication for surgical intervention [9]. Lalakea *et al*., demonstrated that eight of 14 adults noted one or more mechanical limitations, such as cuts from teeth in the frenulum area or discomfort beneath the tongue, and difficulties with licking the lips, eating an ice cream cone, keeping the teeth clean, and doing ‘‘tongue tricks’’. They objectively evaluated the mobility of the tongue with ankyloglossia in adolescents and adults and compared with a control group. In a tongue with normal function and range of movement, protrusion (the maximum extension of the tongue tip past the lower dentition) and elevation (interincisal distance by maximal mouth opening, while maintaining contact of the tongue tip to the posterior surface of the upper central incisor teeth) measured >30 mm, whereas they were nearly half that length when ankyloglossia was present [10]. Prevalance of speech anamolies in patients with ankyloglossia varies -. The difficulties in articulation are evident for consonants and sounds like ‘‘s, z, t, d, l, j, zh, ch, th, dg,’’and it is especially difficult to roll an ‘‘r’’ [11]. However, it should be recognized that a slight difference in pronunciation cannot always be diagnosed as a speech problem. Studies evaluating the efficacy of surgical invertention, reported an improvement in their speech articulation among 40-90% of the patients. These patients were instructed to perform postoperative tongue exercises’. Another approach reported was the observation of the vocal cords with laryngofiberscope during phonation. After the surgery, patients had a louder voice [12].

CONCLUSION

The exact clinical significance and management of anklyoglossia is still unclear. In many children, this condition is asymptomatic, and may resolve spontaneously, or affected children may learn to compensate adequately for their decreased tongue mobility. For ankyloglossia with speech problems, more long term controlled trials should be conducted to compare results after tongue-tie surgery to results of special training provided by speech pathologists without any kind of surgery.

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