

A Case Report

A Case Report on Management of Adult Ankyloglossia Bydiode Laser

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Abstract

Various kinds of anomaly occurs congenitally. These may be systemic or oral anomalies. One of the congenital oral anomaly include tongue tie or ankyloglossia. It refers to the condition in which due to the presence of short,thick lingual frenum which connects the tongue to the floor of mouth. Ankyloglossia can range from mild cases where the tongue is partially attached to the floor of the mouth to severe or complete ankyloglossia where the tongue is tightly attached to the floor of mouth. Present case report is on a 29 years old male who was having mild ankyloglossia and was treated by frenectomy of lingual frenum by diode laser.

Key Words: Lingual frenum, cupping, floor of mouth, ankyloglossia, laser

INTRODUCTION

The term “ankyloglossia” in the Greek word means “agkilos” refer to meaning curved and “glossa means (tongue) hence the meaning of ankyloglossia is curved tongue. Frenum in a layman term means a fold of mucous membrane. Here the term lingual frenum means a fold of mucous membrane originating from tongue and connecting the undersurface of tongue to the floor of mouth.¹ By definition according to Wallace tongue-tie refers to the condition in which because of the short, thick lingual frenum, the person is unable to protrude the tongue beyond the lower incisor teeth. According to the International Affiliation of Tongue-tie Professionals, tongue tie refers to congenital or embryologic tissue remnant in the mid undersurface between the tongue and floor of mouth.² There is a controversial issue regarding that tongue tie is symptomatic or asymptomatic. However most of the professionals are in a favor that tongue tie is symptomatic as it do interferes with breast feeding, oral hygiene, and speech difficulty.³

Tongue Development

The tongue develops in relation to the pharyngeal arches in the floor of the developing mouth. Each pharyngeal arch arises as a mesodermal thickening in the lateral wall of the foregut and that it grows ventrally to become continuous with the

corresponding arch of the opposite side. The medial most parts of the mandibular arches proliferate to form two lingual swellings which are partially separated from each other by another swelling that appears in the midline. This median swelling is called as tuberculum impar. Immediately behind the tuberculum impar, the epithelium proliferates to form a down growth called as thyroglossal duct from which the thyroid gland develops. The site of this down growth is subsequently marked by a depression called as foramen caecum. Another midline swelling is seen in relation to the medial ends of the second, third, and fourth arches. This midline swelling is called as hypobranchial eminence. This eminence get subdivided into the cranial part related to the second and third arches called as copula and a caudal part related to the fourth arch which forms the epiglottis.⁴

The anterior two third part of the tongue is formed by the fusion of tuberculum impar and two lingual swellings. The anterior two third of the tongue is thus derived from the mandibular arch. The posterior one third of the tongue is derived

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from the cranial part of the hypobranchial eminence called as copula. In this situation, the second arch mesoderm gets buried below the surface. The third arch mesoderm grows over it to fuse with the mesoderm of the first arch. The posterior one third of the tongue is formed by third arch mesoderm. The posterior one third of the tongue is formed by third arch mesoderm. The posterior most part of the tongue is formed by the fourth arch. The musculature of the tongue is derived from the occipital myotomes.⁴

The epithelium of the tongue is at first made of a single layer of cells. Later, it becomes stratified and papillae becomes evident. Taste buds are formed in relation to the terminal branches of the innervating nerve fibres.⁴

Anatomy of the Floor of the Lingual Frenum & Floor of the Mouth

The lingual frenum is a fold of mucous membrane connecting the undersurface of tongue with the floor of mouth. This lingual frenum consist of muscle fibres of genioglossus muscle. On either surface of the lingual frenum ,whartons duct is present which empty the submandibular gland. Next to the whartons duct,are the ducts of sublingual gland called as the Bartholin duct is present which empty the sublingual gland. Base of the lingual frenulum consist of various veins called as varicosities.⁵

Etiology

Ankyloglossia is a common congenital anomaly with the occurrence rate of 0.2%to 4.8%. the etiology involves both genetic and environmental factors. Molecular analyses showed that the point mutation in gene located on chromosome 21 can cause ankyloglossia.⁶ Epidermolysis bullae is another hereditary condition which is located directly to ankyloglossia as in epidermolysis bullae there is a scarring, as a result of which adhesions are developed which results in inability of the tongue to get protruded beneath the lower incisor teeth which can result in either reduced tongue mobility upto immobility of the tongue. Ankyloglossia in most of the cases appear as an isolated congenital deformity but in some cases it can also appear in combination with other syndromes like pierre-robin syndrome, vander woude syndrome.⁷

Obstacle of Ankyloglossia

1. Speech and mastication: The most common difficulty is in the production of certain speech constants like s,z,t,d,j,ch,zh,th.⁸
2. Difficulty in breast feeding: tongue tie doesnot lead the infant to hold the mothers nipple resulting in excessive suckling pressure by the infant. This result in nipple pain,and soreness leading to the negative psychological bonding between mother and child.⁸

3. Ankyloglossia,if not corrected at an infantile stage may result into the inhibition of adult swallowing pattern in which the tongue raises upwards while swallowing but because of the tongue tie or ankyloglossia,the tongue is not raised upwards during swallowing,resulting in a continuation of infantile swallowing pattern.⁸
4. Gingival recession-due to the high lingual frenal attachment,there is a pulling of gingiva on the lingual surface of mandibular anteriors,as a result there is a lingual recession on the mandibular anterior teeth.⁸
5. Class 3 Malocclusion: due to the forces directed downward and forward,there is a mandibular prognathism,leading to class 3 malocclusion.⁸
6. Other effects of ankyloglossia include the development of social embrassement and complex within the child due to impaired speech.⁸

Diagnosis

At the time of the clinical diagnosis, the characteristic criteria which is of concern is the functional and appearance characteristic of tongue known as the hazelbakers criteria and in order to know the tongue movement in numerical value,kotlows criteria is followed.⁹

Normal range of tongue motion

Tip of the tongue should protrude outside the mouth without clefting

Tip of the tongue should be able to sweep the lips easily – without straining

When the tongue is retruded, it should not blanch the tissue lingual to the anterior teeth

The lingual frenum should not create a diastema between mandibular central incisors

The lingual frenum should not prevent the infant from attaching to the maternal nipple while nursing.

Children should not exhibit speech difficulties.

Hazelbaker's criteria regarding appearance and function of the tongue in cases with Ankyloglossia

1. Appearance Score

Appearance of tongue when lifted Elasticity of frenulum

2: Round or square 2: Very elastic

1: Slight cleft in tip apparent 1: Moderately elastic

0: Heart- or V-shaped 0: Little or no elasticity

Length of lingual frenulum when tongue Attachment of lingual frenulum to tongue 2: > 1 cm 2: Posterior to tip 1: 1 cm 1: At tip

0:<1 cm 0: Notched tip

Attachment of lingual frenulum to inferior alveolar ridge

2: Attached to floor of mouth or well below ridge

1: Attached just below ridge

0: Attached at ridge

Perfect score = 10 Score is Score <8, ankyloglossia indicated for frenectomy

2. Function score

Lateralization Lift of tongue Extension of tongue
 2: Complete 2: Tip to mid-mouth 2: Tip over lower lip
 1: Body of tongue but not tongue tip 1: Only edges to mid-mouth 1: Tip over lower gum only
 0: None 0: Tip stays at lower alveolar ridge or rises to mid-mouth only with jaw closure.
 0: Neither of the above, or anterior or mid tongue humps
 Spread of anterior tongueCupping Peristalsis
 2: Complete 2: Entire edge, firm cup 2: Complete, anterior to posterior
 1: Moderate or partial 1: Side edges only, moderate cup 1: Partial, originating posterior to tip
 0: Little or none 0: Poor or no cup 0: None or reverse motion
 Snapback
 2: None
 1: Periodic
 0: Frequent or with each suck
 Perfect function score= 14. Score of <11 indicated for frenectomy

Kotlow 's Classification Tongue Movement

Clinically accepted>16mm
 Class I mild AG 12-16mm
 Class II moderate AG 8-11mm
 Class III severe AG 3-7mm
 Class IV complete AG <3mm

CASE REPORT

Present case report is of a 29 years old male who reported to Rishiraj College of Dental Science & Research Centre in the department of Periodontology with the chief complaint of speaking few words unclearly and because of this he got rejected in most of his interviews. Upon examination it was found,that the case is of class 1 mild ankyloglossia with the score of 12-16 mm as per Kotlows classification, with the tongue appearance score of 1 (slight cleft in tongue tip apparent) ,as per Hazelbaker's criteria. So the frenectomy of the lingual frenum was carried out by diode laser under local anaesthesia with a 2.0 watt power. The patient was prescribed mucopain gel ,multivitamins, analgesic and antflammatory medication zerodol sp. The patient reported after two weeks for follow up, and it was himself noticed by the patient, that his speech had become clear with respect to certain words.

Kotlow's classification of Ankyloglossia according to the range of tongue movement



Fig 1. Preoperative Pic of Class 1



Fig 2. Soft Tissue Diode Laser Mild Ankyloglossia



Fig 3: Intraoperative Pic of Excision of Lingual Frenum By Means of Laser Fibre

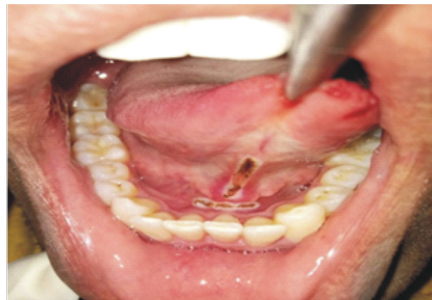


Fig 4: Postoperative Pic of Completely Excised Lingual Frenum



Fig 5: 2 Weeks Follow Up

DISCUSSION

The term free tongue is defined as the free movements of tongue with the ability to move the tongue in all the directions, without any cupping or peristalsis, a proper adult swallowing pattern, a clear speech, a highly elastic lingual frenum, no difficulty in breast feeding by the infant. Ankyloglossia is defined as a restricted tongue with the inability to protrude the tongue partially to completely. This is followed by the difficulty in breast feeding by the infant, inability to speak clearly which can range from unclear speaking of certain words as was in this case to complete unclearance of speech. There can be a recession on the lingual surface of mandibular anteriors resulting in inability to perform oral hygiene measures, diastema because of the constant pull by the lingual frenum, malocclusion particularly class 3 due to constant pressure by the tongue on the mandible to grow downward and forward, cupping, clefting of tongue when the tongue is protruded out, absence of adult swallowing pattern, and the continuation of infantile swallowing pattern. In this case report, the patient was having mild class I ankyloglossia with the clefting of the tongue when the tongue was protruded. The patient also had difficulty to speak few words clearly, because of which he was rejected from his interviews many times. So the case was treated by a procedure called as frenectomy by a diode laser. Frenectomy is the procedure of the complete excision of frenum and can be done by scalpel, electrocautery, laser. Among these three, the laser had minimal to no bleeding, less pain as compared to scalpel, and electrocautery but a delayed healing response as compared to scalpel, and electrocautery. In this case, laser was chosen as a treatment modality, because the floor of the mouth is richly vascular structure, containing numerous vessels and nerves and since because the scalpel provokes more bleeding which might result in difficulty to carry out the procedure, so the laser was used which not result in significant amount of bleeding.

CONCLUSION

Ankyloglossia is a condition, which has to be known thoroughly by medical and dental professionals. This ankyloglossia also known as the tongue tie can result from partial to severe immobility of the tongue leading various psychological impact on patient such as inability to speak clearly, social embarrassment, fear of rejection. Hence therefore ankyloglossia condition must be taken seriously and a thorough management of this condition in the form of surgery followed by speech therapy, surgical intervention alone, or speech therapy alone depending upon the condition should be needed to carry out, so as to prevent the negative psychological build up of impact on the patient.

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