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Original Research Article

A minimally invasive surgical approach for treatment of ankyloglossia (Tounge Tie) with diode laser: A case report (A developmental anomaly)

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ABSTRACT

Tongue tie otherwise called as Ankyloglossia is a developmental anomaly commonly characterized by a very short lingual frenulum that literally restricts the movements of tongue from the floor of mouth. An uncommon thick band extending beneath the ventral surface of tongue to floor of the mouth. This represents a uncommon length of the lingual frenulum. This causes problems in daily life of the person who was affected with the following difficulties of speech, deglutition, poor oral hygiene etc. This article reports a 19 year college going guy came to the department with the complaint of difficulty in speech and poor oral hygiene. The case was successfully treated with a soft tissue diode laser and followed up.

1. Introduction

Ankyloglossia a Greek term agkilo - curved and glossus - tongue respectively.[1] Ankyloglossia is a curved or crooked tongue that is glued to the floor of mouth by a piece of fibrous band the frenulum linguae which is abnormally short to allow free movements of tongue.[2] It is this band of tissue that determines the range of free movements of the tongue. A free tongue is that part of the organ between the attachments of frenulum linguae to its tip. A part from this distance, the thickness and elasticity of the band also determines the effect of the condition. Kotlow's assessment is one of the commonly used diagnostic criteria in case of Ankyloglossia which is as follows; 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. Tongue tie is found rarely among 3-4 percent individuals and shows a male preponderance.[3] Reports suggest that mutations present in the TBX22 gene is involved in Ankyloglossia. Ankyloglossia is reported to be associated with Kindler syndrome, X linked cleft palate syndrome, Opitz syndrome and Van der Woude syndrome.[4] Minor forms of ankyloglossia often resolve with growth, but severe forms need the treatment irrespective of age.[5] In newborn babies, ankyloglossia could cause feeding problems and in adult it develops hindrance in speech and swallowing, dental caries due to food debris due to restriction of tongue action and lingual gingival recessions leading to periodontitis of lower incisors and tooth mobility.[6]

2. Case Report

A male patient with the age of 19 years presented to the surgical opd with complaints of improper pronounciation. He gave a history of his words are tied when he speak with others. On a clinical examination we find out the

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etiology of the condition that presents with a thick band of soft tissue that extends from the ventral surface of his tongue to the floor of mouth which restricts his words. He goes to a regular work (call center, customer care service), has a good conduct in a work place but unable to create a proper pronounciation when he speak, sing and answer to his customers questions. He had minor discomfort with deglutition and salivation that hinders him while talking and drools out which makes him embarrassed. On examination, the frenulum linguae was found to be thickened and short limiting tongue protrusion up to lingual surface of lower incisors and a diagnosis of Class 2 Ankyloglossia was made depending on Kotlow's criteria [Figure 1]. There was no malocclusion or gingival recession. The case was posted for lingual frenulectomy by using diode laser method to avoid the complications of involving the deep lingual veins and arteries and also to avoid any damage to the duct openings of major and minor salivary glands which present there.

3. Surgical Porcedure

The present clinical situation, treatment plan, and the procedure were explained to the patient. The patient was advised to take routine laboratory investigations such as bleeding time, clotting time, hemoglobin count, and complete blood count. After obtaining informed consent from the patient, treatment was initiated. Topical anesthetic gel was applied to the tip and floor of the tongue near frenum attachment [Figure 1]. 2% lignocaine 1:80,000 was administered on the tip of the tongue and along the sides of frenum. After signs of complete anesthesia, for retraction purpose, suturing was done to tip of tongue and frenectomy was initiated using diode (picasso, 2.5 W, 940 nm) laser. Tip of laser was applied from the apex of the frenum to the base in a contact mode using brushing stroke, to cut the frenum [Figure 2]. The ablated tissues were mopped continuously using wet gauze piece. This takes care of the charred tissues and prevents excessive thermal damage to the underlying tissue. Protrusive tongue movement was checked to access complete elimination of frenum [Figures 2 and 3]. No bleeding was observed, and no suturing was done. The patient was prescribed analgesics and antibiotics, capsule amoxicillin (500 mg) thrice a day for 3 days, and non-steroidal anti‑inflammatory drug tablet ibuprofen (400 mg) + paracetamol (325 mg) thrice a day for 3 days was prescribed to prevent postoperative infection and pain and reviewed after 1‑week. Healing was uneventful. The patient reported increased tongue mobility following surgery and was at ease. The patient was referred to a speech therapist for speech improvement. The procedure was done and patient on review a marked improvement in tongue protrusion with the better pronunciation of words during speech. So, he was recommended to do tounge exercises and on further follow up a marked fluency in speech, was able to sing his favorite song and has considerably increased the confidence level of this patient [Figure 3].

Fig. 1: Restriction of movements of tounge by a thick lingual frenum were observed in all aspects

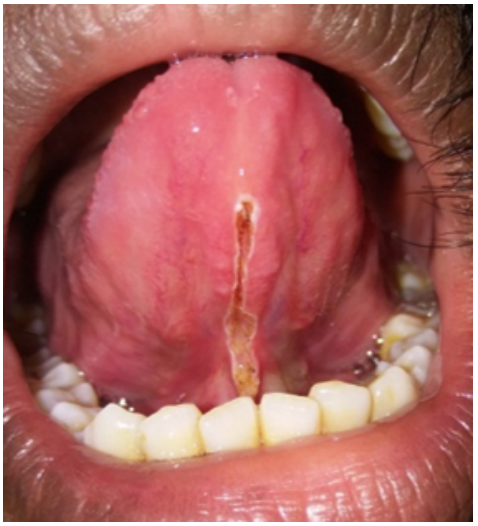

Fig. 2: Lingual frenectomy was performed using a diode laser in contact mode and this immediate post-operative picture represents the restriction free tip of the tounge touching the maxillary central incisior.

4. Discussion

Even though tongue tie seems to be a relatively harmless condition, it poses great impacts in the day to day life of the affected individual starting from the very first day he is born.[7] The tight frenulum prevents the tongue from getting over the lower gum and lips thereby affecting suckling of the breast and even the bottle feeding. This may lead to premature cessation of breast feeding and poor weight gain. Inability to touch the roof of mouth may lead to problems in adult deglutition and the compensatory protraction of mandible may lead to prognathism and maxillary hypodevelopment leading to malocclusion and periodontal problems.[4–8] When he starts to talk, speech difficulties starts arising making it difficult to pronounce consonants and sounds like "s, z, t, d, l, j, zh, ch, th. As the Wharton's duct and many ducts of minor salivary glands open in the base and vicinity of frenulum

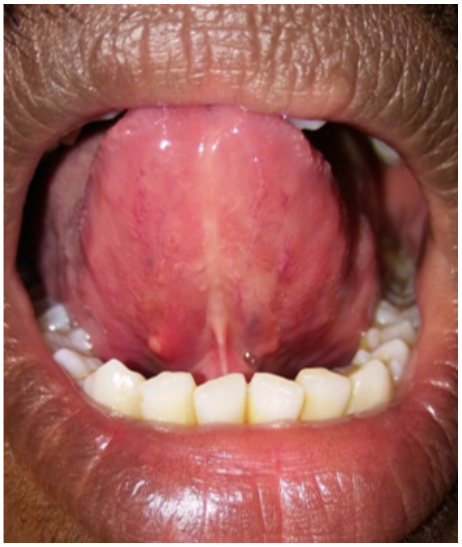

Fig. 3: Post-operative picture after 1 year healing

linguae, the condition leads to a hyper salivation which may lead to dental hygiene problems.[4] The condition had utmost social impact in the life of the affected person that it may cause a social withdrawal and many other psychological issues. Decision making in the management of Ankyloglossia depends on the severity of problem it presents with.[9] A relatively asymptomatic case may be followed up conservatively but if it is affecting the normal life of the individual or posing health issues it should be managed actively.[10] The most common procedure used to relieve tongue tie is a lingual frenulectomy where the frenulum is surgically divided using a scalpel or electro cautery or by a laser procedure. In some cases, speech therapy may be required after the procedure along with postoperative exercise session.[9–12]

5. Conclusion

This case report aims to improve the awareness and knowledge about the advantages of using Diode lasers in the treatment of Ankyloglossia among surgical and dental specialties and emphasize on the hidden multiple dimensions of this problem which seems to be very harmless at the first glance. It also stresses on the multidisciplinary approach that had to be adopted for the successful outcome of the problem.

6. Source of Funding

None.

7. Conflict of Interest

None.

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