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Laser Assisted Lingual Frenectomy For Ankyloglossia: A Case Report

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Abstract
Tongue is the major oral structure which influence verbal communication or speech, tooth position, periodontal tissue, nutrition, swallowing, nursing, and certain social activities. Ankyloglossia also termed as tongue tie, is a birth anamoly or congenital oral defect that limits the ability of the tongue tip to move freely due to uncommonly short, thick lingual frenulum, a membrane joining the ventral surface of the tongue to the floor of the mouth. Ankyloglossia, if neglected or go undiagnosed in early stages may lead to number of problems like feeding difficulties, social issues and may also lead to speech disorder all over life. Early intervention of tongue tie by frenectomy may surmount speech struggles by speech therapy. Considering the risk benefit ratio, treatment of tongue tie should be carried out at any time of life. Since tongue is extremely vascular and agile structure, laser-aided lingual frenulum removal may be considered effortless, harmless and comparatively less traumatic than other treatment modes. This paper reports a case of ankyloglossia of an adult male patient managed by diode laser.

Keywords: Ankylossia, tongue-tie, short lingual frenum, diode laser, lingual frenectomy

INTRODUCTION

The lingual frenulum is a fibro-mucosal fold that bridges the ventral surface of the tongue and the mucosa of the oral pavement.[1] Originally, term "ankyloglossia" developed from the Greek words "agkilos" (curved) and "glossa" (tongue).[2] Reduced motility of the tongue is mainly due to the existence of short lingual frenum. There exist various classification for lingual frenum anomalies. It was classified according to different levels of gravity, for example distinguishing four grades on the basis of the type of lingual insertion.[3] Kotlow's assessment classifies ankyloglossia into 4 classes of which Class III and IV tongue-tie categories should be given special consideration because they severely hamper the tongue mobility.[1]

Ankyloglossia, if neglected or go undiagnosed in early stages may lead to number of problems like feeding difficulties, social issues and may also lead to speech disorder all over life. Early intervention of tongue tie by frenectomy may surmount speech struggles by speech therapy.[4] Ankyloglossia may also avoid the tongue from touching the anterior palate. This may then lead to infantile swallow and hinder adult-like swallow development causing an open bite deformity. Also it may cause mandibular prognathism due to the excess anterior thrusts by the tongue when it contacts the anterior portion of the mandible.[5]

CASE REPORT

This paper reports a case of ankyloglossia of an adult male patient with restrition of tongue movements and speech problems managed by diode laser.

CASE

A 45 year old healthy male patient reported to the Department of Periodontology with a chief complaint of difficulty in movement of tongue since the skin under the tongue gets stuck between lower front teeth and also when talking on phone the other person is not able to understand his speech. On intra-oral examination, the patient had a short lingual frenum (Figure 1) and was not able to protude the tongue completely i.e.partial ankyloglossia was present, also it was noticed that patient was unable to touch the palate with the tip of tongue. According to Kotlow's classification, moderate ankyloglossia was diagnosed.[1] (Figure2) A slight cleft on the anterior tip of the tongue was seen on protrusion. (Figure 3)

Figure 1. Pre-operative (Occlusal view)

Figure 2. Pre-operative, front view
(showing limited elevation of tongue)

Figure 3. Pre-operative, front view
(showing limited protrusion of tongue)

MANAGEMENT

After obtaining informed consent from the patient, lingual frenectomy was envisaged by utilizing soft tissue diode laser. Firstly, the area under the tongue was dried and then topical anesthestic gel was applied to the mucosa of floor of the tongue adjacent to frenal area. Then bilateral local anesthetic infiltration (2% lignocaine 1:80000) was given in the lingual mucosa adjoining the lingual frenum. Traction suture was avoided since the patient was apprehensive about it. After the anesthesia started acting, the tongue was retracted carefully and frenectomy was started using Diode laser (810nm). The tip of the laser was first activated by touching the tip on articulating paper at 2W in a continuous mode. The diode laser was utilized in a contact mode with focused beam and the tip of the laser was advanced from apex of the frenum to the base in a brush like stroke to cut the frenum. The ablated tissue is then constantly mopped up with wet guaze piece to care of the charred tissue as well as to avert thermal injury to the underlying soft tissue. There was no bleeding seen after the procedure hence suturing was avoided (Figure 4). Favourable results of the treatment were evident immediately post operatively and can be assessed. Immediate post operative protrusion of tongue was then examined for complete removal of frenum (Figure 5).

Figure 4. Immediate Post-operative view (laser assisted lingual frenectomy)

Figure 5. Immediate Post-operative protrusion of tongue

Patient was prescribed with antibiotics, analgesics and warm saline rinse for better and speedy recovery and was reviewed after a week. Follow up showed uneventful healing with increased tongue mobility following laser surgery. Patient was then advised to refer to speech therapist for speech correction and refinement. Follow up after 9 months showed marked improvement in tongue protrusion, elevation and mobility. Also the patient was able to touch the palate with the tongue (Figure 6 and Figure 7). Patient was extremely content with the better speech results.

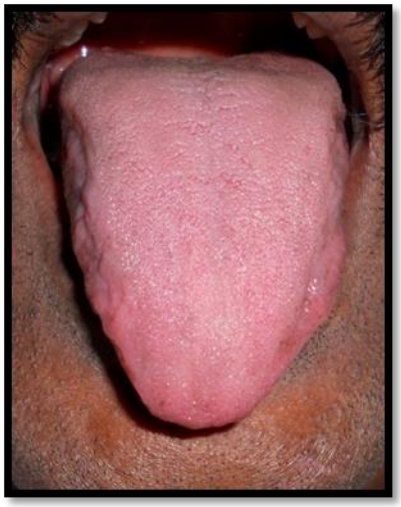

Figure 6. Post treatment after 9 months

Figure 7. Post treatment after 9 months with marked improvement in tongue

DISCUSSION

Ankyloglossia epitomizes a distinctive interdisciplinary problem which deals with various specialties in dentistry which range from periodontics, pedodontics, to oral surgery. It's presence can be witnessed neonates, children, or adults and it's prevalence varies from 0.1% to 10.7%, with trivial male predilection.[6,7] The exact cause and development of ankylossia is not known but genetic role with the probable association of human G-protein coupled receptor gene (Lgr5) have been advocated.[8]

Treatment of ankyloglossia remains debatable since practitioners of several specialties have widely diverse opinions concerning its significance and treatment. Mostly in patients with ankylossia the disorder remains asymptomatic and may settle spontaneously and also the affected individual may get used to the reduced tongue mobility hence compensate adequately. Though some patients may have an advantage from surgical intervention (frenotomy, frenectomy or frenuloplasty) for their tongue-tie. It is always better to educate the patient or their guardian about the probable possible long-term effects of tongue-tie so they can always make a decision about the possible therapy.[7]

Tongue-tie is mostly diagnosed in adults when there is dental malocclusion which may imply a wrong lingual posture, pathological swallowing or in geriatric patient wearing denture complains of pain or instability of prostheis due to short lingual frenum. Sometimes patients also complains of sleep disturbance, or postural problems (neck pain, etc.).[9] Tongue tied individuals may not swallow and chew food adequately which may increase the gastric distress and bloating, and snoring and bed wetting at sleep are common among tongue-tied children. Dental caries (due to reduced tongue mobility and sweeping of saliva), malocclusion, spreading of lower incisors with periodontitis, and tooth mobility due to long-term tongue thrust are associated problems. It also affects self-esteem as noticed clinically that some times older children or adults will be self-conscious or embarrassed about their tongue-tie because they may have been mocked by their collegues for speech difficulties. In infants, feeding problem may be experienced due to latching on to the nipple.[10-14]

There exist various treatment options to release the frenum surgically either by frenotomy or frenectomy. In both the cases, the intervention on the short lingual frenum is easy, of brief time interval, and does not present particular complications. Also these procedures can be done with diferrent devices i.e. with typical cold blade scalpel, or by using laser which has more advantageous over the conventional surgical procedure.[15] Advantages of laser frenotomy over surgical intervention are: minimal invasive procedure with reduced trauma, bleeding and scarring,patient can be sent for immediate post-operative speech therapy, use of topical anesthesia instead of infiltration in most cases and also the operative time is reduced.[16]

In adults, but mostly in children, laser therapy shows numerous benefits in dental treatments. Fear of scalpel, and in most cases local anesthesia and it's risk can be prevented by the use of laser assisted approach. Laser also has an advantage of anti-bacterial effect that reduces the risk of infections and recidivisms, avoiding the swelling and the inflammation that usually occurs after surgery.[17,18]Histologic studies have revealed less number of myofibroblast in laser wounds which results in reduced wound contraction and scarring and hence improved healing.[19]

CONCLUSION

Ankyloglossia is a relatively harmless condition and the treatment is quiet simple and safe. Considering the risk benefit ratio, treatment of tongue tie should be carried out at any time of life or age. Since tongue is extremely vascular and agile structure, laser-aided lingual frenulum removal may be considered effortless, harmless and comparatively less traumatic than other treatment modes since it provides practical benefit to the patient as it reduces bleeding, postoperative pain, and swelling.

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