

Case Report

Management of Ankyloglossia In Pediatric Patients using Diode Laser-Case Report

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Abstract

Ankyloglossia, is one of the widely found anomalies in the general population with no existing age differences. Ankyloglossia or tongue-tie leads to a variety of speech and associated problems. Frenectomy with diode lasers when compared to conventional surgical techniques provides reduced or negligible blood loss along with little or no postoperative pain. Lasers have become an amicable and widely prospective treatment modality in Pediatric Dentistry. Its high acceptability rate among children have embedded in designing and formulating stress free environment in Pediatric Dentistry. Hence it is essential to be familiar with adequate knowledge and needed treatment modalities according to the child's developing pattern. This article presents with case reports in which diode laser had been utilized for frenectomy procedure.

Keywords: Laser treatment, Diode Laser, Pediatric Dentistry, Ankyloglossia, Frenectomy

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Introduction

Ankyloglossia originates from the Greek words "agkilos" (curved) and "glossa" (tongue) and hence termed as tongue tie [1]. Wallace had described ankyloglossia "as the inability of the tongue tip to be protruded due to pertaining short lingual frenulum" [2]. Complete ankyloglossia is very rare to be found in which the entire tongue is attached to mouth's floor thereby restricting any further mobility [3]. The most accepted treatment modality for tongue-tie is frenectomy. Surgical frenectomy

with conventional scalpel and blade had been the recommended treatment technique ever since tongue tie had been identified. Lasers are predominated to possess varied applications in dentistry. The use of laser therapy has dominated the dentistry world as an affordable and widely accepted treatment modality than the existing conventional methods of blade and scalpel. The diode lasers efficacy in treating soft tissues is related to their higher concentration of chromophores [4]. The laser application of maintaining it in contact thereby

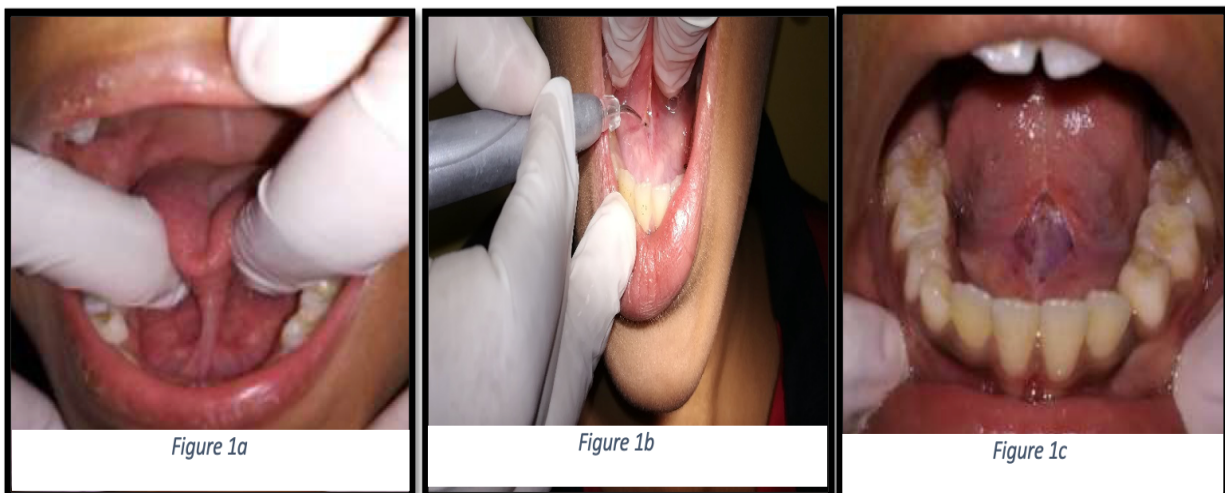
creates a tactile sensory feedback at the surgical site [4]. The main objective of Pediatric Dentistry is in providing the required dental care to pediatric dental patients in a stress-free and comfortable environment [5].

Case Reports: lingual frenectomy

Three children, two boys of age 8 years and a girl of age 9 years came to the department with complaining of difficulty in pronunciation. On clinical examination intraorally, all the three patients restricted tongue mobility. The parents of the three patients were very concerned about the present condition as it hampered the child's confidence and also hindered their speech. After a detailed explanation of the surgical procedure, all three were confirmed to be a cases of Ankyloglossia. Written informed consent was obtained from parents of the three children and lingual frenectomy was planned using diode laser (Biolase®; Biolase Tech, San Clemente, CA, USA) with 980 nm in continuous mode at 1.8 Watts (W) and under local anaesthesia (one cartridge of 2% Lidocaine with Epinephrine

1:100,000). The children and the operator were protected with appropriate eyeshields and were treated in a subsequent manner. Firstly the tongue tip was immobilized, then the lingual frenum was dissected. The diamond incision was then given to release the lingual frenulum using laser beam. In order to provide adequate and recommended tongue movement the tightly embedded muscle fibres were separated from floor of mouth. The adjacent tissue surfaces were cooled down from the heat generated by using high volume suction evacuator. After obtaining hemostasis sutures were placed to prevent any further chances of bleeding. Paracetamol 200 mg and 0.2% chlorhexidine mouth wash were prescribed. The parents were told to nourish their children with a comparatively soft and cold diet for the next 4 days as this would promote rapid healing. The 1 week follow up was uneventful, with no delayed hemorrhage and normal wound closure (Figure: 1a,2a,3a) Preoperative (1b,2b,3b) Intraoperative (1c,2c,3c) Post operative).

CASE 1



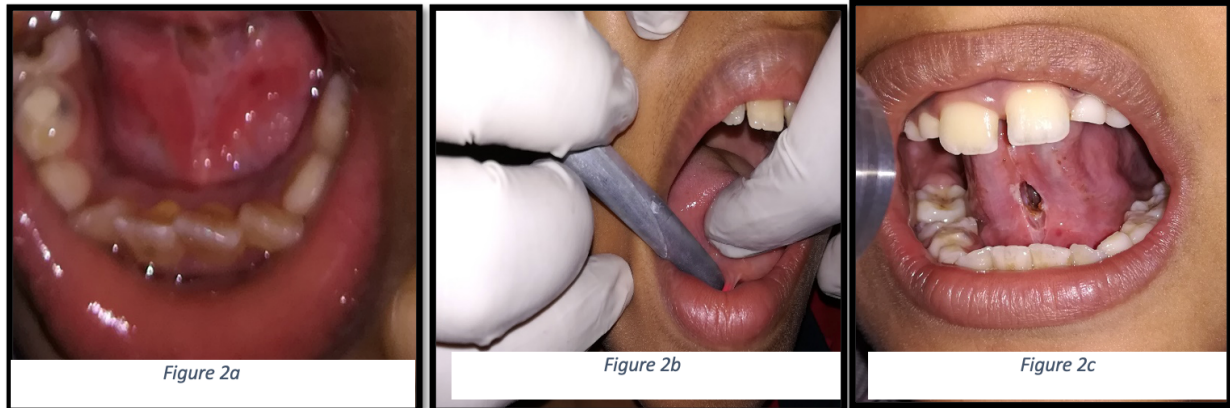
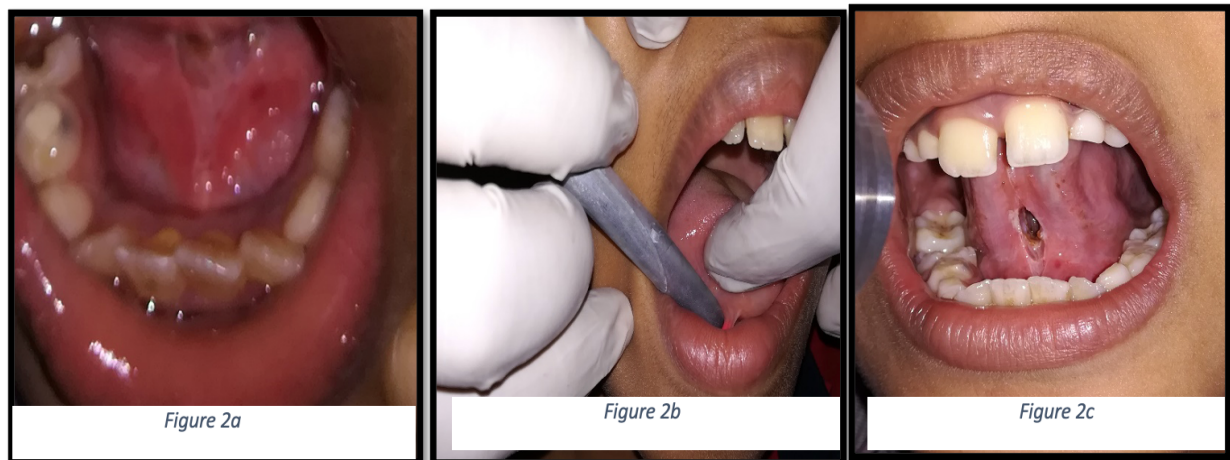
CASE 2**CASE 3**

Figure:(1a,2a,3a)Preoperative(1b,2b,3b)During procedure(1c,2c,3c) Post operative

Discussion

Ankyloglossia is defined as the inability of the tongue tip to be protruded due to a persisting short lingual frenulum along with existing difficulties in speech. [6] The free tongue is defined as the length from insertion of the lingual frenulum to the tongue base [6]. Based on the length of free tongue, five categories can be distinguished, which are as follows [7].

Clinically acceptable normal, 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

Ankyloglossia has been associated with midline diastema, oral motor dysfunction, and gingival recession [7].

The diode laser is predominantly composed of semiconductor crystals of any of the following metals namely aluminium iridium, gallium, or arsenic [7]. The normal acceptable wavelength range of diode lasers is from 810 nm - 1064 nm [7]. The diode laser chromophores are melanin hemoglobin and oxyhemoglobin which are colored pigments. Diode lasers are used in two types of modes which are the continuous wave and pulsed wave modes. Pulsed mode is used in frenectomy, pulpotomy and for canal disinfection. The continuous wave mode causes extreme heat buildup resulting in subsequent damage of the surrounding as well as target tissues. This resultant heat can be lowered by moving the laser beam in a faster motion [8]. The diode houses a flexible optic fiber which directs the laser beam to the target [8]. The smaller the diameter of the fiber greater will be the power. Thus, lasers can reduce psychological trauma and fear among children as well as adults during the dental visits [9].

Several postoperative exercises were advised to patients following frenectomy. These exercises provided the following functional improvements: (i) Develop new muscle movements, (ii) Increase kinesthetic awareness of the full range of movements the tongue (iii) Encourage tongue mobility [10].

Conclusion

Pediatric Dentistry is a dental specialty which requires the most easy, less time consuming and comfortable treatment modalities which is acceptable and welcoming the child to acquire the advocated treatment modalities. The three case reports of lingual frenectomy which was

carried out successfully in a very comfortable environment using diode dental lasers brings in to light that laser assisted minor surgical procedures can be used as an adjunct to conventional surgical techniques which might aid in creating a more child friendly treatment atmosphere. Further more larger studies and case presentations have to be carried out using dental diode lasers which would signify its advantages on a broader scale regarding its wide range of applications.

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