An Alternative Method to Treat Ankyloglossia

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Ankyloglossia entails short lingual frenum, impairing satisfactory tongue movement and leading to problems related to deglutition, feeding and diction. This clinical report uses laser technology, rather than traditional surgical procedure with scalpel, to perform a lingual frenulotomy on a 9-year old child diagnosed with ankyloglossia, aiming to investigate more conservative and less traumatic dental procedures. Due to the many advantages of the laser device, such as bloodless surgical field, absence of sutures, minimal swelling and post-surgical pain, the high intensity diode laser is a viable alternative technique in soft tissue surgeries.

Key words: *lasers, surgery, ankyloglossia*

INTRODUCTION

Nowadays in pediatric dentistry, there is a continual pursuit for minimal intervention procedures, which also require less operative time because most children exhibit higher levels of fear and anxiety. Ankyloglossia or "tongue-tie" is an uncommon congenital abnormality, characterized by a short lingual frenum and some dysfunctional alterations in the genioglossus muscle. In most cases, the treatment consists of removing this frenum by scalpel, leading to a painful and uncomfortable post-surgical period, mainly because of the sutures. However, there are some alternatives to the conventional method, which can make the procedure more comfortable for children. One frequently employed alternative in surgeries involving soft tissues is the utilization of a laser device mostly because of advantages, such as no bleeding, pain or suturing[1,2].

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The laser is an electromagnetic radiation propagated in waves and different types of laser, each with a specific wavelength, can be selected depending on the characteristics of the tissue irradiated[3]. Lasers can be classified according to their use, e.g., low intensity when applied for biostimulation and high intensity frequently used to perform oral surgeries. The diode laser offers a feasible alternative to surgeries in soft tissues, as they are relatively inexpensive and easy to use. It operates at a wavelength ranging from 620 to 904nm and uses a pulsed or continuous waveform. Finally, its interaction with the tissues involves vaporization and coagulation as the incision is performed[4].

The aim of this study was to report a lingual frenulotomy in a 9-year old child using a high intensity diode laser.

Case Report

The ASA 1 patient was attended at a clinic. During anamnesis and clinical exam, an abnormal lingual frenum accompanied by speech problems was observed. After analysis, the diagnosis was established as ankyloglossia and a frenulotomy was recommended as treatment (Figure 1A).

The device used was a diode laser (Thera Lase Surgery – DMC equipment – São Carlos, SP) operating at a wavelength of 810nm, continuous mode. An output of 2000 milliwatts was established and the energy dose used in the surgery was 272 Joules. A minimum amount of anesthetics was utilized in the anesthesia which was performed bilaterally at the frenum. As the procedure did not involve a deep cut and was easily controlled, it was not necessary to place a suture in the tip of the tongue for immobilization—instead, only a piece gauze was utilized. Incision was performed using the laser beam guided by an optical fiber in a transverse direction for its release (Figure 1B). After an initial incision, an additional incision on the horizontal plane was performed to increase the amplitude of movement. This incision was performed up to the point where the patient was able to touch her tongue tip to the incisal papilla and to stick her tongue out past her lips. During the entire surgery,

Figure 1A Pre-operative view. Short lingual frenum is extremely fibrous and firmly adhered to the mouth floor. Figure 1B Immediate post-surgical. Incision accompanied by absence of sutures and bleeding.

Figure 2.A One week after surgery. Secondary intention healing as a result of production of granulation tissue and re-epithelization. Figure 2.B Four weeks after surgery. Complete healing and full tongue amplitude observed in the final exam.

aspiration was utilized only for the vapor produced in the cutting of tissues. No bleeding was noticed in the procedure and no sutures were needed. In the immediate post-operative period, the patient displayed improved amplitude of tongue movement and Paracetamol 200mg/ml was prescribed, in case of pain.

After 24 hours, the child reported only slight discomfort and a single dose of analgesic was administered. One week after surgery, when the clinical exam was performed, the surgical site presented a small wound and the patient had no difficulties to perform lingual movements (Figure 2.A). In the final exam, four weeks after frenulotomy, healing was completed, which due to the absence of sutures, occurred by secondary intention, as a result of production of granulation tissue and re-epithelization. Wide lingual mobility was observed in the clinical exam, indicating a successful procedure (Figure 2.B).

DISCUSSION

It was clear that the patient had abnormal insertion of the lingual frenum, impairing proper tongue movements and interfering in speech, leading to the diagnosis of ankyloglossia. Therefore, frenulotomy, which is the repositioning of the frenum to another site was the best treatment option. It is well known that ankyloglossia when not treated, can result in problems related to feeding, deglutition, suction and diction[5]. Thus, an adequate anamnesis and clinical exam are necessary to discern cases in which surgery is indicated.

In the literature, three techniques for soft tissue surgery are well documented[6]. The most common and traumatic to the patient is known as the conventional technique, in which a scalpel and surgical scissors are used to cut or remove the frenum. It is also documented that laser device and electrosurgery can be utilized in such cases and these are less traumatic, especially when treating pediatric patients.

Laser surgery was chosen rather than electrosurgery due to the known advantages of the former. It is cited in the literature that electrosurgery can be more painful because of excessive tissue damage[6,7]. Thus, although both techniques demand less operative time and offer a better post-surgical period in comparison to the conventional method, laser surgery still provides the best post-operatory period.

The output of the laser device should be established at the beginning of the procedure to determine the depth of penetration. A higher output produces a deeper incision in the vaporized tissue[4]. In this case report, output was set at 2000 milliwatts, since sectioning and vaporization at this setting were neither too slow, nor produced a deep wound. In this sense, there was minimal thermal tissue damage.

As documented in this case report, laser technology offers many benefits when compared to the conventional method, which include a bloodless surgical field, minimal swelling and post-surgical pain, fewer functional complications (chewing and speaking), less wound contraction, reduced rates of post-operative infection and no suturing needed[1,8,9]. It is noteworthy that the laser beam penetrates soft tissues sealing blood vessels and nerve endings, therefore, most patients experience virtually no pain in the post-surgical period[10].

Another advantage to laser surgery is the lowered anxiety levels observed during this procedure as described by our patient. This finding is in accordance with a previous study[1], which evaluated anxiety levels of patients prior to laser and conventional surgery. The author observed that when laser was conducted as the first treatment to perform frenectomy, the patients reported less anxiety in the second surgery (conventional) which was not observed when the opposite was performed.

Notwithstanding, in some cases, recurrence can be observed after the frenulotomy. Although healing occurs by secondary intention, which could lead to recurrence as observed after conventional surgery, it is likely that interactions between laser and tissues, such as vaporization and cauterization, hinder the growth of a new frenum, minimizing this possibility.

Although there are many advantages to this technique, the laser surgery must be performed carefully because the laser beam interacts with eyes and tissues adjacent to the surgical wound. Thus, protective eyewear must be worn by the patient, assistants and operator. Another disadvantage entails the cost of the device which varies in accordance with the different types of laser available.

In conclusion, due to the benefits of laser technology in surgery involving soft tissues, the high intensity diode laser can be used as an alternative technique. For pediatric patients, this procedure is especially suitable because it requires less operative time and a more comfortable post-surgical period.

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