

# LASER LABIAL FRENECTOMY IN A 12 YEARS-OLD PATIENT -A CASE REPORT

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## Abstract

We present the case of a 12 years-old male patient with maxillary diastema induced and maintained by labial frenum in which we performed a laser-assisted labial frenectomy.

**Keywords:** frenectomy, diastema, diode laser

## Introduction

Frenulum is an anatomical fibrous mucosal fold of congenital origin located on the midline, which connects the lips and cheeks to the alveolar mucosa or gingiva and the underlying periosteum (1). It is composed from connective, fibrous, muscular or fibromuscular tissues, covered with a mucosal membrane (2). Its main function is to modulate the labial movement, but when it grows beyond the normal limits and is located very close to the marginal gingiva, it acts like a limitation for the lip movements and as a local contributing factor in the appearance of teeth, diastemas, teeth deformities, dental plaque accumulation and speech problems (1, 2).

The upper lip frenulum extends from the internal surface of the upper lip to its insertion on the midline of the attached interincisal gingival tissue of the upper maxilla and in children, these frenula cause interincisal diastemas, which in turn require orthodontic treatment, entire-related problems, periodontal disease secondary to retained or impacted food, oral hygiene difficulties, and impairment of lip mobility and/or a short lip (2).

A radiological study is also required to discard other possible causes of diastemas, such as mesiodens, odontoma or root cysts, among other causes, and assess the characteristics of the interincisal bone (3).

Treatment of diastema varies and it requires correct diagnosis of its etiology and early intervention relevant to the specific etiology. No treatment is usually initiated if the diastema is physiological/transient as it spontaneously closes after the eruption of permanent maxillary canines (11-12 years) (4).

The conventional frenectomy techniques involve complete excision of the frenum, including its attachment to the alveolar bone, followed by the suture of the remaining wound edges. This type of soft tissue excision carries the routine risks of surgery like bleeding, postsurgical pain, discomfort and a longitudinal surgical incision and scarring,

problem that may lead to periodontal involvement and an unaesthetic appearance (5).

Another approach of this pathology is represented by the laser-assisted surgery which can be performed with various types of lasers: neodymium-doped yttrium aluminum garnet (Nd: YAG), carbon dioxide (CO<sub>2</sub>), erbium YAG (Er: YAG), erbium, chromium YSGG (Er, Cr: YSGG) (1, 2, 6-10). Many authors have described the use of different lasers in oral soft tissue surgery (1, 2, 6-10).

## Case report

We present the case of a 12 years-old male patient with maxillary diastema maintained by upper lip frenulum. The patient's medical history did not reveal any systemic diseases. Intra-oral examination revealed presence of high frenum attachment, with strong connective tissue fibers (Figure 1) and midline spacing between maxillary central incisors, the latter also revealed at the X-ray exam (ortopantomography) (Figure 2).

After obtaining informed written consent from the parents, decision was made to remove high frenum attachment by a laser-assisted technique. Frenectomy was carried out under local anesthesia with Diode Laser Epic X® (BIOLASE, California, USA), 940nm. The optical fiber used was 400 µm diameter allowing a very fine soft tissue cut (Figure 3) used in pulsed mode CP2 (comfort pulse) at a power of 2 W.

The patient was at the recall visit, after 3 weeks, the tissues healed completely (figure 4).

## Discussion

In the conventional frenectomy procedure, the main accusations of the patients are postoperative discomfort, pain, and bleeding caused by the sutures (1). Remarkable aspects of laser surgery in pediatric dentistry are the minimum level of pain felt by the patient during (the local anesthesia is not mandatory) and after the procedure, the reduction of bleeding, swelling and scarring. Furthermore higher precision of the practitioner when compared to surgical tools represents a major feature which recommends this time-saving technique in the management of the pediatric cases (6).

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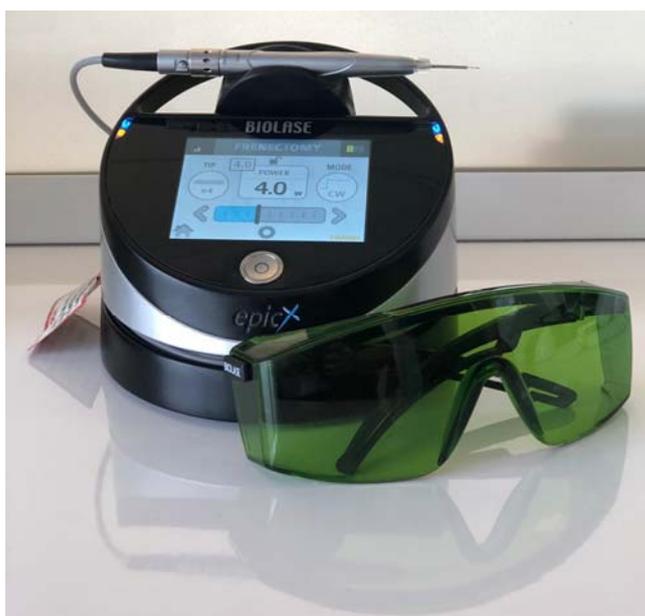
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**Fig.1.** Intra-oral linical aspect of the upper-lip high frenal attachment



**Fig. 2.** Radiographic examination (orthopantomography) of the patient



**Fig. 3.** Diode Laser Epic X® (BIOLASE, California, USA)



**Fig.4.** Intra-oral clinical aspect of the interventional site after frenulum removal



**Fig. 5 a, b.** Intra-oral clinical aspect of the interventional site after healing (3 weeks from the intervention).

Another benefit for the patient is the reduced risk of postoperative infection ensured by the lack of sutures needed (healing is by second intention) which usually accumulate dental plaque and by the fact that the laser beam provides a sterilization of the tissue during the process (1).

The CO2 laser offers a bloodless field and shorter surgical times compared with the Er, Cr: YSGG laser, the latter being considered for the post-op faster wound healing (2). The Nd: YAG laser surgeries have significant advantages over the conventional technique like minimal or no bleeding after treatment (1).

The great superiority of diode laser frenectomy in children is represented by the possibility to avoid needle-infiltrated anesthesia, when set at pain-free parameters. This might represent an advantage to the patient, but at the same

time a prejudice for the clinician considering the time required for this procedure. The good compliance and cooperation with our case patient allowed us to use a higher power for this wavelength under local infiltration anesthesia.

### **Conclusions**

This case report indicates that diode laser treatment used for frenectomy operations provides better patient perception in terms of postoperative time, pain and function than that obtained by the conventional scalpel technique.

Considering the above advantages, when used correctly, the use of diode laser offers a safe, efficient, acceptable, and impressive alternative for frenectomy operations.

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