Case report

Upper-lip laser frenectomy without infiltrated anaesthesia in a paediatric patient: a case report

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Abstract
Labial frenectomy is a common surgical procedure in the field of oral surgery. Labial frenectomy is a procedure usually done for orthodontic reasons. The role of laser surgery in the oral cavity is well established. The use of diode laser frenectomy without infiltrated anaesthesia is currently under investigation. Needle-less oral surgery, without infiltrated anaesthesia, is a novel situation in paediatrics with paramount importance.

Introduction
The role of laser in dentistry is well-established in conservative management of oral diseases [1]. In oral surgery, it is still under evaluation [2–4]. This seems to be unavoidable if we consider that in the surgical science it is very difficult to perform an organized double-blind randomized controlled trial, which is the prerequisite for the estimation of each surgical technique.

The diode light equipment may be considered a modern laser technology in the field of dentistry. Diode laser showed good results as an extra adjunct to the classical methods in the management of inflamed periodontal tissues and endodontics [3,5,6].

Currently, painless procedures are secured by using local or general anaesthesia. This case report describes the parameters of performing upper labial frenectomy in pediatrics without infiltrated local anaesthesia. Moreover, the reassurance of the patient about the painless procedure is one of the most important criteria.

Case presentation
A 9-year-old Caucasian boy of Greek nationality was referred by his orthodontist for assessment of the upper anterior labial frenum (Figure 1). The medical history was free. The dental history was composed of very minor dental procedures depending on the growth of the child.
No allergies reported. The weight of the patient was 32 kg. The height of the patient was 112 cm.

The clinical examination revealed the presence of a high frenum attachment pathologically extending to the palatal inter-incisal region. As a consequence this presented a pathological eruption of the upper central incisors laterally, and towards to the canines.

It was decided to perform laser frenectomy without infiltrated anaesthesia using specific laser parameters (Figure 2). The laser equipment was defined by the manufacturer (Lamda Scientifica Srl) as a class-II B device according to the CE conformity statement, and the parameters were 1400 mW at 808 nm with continuous output. The optical fiber used was 300 \( \mu \)m diameter allowing a very fine soft tissue cut. According to the manufacturer, the optical protective glasses had an Optical Density > 5 at the wavelength of emission from the diode. According to standard EN 60825 CEI 76-2 II, the minimum optical density has been estimated to be 4.96 at 0.05 m.

The labial frenum was sprayed with lidocaine twice. The laser fiber was applied vertically and laterally to the frenum initially causing disruption of the mucosa continuity. This easily allowed performing a deeper cut of the frenum in a horizontal dimension. The design of the frenectomy was rhomboidal allowing easy pass of the fiber-optic between the central incisors and from the buccal to palatal area. The whole procedure was performed in about five minutes, without pain. No sutures were required. Haemostasis was optimum immediately after the procedure (Figure 3). The patient was comfortable with no pain, either intra-operatively or post-operatively. The patient described the procedure as totally painless. Ten days later the healing was found to be uneventful (Figure 4). Pre-operatively, the parents of the patient had been informed verbally about the procedure finally signing a written consent form.

**Discussion**

Frenectomy is a common procedure in the field of oral and maxillofacial surgery. The advantage of laser surgery includes higher precision when compared to surgical tools, which results in less pain, bleeding, swelling and scarring. The procedure is no time consuming, easy to
experience affects the emotional status of the children when a dental procedure is to be performed.

Concluding, pain is a subjective feeling, which is very difficult to be assessed. Pain perception is another important issue in creating guidelines for surgical procedures. Diode laser surgery may be considered a useful tool for the clinician in performing paediatric labial frenectomy. The need for a randomized controlled trial is emphasized in order to establish the exact efficacy of this technique if compared to other methods. It is obvious that diode laser frenectomy may be performed without infiltrated anaesthesia with the optimum healing post-surgically. In severe cases of soft tissue excision the need of anaesthesia may be essential [11].

Consent
Written informed consent was obtained from the parents of the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests
The authors declare that they have no competing interests.

Authors' contribution
CS, MV, MT and IS were major contributors in assessing the case data. PK, WJ and TU were major contributors in writing the manuscript. All authors read and approved the final manuscript.

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