

# Correction of Habit along with Laser Assisted Frenectomy in High Frenal Attachment - A Case Report

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## ABSTRACT

Digit sucking is the most prevalent oral fixation seen in young toddlers. Digit sucking can be brought on by fatigue, boredom, excitement, hunger, fear, and both mental and physical stress. If these practices persist until the preschool years, when permanent teeth start to erupt, they may operate as a substantial environmental etiological factor in the development of malocclusion. The diode laser can be used to successfully remove pathological frenum. The diode laser can be used in paediatric dentistry due to its application, adequate coagulation, lack of need for sutures, and decreased discomfort and inflammation. In the case study presented in this paper, an 8-year-old female patient who had a high frenal attachment and had thumb-sucked her entire life was treated with fixed appliance therapy and laser labial frenectomy. In addition to resolved malocclusion, acceptable secondary intention wound healing, and beginning functional recovery of a physiological upper lip movement, the clinical evaluation revealed that the malocclusion had been corrected. The surgery was well tolerated, according to the patient.

**Keywords:** Thumb sucking, Fixed appliance therapy, Laser frenectomy

## INTRODUCTION

Children frequently exhibit the oral habit of sucking their fingers. It can be identified by the positioning of one or more digits at

various mouth depths. According to data from various researchers, the prevalence of this practise among children ranges from 1.7% to 47%.<sup>[1]</sup> This behaviour may start early in life and persist throughout primary, mixed, and permanent dentition from infancy.<sup>[2]</sup> Malocclusion may form if the habit persists throughout the mixed dentition. The negative effects of digit sucking are visible in the child's dentition as proclined and flared maxillary and/or mandibular incisors, the emergence of an anterior open bite, and Class II malocclusion. Other consequences that may result from such a practice include changes in the child's digit's morphology, swallowing pattern, speech deficiency, and swallowing pattern deviation. To get kids to stop thumb sucking, two "reminder therapy" techniques are frequently applied. These are appliance therapy and response prevention. Parents typically use the former, which entails the use of bitter taste solution, thumb guard, mitten, wearing socks and other methods. The latter includes use of orthodontic appliance either fixed or removable of various designs in order to make the habit rather unpleasant and difficult to be practiced.<sup>[1]</sup> The use of a corrective appliance to manage oral habits is indicated only when the child wants to discontinue the habit and needs only a reminder to accomplish the task.<sup>[3]</sup>

The use of lasers in dentistry is widely known to treat the oral diseases conservatively.<sup>[4]</sup> Diode laser showed good results as an extra adjunct to the classical methods in the management of inflamed periodontal tissues and endodontics.<sup>[5]</sup> 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.<sup>[6]</sup>

The procedure is no time consuming, easy to perform in an outpatient set and no sutures are required, which decreases the risk of post-operative infection.<sup>[7]</sup> This paper presents a clinical case of using nonpunitive reminder therapy to intercept the thumb-sucking habits of an 8-year-old child along with laser frenectomy.

### CASE REPORT

An 8-year-old female child reported to our department with the chief complaint of misaligned teeth. An anterior open bite and a tendency of anterior tongue thrusting were discovered during the intraoral examination of the patient. An ovoid callus approximately 2 cm by 2 cm was discovered during an extraoral examination on the dorsal surface of the left thumb. A thorough history revealed that the patient's habits of thumb sucking, which she has been doing since she was 2 years old, has now continued and given rise to a secondary habit of tongue thrusting. She had a subconscious tendency of exclusively thumb sucking when she was asleep. The patient would place the thumb completely in her mouth and suck it regularly for about 8-9 hrs/day. The cause of her thumb-sucking behaviour was fairly associated with the psychological stress in her household. However, the detrimental effects of the thumb sucking habit over a period of 6 years showed anterior open bite, disturbed eruption of the laterals, increased overjet, decreased overbite, and lip incompetence (Figure1). Further intraoral examination showed high labial frenum attachment which caused deviation of both the centrals.

Labial frenectomy would help the proper alignment during eruption of all the anterior. Hence, accordingly the frenectomy was planned after the habit correction.

Patient and parental counselling was done which revealed that the child felt insecure to sleep alone. Application of femite or red chilli powder showed not effect in order to cease the habit. Hence, the fixed appliance therapy was planned in order to correct the habit (Figure 2, Figure3)

On three months follow up there was proper eruption of the anterior teeth seen along with the closure of the anterior open bite (Figure 4) but the secondary tongue thrusting habit persisted so the removable appliance therapy was planned where the removable palatal crib was delivered to the patient (Figure 5). Further the labial frenectomy was planned for high frenal attachment. Laser assisted frenectomy was performed and the frenum was relieved (Figure 6).

After six months there was complete interception of habit achieved along with the proper alignment and eruption of the anterior teeth (Figure 7).



Figure 1: Pre-operative image



Figure 2: Occlusal view of fixed intraoral appliance



Figure 3: Anterior view of appliance therapy



Figure 4: Three months follow-up



Figure 5: Removable palatal crib



Figure 6: Laser frenectomy



Figure 7: Postoperative image after 6 months

## DISCUSSION

Prolonged digit sucking habit is responsible to cause many harmful effects on the child. A child could develop speech issues such as mispronouncing Ts and Ds, lisping, and thrusting out the tongue while talking. Usually it is associated with anterior open bite and secondary tongue thrust habit develops, exaggeration of the conditions is seen in this case also. Thumb sucking habit treatment consists of different modalities such as behaviour modification strategies, myofunctional treatment, appliance therapy. [8]

In the first two weeks the counselling, the parents were instructed to let the child sit in front of a mirror and continue his thumb-sucking habit observing himself by indulging in the habit (Dunlop beta hypothesis) but this is useful only if the child performs thumb sucking in the conscious state. [9] After that reminder therapy chemical means such as femite was also suggested. When the femite was not successful further the appliance therapy was introduced as a reminder appliance. Presence of crib in return reduces sucking pleasure and also serves – reminder therapy. [10]

In this present case, laser assisted frenectomy was done. The advantage of laser surgery includes higher precision when compared to surgical tools, which results in less pain, bleeding, swelling and scarring. It is easy to perform in an outpatient set and also no sutures are required, which decreases the risk of post-operative infection. Higher precision required as if the laser contacts the hard tissue it may cause necrosis of the tissue. [11] Avoiding needle-infiltrated anaesthesia should be the primary benefit of diode laser frenectomy in paediatrics. When compared to electrosurgery and blade incision, which both require anaesthesia, the time needed for frenum removal utilising a diode laser in pain-free conditions is less. [12]

A delayed healing as compared to that in the conventional scalpel techniques, a reduced surgical precision which results in an inadvertent laser-induced thermal necrosis

and/or a photo acoustic injury, are some of the complications which are associated with lasers. [13] The application of diode and Er:YAG lasers in labial frenectomies in infants have also been reported without any complication. [14]

## CONCLUSION

In contrast to other approaches, the fixed appliance therapy proved to be quite comfortable for the patient and was effective in intercepting the habit quickly. Laser surgery has a well-established place in the oral cavity. Investigations are currently being conducted about the use of diode laser frenectomy without infiltrated anaesthesia. A novel scenario in paediatrics with the utmost significance is needle-free oral surgery performed without infiltrating anaesthesia.

### Declaration by Authors

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