

## A Case Report of Multifocal Epithelial Hyperplasia (Heck's Disease) Treated with CO<sub>2</sub> Laser

Javad Sarabadani<sup>1</sup>, Sahar Heydari<sup>2</sup>, Amir Mashreghi<sup>3</sup>, Niloofar Poornazari<sup>4</sup>

<sup>1</sup>Javad Sarabadani, Oral and Maxillofacial Disease Research Center, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>2</sup>Sahar Heydari, School of dentistry, Mashhad University of medical sciences, Mashhad, Iran

<sup>3</sup>Amir Mashreghi, Department of Orthodontics, School of dentistry, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>4</sup>Niloofar Poornazari, School of dentistry, Mashhad University of medical sciences, Mashhad, Iran

Received 9 May 2017 and Accepted 24 June 2017

### Abstract

Focal epithelial hyperplasia or Heck's disease is a rare benign lesion of oral mucosa caused by human papilloma virus especially subtypes 13 and 32. The disease is predominantly found in children and adolescents with indigenous heritage. This paper reports a unique case of Heck's disease in an 11-year-old Iranian girl with multiple, bilateral and elevated lesions on the buccal and labial mucosa. The lesions had persisted for a year. The disease was diagnosed as focal epithelial hyperplasia through the clinical examination. Considering esthetic and functional problems, CO<sub>2</sub> laser (Wavelength: 10600 nm) surgery was determined as a suitable choice of treatment. The patient was followed up over 1 year with no signs of lesion recurrence.

**Keywords:** Focal Epithelial Hyperplasia; Heck's Disease; CO<sub>2</sub> Laser; Carbon Dioxide Laser; Case Report.

### Introduction

Focal epithelial hyperplasia (FEH) which is also known as Heck's disease or multifocal papilloma, is a benign proliferation of squamous cells produced by the subtypes 13 and 32 of human papilloma virus (HPV) (1). Although the subtypes 13 and 32 of this virus are common, the existence of other subtypes, such as 1, 6, 11, 16, 18, 24 also have been detected in this disease. Association with some of these subtypes may indicate a malignant potential of the lesions (2,3). The long-term behavior of FEH lesions is unclear (2).

Although the disease is more common in children and adolescents, it can be seen at lower incidence in older ages (1). Some authors have stated that underdeveloped immune system in children might be associated with the onset of the disease and by development of immune system, wounds will recover spontaneously. This spontaneous recovery is presumed to be the cause of rarity of the disease in adults (4). According to previous studies, significant differences do not exist in prevalence between male and female genders although in some studies there is a female predilection about FEH (1, 5). The disease was first seen in Native Americans and Eskimos, but the frequency of it varies widely from one geographic region and ethnic to another (1, 6). However, the disease is relatively rare in Asian countries (2). It was first described in children belonging to the Navajo and other Native American tribes in 1965 by Archard Heck et al. A year after publishing that article, Witkop and Nis Wander also reported the disease in Indians of Central and South America (5).

This lesion is often familial and this tendency may be related to genetic susceptibility or HPV

-----  
Sarabadani J, Heydari S, Mashreghi A, Poornazari N. Prevalence of impacted teeth among young adults: A Case Report of Multifocal Epithelial Hyperplasia (Heck's Disease) Treated with CO<sub>2</sub> Laser. *J Dent Mater Tech* 2017; 6 (3): 138-141.

transmission between family members. However, the factors that determine disease susceptibility are unclear. Genetics and allele HLA\_DR4 (DRB10404) in particular, are thought to play a major role in this disease (1, 2). It seems that some other risk factors such as poor socio - economic conditions, living in crowded environments, poor hygiene and immune system deficiency could be related to this disease (1).

Clinically, the disease is characterized by presence of multiple, soft, sessile papules and nodules that can be whitish or normal in color, with 1 – 10 mm in diameter affecting buccal and labial mucosa, lower lip and tongue, and less often on the upper lip, gingiva, palate and tonsils. Involvement of conjunctiva have been reported very rarely (1). Typical histopathological characteristics of FEH consist of a squamous epithelium with acanthosis, parakeratosis and horizontal fusion of elongated epithelial rete ridges. The spinous layer exhibited groups of cells with pycnotic or absent nuclei (koilocytes) and some keratinocytes with nuclear fragmentation resembling a mitotic figure (mitosoid cells) (1-4).

With regard to the treatment and considering esthetic and functional problems, several treatment modalities have been proposed for FEH such as conservative surgical removing of lesion, cryotherapy, topical interferon- $\beta$  or systemic interferon- $\alpha$ , electrocoagulation and chemical agents (e.g., retinoic acid) (1, 3, 4).

In this paper, the use of CO<sub>2</sub> laser will be introduced as a new therapeutic procedure in treatment of Heck's disease.

### Case report

Patient was an 11-year- old girl who referred to department of oral medicine of Mashhad dental school, because of multiple lesions in her mouth (Fig. 1). Physical examination of patient was normal with no systemic disease or experience of smoking. None of her family members had the disease. Clinical examination of oral cavity revealed peripheral multiple or unique soft, elevated, sessile, smooth surface papules and nodules with same color to the surrounding mucosa involving right and left buccal and also upper and lower labial mucosa. In other words, all of the oral mucosa had been involved by the disease (Fig. 2, 3). The lesions were not ulcerated or inflamed. The patient mentioned her oral lesions had been appeared for 1 year which were gradually spreading and were asymptomatic. Also, the patient previously had not been subject to any treatment. Due to young age of the patient, biopsy was not submitted and the final and definitive diagnosis of the disease was made just through her present history and clinical examination. By considering the esthetic and for Sarabadani et al.

correcting the patient's function, surgery with CO<sub>2</sub> laser (Wavelength: 10600 nm, Continuous pulse, power: 2 watts) was performed (Fig. 4). All lesions were removed by an oral medicine specialist in laser research center of above-mentioned department, during five sessions at intervals of a week as described below:

Session 1: Lesions of right buccal mucosa, right upper and lower labial mucosa

Session 2: Residual lesions of upper and lower labial mucosa

Session 3: Lesions of both left and right commissural areas

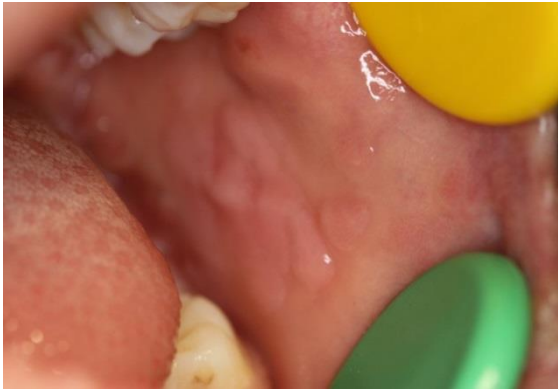
Session 4: Residual lesions of right buccal mucosa and right commissural area

Session 5: Residual lesions of left commissural area and left buccal mucosa

Procedure was performed without local anesthesia with a distance of 1 or 2 mm above the surface. Duration of laser therapy in treatment sessions was 20 second. Neither sutures after excision, nor wound dressing were applied (Fig 5). Lesions healed by second intention. All laser safety measures were followed during procedure. The child and dentist's eyes were protected with laser glasses. Patient received post-operative guidelines after surgery. In this case no antibiotic was prescribed and no signs of local infection were seen on follow up. Ibuprofen 400 mg was prescribed, if there was pain a few days after surgery. Healing process of lesions evaluated a week after each therapy session; during 1 year after surgery, no recurrence of the lesions reported.



**Figure 1.** Focal epithelial hyperplasia. Multiple, soft, sessile, smooth surface papules and nodules involving upper, and lower labial mucosa, that are so close together that form a cobble stone appearance



**Figure 2.** Multiple flat-topped lesions on the right and left buccal mucosa



**Figure 3.** Individual lesions on the upper labial mucosa.



**Figure 4.** The largest lesions, which were located at upper lip and commissural areas, were interfering with patient's speech and esthetic.



**Figure 5.** Postoperative aspect of the lesions. Neither sutures after excision, nor wound dressing were applied

## Discussion

In this study, an 11-year-old girl with Heck's disease was treated by CO<sub>2</sub> laser. Today, surgery lasers are recommended because of their safety and effectiveness in treatment of lesions. Due to its wavelength, the CO<sub>2</sub> laser has very strong affinity for soft tissues because of their high fluid contents, and it is introduced as a successful treatment for removing superficial skin and mucosal lesions. CO<sub>2</sub> laser like other lasers has a uniform depth due to its characteristics and this can reduce unwanted damage to underlying tissues (7). The tissue effect of CO<sub>2</sub> laser is mainly the result of heat generation. This heat causes evaporation of the irradiated tissues. The energy of laser irradiation causes molecular vibrations in tissue and this energy becomes the translation, which is accompanied by an increase in temperature and consequently leads to chemical decomposition. The act of evaporation with CO<sub>2</sub> laser is possible by non-focal, pulsed radiation and increasing output power. Coagulation by non-focal radiation is possible as well (8).

Different forms of treatment have been used to manage the FEH. Most of them are conservative, with the use of topical or systemic drugs that may exacerbate the pain or burning after treatment. CO<sub>2</sub> laser surgery has shown to exhibit several advantages over other

methods such as conventional scalpel. Some of these advantages include topical hemostasis, reducing scar formation, burning nerve endings and sealing of lymph vessels, rapid surface disinfecting of wounds, ability to perform certain procedures without anesthesia and increasing the visibility and control of the surgeon. The heat that generates by laser beams disinfect surface of the wound and no need to antibiotic therapy postoperatively. In addition, intra-operative bleeding is significantly higher in scalpel method compared to laser therapy. The amount of facial edema in laser therapy is significantly lower than the scalpel method.

Patient's postoperative satisfaction after laser excision was greater when compared with those who had conventional excisions (7, 9). The numbers of myofibroblasts that are present in wounds of CO<sub>2</sub> laser are three times less than the wounds that have been created by a scalpel. Scar formation also reduces due to the presence of scattered myofibroblasts. This last feature "Reducing scar formation" is very important in treatment process; especially in wounds that cause improper function (8). Burning nerve endings is important in the sense that nerve causes less pain after surgery and it can reduce the use of analgesic drugs. Referring to the report of Van der Hem et al, the superficial mucosal epithelium would be repair around 3 weeks after removing epithelium by laser. Also, patient's discomfort in contact with food and liquids will be resolve after 3 weeks (8).

Other studies have found similar results with our findings; they have reported long-term improvement with CO<sub>2</sub> laser, especially in patients with chronic, resistant and widespread disease (2). Because of its comfort level for the operator and the patients benefit, CO<sub>2</sub> laser can be recommended in oral therapy.

### Conclusion

In this study, lesions on the buccal and labial mucosa of the patient completely healed and mucosal repairing was done with minimal scar formation. The patient was totally satisfied with the treatment. CO<sub>2</sub> laser is an easy technique for quick surgeries and can be used in dental procedures conservatively. As a result, the use of CO<sub>2</sub> laser in treatment of focal epithelial hyperplasia is recommended.

### References

1. Neville B DD, Allen C.. Oral and Maxillofacial Pathology. 3 ed. Philadelphia: WB Saunders; 2009.
2. Mansouri Z, Bakhtiari S, Noormohamadi R. Extensive Focal Epithelial Hyperplasia: A Case Report. Iranian journal of pathology. 2015;10(4):300-5.
3. Prabhat MP, Raja Lakshmi C, Sai Madhavi N, Bhavana SM, Sarat G, Ramamohan K. Multifocal Epithelial Hyperplasia of Oral Cavity Expressing HPV 16 Gene: A Rare Entity. Case reports in dentistry. 2013;2013:871306.
4. Ozden B, Gunduz K, Gunhan O, Ozden FO. A Case Report of Focal Epithelial Hyperplasia (Heck's disease) with PCR Detection of Human Papillomavirus. Journal of maxillofacial and oral surgery. 2011;10(4):357-60.
5. de Castro LA, de Castro JG, da Cruz AD, Barbosa BH, de Spindula-Filho JV, Costa MB. Focal Epithelial Hyperplasia (Heck's Disease) in a 57-Year-Old Brazilian Patient: A Case Report and Literature Review. Journal of clinical medicine research. 2016;8(4):346-50.
6. Jayasooriya PR, Abeyratne S, Ranasinghe AW, Tilakaratne WM. Focal epithelial hyperplasia (Heck's disease): report of two cases with PCR detection of human papillomavirus DNA. Oral diseases. 2004;10(4):240-3.
7. Chiniforush N, Ghadimi S, Yarahmadi N, Kamali A. Treatment of Ankyloglossia with Carbon Dioxide (CO<sub>2</sub>) Laser in a Pediatric Patient. Journal of lasers in medical sciences. 2013;4(1):53-5.
8. de Magalhaes-Junior EB, Aciole GT, Santos NR, dos Santos JN, Pinheiro AL. Removal of oral lichen planus by CO<sub>2</sub> laser. Brazilian dental journal. 2011;22(6):522-6.
9. Amaral MB, de Avila JM, Abreu MH, Mesquita RA. Diode laser surgery versus scalpel surgery in the treatment of fibrous hyperplasia: a randomized clinical trial. International journal of oral and maxillofacial surgery. 2015;44(11):1383-9.

### Corresponding Author:

Sahar Heydari

School of dentistry, Mashhad University of medical sciences, Mashhad, Iran

Tel: 09334766625

Email: Sahar.hdi72@yahoo.com