The Treatment of Gingival Hyperpigmentation by CO_2 Laser

Kyung-Min Kwon, D.D.S.,M.S.D. Il-Ho Tae, D.D.S.,M.S.D.,
Myung-Yun Ko, D.D.S.,M.S.D.,Ph.D., Yong-Woo Ahn, D.D.S.,M.S.D.,Ph.D.

Dept. of Oral Medicine, School of Dentistry, Pusan National University

Gingival hyperpigmentation may cause esthetic problems, especially in patients with a gummy smile. This report presents the use of the CO_2 laser for gingival depigmentation. Two cases presented with the same chief complaint of unesthetic gingiva caused by melanin hyperpigmentation. The CO_2 laser was setted at 0.8 watt, 40Hz, 0.01sec. The procedure were performed with non-contact mode in all pigmented areas. Ablation of the gingival hyperpigmentation areas were accomplished without any bleeding complications or postoperative pain. After 2 weeks and 4 weeks later, healing is completed and hyperpigmented gingiva appeared pink and firm.

Key words: Gingival hyperpigmentation, CO_2 laser, Melanin

I. INTRODUCTION

As the interest of aesthetic increases recently, the aesthetic takes the important part as same as the treatment of the functional and physiological problems in the dental treatments. Also, the image is the competitiveness and the standard of self-esteem. Therefore, not only face, body, and skin but the value of smile with well aligned and white teeth is elevated. The smile without confidence may be the complex and affect negatively in the interpersonal relationship. The gingival hyperpigmentation associated with melanin can occur in every human race. Especially, it causes severe aesthetic problem in the patients who have 'gummy smile'.

The wavelength of CO_2 laser is 10600nm that is in the infrared range. The advantage of this laser is that it is compatible to the wet tissue irrespective of color. Therefore, CO_2 laser is suitable for soft tissue surgery. In the recent dental field, the laser is used in the soft tissue removal, hemostasis and blood coagulation, benign and malignant tumor removal, leukoplakia, frenectomy, clinical crown lengthening, treatment of hyper-sensitive tooth, and gingival hyperpigmentation removal(Fig. 1).

Among these, gingival hyperpigmentation can be treated by not only the laser but phenol, gingivectomy and cryosurgery.[1] Among these therapies, the surgical and blood operation cause severe post-operation pain and slow healing.[2] Cryosurgery needs a particular device and requires skilled hands.[3] However, the laser is simple and has little side-effect such as pain, infection, scar, and the change of texture expression.

According to these, we report the clinical case of treatment of gingival hyperpigmentation by CO_2 laser.

Corresponding author : Yong-Woo Ahn
Dept. of Oral Medicine,
School of Dentistry Pusan National University, 1-10
Ami-Dong, Seo-Gu, Busan 602-739, Korea
Tel: 82-51-240-7465
Fax: 82-51-247-0955
E-mail: ahnyongw@pusan.ac.kr

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Ⅱ. CASE REPORT

Clinical case 1

21 year old female had chief complain “I can’t smile with confidence due to the dark colored gingiva”. The melanin deposit was observed on the anterior part of maxilla and mandible(Fig. 2,3). She had neither smoking history nor systemic disease. The periodontal abnormality is not observed either. According to the patient demand, we planned to remove the melanin deposit on the both maxilla and mandible under the infiltrated anesthesia. CO_2 laser set on the Pulsed type 40Hz, 0.01sec, 0.8 watt and Arm type non contact type headpiece is used. The total emitted time was not over 10 minutes. While operating, we had done dressing several times with wet gauze. The careful laser contral is required at the root bulge part and interdental papilla. Analgesic was prescribed. Two weeks after surgery, the satisfied healing aspect was observed(Fig. 4).

Clinical case 2

25 year old female had chief complain "I have dark colored gingiva". The band type melanin deposit was observed on attached gingiva of maxilla and mandible(Fig. 4) She smoked a half pack per day and had no systemic disease. We planned to treat gingival hyperpigmentation on the both maxilla and mandible and used the same CO_2 laser setting as case 1. The infiltrated anesthetic is performed and

Fig. 1. CO_2 LASER (Arm type)

Fig. 2. Preoperation clinical view (Upper gingiva)

Fig. 3. Preoperation clinical view (Lower gingiva)

Fig. 4. Postoperation clinical view

analgesic was prescribed after operation.. Both two weeks(Fig. 6) and four weeks(Fig. 7) after surgery, the satisfied healing aspect was observed without discomfort.

Fig. 5. Preoperation clinical view

Fig. 6. Postoperation clinical view (after 2 weeks)

Fig. 7. Postoperation clinical view (after 4 weeks)

Ⅲ. DISCUSSION

The energy absorption range of melanin is various from 351-1064nm and many types of lasers are used to treat. Many lasers are used to treat skin hyperpigmentation such as ruby laser, argon laser, CO_2 laser, and Nd:YAG laser.[4] The problems of argon laser and CO_2 laser are reported such as scar formation, the change of skin texture expression, and low-level removal of hyperpigmentation.[5,6] However, ruby laser and pulsed type Nd:YAG laser showed the excellent result without post-operation problems.[7-9]

In this study, CO_2 laser set at 0.8watt, 0.01sec, 40Hz showed excellent result in the treatment of gingival hyperpigmentation. The direction for use is not to emit at the cervical gingiva and adjust the pulse range depended on the thickness of melanin deposit as following company instructions. CO_2 laser is easy to use and operation time is short. Also, it is thought to be saft. The patient does not complain the pain during and after the operation. According to the company instructions, the minimum anesthesia is used to reduce the patient's discomfort.

In this study, the side-effects of CO_2 laser was not occurred such as scar formation, the change of texture expression, and low level removal of hyperpigmentation. The epithelialization is completed two weeks after operation. Also, the complete gingival regeneration is achieved not with post-operation infection, pain, edema, and scar but with the satisfied esthetic results of the patients. Although it has a short observesion period, no relapse is occurred. From this study, CO_2 laser is clinically suitable for the melanin hyperpigmentation removal. It is important that CO_2 laser needs the religious care at the free gingiva and interdental papilla. However, the long-term follow-up check needs.

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국문초록

CO_2 레이저를 이용한 착색치은의 치료

부산대학교 치의학전문대학원 구강내과학교실

권경민 · 태일호 · 고명연 · 안용우

치은의 착색은 심미적 문제를 야기시킬 수 있으며 특히 gummy smile의 경우 더욱 그러하다. 이 보고는 CO_2 레이저를 이용한 치은 탈색의 효용성에 대한 것이다. 멜라닌 과착색으로 인한 비심미적 치은이 주소인 두 증례를 나타내고 있다. CO_2 레이저는 0.8 W, 40 Hz, 0.01로 조절하여 사용하였다. 탈색 부위는 출혈이나 술후 통증없이 치유되었다. 2주 및 4주 후 착색부위의 양호한 치유과정을 확인할 수 있었다.

주제어: 치은 착색, CO_2 레이저, 멜라닌