



## Laser Excision of Leukoplakia - A Case Report

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### Abstract

In the past few decade there has seen a veritable explosion of research into the clinical applications of LASER (light amplification by stimulated emission of radiation) in dental practice, and with an international focus, the parallel emergence of organizations to support laser dentistry. Lasers are used an adjunct or alternative to traditional approaches in the modern dental practice. This case report of leukoplakia successfully treated with diode laser at 940nm.

**Keywords:** Diode laser; Excisional biopsy; Leukoplakia; White lesion; Histopathology

### Introduction

White plaques of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer is known as Leukoplakia [1]. The predisposing factors for leukoplakia are smoking, alcohol consumption, physical irritants, galvanism, chronic trauma, poor oral hygiene, and micro-organisms like candida albicans and human papilloma virus (HPV) [2].

The estimated average malignant transformation rate of leukoplakia is 5% to 6% or more depending on the time of observation. Dysplasia appears to be the best predictor of malignant potential. Not any specific clinical appearance is there for Dysplastic lesions. In any case, the clinical appearance is not indicative of the histology [3].

Discontinuation of habits, vitamin supplements, diet rich in nutritive value, surgical treatment modalities, antifungal and chemotherapeutic agents have been tried with various results is required for the management of oral leukoplakia. If the lesion is small, excisional biopsy is recommended. For histopathological evaluation it is advisable to perform incisional biopsy of larger lesions that will guide further decisions on the treatment or cryosurgery and laser ablation can also be done.

A combination of Gallium (Ga), Arsenide (As) and other elements such as Aluminum (Al) and Indium (In) is used by Diode laser to change electrical energy into light energy and is a solid-state semiconductor. The wavelength range is about 810-980 nm, the laser is emitted in continuous wave and gated pulsed modes and is usually operated in a contact method using a flexible quartz optic delivery system [4].

In soft tissue surgery use of this instrument in a continuous wave or pulsed mode greatly increases its usefulness. The laser is indicated for surgery of oral soft tissues close to dental structures that does not involve excessive bleeding as it has low absorption in dental hard tissues and high absorption in tissues pigmented with hemoglobin, melanin, and collagen chromophores. Advantages of Diode lasers are - they are small, portable, and inexpensive, the optical fiber delivery system touches the soft tissue and can be used for ablation, incision, and excision (cutting, vaporization, curettage, coagulation, and hemostasis), [5] better postoperative tissue healing and reduction of scar tissue formation due to decreased collateral tissue damage and fewer myofibroblast cells in laser wounds. This case report presents a case of leukoplakia treated successfully with the application of diode laser at 940nm.

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## Case Report

A 43-year-old female patient reported with growth in between upper front teeth. On oral examination white linear continuous patch above, maxillary teeth were also seen (Figures 1). It was a recurrent lesion which got previously operated 5 years & 10 years back with histopathological report confirming as leukoplakia both the time. No history of tobacco or any medication. First time it appeared was after her pregnancy with very small lesion.



*Figure 1: Pre-operative picture of patient.*



*Figure 2: After Excisional biopsy of lesion.*

Excisional biopsy was carried out by the application of the diode laser at 940nm wavelength. After adequate local anesthesia was achieved (2% lidocaine HCl), incision was placed with the fiber optic tip of the semiconductor diode laser. The incision was performed at 2.5W and with the contact mode.

Necessary precautions were taken such as eye wear for the patient, operator, and the assistant. Procedure was performed according to the manufacturer's recommendations and the treatment needs of the patient. With the help of gauze carbonized layer was wiped and the operating area was kept clean. The entire lesion was excised, and the excised specimen was sent for histopathological examination.



*Figure 3: After oral prophylaxis.*

Healing was uneventful without pain, swelling or scar formation (Figures 2) and oral prophylaxis was also done (Figures 3). Patient was recalled one month, 3 months and 7 months for follow-up. Histopathological report confirmed leukoplakia as clinical diagnosis.

## Discussion

Oral leukoplakia is usually seen in middle aged and older men than female, with an increasing prevalence with age. It is less than one percent of men below the age of 30 have but increases to eight percent in men over the age of 70. In case of leukoplakia buccal mucosa, alveolar mucosa and lower lip are the most common sites. Lesions in the floor of mouth, lateral tongue and lower lip are most likely to show dysplastic or malignant changes

and it is found in only 5% to 25% of biopsy samples of leukoplakia [2].

In the present case with the use of diode laser, the patient experienced no deep tissue damage and wound contraction. However, advantages of scalpel are distinct over the laser i.e., low cost, and positive tactile feedback. Scalpel incisions heal more rapidly than those made by lasers [6]. The histopathological marginal clearance is better appreciated in scalpel excisions, but in cases of diode lasers it is necessary to keep at least 2mm additional margin when excision is planned as the tissues get charred closer to the lesion. Also, the thermal side effects of the laser can further be controlled and reduced by altering the use of power, pulse duration and pulse repetition rate. However, scalpel surgery usually causes bleeding complications in leukoplakia cases, particularly when excising from the floor of the mouth, dorsum of tongue, and the corners of the mouth. Thick post-surgical scar tissue may be formed after healing. Grafting procedures may be necessary for large lesion after surgery [7].

Re-epithelialization following laser surgery is achieved with minimal wound contraction. Due to its high temperature, the diode laser beam results in a sterile and non-contaminated wound. Lasers produce a sterile surgical field based on instant vaporization of tissue and adjacent vascular and lymphatic sealing. Furthermore, it helps in preventing the seeding of the dysplastic cells in adjacent soft tissue areas [8].

However, some disadvantages of using laser on soft tissue lesions usually include a prolonged healing time due to sealing of blood and lymphatic vessels. The expense of laser systems and the relatively longer rehabilitation period of treated areas seem to be the main disadvantages of the laser procedures. As with all pre-malignancies, operating protocol must be followed [9].

## Conclusion

Leukoplakia is a potentially malignant lesion; therefore, early diagnosis and treatment should be effectively carried out. Dentists play an important role in both the education of patients about the harmful effects of tobacco and chewing arecanut and in the early diagnosis of high-risk oral leukoplakia and cancerous lesions. For treating oral leukoplakia diode lasers proven to be an effective and less painful procedure. The future of laser use in dentistry has exciting potential and should be studied through scientifically based research.

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