Case Report

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Surgical Management of Oral Leukoplakia: A Case of Laser Excision

Dr. Soni Bista,[1] Dr. Rebicca Ranjit,[2] Dr. Suraksha Subedi[3]

[1,3]Department of Periodontology and Oral Implantology, Gandaki Medical College, Kaski, Nepal

Correspondence :

Dr. Soni Bista. Email: sonibista1234@gmail.com

ABSTRACT

Oral leukoplakia is the most frequent potentially malignant disorder of the oral mucosa which requires definite treatment. A wide variety of medical and surgical treatment modalities have been endeavoured with varying degrees of success. Among various surgical treatments, laser techniques have helped improve surgical approaches and ultimate control of leukoplakia. The present case reports homogenous leukoplakia in an adult male treated successfully with diode laser and followed up for six months without any complications and recurrence. Thus, the application of diode laser is safe and can be effectively used as a good substitute for the management of oral leukoplakia.

Keywords: Diode lasers; laser therapy; oral mucosa; oral leukoplakia.

INTRODUCTION

The term leukoplakia is recognized as white patches of questionable risk having excluded known diseases or disorders that carry no increased risk for cancer.[1] The cause is multifactorial including tobacco or areca nut use, alcohol abuse, human papilloma virus, fungal infections, chronic trauma, and nutritional deficiency.[2] Different modalities for its management includes medical therapy (antioxidants, Vitamin A), surgical therapy using scalpel, electrocautery, and laser.[3] Surgical excision done by soft tissue diode laser have shown beneficial role in the treatment of the lesion.[4] This paper reports a case of oral leukoplakia treated successfully with the application of diode laser.

CASE REPORT

An adult male aged 60 years reported to the Department of Periodontology and Oral Implantology of Universal College of Medical Sciences, Bhairahawa, Rupandehi, Nepal with a chief complaint of white patches on his right lower back gum region for two years. The patient's medical history and family history were non-contributory. He had the habit of smoking tobacco, one pack of bidi (25 bidis) per day for 10 years. On extraoral examination, there were no significant findings. On intraoral examination, white plaques were appreciated on right lower buccal gingiva of the posterior teeth extending from the first premolar to the second molar involving their marginal, attached and papillary gingiva (Figure 1). The lesion was non-scrappable, had firm consistency, diffused margins, wrinkled surface, crack-mud appearance

Figure 1: Preoperative clinical view.

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Figure 2: Punch biopsy of the lesion was taken.

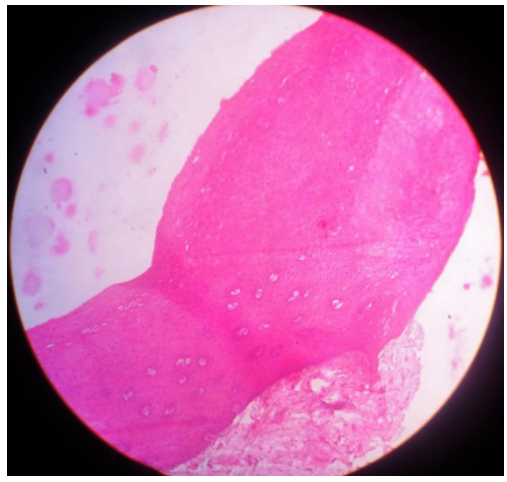

Figure 3: Keratosis with mild dysplasia under haematoxylin and eosin staining of the lesion.

measuring approximately 7x4 cm^2 with normal surrounding mucosa. Class II Gingival recession was observed in relation to #46 (according to two-digit numbering system). Furthermore, stain and calculus were present in all teeth. The provisional diagnosis was made as homologous leukoplakia on right buccal gingiva in relation to #45, #46, and #47 because at clinical examination a predominantly white lesion was appreciated which cannot be clearly diagnosed as any other disease or disorder of the oral mucosa.

Following an initial examination and treatment planning discussion, the patient underwent nonsurgical periodontal therapy including scaling and root planing with oral hygiene instructions. He was given strict advice for complete cessation of the habit of smoking tobacco and prescribed with Tablet BNM forte (Lycopene, Meobalamin, Omega three with multivitamin) twice daily for a month. Meanwhile, a punch biopsy with a diameter of 0.5 cm (involved and normal tissue) of the lesion from marginal and attached gingiva in relation to #45 was sent for histopathological examination as it is mandatory to rule out any malignancy (Figure 2). The histopathological analysis revealed a hyperkeratinised stratified squamous epithelium with mild dysplasia (Figure 3). On the basis of clinical presentation and histopathological reports, a definite diagnosis of Homogenous Leukoplakia with mild dysplasia on buccal gingiva in relation to #45, #46, and #47 was made. The patient did not respond to conservative medical management with multivitamins, multiminerals, and antioxidants (Tablet BNM forte) even after a month of follow-ups, so he was advised for complete excision of the lesion using a diode laser. A complete haemogram was done which depicted values within normal limits. Written informed consent was taken from patient.

On the day of surgery, a complete protocol for surgical preparation was followed. The patient was asked to do a presurgical mouthrinse using 2 ml of 0.2% chlorhexidine diluted solution, and 5% povidone-iodine solution (Betadine) was used to perform extraoral antisepsis. Right inferior alveolar nerve block using 2% lignocaine with adrenaline 1:200,000 was administered. Safety measures were taken for the operator, patient, and assistants by wearing the recommended laser protective eyewear. High-speed suction and surgical masks were used to prevent infection from the laser plume. Diode laser (iLase™) emitting 940 nm was used for excision where a preset value was adjusted: power of 3.00 W, pulsed contact mode, continuous pulse duration, and pulse interval of 1.00 ms. Blunt end of the probe was used to check for objective symptoms. After the area was anaesthetised, the excision of the lesion in the right lower posterior gingiva and buccal mucosa was carried out using a bendable laser tip with a diameter of 300 mm (Figure 4). After excision, the surgical site was wiped off with a cotton pellets soaked in normal saline. The operated site was then protected with periodontal dressing (COE–PAK™ GC America) (Figure 5, 6). The entire procedure was painless with no bleeding and lesser intraoperative time.

Figure 4: Diode laser tip directed towards the lesion for the excision.

Figure 5: After complete excision of the lesion on the gingiva at lower right posterior teeth.

Figure 6: Periodontal dressing (Coe-pak) placed over the surgical site.

Figure 7: Post-operative view after two weeks.

Figure 8: Post-operative view after six months

Post-surgical instructions were given with the prescription of analgesics (Ibuprofen 200 mg, if needed) and warm saline rinse (three to four times/day for two weeks). To minimise traumatic injury to the wound, mechanical tooth cleaning was restricted to the surgical site for the first week. The patient was recalled immediately after a week for removal of periodontal dressing then after two weeks and six months for revaluation (Figure 7, 8). No complication without recurrence was observed at follow-ups.

DISCUSSION

The management protocol for leukoplakia should be based on grade of dysplasia, size, and location of the lesion; however, local factors such as trauma and adverse habits such as using tobacco should be controlled. Both non-surgical and surgical treatment modalities can be applied with varying success. In non-surgical methods, anti-inflammatory agents, carotenoids, retinoids, antimycotic agents, and cytotoxic agents can be used topically. Chemo-

preventive agents such as vitamins (A, C, E), fenretinide (Vitamin A analogue), carotenoids (beta carotene, lycopene), green tea, curcumin are also beneficial. They play a vital role during the early healing of the lesion but they will appear once the patient stops taking the supplements. Researchers have found it to be less convincing and possessing a longer duration of treatment. In the present case, combination of multivitamins, multiminerals, and antioxidants drug was prescribed to the patient for a month, but it did not show any effect. Thus, surgical excision was opted as an appropriate treatment for the case.

Surgical treatment can be carried out using scalpel, cryotherapy, electrocautery, and laser, but will not prevent all premalignant lesions from undergoing malignant transformation, which can be explained by the genetic defects even in the normal appearing mucosa surrounding the excised lesion (field cancerisation).[4]

Surgical excision of lesions using laser offers several advantages over scalpel excision which includes bloodless surgical and postsurgical events; the ability to precisely coagulate, vaporise, or cut tissue; minimal swelling and scarring; reduction of surgical time, postsurgical pain with high patient acceptance.[5] Previous study has evidenced promising results using lasers in the excision of oral leukoplakia.[6] The diode laser is not indicated as the main laser for soft tissue surgery, but its versatility of use led us to choose it for the study. In the present case, the patient reported minimal intraoperative and post-operative pain and discomfort. These results are similar to the findings of Mohan et al., who reported minimal post-operative pain and discomfort.[7] The wound healing was also satisfactory similar to the previous study.[7] Histologically, laser-created wounds heal more quickly and produce less scar tissue than conventional scalpel surgery,[8] although contrary evidence also exists.[9] In the present case, the patient did not show any signs of recurrence in six months' follow-up. This was similar to the findings of a study conducted in Natekar et al.,[10] the patients in their study showed no sign of recurrence on six months' follow-up. Although laser has many advantages, it requires some precautions during and after irradiation such as using protective eyewear, high-speed evacuation, and a properly trained operator as an important part of laser safety.

Thus, the main purpose of treating oral leukoplakia is to prevent transformation into a malignant form as the patients are mostly asymptomatic. Diode laser provides an effective technique with marked clinical improvement and high degree of patient acceptance in the management of oral leukoplakia.

Conflict of interest: None.

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