ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(7): 93-95
www.allresearchjournal.com
Received: 08-04-2022
Accepted: 14-05-2022

Dr. Rajhans Nilima
Professor and Head of the Department, Department of Periodontology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Dr. Pathare Aparna
Post Graduate Student, Department of Periodontology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Dr. Dhanesh Sable
Reader, Department of Oral Pathology and Microbiology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Dr. Joanna Shrisunder
Post Graduate Student, Department of Periodontology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Dr. Tanuja Ugale
Post Graduate Student, Department of Periodontology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Corresponding Author:
Dr. Rajhans Nilima
Professor and Head of the Department, Department of Periodontology, YCMM & RDF's Dental College, Ahmednagar, Maharashtra, India

Diode laser assisted excision of verrucous leukoplakia: A case report

Dr. Rajhans Nilima, Dr. Pathare Aparna, Dr. Dhanesh Sable, Dr. Joanna Shrisunder and Dr. Tanuja Ugale

Abstract
Proliferative Verrucous Leukoplakia is a rapidly proliferating and recurrent lesion of the oral cavity whose etiology is still unconfirmed. The treatment of this is carried out by excising the lesion completely. This can be done with either scalpel or a laser. Our case report consists of a case of proliferative verrucous leukolplakia in which a diode laser was used for the excision of the lesion as it has added benefits over the scalpel technique.

Keywords: Diode laser, verrucous leukoplakia, still unconfirmed, etiology

Introduction
White lesions of the oral cavity are quite common and can have a variety of etiologies, both benign and malignant [1].
Oral white lesions can have a variety of etiologies as well. They are caused by thickening of the keratin layer or deposition of some non keratotic material. Various intraoral white lesions can include squamous papilloma, focal epithelial hyperplasia, condyloma accuminatum (genital warts), verruca vulgaris (common wart), leukoplakia, verruciform xanthoma, squamous cell carcinoma, etc. [2]
The diagnosis of oral white lesions can be quite challenging. These lesions represent a wide spectrum of lesions with different etiology and varied prognoses. The diagnosis of white lesions can vary from benign reactive lesions to dysplastic or carcinomatous lesions. While there are some typically classical features that help distinguish these lesions, similar features may give rise to some difficulties in diagnosis [2].
In order to obtain a conclusive diagnosis a histopathological analysis of the specimen is necessary. This can be done by obtaining a biopsy, which can be either excisional or incisional. This is done with either a scalpel or a laser the laser has the added advantage of being able to obtain a good hemostasis, bloodless field and a faster healing during the initial phases [3].

Case Report
The patient was a 47 yr old male that came to the outpatient department with the chief complaint of a white patch in the upper right back region of the buccal mucosa since one year. The patient also reported reduced mouth opening. The patient noticed a small white lesion 1 year ago which grew to the present size over the past year. The patient also revealed a history of smokeless tobacco usage 5-6 times a day for the past 20 years which he placed in the right buccal vestibule. The lesion was partially excised a year ago but showed a rapid rate of recurrence.
The patient's medical history revealed him to be hypertensive and under medication for the same since the past 12 yrs.
Intra oral examination revealed a large white non scrapable lesion which was seen on the right buccal mucosa which measured in width 20mm at the tip, 18 mm in the middle and 39mm at the base. The height of the lesion was 20 mm. The lesion showed a hyperkeratotic appearance with multiple projections on an elevated base.
On palpation the base of the lesion was found to be firm and non tender. Reduced

Pre-Operative lesion

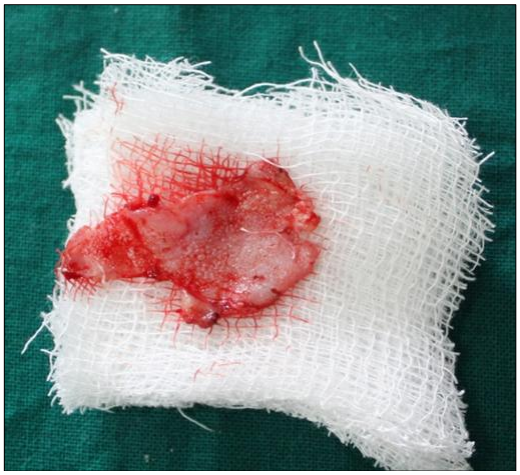
cheek flexibility and reduced mouth of 37mm opening was also observed.

Cervical lymph nodes were not palplabe.

The differential diagnosis included veruccous hyperplasia, verrucous carcinoma, carcinoma insitu and squamous carcinoma.

An excisional biopsy of the lesion was planned under local anesthesia. A diode laser (Doctor Smile ™) 980 nm was used at 0.8–1.2 W to cut the mucoperiosteum with a 2–3 mm clinically safe margin around the lesion. Use of laser reduced the volume of local anesthetic solution required for regional anesthesia and provided a relatively bloodless field of operation.

Excision of lesion

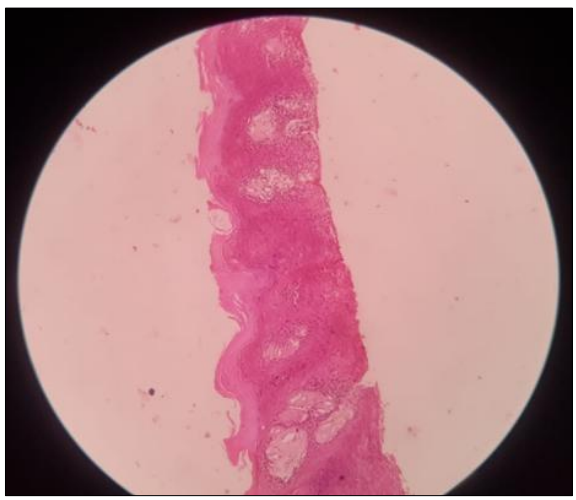


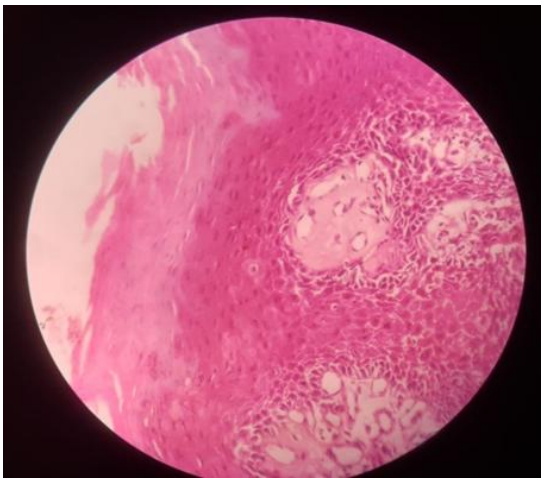
Excised lesion

Post Operative after 1 month

On histopathological examination the sample showed proliferative papillomatous hyperkeratinized stratified squamous epithelium and connective tissue. Epithelium was hyperkeratinized showing parakeratin plugging at a majority of sites. Epithelium shows bulbous rete ridges at the same level. Keratinized epithelial layer and spinous cell layer showed numerous vacuolated keratinocytes. Underlying connective tissue showed intense chronic inflammatory cells, chiefly lymphocytes and plasma cells subepithelially.

On taking into account the clinical features and the histological appearance a conclusive diagnosis of proliferative verrucous leukoplakia was reached.





Discussion

Proliferative verrucous leukoplakia is a rare form of oral leukoplakia that was first reported by Hansen *et al*. in 1985 that initially develops as a white plaque of hyperkeratosis that later on becomes a multifocal disease that has exophytic and proliferative features [6]. It presents with a more aggressive characteristics than leukoplakia with a high rate of recurrence and malignant transformation ranging between 40-100% in a follow up of 4.4 – 11.6 years [7, 8]. The etiopathogenesis of it appears to be idiopathic and the use of tobacco does not appear to have any significant relation to the lesion as it was seen in tobacco and non tobacco users. As this is a lesion which is highly progressive and has a high rate of recurrence it requires very close monitoring and observation [9]. Surgical excision is the treatment of choice and can be carried out using wither a scalpel or laser [10].

In recent times, lasers are being used widely in the field of dentistry and have been used a suitable treatment modality for exophytic growths as they provide the bloodless field with minimal or no need of anesthesia. Jangam *et al*. reported the use of CO2 lasers for excision of Oral Verrucous Carcinoma involving retromolar area [11].

Soft tissue diode laser (980 nm) was used for excision of the lesion in our present case. Previous clinical applications of diode laser (980 nm) in oral surgical procedures have shown that it provides a more precise incision margin as compared to other laser systems [12]. The cutting effect was found to be similar to the CO2 laser and the coagulation properties comparable to the neodymium-doped yttrium aluminum garnet laser [13]. Lasers also have the added advantage of providing a bloodless field and thus allowing better vision to the surgeon. The healing is also quicker and the scar formation is lesser [14, 15, 16].

Conclusion

Diode lasers have been shown to be a successful treatment modality for proliferative verrucous leukoplakia and also obtain biopsy specimens for histopathological examination. It has a better outcome than other methods due to its ability to decontaminate the area, ablate the tissue, provide excellent hemostasis and also less post operative pain [10].

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