Case Reports in Dermatology

Case Rep Dermatol 2021;13:317–320
DOI: 10.1159/000515733
Received: December 20, 2020
Accepted: March 8, 2021
Published online: June 21, 2021

Single Case

Laser Surgery of Extensive Homogeneous Oral Leukoplakia Histologically Suggestive of Proliferative Type: A Case Report

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Keywords
Oral leukoplakia · Malignant transformation · Management · Surgical laser

Abstract
Oral leukoplakia (OL) has the potential for malignant transformation; unfortunately, there are no strategies to prevent this possible outcome. Surgical intervention has been reported to be effective in reducing but not eliminating the risk of malignant transformation. Meta-analyses have reported that patients who underwent excision of OL lesions had a significantly lower chance of malignant transformation than those whose lesions were not excised. The present study aimed to report a case of successful management of extensive OL using a high-power laser. The patient has been under periodic monitoring, and we aim to continue the follow-up as long as possible. Recurrence or signs of malignancy were not observed at the 2-year follow-up.

Introduction

Oral leukoplakia (OL) is a potentially malignant disease, which generally requires long-term follow-up, regardless of the treatment provided to the patient. Several studies have reported that surgical removal of OL reduces, but does not eliminate, the probability of malignant transformation [1]. Surgery is highly recommended for lesions located at sites with higher risk of malignant transformation, such as on the border and ventral surfaces of the

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tongue, floor of the mouth, and soft-palate mucosa. The size and pattern of the lesion (homogeneous or nonhomogeneous) also play an important role in the surgical judgment.

The histopathological examination following biopsy is essential, not only to support a clinical diagnosis of OL but also to identify of epithelial changes, including the degree of dysplasia, early signs of malignancy, and progression to a more dangerous type of OL such as the proliferative variant [2–4]. High-power lasers have been instrumental in the treatment of extensive plaque-like lesions, as they enable effective surgical maneuvering and control of bleeding [2]. OL is a type of lesion that fits in this category to be managed by laser. This study reports a case of extensive OL successfully excised using a surgical laser.

Case Report

A 38-year-old white woman was referred to our oral medicine and laser clinic for evaluation and management of an extensive white lesion on the ventral surface of the tongue on the right side that had been present for 14 years. Oral examination revealed a white plaque, which was predominantly homogenous, measuring approximately 3.200 mm^2 (Fig. 1a). The patient was healthy and did not have smoking or alcohol consumption habit. A diagnosis of unifocal homogenous leukoplakia was made, and a 6-mm punch biopsy was obtained. Histopathological analysis supported the clinical diagnosis of OL, with no epithelial dysplasia; however, there were some changes indicative of a proliferative potential (Fig. 2).

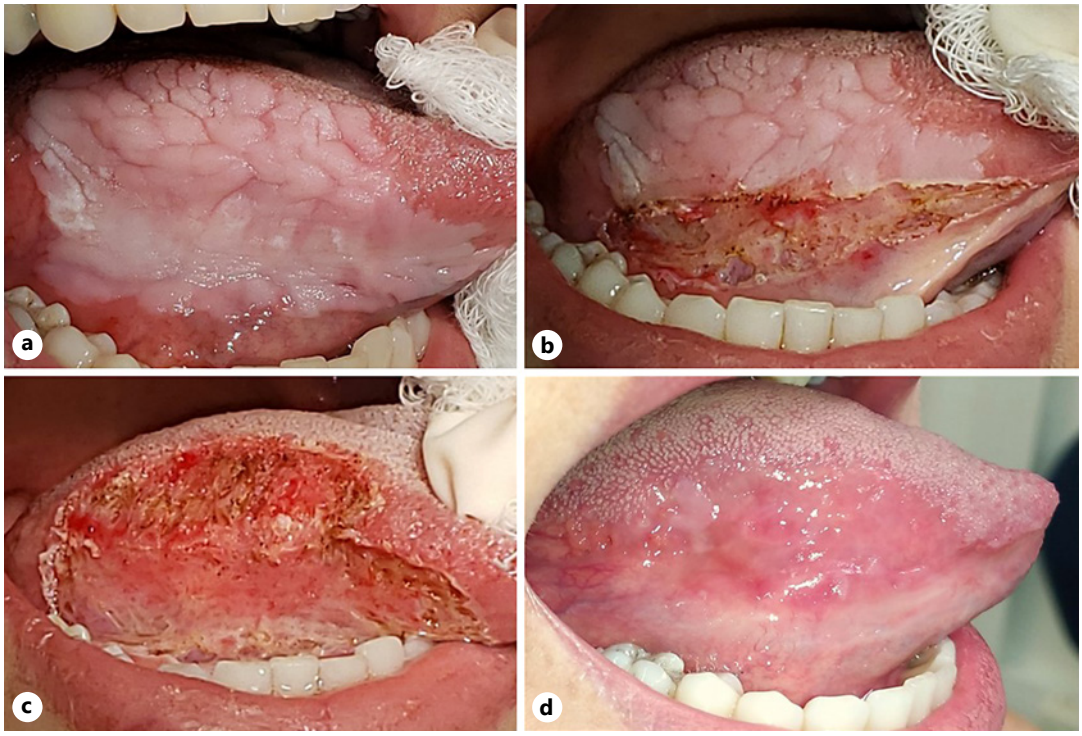

Fig. 1. a Typical homogeneous OL lesion. The lesion is substantially large, covering the whole ventral surface of the tongue on the right side; the first step of the surgical intervention with a high-power laser: excision of one-half of the lesion (**b**); complete removal of the lesion: the undercutting is not deep and bleeding is minimal (**c**); complete re-epithelialization of the tissue after 6 weeks: smooth appearance of the tongue with no scar (**d**). No recurrence observed at the 2-year follow-up. OL, oral leukoplakia.

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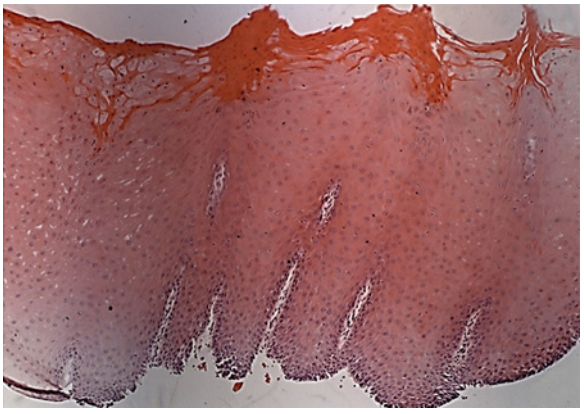

Fig. 2. 6-mm punch biopsy was done. Histopathological analysis shows hyperkeratosis, acanthosis, discrete papillomatosis, and bulbous or teardrop-shaped rete ridges (×40).

Considering factors such as age of the patient, size and location of the lesion, and the histopathological findings, the decision was made to excise the lesion under local anesthesia using a high-power laser (Nd:YAG, Light-Walker ATSM021-5AF/1S, Ljubljana, Slovenia). The first incision was made longitudinally to divide the lesion into 2 halves (Fig. 1b), which were subsequently removed individually by undercutting the tissue at a constant depth of approximately 3–5 mm (Fig. 1c). The specimens excised using the laser were submitted for histopathological analysis. However, the analysis could not be performed due to extensive burning of the tissue during the undercutting. The patient reported intense pain in the following days after the intervention, which was managed with anti-inflammatory and painkiller medications for 1 week. In addition, antibiotics were prescribed to control infection. Pain and oral discomfort subsided after 10 days. Complete re-epithelialization was observed after 40 days. Recurrence was not observed at the 2-year follow-up (Fig. 1d).

Discussion

The patient in the present study reported the appearance of the lesion at the age of 22 years. This indicated the possibility of a genetic component as the determining factor in development of the lesion. The combination of genetic predisposition and age, in addition to the location of the lesion, could significantly increase the risk for malignant transformation.

Excision has been recommended for OL lesions at high-risk sites, when feasible [1, 4, 5]. This approach has been considered to significantly benefit patients on a psychological level, and they tend to cooperate in the long-term follow-up. Patients should be informed regarding possible recurrence of the lesion and the reduced, but not eliminated, potential for malignant transformation.

Surgical intervention for patients with extensive OL should be considered based on morbidity related to postoperative scar formation and functional impairment. The use of high-power lasers has substantially reduced these undesirable outcomes. In addition, the surgical procedure is faster, and bleeding can be controlled. However, the disadvantage is that the undersurface and peripheral portion of the excised tissue could be burnt, thus making the specimen unusable for histopathological analysis. This limitation can be overcome by performing biopsy before excising the lesion.

Finally, histopathological analysis of the specimen in the present case hinted at the proliferative nature of the lesion. This was considered important to schedule clinical monitoring as the verrucous proliferative variant generally evolves from a unifocal homogenous

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leukoplakia and is far more aggressive in terms of malignant transformation, affecting predominately elderly women [6].

Statement of Ethics

We, the authors, openly state that this case report was conducted in accordance with the World Medical Association Declaration of Helsinki; additionally, that after the clinical management of the case had been concluded, the patient was informed about the authors' purpose to send her clinical data (including images) for a possible scientific publication, of which she has formally agreed and authorized it by signing a written informed consent.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

The authors state that there was no external funding source for the preparation of this manuscript. All the available sources were provided by the authors themselves.

Author Contributions

Luciane Azevedo: performed the laser intervention and the patient follow-up. Mariana Tuma: helped in writing the case report and provided a clear-cut analysis of the lesion's histopathological differential diagnosis. Suzana Orisine: made a thorough histopathological analysis of lesions and written its legend. Dante Migliari: written and edited this manuscript apart from searching for the pertinent literature related to this clinical case.

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