Denture Stomatitis: Treatment with Diode Laser

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_Introduction

Denture stomatitis (DS) is one of the most common oral lesions in patients who wear a complete or partial removable denture. Very few cases regarding the treatment of denture stomatitis lesions by laser are reported in the literature. We present a case of treatment of DS without the use of any pharmaceutical aids.

The prevalence of DS is 15% to 70% among patients using dentures.[1,2] DS is a chronic candida infection. Thus, *Candida albicans* is the main causative organism. Besides *Candida albicans*, additional predisposing factors can play a role in the occurrence and progression of DS, including poor oral and denture hygiene, continual and overnight wearing of removable dentures, hyposalivation, bacterial and yeast contamination of denture surfaces as well as poor-fitting dentures. All of the mentioned factors are able to increase the ability of *Candida albicans* to colonise both the denture and the oral mucosal surfaces. Additionally, long-term antibiotic therapy, use of corticosteroids, diabetes, impaired immunity, malignancy, alcohol consumption, trauma, and diet may increase the development of DS.[3,7]

DS is classified in three types (Nyoton classification): pin-point hyperemic lesions or simple inflammation (type I); diffuse erythema or generalised inflammation (type II) and inflammatory papillary hyperplasia (type III).[8,9]

Treatment of DS is traditionally started with the introduction of good oral and denture hygiene, correction of ill-fitting denture, discontinuation of nocturnal denture wearing, usage of topical agents such as nystatin and miconazole and finally relining or replacing of the denture. Systemic antifungal agents such as amphotericin B and fluconazole are also effective in cases of recurrence and for patients contraindicated to surgery. Surgical treatment of the lesion in cases of type II and type III can be applied in the form of scalpel surgery, electrosurgery and cryosurgery. Recently, laser-assisted photodynamic therapy has been reported.[10]

Vaporisation is ideal for large surface lesions confined to the epithelium,[11] whereas cryosurgery is an option for the removal of superficial, wide lesions in the oral cavity. Both laser vaporisation and cryosurgery preclude a histological diagnosis. Therefore, both

Fig. 1_Clinical view of type II DS according to the Newton classification.
Fig. 2_Immediately after superficial contaminated layer vaporisation with diode laser.
Fig. 3_One day after treatment.


Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6

techniques only are performed in areas that previously had biopsy specimens taken or when a clinical diagnosis has been made properly. Cryosurgery disadvantages include unpredictable degree of swelling, lack of precision for depth and freezing area, and high dependence on the operator's skill and experience. However, advantages of cryosurgery include absence of pain, low risk of infection and no need of suture removal.[12, 15]

_Case report

A 65-year-old female patient with sore mouth sensation, who had worn her dentures for six years continuously without removing it during sleep, was referred for treatment.

Medical history

The anamnesis of the patient revealed no systemic medical problems, no allergic reactions, no medicament or drugs and no history of past surgical procedures so that the patient had no need for a referral to a medical consultant.

Dental history

Oral and maxillofacial examination of the patient revealed no T.M.J. or myofascial disturbances.

Clinical findings

Old and ill-fitting dentures, resorbed alveolar ridge and a diffuse erythematous lesion of the palate were observed (Fig. 1).

X-ray examination

X-ray examination showed no abnormal destructive effects.

Clinical diagnosis

The case was clinically diagnosed as denture stomatitis type II according to the Nyoton classification, and we decided to treat it by diode laser.

Laser parameters

The laser had a wavelength of 980 nm, 400 µm fibre, 1.2 W output power, continues mode and initiated fibre.

Treatment delivery sequence

After filling out the consent form, the surgery area was anaesthetised by infiltration method with 2% lidocaine with Epi 1:100,000, 1.8 ml. Afterwards, the following treatment steps were executed:

– Defining of the controlled area and the proper placing of the laser warning signs to secure the operating room.
– Checking of the safety for patient's eye glasses, patient's guardian eye protection and the assistant eye protection.
– Set up of the laser and test of proper laser operation (fibre cleaving, control of the laser output, aiming beam control, spot size estimation, initiation of the fibre with a dark articulation paper and test-fire of the laser), using minimum power and setting.
– Checking the patient's information (examination sheet and X-ray, consent form, etc.).

The lesion vaporization

Removal of the superficial contaminated epithelial surfaces was performed with contact and scanning mode in combination and the lesion was vaporized. During the treatment, high volume suction was used to evacuate the vapor plume and objectionable odors at the site of operation. During the entire procedure, the laser-tissue interaction was respected in order to prevent any unsuitable reactions in the surrounding tissue. Removal of carbonized tissue was done by a micro-applicator brush sucked in 3% hydrogen peroxide solution.

Post procedural education

The patient was advised to keep the area clean and to avoid food and liquids that may cause pain or irritation to the sensitive tissue, but can use over-the-counter analgesics as needed.

Final result

Excellent laser vaporization of the contaminated layer was observed with no bleeding, no carbonization and no char (Fig. 2). The patient did not experience any discomfort and was satisfied.

Follow-up

The first visit after laser treatment was one day after the procedure (Fig. 3). The patient revisited after five

Fig. 4_Five day after treatment.
Fig. 5_One week after treatment.
Fig. 6_Two weeks after treatment.

days and one week. As Figs. 3 and 4 show, the healing process was as expected so that the healing was progressing well and devoid of any pain or discomfort. Finally after two weeks, the final goal was achieved (Fig. 5). A new denture was provided after complete treatment (Fig. 6).

_Discussion

Diode lasers with wavelengths ranging from 810 to 980 nm are used for soft tissue surgery in the oral cavity. In comparison to conventional DS treatment (scalpel technique, cryosurgery, topical or systemic antifungal agents), the laser assisted DS therapy can be performed fast, with no bleeding, with little or no pain, no oedema and little or no need to use over-the-counter analgesics. Although antifungal agents, such as nystatin (100,000 unit per ml) and amphotricin B (lotion 3 %) are effective in alleviating the clinical signs and symptoms of candida infection, unpleasant taste, gastrointestinal side effects such as nausea, vomiting and diarrhoea can be seen in this model of treatment. Additionally, topical agents can be diluted through saliva and displaced by oral movable tissue so that treatment regimens may be prolonged and lead to unsuccessful treatment of the infection and also development of resistant species.[16–18] Systemic antifungal agents cannot fully eradicate the microorganisms that colonize the denture.[19] Further side effects such as gastrointestinal disturbances, hypersensitivity, renal and liver toxicity and interaction with other medicines can be seen during usage of systemic antifungal drugs.[20] High recurrence rates of denture stomatitis and recolonization of candida have been reported after cessation of the antifungal treatment.[19, 21]

Use of disinfection agents can also have minor side effects such as staining and alterations of taste.[22] Photodynamic therapy has been suggested as a conservative treatment of DS but there is yet little literature to support this kind of treatment.[19, 23]

Cryosurgery can be used in the field of oral lesion treatment, but a relatively long period of wound healing is one of its disadvantages and the prevention of loss of gas attributable to leakage and evaporation, and a risk of accidents during storage has to be taken into account.[24, 25]

_Conclusion

The 980 nm diode laser is a useful tool for the treatment of denture stomatitis._

Editorial note: A list of references is available from the publisher.

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Kurz & bündig

Prothesenstomatitis ist eine der häufigsten oralen Läsionen bei Patienten, die eine Voll- oder herausnehmbare Teilprothese tragen. In der Literatur werden nur wenige Fälle zur Laserbehandlung solcher Läsionen erörtert. Im vorliegenden Artikel wird der Fall präsentiert, bei dem Prothesenstomatitis ohne jegliche pharmazeutischen Mittel erfolgreich mithilfe eines Diodenlasers behandelt wurde.

Eine 65-jährige Patienten stellte sich mit schmerzendem Mund vor. Sie hatte zu diesem Zeitpunkt ihre Prothesen seit sechs Jahren getragen, ohne diese während des Schlafs herauszunehmen.

Nach klinischer und röntgenologischer Untersuchung wurde der Fall als Prothesenstomatitis Typ II gemäß der Newton-Klassifikation eingestuft und mithilfe des Diodenlasers behandelt. Nach der Behandlung zeigte sich eine sehr gute Laservaporisation der kontaminierten Gewebe, jedoch keine Blutung oder Karbonisierung. Die Patientin blieb während und nach der Behandlung schmerzfrei. Nach zwei Wochen war das Behandlungsziel vollständig erreicht, sodass eine neue Prothese verwendet werden konnte.

Zusammengefasst stellt die laserunterstützte Behandlung der Prothesenstomatitis eine gute Alternative zu konventionellen Behandlungsmethoden dar (Skalpell, Kryochirurgie, topisch applizierte oder systemisch wirkende Antimykotika), denn sie verläuft schnell und blutungsfrei. Weiterhin ist sie für den Patienten mit keinen oder geringen Schmerzen verbunden, Ödeme können ausgeschlossen und selbst frei erhältliche Schmerzmittel müssen nicht verwendet werden.

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