

Laser Treatment of Oral Mucosa Tattoo

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Case report

SUMMARY

The most common oral solitary pigmented lesion is the dental amalgam tattoo. It occurs as a result of colouring of the tissue by alien pigment which was administered intra or subepidermally either intentionally or accidentally. The most common material

used for the colouring of the oral mucosa is amalgam from amalgam fillings and metal particles from prosthetic restorations which are absorbed accidentally. The oral mucosa tattoos are most often found in the area of the marginal gingiva or the buccal mucosa. The metal particles may accidentally reach the area of the oral mucosa during various

dentistry interventions. The therapy most often involves surgical intervention with excisional biopsy while in the recent period the low power laser therapy has provided exceptional results. The aim of the paper was to present the successful removal of the oral mucosa tattoo in a single visit.

Key words: tattoo, diode laser.

1. INTRODUCTION

The pigmented lesions may be solitary, multiple or diffuse. The solitary pigmented lesions characterised by dark colour are: tattoos, ephelis (freckles) and the oral melanotic macule (1). The most common oral solitary pigmented lesion is the dental amalgam tattoo and it occurs in almost 0.4-0.9% of the US and 8% of the Swedish adult population (2, 3). It occurs as a result of colouring of the tissue by alien pigment which was administered intra or subepidermally either intentionally or accidentally. The most common material used for the colouring of the oral mucosa is amalgam from amalgam fillings and metal particles from prosthetic restorations which are absorbed accidentally. The mucosa may also be coloured by various graffiti writing colours such as skin tattoos.

The oral mucosa tattoos are most often found in the area of the marginal gingiva or the buccal mucosa. The metal fragments – the dust from amalgams or other metals inside the tattoo may be diagnosed by means of a clinical examination or an x-ray.

The metal particles may accidentally reach the area of the oral mucosa during various dentistry interventions. It is thus possible that dur-

ing the routine preparation of the cavity, the gingival sulcus is damaged and the amalgam particles may penetrate into the epithelium during the placement of the fillings. During the removal process of the old amalgam fillings or the removal of old fixed prosthetic restorations the gingival may be damaged thus creating an entry point for the metal particles.

In the adaptation and treatment of the custom-cast post with rotating instruments, the metal particles may penetrate deeper into the epithelium through a damaged gingival sulcus. The fractured piece of metal or amalgam may remain during the tooth extraction in the area of the extraction wound. Moreover, some cases of surgical intervention of apicoectomy of the root top saw the retrograded closing of the resected root with amalgam which can later lead to the occurrence of a tattoo.

Clinically, the tattoo is regarded as an alteration in the colour of the oral mucosa clearly distinguished in its setting without pulping, remaining intact, smooth and of dark grey to blue colour. The patients are most often administered for aesthetical reasons. The most common therapy involves surgical intervention with excisional biopsy (4).

The histological section presents brown, fine-granulated, punctuated reticular fibres notably around the blood vessel walls with a rare occurrence of larger pieces of black metal particles. There is a frequent presence of the mononuclear inflammatory infiltrates while findings of giant cells are not common (5, 6).

In the recent period the laser therapy has provided exceptional results in the removal of such alterations both on the skin and on the mucosa.

The laser beams can have primary (photochemical, photoelectric and photo-energetic) and secondary effects (stimulation of the cell metabolism and microcirculation) which result in treatment effects (analgesic, anti-inflammatory, anti-edematose and bio-stimulant). Lasers are distinguished by the power of the radiation emission into low and high energy lasers. The most common representatives of the low energy are the gas lasers (He-Ne) and the semiconductor (gallium arsenide-GaAs and gallium aluminium arsenide – GaAlAs) lasers. The low energy lasers are used in oral medicine and periodontology for their biological effects (activation of the enzyme substances, increase of neurotransmitters and increase of neuropeptides), bioelectrical effects (nor-

malization of the cell membrane potential) and bio-energetic effects (stimulation of the energetic process through the formation of the ATP). The indirect effects stimulate microcirculation, cell tissue exchange which as a result stimulates the cell metabolism. This emanates with very precise treatment effects which are reflected as bio-stimulant, analgesic, anti-inflammatory and anti-edematose (7). In our work, we used the diode laser (gallium aluminium arsenide – GaAlAs) which belongs into the category of low energy lasers (Figure 1).



Figure 1. Diode laser, smile Pro980, Biolitec

2. CASE OVERVIEW

A 25-year old girl was administered for alterations in the colour of the gingiva in the area of the upper first premolar which posed an aesthetic issue for the patient. (Figures 2 and 3).



Figure 2 and 3. Te alterations in the colour of the gingival in the area of the upper first premolar

The patient's medical history indicated that the dark colouring of the gingiva appeared three years ago shortly after the placement of the custom-cast post which was additionally treated by the dentist before cementing the crown. The patient's wish is to replace the crown on that tooth but primarily to remove the pigmentation from the gingiva. A tattoo removal treatment with the low power diode laser (SmilePro980, Biolitec, Germany) was recommended. The patient received local anaesthetics of 2% lidocaine with adrenaline. With the operational end of the laser and with the help of optical fibre cable, we managed to reach the area of the sulcus and to remove the tattoo in the pulsing mode (Pulse 3, On time 0,10s, Of time 0,10s, Fibre Range 300-600µ, Set Power 3.0W) (Figure 4).



Figure 4. The treatment with laser

After the intervention, the gingiva was whitish colour without visible signs of surface tissue damage (Figure 5).



Figure 5. The status of gingiva after laser intervention

The patient was recommended to keep the oral hygiene with the use of an ultra-soft tooth brush (Cura-prox 5460) and to apply Gengigela (0.2% hyaluronic acid).

After 10 days, the control check-up showed irregular colouring of the gingiva in the area treated by the laser (Figure 6).

4 weeks after the treatment, the



Figure 6. Ten days after laser treatment



Figure 7. The gingival colour is light pink and without the presence of the tattoo

gingival colour is light pink and without the presence of the tattoo (Figure 7). No bleeding is registered upon sounding. The patient is satisfied with the aesthetic effects of the performed therapy.

Discussion

The advantage of the laser removal of oral mucosa tattoo is that it can be performed as an outpatient treatment without the use of a scalpel and the subsequent wound stitching. The procedure is simple with only minimum trauma to the surrounding tissue. The fractured pigment particles are phagocytosed and removed by means of a transepidermal exudate (8).

Shan i Alster have conducted an amalgam tattoo removal treatment by using the Q-Switched Aleksandrite (755nm) laser. They achieved satisfactory results after the third treatment (9). In our case, the tattoo resulted from metal particles which have penetrated into the epithelium during the processing of the custom-cast post and it was removed in a single patient visit. We deem that the number of necessary treatments for the removal of the tattoo depends on the density and the type of material from which the tattoo had arisen as well as the place in which it is located.

3. CONCLUSION

The diode laser can safely and efficiently remove the oral mucosa tattoo.

Conflict of interest: non declared.

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