Treatment of an Amalgam Tattoo with a Q-Switched Alexandrite (755 nm) Laser

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BACKGROUND. **Amalgam tattoos result from deposition of metallic particles (eg, silver, mercury, copper, zinc, and tin) into the oral mucosa. Their clinical and histologic appearance is similar to that of decorative tatoos.**

OBJECTIVE. **To describe the successful use of a Q-switched alexandrite laser for removal of an amalgam tattoo.**

MATERIALS AND METHODS. **An amalgam tattoo on the buccal mucosa and gingiva was treated with a QS 755nm alexandrite laser. Three treatments were delivered at 8-week time intervals (average fluence = 6.8 J/cm^2).**

RESULTS. **Significant lightening of the tattoo was achieved after each of the three treatments without adverse sequelae.**

CONCLUSION. **Q-switched alexandrite laser irradiation can safely and effectively eradicate amalgam tattoos.**

G. SHAH, MD AND T.S. ALSTER, MD HAVE INDICATED NO SIGNIFICANT INTEREST WITH COMMERCIAL SUPPORTERS.

AMALGAM FILLINGS are made of a mixture of silver, mercury, copper, zinc and tin and are used commonly in dentistry. Amalgam tattoos may occur as a result of leaching of these metals into the oral mucosa from old amalgam fillings. Tattooing may also occur by accidental deposition of fine metallic particles into the gingiva by high-speed drills or rotary instruments used during filling placement. Clinically, amalgam tattoos appear as blue-black or blue-gray patches on the oral mucosa, most commonly on the gingival surfaces. The incidence of amalgam tattoos has been reported to occur in up to 8% of samples surveyed.[1,2] Their histologic appearance is similar to that of decorative cutaneous tattoos. Fine, dark granules and irregular fragments are seen extracellularly in the dermis along collagen bundles and intracellularly in macrophages, fibroblasts, endothelial cells, and multinucleated giant cells.[1,2]

Because the mercury is not in a free state, amalgam tattoos do not pose a health hazard. However, amalgam tattoos remain a cosmetic concern, especially for patients who demonstrate extensive frontal gingival involvement.

Prior treatments for amalgam tattoos have included surgical excision and transplantation of mucosal tissue.[3,4] The Q-switched 694 nm ruby laser has also been used to treat these tattoos with favorable results.[5] We describe a case of an amalgam tattoo that demonstrated significant improvement after treatment with a quality (Q)-switched 755 nm alexandrite laser.

Case Report

A 39-year-old man presented with a 1-year history of an amalgam tattoo on his oral mucosa due to leaching of metallic particles from an amalgam filling. Although asymptomatic, the tattoo was cosmetically unappealing to the patient. On physical examination, a blue-black patch with reticulate borders was present on the right upper buccal and gingival mucosa (Figure 1).

Treatment of the amalgam tattoo with a Q-switched 755 nm alexandrite laser (TATULAZR, Candela Laser Corp, Wayland, MA) was prescribed. Cutaneous anesthesia was achieved with intraoral trigeminal nerve blocks using 1% lidocaine without epinephrine. Tooth enamel was protected with water-soaked gauze during laser irradiation. A fluence of 5.5 J/cm^2 was applied to the tattooed mucosa through a 3-mm collimated handpiece, producing an immediate ash white tissue response with minimal to no tissue splatter. No postoperative wound care was prescribed and the treated area healed without any adverse sequelae. The lesion was treated at 8-week time intervals with an end treatment fluence of 8.0 J/cm^2 (average fluence = 6.8 J/cm^2). Significant lightening of the tattoo was noted after the third treatment (Figure 2).

Discussion

Quality-switched (QS) lasers are advantageous for treatment of tattoos because they produce high ener-

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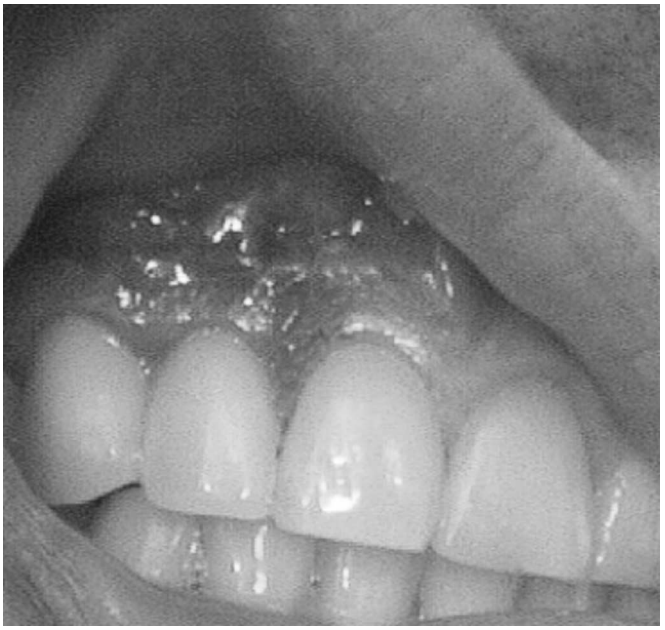

Figure 1. Amalgam tattoo on the gingiva.

Figure 2. Amalgam tattoo removed S/P three QS alexandrite (755nm, 50ns) laser treatments.

gies in ultra short pulses that shatter tattoo particles with minimal destruction to surrounding tissue. After the selected injury occurs, the fragmented tattoo particles are phagocytosed and removed by lymphatics or via transepidermal extrusion.[6] Blue, gray, and black tattoos have been treated successfully by Q-switched ruby, alexandrite, and Nd:YAG lasers.[7] The 755 nm alexandrite laser has been touted as more advantageous than the 694 nm ruby laser for tattoo removal due to its tendency to effect less epidermal tissue destruction as a consequence of decreased absorption of its longer wavelength by epidermal melanin.[8] As a result, the incidence of unwanted side-effects such as permanent hypopigmentation is minimized with QS alexandrite laser treatment.

Similar to treatment of amateur tattoos, amalgam tattoos require fewer laser sessions to clear than do professional tattoos.[7] In Ashinoff and Tanenbaum's report, 7 ruby laser sessions were required at an average fluence of 6.0 J/cm^2 to effect significant lesional fading.[5] Our case is noteworthy in that it produced such a dramatic response after only 3 QS alexandrite laser treatments at similar fluences. In general, fluences appropriate for treatment are dependent on the tattoo ink density and the location of the tattoo, with lower fluences typically applied to more heavily pigmented tattoos and in thin-skinned areas (e.g., periorbital regions).

Conclusion

Amalgam tattoos can be successfully and safely removed by Q-switched alexandrite laser treatment.

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