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Cultural Gingival Tattoo Diagnosis and Origins

A Case Report

Austin J. Shackelford, D.M.D.; Carleigh R. Canterbury, D.D.S.; Scott M. Peters, D.D.S.

ABSTRACT

Background: Cultural gingival tattooing is the practice of placing pigmented material into the maxillary anterior gingiva as a means of aesthetic enhancement, medicinal therapy or assimilation in some African and Middle Eastern nations.

Case Description: This is a report of a 47-year-old female from Senegal who presented with cultural gingival tattooing for cosmetic purposes. The patient's maxillary facial gingiva displayed a gradient of blue-gray-black pigment that extended from the right maxillary second molar to the left maxillary second molar.

Clinical Relevance: There are many systemic and local causes of pigmentation in the oral cavity, many of which require laboratory testing or biopsy for definitive diagnosis and resultant appropriate therapy. In contrast, cultural gingival tattooing is a clinically recognizable entity in the context of an appropriate patient history. While this entity is clinically diagnostic, it can pose a hurdle in routine oral cancer screening, as it has the potential to obscure other pathoses.

Case Report

A 47-year-old Senegalese female of Wolof descent presented to our institution for a comprehensive examination. The patient denied any oral or odontogenic pain. She reported a non-contributory medical history and had no prescribed medications. The patient also denied the use of tobacco products, alcohol or illicit drugs. Extraoral examination was unremarkable, with no evidence of facial asymmetry, swelling, trismus or lymphadenopathy. Intraoral examination revealed a diffuse, blue-gray-black pigmentation on the maxillary facial gingiva extending from the right maxillary second molar to the left maxillary second molar (Figure 1).

The pigmentation was predominantly present in a gradient, such that the darkest blue-black areas appeared superiorly along the alveolar mucosa and mucogingival junction, while inferiorly, the free gingival margin lacked obvious pigmentation. Physiologic pigmentation was also noted on intraoral exam and seen scattered throughout the oral mucosa inclusive of areas involved by the blue-black pigmentation previously described. The remaining hard and soft tissues were within normal limits.

Upon inquiry, the patient reported that she had undergone multiple sessions of gingival tattooing for aesthetic purposes in her home country of Senegal. Her last session of tattooing had taken place approximately 20 years prior. The patient remarked that she would like to have the tattoo reinforced with new pigment to cover the areas that now appeared faded.

Discussion

Cultural gingival tattooing is the practice of impregnating pigmented material into the maxillary facial gingiva. The tattooing is

a practice that originates primarily in the Sahel region of Africa, extending from Senegal in the West to Sudan in the East.^[1] There are approximately eight Western African ethnic groups that practice cultural tattooing, including Wolof, Serer, Diola, Mandinka, Fulani Laobe, Kanuri and Soninke, which are primarily located within the countries of Senegal, Mauritania, Guinea-Bissau, Nigeria, Niger, Chad and Mali.^[2] While a majority of cases have been studied in these Western groups, there have been reports of the practice in Eastern Africa, namely, the Eritrean ethnic group, and into the Middle East as well.^[2,3]

A majority of gingival tattooing in these ethnic groups are performed on preteen and teenaged females in their first and second decades of life. Of note, there are reports of males participating in tattooing, but to a lesser degree and limiting the pigment to the gingiva adjacent to the maxillary right and left canines.^[3-6]

Up to 80% of women who participate in the tattooing ritual will repeat the procedure at least once, while 20% will undergo the procedure three times or more in their lifetime.^[3,7]

Bukar et al. found that 97.7% of women with gingival tattoos had them done before marriage.^[8] Previous authors have also shown that the hue and pigment intensity of the tattoo acts as a surrogate marker of the age of the tattoo. Gbane et al. analyzed a cohort of 52 women with gingival tattoos in the Ivory Coast and determined that tattoos with a primarily bluish hue were likely less than a year old; those with a gray-blue color were present from one to three years; primarily gray was indicative of three to six years old; and tattoos with a gray-to-pink transition were likely more than six years old.^[9,10]

There are a variety of reasons for cultural gingival tattooing, including aesthetics, assimilation and homeopathic remedies for dental disease and pain management.^[2-4,6,11-13] The most reported reason for women to partake in gingival tattooing is aesthetics.^[2-4,6,11,14] The ethnic groups participating in the tattooing believe that the natural pink-to-red color of the gingiva represents an unhealthy appearance, thus, the blue-black pigment used helps to conceal the physiologic color.^[3] Furthermore, the dark tattoo pigment also provides color contrast with the teeth, making them appear whiter, which is also considered a desirable characteristic.^[2,14]

The importance of the aesthetic effect of pigmentation on the gingiva extends beyond the life of the teeth. Tinklepaugh and Norton reported a case of a Senegalese woman who had the acrylic gingival component of her partial denture fabricated with dark pigment to match her pre-existing gingival tattoo, thus, keeping the continuity of color between the tattooed gingiva and the prosthesis.^[1]

A case of gingival tattooing performed as a means of cultural assimilation has also been reported in the literature. Hohenleutner and Landthaler reported a 26-year-old Caucasian female who underwent cultural gingival tattooing after moving to Sen-



Figure 1. Diffuse, blue-gray-black pigmentation on the maxillary facial gingiva extending symmetrically from right second molar to left second molar. Pigmentation transitions from blue-black superiorly to blue-gray inferiorly. Blue-gray pigment transitions to normal pink hue at marginal gingiva. Physiologic (racial) pigmentation is scattered throughout oral mucosa, including tattooed portions of the gingiva. (A) Anterior view along with view of patient's (B) left maxillary gingiva and view of patient's (C) right maxillary gingiva.

egal to live with her Senegalese husband, where the tattooing was performed for beautification or as a tribal mark. The marriage did not last and the tattoo was later removed via laser therapy.^[12]

Gingival tattooing has also been employed as a therapeutic agent, believed to achieve healing of the gingiva and dental tissues.^[2,3,6,11,13,15] Brooks et al. reported a patient who used gingival tattooing in an attempt to alleviate dental pain in the anterior maxillary region.^[3] Although unsuccessful in alleviating the pain, the patient opted for extension of the tattoo posteriorly as they believed this would reduce the chance of the pain spreading. Gingival tattooing has also been reported to having been performed in patients not experiencing pain but, rather, seeking improved overall health of the gingiva and to reduce generalized gingival bleeding.^[2]

The socioeconomic significance of gingival tattooing remains unclear and may vary by region. Telang and Ditre found that gingival tattooing was not considered indicative of socioeconomic status by their Ethiopian subject.^[6] In contrast, Gaye et al. studied members of the Wolof people in Senegal and determined that gingival tattooing was a sign of elegance, nobility and beauty, attributes often associated with higher socioeconomic status in Western culture.^[14]

There are a wide variety of instruments and materials used in the practice of gingival tattooing. Sharp instruments are required to deliver the pigment beneath the epithelium and into the underlying connective tissue. The most commonly reported natural instruments used are the thorns from *Balanites aegyptiaca*, also known as the desert date tree.^[3,8] On the other end of the spectrum, patients report having the tattooing done in a dental office with sterile needles.^[2,6]

The source of the pigment used in the practice of gingival tattooing also varies and includes powder from the plants *Durata stramonium*, *Julgans regia*, *Acacia nilotica*, generalized burnt plant material, khol powder, charcoal, and soot from a lantern or clay.^[2,3,5,6,8,12,13] Patients report having the pigment placed on the gingiva, then, without the use of anesthesia, having the sharp instrument(s) pierce the tissue and implant the pigment.^[8] The procedure is most often performed in a home setting, but is sometimes done by a medical professional in a sterile setting.^[2]

Although there are many histopathologic entities that can cause pigmentation of the gingiva, the characteristic pattern and symmetric distribution of the pigment seen in cultural tattooing is typically clinically diagnostic. In addition to the characteristic appearance, most patients upon interviewing will acknowledge the practice of gingival tattooing, further confirming that the pigmentation of the gingiva is an intentional process. In this context, biopsy is not indicated unless the clinician detects other pathology of concern that happens to occur within the tattooed region. In fact, the clinician should closely evaluate and even photograph the region of tattooing for close comparison during

routine oral cancer screenings, as the tattooed region has the potential to obscure subtle pathology of the gingiva.

To this point, while rare, the maxillary gingiva does represent a high-risk site for mucosal melanoma, which can initially present as an asymptomatic, flat, variably pigmented lesion. Should the clinician detect any significant changes to the tattooed region outside that of typical aging, a biopsy would be indicated. If a biopsy were to be taken of a cultural gingival tattoo, it would demonstrate dark granules in the connective tissue and, in some cases, a foreign-body inflammatory response.^[3] This biopsy finding is in stark contrast to that of melanoma, which would show atypical melanocytes with cellular pleomorphism, hyperchromatic nuclei, and prominent nucleoli within the epithelium above the epithelial-connective-tissue junction and also invading into the underlying connective tissue.^[16]

In the circumstance that the patient does not disclose a history of intentional tattooing, physiologic (racial) pigmentation is another consideration on the differential diagnosis. Physiologic pigmentation is most commonly found on the gingiva, but also can be found anywhere in the oral cavity and often presents in a diffuse pattern.^[17] Areas of physiologic pigmentation can and frequently will be interspersed within an oral tattoo, as was the case with our patient (Figure 1). Similar to cultural gingival tattooing, physiologic pigmentation classically presents in a clinically identifiable pattern and does not require biopsy. However, in cases that appear atypical, or should the patient desire removal of an area of pigment, a biopsy may be performed. A biopsy of physiologic pigmentation will demonstrate an increase in melanin pigment in the absence of an increased number of melanocytes.

Other considerations on the differential in the absence of clinical history or in the presence of an atypical appearance of a gingival tattoo include melanoacanthoma and smoker's melanosis. Melanoacanthoma (melanoacanthosis) is considered a benign reactive lesion that demonstrates dendritic melanocytes dispersed throughout the epithelium.^[10] Smoker's melanosis is another benign inflammatory condition that can appear similar to a cultural gingival tattoo. It is most commonly seen on the labial gingiva and is more common in females, though a lack of smoking history would easily negate this diagnosis as a possibility.^[18] Biopsy is not usually indicated when correlated with the patient's social behavior, but if performed, would resemble physiologic pigmentation.^[18]

Conclusion

Cultural gingival tattooing is the practice of impregnating a variety of natural dyes into the maxillary gingiva, and is primarily performed on women of Africa's Sahel region for aesthetics and healing. Cultural gingival tattooing should be considered in the differential diagnosis in the presence of a diffuse, symmetric and uniform pattern of pigment present on the maxillary facial gin-

giva. This entity may be clinically diagnosed when correlated with patient history, thus saving the patient from unnecessary biopsy in many cases. However, the clinician should be cognizant and diligently assess for the possibility of a concurrent lesion within the area of the tattoo, as this may pose a hurdle in the early detection of a precancerous or cancerous lesion histologically. *✍*

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