DEPIGMENTATION OF GINGIVA

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INTRODUCTION:

The colour of gingiva depends on several factors: number and size of blood vessels, thickness of the epithelium, level of keratinization, quantity of pigments.

Melanin, carotene and oxyhaemoglobin are the main pigments, responsible for the normal physiologic pigmentation within the oral cavity. Melanin is a natural brown pigment, produced by melanocytes that reside in the basal layer of the epithelium. Chemically, melanin is a high – molecular weight dye that is insoluble in water and most organic solvents. Melanin is formed only in the cytoplasm of melanin-forming cells or the melanocytes. These are dendritic cells found at the epidermal – dermal junction of the skin, mucous membranes, in the leptomeninges of the central nervous system and in the retina of the eye. [1] The degree of pigmentation depends on variety of factors, especially the activity of the melanocytes.

The degree of gingival pigmentation of the gingiva and skin is reciprocally related. Fair-skinned individuals are very likely to have non-pigmented gingiva, but in darker skinned persons, the chance of having pigmented gingiva is extremely high. The highest rate of gingival pigmentation is observed in the area of the incisors.

Within the oral cavity, the melanin is found in the gingiva, hard palate, mucosa and tongue. Its appearance may be: diffuse, solid or irregular shaped, with different shades of colour: from light brown to black.

Hyperactivity of melanocytes is the reason for dark colour of gingiva, which is absolutely benign condition with only esthetic disadvantage, for people with gummy smile mostly. Depigmentation is a procedure of removing or reducing of gingival hyperpigmentation. Possible ways of doing it are: surgical, by lasers, cryosurgery, bur abrasion and electro-cautery. Each technique has its own advantages and inadequacies.

METHODS:

We are observing two alternative methods: laser ablation [2] and cryosurgical procedure of tissue destruction by fast freezing with liquid nitrogen (- 196º C). [3]

RESULTS:

Case 1: A 24 years old male patient, with melanin hyperpigmentation in the area of lower incisors (Pic. 1). We used gas expansion cryoprobe, cooled to - 81ºC and applied to the pigmented gingiva for 10 sec (Pic. 2). [1] Gingiva-thawed spontaneously within 1 minute and necrosis become apparent within 1 week. Keratinization was complete within 3 - 4 weeks (Pic. 3). This procedure does not require the use of local anesthesia and has shown to produce excellent results. Rapid freezing is leading to denaturation of proteins and cell death. There is no need of using a periodontal dressing in this procedure. The removal of the pigments cannot be evaluated immediately, it requires a second procedure in about 5 days, during which the residual pigmentation should be removed. The big disadvantage is that the liquid nitrogen evaporates too fast.

Cryotherapy procedure requires a special container for storage of liquid nitrogen. The depth of penetration is difficult to control and prolonged freezing can cause excessive tissue destruction.

The accidental contact of the liquid nitrogen can also cause injury of the skin and other contact areas.

Case 2: A 27 years old female patient, with dark skin and black hair, active smoker. The examination showed acute gingival inflammation (Pic. 4), but the X – ray proved lack of pathological changes in the bone structure.

Depigmentation was completed by an Er: YAG laser ablation, after using contact anesthesia (Pic. 5).

Parameters of the irradiation. [4, 5]:
- Distance – 7-9 mm (non – contact, defocused mode)
- Water cooling
- Energy – 300 mJ
- Frequency – 15-17 Hz

The patient didn’t feel any pain during or post-operatively. Mild itching was common during the first week. The esthetic results were pleasing and healing was uneventful. Gingiva showed fast epithilization with a healthy appearance (Pic. 6).
CONCLUSIONS:
Laser assisted gingival depigmentation is a single step procedure, with fast healing process and sterilization and without necessity of using periodontal dressing.
Cryosurgical procedure of depigmentation is complicated by the necessity of providing special containers for liquid nitrogen saving and the requirement for fast (20 – 30 sec) application. There is also difficult control of penetration and risk for excessive tissue destruction after prolonged freezing.

Picture 1. Gingival hyperpigmentation.

Picture 2. Cryosurgical procedure.


Picture 5. Gingival view after laser ablation.

REFERENCES:


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