

**Research article**

# Is Conventional Management of Hyperpigmentation Still the Best Choice? -- A Case Report

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**Abstract.**

**Background:** A normal gingiva is generally “salmon” pink in color. Varying degrees of brownish pigmentation in gingiva may be seen in Blacks (seldom also in Caucasians). Those who exhibit gingival hyperpigmentation face aesthetic problems.

**Objective:** To describe the treatment of gingival hyperpigmentation in a 29-year-old male attending the Department of Periodontics Clinic, Universitas Padjadjaran, exhibiting excessive staining on the gums of the right to left canine region of the upper and lower jaw.

**Case Report:** This gingival hyperpigmentation case was managed through a conventional method of using scalpel.

**Results:** Gingiva that had excessive staining in this case was eliminated and exhibited good aesthetic.

**Conclusion:** The conventional management of gingival hyperpigmentation is still the best choice to solve an aesthetic problem with a simpler and safer technique, and at more affordable costs.

**Keywords:** gingival hyperpigmentation, gum excessive staining, conventional gingival surgery

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## 1. Introduction

All races of man from one race to another have varies gingival pigmentation. It is due to melanin granules produced by melanoblasts. Excessive pigmentation of gingiva is considered as one of the major aesthetic concern for many patients [1]. The word “melanin” comes from the Greek “melanos”, which means “dark”. Melanin was first used in the dark pigment extracted from the membranes of the eye by Berzelius (1840) a scientist from Sweden [2]. Pigmentation in the oral cavity between men and women there is no significant difference. Different individuals of the same race and in different oral cavities have varying intensity and distribution of racial pigmentation on the oral


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mucosa. Attached gingiva represents the most common intraoral pigmented area. Other less common sites include hard palate, lips and tongue [3].

Oral pigmentation can be caused by smoking. This is known as melanosis. In light-skinned individuals while in dark-skinned individuals will further highlight the pigmentation. Biological defenses against harmful agents present in tobacco smoke lead to increased melanin production. Melanosis due to smoking can occur in about 21.5% of smokers [4].

Gingival hyperpigmentation can be removed in various ways. The main complaint that causes patients to come for gingival depigmentation treatment is for aesthetic reasons [5].

Recurrent pigmentation is a common problem, even though the depigmentation procedure produces very satisfactory gingival esthetics. Differences in the onset of repigmentation may be related to the choice of depigmentation technique employed and the individual race. Repigmentation occurs spontaneously. Histologically indicated by the presence of surrounding melanocytes actively migrating to the treated area [6].

## 1.1. Technique of gingival depigmentation

There are several gingival depigmentation technique by Roshni and Nandakumar (2005) including scalpel surgical technique, bur abrasion, electro-surgery, cryosurgery, lasers, and radiosurgery [6].

Scalpel technique surgery as the conventional management of hyperpigmentation offers simple, easy to perform, non invasive, cost effective, does not require any extensive armamentarium and faster healing [7].

## 2. Case Report

A male 27 years of ages visited to Department of Periodontics Clinic, Universitas Padjadjaran. His main complaint was excessive gums staining in the at facial area, not accompanied by any pain. Sometimes, the patient felt uncomfortable during activities in front of public even talking with his friend.

Clinical examination showed gums staining in the at facial area of teeth 13 to 23 and 33 to 43 extended to attached gingiva. Plaque and calculus were present slightly at maxilla and mandible. The hyperpigmentation was slightly brown, with normal probing depth varies between 1-3 mm but without any gingival bleeding on probing. The patient

TABLE 1: First illustration, benefit and disbenefit of gingival depigmentation technique [7].

Gingival Depigmentation Technique	First Illustration	Benefit	Disbenefit
Scalpel surgical technique	First illustrated by Dummett and Bolden in 1963.	Simple, easy to perform, noninvasive, cost effective, does not require any extensive armamentarium and faster healing	During and after surgery, unexpected bleeding occurs, more likely to experience infection
Bur abrasion method	This technique was first reported by Ginwalla et al (1966) in the first case.	Quite simple, safe, non-aggressive, slightly uncomfortable, easy to work with, easy to repeat, does not need sophisticated instruments and is economical.	The time it takes is 45 minutes to 1 hour. The depth of de-epithelialization is difficult to determine. It is necessary to anticipate postoperative bleeding and pain.
Electro surgery [45, 46]	This technique was first reported by Ginwalla et al (1966) for depigmentation	This technique is able to control bleeding, allows sufficient tissue formation, patient discomfort, scar formation and less procedure time.	Need more skill than scalpel surgery technique. Induces heat and tissue damage when carried out for prolonged or repeated use. Uncomfortable because it produces an unpleasant smell.
Cryosurgery	This technique was first reported by Tal et al (1987).	Easy and fast to work on. Anesthesia or suturing is not necessary. No bleeding or scarring.	Difficult to control depth. The optimal duration of clotting is not known. Tissue damage may result from prolonged freezing. Requires extensive special equipment. Generally cause considerable swelling and additional soft tissue damage
Laser	This technique was first reported by Trelles et al, (1992) using Argon laser.	The operating area is dry and does not bleed. Bacteremia, mechanical trauma, swelling, pain and postoperative scarring are few.	Delayed epithelial regeneration. Very high cost. when using the laser tactile feedback is lost. It is possible that gingival and bony fenestrations are exposed. Periodontal tissue healing time is longer.
Radiosurgery	This technique was first reported by Drs. Arikian and Gurkan.	Produces coagulation. Less bleeding, less incision pressure. Sterile and produces a sterile incision. Hand pieces and electrodes can be sterilized by autoclaving. The resulting scar tissue is either absent or minimal. Hand support and finger rest are required. No bleeding or hemorrhage; better visibility. Small size; easy maintenance and repair.	Treatment time is at least two visits within 2 weeks. Patients with poorly protected pacemakers are contraindicated. The place should be away from flammable gases. This technique produces an unpleasant odor that is uncomfortable for the patient. Equipment costs are very high compared to scalpels.
Free gingival graft	This technique was first reported by Tamizi M and Taheri M (1996).	More esthetic results. Less recurrence rate.	Additional surgical area required. Uncomfortable. Healing time is long and painful. Tissue in the donor area is limited. The border of the former graft area is visible so that it can interfere with esthetics.

has ever been a smoker about 2 years ago along 3 years, no drug even systemic

TABLE 1: First illustration, benefit and disbenefit of gingival depigmentation technique [7].

Gingival Depigmentation Technique	First Illustration	Benefit	Disbenefit
Acellular dermal matrix allograft	This technique was first reported by Novaes AB Jr <i>et al</i> (2002).	Shorter surgical time and fewer postoperative complications than free gingival grafts.	It is expensive and requires special clinical expertise. Possible graft contraction.

disease, no genetic familial history present, no history for any gingival depigmentation treatment before. Frenulum was observed highly.



Figure 1: The first visit of gingival clinical appearance.

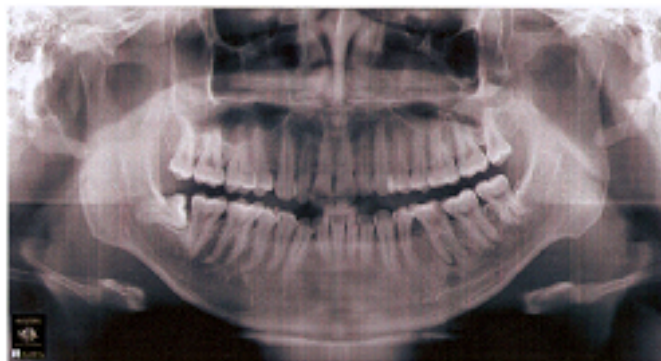


Figure 2: Radiographic examination.

On the first visit, The patient was informed the stages of treatment then signed the approval of the treatment, obtained oral hygiene instructions after initial treatment. After phase I therapy, the patient was recalled and the results were evaluated.

TABLE 2: Patient Blood Examination.

Tests	Result	Reference	Unit	Conclusion
Hb	15,7	14-18	g/dL	Normal
WBC	6100	4.000-10.000	/mm <sup>3</sup>	Normal
RBC	5,3	4,5-6,5	millions/mm <sup>3</sup>	Normal
ESR	5	<20	mm/hour	Normal
Platelets	245.000	150.000-450.000	/mm <sup>3</sup>	Normal
Bleeding Time/BT	1'00	1-3	Min.sec	Normal
Clotting Time/CT	7'00	5-11	Min.sec	Normal
Blood Group	A			
Glucose	83	<150	mg/dL	Normal

Patient had no contraindications for periodontal surgery. It was planned to perform gingival surgery with depigmentation. Local anesthetic infiltration of 2% lidocaine containing adrenaline at a concentration of 1:80.000 was injected in the first right premolar to the first premolar left of the upper jaw. This was followed by scrapping attached gingiva to margin gingiva at maxilla and mandible. Blade number 15 was held parallel to the gingival surface, removal of pigmented epithelial tissue up to the mucogingival junction was performed. After the removal of all the epithelium, the gingiva was smoothed gently to obtain the physiologic contour of the gingiva. Immediately after completion, a frenectomy was performed.



Figure 3: Scrapping attached gingival to margin gingival.



**Figure 4:** Frenectomy procedure.



(a)

(b)

**Figure 5:** Application of a periodontal dressing (Coe-Pak) at facial (a) and palatal (b).

The surgical wound area was covered with a periodontal pack (Coe-Pak) so that it was protected for at least 1 week and the patient was comfortable. Antibiotics, analgesics and 0.12% chlorhexidine gluconate mouthwash were prescribed. Postoperative instructions were delivered. Seven days later, the periodontal pack was removed and the periodontal tissue condition was evaluated. Further evaluation was also carried out at 1 month after surgery.





(a)



(b)

**Figure 6:** One week evaluation after depigmentation (a), and 1 month evaluation after depigmentation (b).

### 3. Discussion

Gingival depigmentation is a periodontal plastic surgical procedure in which the gingival hyperpigmentation is eliminated or reduced by several treatment modalities that have been suggested ranging from a simple conventional scalpel method to sophisticated lasers [8]. Methods of depigmentation are vary including conventional method using scalpel, gingival abrasion technique by gingivectomy, electrosurgery, cryosurgery, and chemical agents. Other methods aimed at masking the pigmented gingival from less pigmented gingival areas as free gingival graft and acellular dermal matrix allograft. The selection of technique should be based on clinical experience and individual preferences [5,9]. In the scalpel technique or conventional method, gingival epithelium is removed along with a layer of the underlying connective tissue. The denuded tissue heals by secondary intention. This technique has an advantage of being effective and requires minimum time and effort; however, its disadvantage is mainly due to bleeding, postoperative pain, and discomfort [10].

The depigmentation procedure by conventional method is simple, easy to perform, noninvasive, and above all, cost-effective compared to other techniques. However,

erbium: yttrium-aluminum-garnet (YAG) laser is more useful and safe in thin gingival biotype, and healing of wound is relatively fast and comparable to scalpel wound [2]. Unlike conventional method, the bur abrasion method is difficult to determine the depth of de-epithelialization. Electrosurgery needs more skill than scalpel surgery technique, induces heat and tissue damage when carried out for prolonged or repeated use, and uncomfortable because it produces an unpleasant smell. Cryosurgery is difficult to control depth, the optimal duration of clotting is not known, tissue damage may result from prolonged freezing, requires extensive special equipment, and generally cause considerable swelling and additional soft tissue damage. Laser

experiences delayed epithelial regeneration, very high cost. It is possible that gingival and bony fenestrations are exposed, and periodontal tissue healing time is longer [7].

According to the migration theory, active melanocytes from the adjacent pigmented tissues migrate to treated areas, causing repigmentation. Repigmentation was reported with nearly all methods. Bur abrasion has the highest rate of repigmentation by 8.89, followed by laser 1.16%, then electrosurgery 0.74%, then cryosurgery 0.32%, and then diode laser 0.19%, while repigmentation rate following scalpel technique may occur after 7 years [11].

According to Almas and Sadiq, the scalpel wound heals faster than that in other techniques. However, scalpel surgery causes unpleasant bleeding during and after the operation. It is also necessary to cover the exposed lamina propria with periodontal dressing for 7–10 days [12].

The scalpel technique procedure is more convenient, regarding duration and effort, and it is also more economical to the patient when compared to abrasion and laser techniques [12].

Gingiva that has excessive staining in this case could be eliminated well and exhibited good aesthetic. During the postoperative period, the wound healing was exhibited without any discomfort. After removal of the pack (1 week), hyperpigmentation was absent in the newly formed epithelial tissues, with the gingiva appearing pale pink after a period of 1 month.

Gingival depigmentation using conventional method has an advantage of being effective and requires minimum time and effort compared to laser and abrasion methods [13].



## 4. Conclusion

This conventional management of gingival hyperpigmentation is still the best choice in order to solve the aesthetic problem with a simpler and safer technique, and more affordable costs.

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