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Comparative evaluation of patient response and appearance after being treated for gingival hyperpigmentation with various surgical techniques involving the use of diamond bur, scalpel, laser and, electrocautery technique: A case series

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Abstract

The gingival colour is important in facial beauty of individual. Excessive melanin deposition is ultimate cause of gingival hyperpigmentation. The degree of pigmentation varies from person to person and is determined by variety of factors, particularly melanoblastic activity. Gingival depigmentation is a periodontal plastic procedure in which hyperpigmented gingiva can be removed by various techniques. The technique selection should primarily be based on clinical experience and individual preferences, with primary indication of demand for improved esthetics. Each technique has its own advantages and disadvantages. Re-pigmentation after gingival depigmentation is important point of which clinicians should be aware. The present case series describes four treatment modalities and their outcomes in patients.

Keywords: Depigmentation, electrosurgery, scalpel technique, pigmented gingiva

Introduction

Gingival hyperpigmentation is excessive pigmentation on gingiva. Drugs, metals, genetics, endocrine disturbances, syndromes and inflammation are the various etiological factors. Melanin, is non-haemoglobin derived pigment formed by melanocytes [1]. Active melanocytes convert tyrosine to melanoprotein, which is transferred to basal and prickle cell layers [2].

Various gingival depigmentation techniques include scalpel, cryosurgery, electrocautery, lasers, free gingival graft, and acellular dermal matrix allograft [3, 4]

Case in details

Two patients having gingival melanin hyperpigmentation were selected. Systemic diseases associated with healing disturbances, pregnancy, and smoking were the exclusion criteria while selecting the cases. Surgical procedure and follow-up explained to patients. Signed consent form were also recorded.

Selection Criteria

Cases were selected based on Dummett–Gupta Oral Pigmentation Index (DOPI 1971) [5]

1. No pigmentation (pink gingiva)
2. Mild pigmentation (mild light brown)
3. Moderate pigmentation (medium brown)
4. Heavy pigmentation (deep brown)

The smile line classification (Liebart and Deruelle 2004) [6]

Class 1: Very high smile line – > 2 mm of marginal gingiva (MG) visible.

Class 2: High smile line – between 0-2 mm of MG visible.

Class 3: Average smile line – only gingival embrasures visible.

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Class 4: Low smile line–gingival embrasures and CEJ not visible

The present case series describes depigmentation techniques; diamond bur, scalpel, diode laser and electrocautery.

Case 1

Depigmentation with diamond bur and scalpel technique [7]

34 year-old male patient reported to department and complained of having black gums [Figure 1]". Bur, scalpel technique were used to remove pigmented layer in mandibular as well as maxillary anterior region, respectively [Figure 2, 5]. Local anaesthesia was infiltrated. After removing pigmented epithelium, exposed surface irrigated and dressing was given [Figure 3, 4]. Postsurgical antibiotics, analgesics (Amoxicillin 500 mg, ibuprofen with paracetamol three times daily for 5 days) were prescribed. Patient reviewed at end of 1 week [Figure 8] found satisfactory. On examination, at end of 1, 3 months, no recurrence of pigmentation was seen [Figure 9, 10].

Case 2

Depigmentation with laser and cautery technique [7, 8]

22 year-old male patient reported to department and complained of having black gums, [Figure 11] Laser assisted depigmentation [Figure 12, 15] in maxillary and

electrocautery in mandibular region was planned. Topical anaesthetic gel applied. Laser unit (wavelength 810 nm) and having energy settings of 0.5-1.5 W was used. When overall pigmented epithelial tissue were removed ,power setting was increased to 2 W for removing pigments which are present deep beneath basement membrane [Figure 13]. During procedure, tissue tags left out and covered with dressing [Figure 14]. Patient was prescribed analgesic, when required. 1 week follow up were recorded and healing was uneventful [Figure 17]. Patient recalled after 1, 3 months [Figure 18, 19]. There was no incidence of depigmentation.

Patient's Clinical evaluation by recording following indices-

1) Melanin pigmentation index (DUMMETT *et al.*) [5]

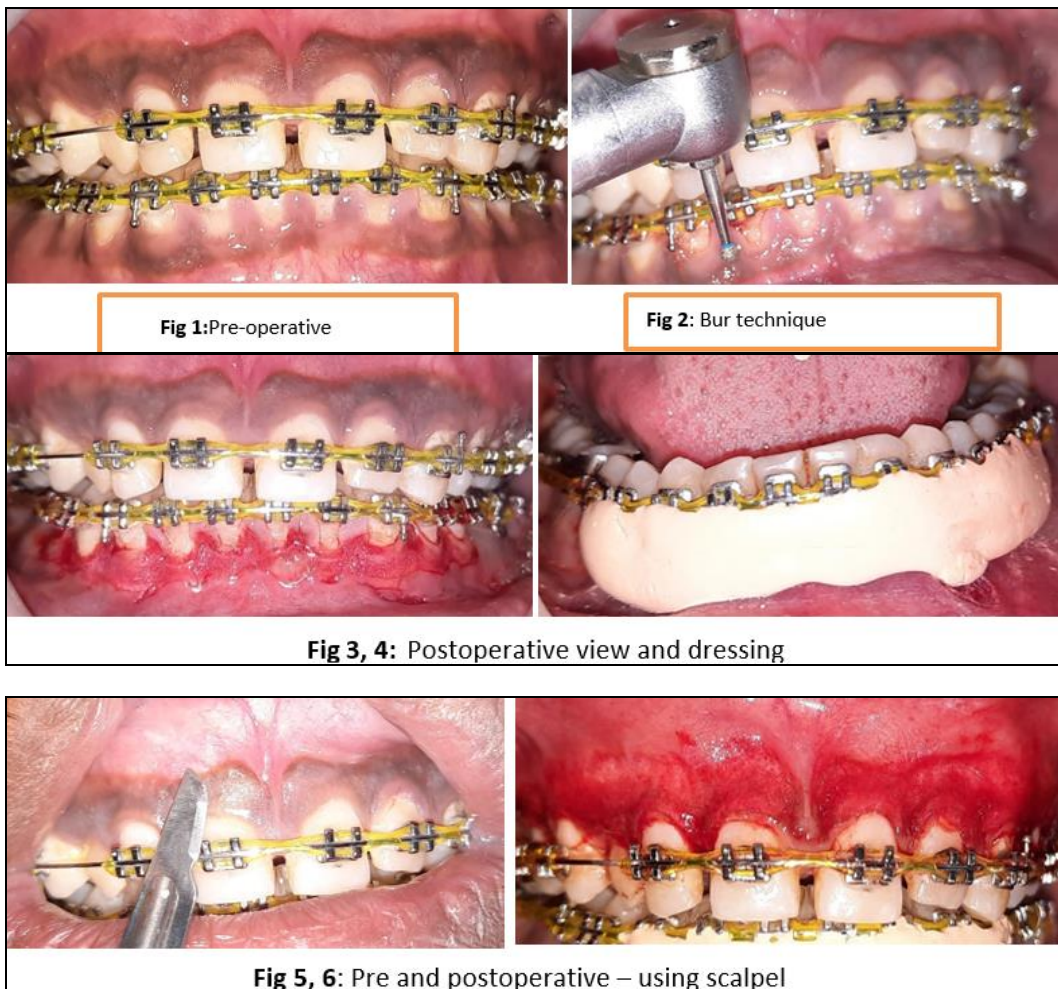
2) Wound healing

Wound healing was evaluated based on following scores⁷:

A. Complete epithelisation, B. Incomplete epithelisation, C. Ulcer, D. Tissue defect or necrosis.

3) Visual Analog scale (VAS)

VAS were used to evaluate pain level, which is experienced by patient⁷. VAS was recorded by using 10cm long line, anchored by "no pain" at left end and unbearable pain at right end. Visual Analogue Score were recorded as; 0 = no pain; 1–3 = slight pain; 3.1–6 = moderate pain; 6.1–10 = severe pain



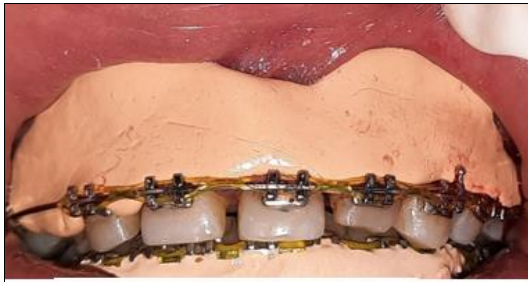


Fig 7: Coe pack placement



Fig 8: 1 week follow-up –using bur, scalpel



Fig 9, 10: 1, 3 month post-operative–bur, scalpel technique



Fig 11: Preoperative – LASER and electrocautery technique



Fig 12, 13: Pre and post-operative–using laser



Fig 14: Coe pack placement



Fig 15: Preoperative –using cautery



Fig 16: Postoperative– using cautery



Fig 17: 1 week follow-up –using laser, cautery



Fig 18, 19: 1, 3 month post-operative – laser, cautery technique



Result

Healing was uneventful in first week which results in significant improvement in gingival appearance. Results obtained were excellent and overall patient’s acceptance was good. Compared to scalpel, bur, and electrocautery, laser technique showed slow healing pattern [Table 1]. On VAS evaluation, there was moderate pain on sites operated which were with scalpel, electrocautery, and bur. However, pain had significantly reduced 1 week of surgery [Table 2]. While sites treated with laser, no pain was recorded.

In MPI score, there was no recurrence of pigmentation at 3 months and patient was satisfied with overall gingival appearance.

Discussion

Scalpel technique is most economical as compared with other

techniques. There are several techniques available, in which scalpel technique is still most widely employed and is highly recommended [8] the process of healing in bur and scalpel method is similar [9] but there is difficulty in controlling depth of de-epithelisation procedure while using scalpel technique and obtaining sufficient access.

Table 1: Clinical evaluation of wound healing Index

Technique	Immediately	1 week follow-up	1 month follow-up	3 months follow-up
Scalpel	C	A	A	A
Bur	C	A	A	A
Electrocautery	C	A	A	A
Laser	C	B	A	A

Scores: A – fully complete epithelisation; B–Partial epithelisation; C – Ulcer

Table 2: Clinical evaluation of VAS and recurrence of pigmentation

Technique	VAS			MPI SCORE		
	immediately	1 day follow-up	1 week follow-up	1 week follow-up	1 month follow-up	3 month follow-up
Scalpel	2	4	2	0	0	0
Bur	2	3.5	1.5	0	0	0
Electrocautery	2	2.5	1.5	0	0	0
Laser	2	1.5	0.5	0	0	0

MPI – Melanin pigmentation index

The use of electrocautery for longer duration induces heat accumulation and undesired cell destruction [10]. The use of laser technique didn’t produce deleterious effects on root surfaces. Healing with scalpel require shorter time than with using laser. The use of laser causes minimal damage to periosteum and bone under gingiva which are under treatment. Laser has unique property of being able to remove very thin layer of epithelium cleanly. Healing with using laser is slower than healing with scalpel wounds. [11]

Shortcomings in study

- Large sample size and longer follow-up, required.
- More confirmatory studies are required.

Conclusion

Laser technique appears to be safe and most effective for the treatment of gingival depigmentation. It has many advantages including convenience in dental clinics, effectiveness in

treatment of superficial benign pigmented lesions, and decreased trauma and time for patient.

Acknowledgement

Not available

Conflict of Interest

Not available

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Not available

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