



International Journal of Case Reports (ISSN:2572-8776)



Comparative Evaluation of healing following gingival depigmentation procedures using four Techniques: a report of 5 cases.

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ABSTRACT

Background:The outcomes of techniques employed for depigmentation are varied and no one method can be deemed as ideal. The present case series is an evaluation of 4 popular depigmentation procedures `carried out today.

Material and methods: 5 patients with non-syndrome associated gingival hyperpigmentation in all 4 quadrants based on Dummetts scoring criteria were included. Healing and pain were assessed following depigmentation carried out by scalpel, bur, electro surgery and laser in the 4 quadrants respectively and followed up for a period of 2 years.

Results: Healing following Scalpel method and laser were better than bur and electro surgery. Post-operative pain was less with the use of scalpel and laser when compared to the other 2 techniques at the end of 1month. Pain was still evident at the site of electro surgery at the end of 2 months. However at the end of 3, 6 months and 1 and 2 years there was no difference in all 4 techniques.

Conclusion: Better treatment outcomes were observed with the scalpel and laser techniques than bur and electrosurgery.

CONFLICT OF INTEREST: NIL

SOURCE OF FUNDING: The study has not been funded by any party or organisation as such, and any expenses incurred for the same were minimal and borne by the authors.

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How to cite this article:

Shreya Shetty and Aruna Vanka. Comparative Evaluation of healing following gingival depigmentation procedures using four Techniques: a report of 5 cases. International Journal of Case Reports, 2018 2:24

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Introduction

Oral melanin pigmentation may not be a medical problem, however, it could be an aesthetic issue for some patients, especially when it is located in the anterior labial gingiva and is combined with a high smile line (gummy smile) and is not uniform in appearance(1).

The methods which have been used over the years for gingival depigmentation procedures include- gingivectomy, gingivectomy with free gingival autografting(1)(2) electrosurgery, cryosurgery(3)(4)(5), chemical agents such as 90% phenol and 95% alcohol, abrasion with diamond bur(6), Nd:YAG laser (1)(7)(8)(9), semiconductor diode laser and CO2 laser(10).

This case series is an attempt to evaluate depigmentation procedures with 4 different techniques (scalpel, bur, electrocautery, laser) with regard to healing and pain perception and reemergence of pigmentation.

Case report:

5 patients (3 females and 2 males) aged between 24-35yrs with non syndrome associated gingival hyperpigmentation were selected from the out patient department of Bangalore institute of dental sciences and hospital, Bangalore. These patients were primarily concerned with unaesthetic appearance of their gingival tissue. A complete medical examination, family history and blood investigations were done to rule out any systemic conditions or syndromes and hence any contraindication for surgery. The procedures to be carried out were explained to the patient and written consent was obtained. All the 5 patients had scores of 3 based on Dummetts index score (11)

Following phase-I therapy, the various depigmentation procedures in each patient were carried out quadrant wise, under local anesthesia, following the split mouth design as follows:-

Scalpel:

A Bard Parker handle with a No. 15 blade was used to remove the keratinized epithelium

containing the pigmented layer along with a thin layer of connective tissue; the exposed surface was thoroughly irrigated with saline. Care was taken to see that all remnants of the pigment layer were removed.

Bur method:

A round diamond bur with a micromotor handpiece was used on the surface of pigmented gingiva and moved with feather light strokes without applying any undue pressure. It was not held at one area for long time to avoid thermal trauma and permanent harm to underlying tissue.(12)

Electro surgery:

Needle electrode was used for incisions and ball electrodes of different diameters were used to coagulate. Light brushing strokes were used and the tip was kept moving all the time. Prolonged or repeated application of electrode to the tissues was avoided to prevent heat accumulation and undesired tissue destruction. Continuous irrigation was done while performing the procedure.

Laser:

A diode laser (810 nm) at 0.5watt used for depigmentation procedure. The tip was moved in a brush stroke to prevent heating of the tissue.

Periodontal dressing was used following all 4 procedures.

The outcome of all 4 procedures were assessed at 1 week, 2 weeks, 4 weeks(1 month) and thereafter at 2 months, 3 months and 6 months, 1 year and 2 years respectively; for pain, healing(13) and recurrence of pigmentation.

Results:

Scalpel technique:

None of the 5 patients complained of any post operative pain and healing also proceeded satisfactorily in the follow up period.

Bur technique & Electrosurgery technique:

At the 1st week of follow-up all 5 patients complained of persistent pain at both the



FIGURE 1 Assessment of pain was done by Wong-Baker FACES Pain Rating Scale(16)



FIGURE 2 HYPERPIGMENTATION OF THE GINGIVA- PREOPERATIVE



FIGURE 3 DEPIGMENTATION WITH THE SCALPEL



FIGURE 4 DEPIGMENTATION WITH THE BUR METHOD



FIGURE 5 DEPIGMENTATION WITH ELECTROSURGERY



FIGURE 6 DEPIGMENTATION WITH THE LASER



FIGURE 7 POSTOPERATIVE – AT THE END OF 1 MONTH



FIGURE 8 POSTOPERATIVE – AT THE END OF 1 YEAR



FIGURE 9 POSTOPERATIVE – AT THE END OF 2 YEARS

treated sites. In addition healing also appeared to be delayed with persistent granulation tissue and increased redness of the gingival tissue in the sites treated by the bur technique; and delayed with the formation of a scar in the electrosurgery treated sites, which persisted until 1 month following the procedure. However at the end of 2 months and thereon, the pain had completely subsided and healing was complete.

Laser:

In the follow up period, none of the 5 patients complained of any post op pain and healing also proceeded satisfactory.

No recurrence was observed following all 4 procedures at the end of 2 years.

Discussion:

Gingival health and appearance are the essential components of an attractive smile. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced. The first and foremost indication for depigmentation is patient demand for improved esthetics. The patients in this case report were very particular about the appearance of the gingiva, and hence were recruited for this comparative evaluation.

This case series was an attempt to evaluate various techniques of gingival depigmentation- viz scalpel surgery, abrasion by a diamond bur, electro surgery and laser. All the four techniques were carried out in the same patient in a split mouth design so as to avoid bias related to the host with regard to healing, pain response and recurrence. The 3 parameters assessed viz, healing, pain perception and recurrence of pigmentation vary from individual to individual. By ensuring that all 4 procedures are carried out in the same individual it was attempted to consistently rule out any such variation.

In this case series, it was found that the time taken to carry out all the 4 procedures were nearly the same. In addition, it was also observed that both scalpel surgery and laser led to uneventful healing and minimal post-

operative pain when compared to abrasion by burs and electro surgery in the immediate post-surgical period of 1 week to 1 month. However, at the end of 2 months to the 2 year follow-up period all 4 techniques were comparable to each other.

Scalpel surgical technique is highly recommended as it is simple, easy to perform, cost effective and above all causes minimum discomfort and is also esthetically acceptable to patient (14). The healing period for scalpel wounds is faster than other techniques. However, scalpel surgery may cause unpleasant bleeding during and after the procedure. (15)(16)(17).

Similarly, bur techniques do not require any sophisticated equipment and are hence economical. Pre- and post-surgical care is similar to that of the scalpel technique.

Electro-surgery requires more expertise than scalpel surgery. This technique is uncomfortable to patients due to foul odor and the use of high-speed suction is mandatory. Electrosurgery has a strong influence in retarding migration of melanin cells from the locally situated cells (18) but also has its own limitations in that, its repeated and prolonged use induces heat accumulation and undesired tissue destruction (18). Cicek (2003) [19] reported that there is no bleeding and there is minimal patient discomfort while using electrocautery.

Easy handling, short treatment time, better homeostasis, sterilization effects and excellent coagulation can be achieved with the laser as it produces bloodless field for surgery, causes minimum damage to the periosteum and underlying bone, and the treated gingiva and mucosa do not need any periodontal dressing. However, this approach needs sophisticated equipment, which makes it very expensive. (20)

A recent case series comparing gingival depigmentation procedures by 3 techniques- scalpel surgery, abrasion by a diamond bur and electrosurgery found that the scalpel surgical

technique gave results as good as the other techniques. The post-operative complications and scar formation was lesser than with the electrosurgical procedure. However, the treatment time required was high compared to the other techniques [15].

Interestingly, no recurrence of pigmentation was observed in all 4 procedures at the end of 2 years. This is a very important aspect of depigmentation treatment outcomes as reemergence of pigmentation is a common occurrence which is usually seen anywhere between 6months/3years and it has also been suggested that gingival surgical procedures performed solely for cosmetic reasons offer no permanent results.[21]

Conclusion:

Within the limitations of the present study, depigmentation by scalpel and laser have shown better results than bur and electrocautery techniques. Although the scalpel was most economical, with regard to healing and recurrence of pigmentation, all four techniques were at par with each other.

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