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Scalpel-Assisted Gingival Depigmentation for the Management of Physiologic Melanin Pigmentation: A Case Report with Six-Month Follow-Up

Dr. Ayesha Ahmed[1], Dr. Anisha Kumari[2], Dr. Shefali Sharma[3]

[1,2,3] Department of Periodontics, Post Graduate Institute of Dental Sciences, Rohtak, India

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ABSTRACT

Background: Physiologic gingival pigmentation is a common biological variation resulting from melanin deposition within the gingival tissues. Although benign, prominent pigmentation in the aesthetic zone may cause dissatisfaction among individuals seeking a more uniform gingival appearance. Several techniques have been described for gingival depigmentation, including conventional scalpel surgery, rotary abrasion, electrosurgery, cryosurgery, and laser-assisted procedures. Conventional scalpel surgery remains a practical and economical treatment option.

Case presentation: A 27-year-old patient presented with a chief complaint of gingival discoloration and expressed a desire for aesthetic improvement. Clinical examination revealed diffuse physiologic melanin pigmentation involving the maxillary gingiva from the right second premolar (15) to the left second premolar (25). The gingival tissues showed no inflammation, swelling, or ulceration. Oral hygiene status was fair, with minimal plaque deposits. Following clinical assessment and treatment planning, gingival depigmentation was performed using a conventional scalpel technique. A Coe-Pak periodontal dressing was placed over the surgical area and maintained for one week. Postoperative instructions were provided. At the one-month follow-up, a noticeable improvement in gingival colour was observed. The aesthetic improvement was maintained at the six-month follow-up, as documented in the clinical photographs.

Discussion: Scalpel-assisted gingival depigmentation involves controlled removal of the pigmented gingival epithelium and, depending on the technique, superficial connective tissue containing pigment-producing cells. The procedure is accessible, relatively economical, and does not require specialised laser equipment. However, intraoperative bleeding, postoperative discomfort, and the possibility of recurrence remain important considerations. Comparative clinical studies and systematic reviews indicate that conventional scalpel surgery can achieve satisfactory aesthetic outcomes, although the relative advantages of different treatment modalities vary according to the outcomes assessed and the duration of follow-up.

Conclusion: In this patient, scalpel-assisted gingival depigmentation resulted in an evident aesthetic improvement at one month that was maintained at six months. The case demonstrates the clinical application of a conventional periodontal surgical technique for managing aesthetic concerns associated with physiologic gingival pigmentation. Longer follow-up and standardised outcome assessment would be necessary to establish the durability of the result beyond six months.

Keywords: Physiologic gingival pigmentation; gingival depigmentation; melanin; scalpel technique; periodontal dressing; periodontal plastic surgery; gingival aesthetics.

INTRODUCTION

Gingival aesthetics constitute an important component of smile harmony and contribute to the overall perception of dental attractiveness. Although considerable attention is traditionally directed towards tooth colour, shape, alignment, and proportions, the gingival tissues also influence the appearance of the smile. Gingival colour, contour, symmetry, and the relationship between the gingival margins and the teeth collectively contribute to an aesthetically pleasing result. Consequently, visible gingival pigmentation may become a concern for patients who desire a more uniform appearance of the gingival tissues.

Gingival pigmentation refers to variations in gingival colour resulting from the presence or accumulation of pigments within the tissues. Melanin is one of the principal determinants of physiologic gingival pigmentation. It is synthesised by melanocytes located predominantly in the basal layer of the oral epithelium and transferred to neighbouring keratinocytes. The resulting colour depends on the amount and distribution of melanin, its localisation within the epithelium, and the optical properties of the surrounding tissues.

Physiologic gingival pigmentation is generally benign and may vary considerably in intensity, ranging from light brown to dark brown or nearly black. It may appear as diffuse pigmentation, discrete macules, or bands affecting different regions of the gingiva. The extent and distribution of pigmentation vary between individuals and are influenced by genetic and biological factors. Accordingly, darker gingival pigmentation should not automatically be interpreted as a pathological condition.

Nevertheless, the aesthetic significance of gingival pigmentation is determined partly by individual perception. Pigmentation involving the anterior gingiva may be particularly noticeable during smiling or speaking. For some patients, the contrast between the teeth and the surrounding pigmented gingiva may be perceived as aesthetically undesirable. This concern may motivate patients to seek elective periodontal treatment, even when the pigmentation does not represent a threat to oral health.

A careful distinction must be made between physiologic melanin pigmentation and pigmentation associated with other causes. Gingival discoloration may occur in association with tobacco exposure, certain medications, post-inflammatory changes, systemic conditions, and melanocytic lesions. A thorough medical and dental history, assessment of the distribution and clinical characteristics of the pigmentation, and consideration of any changes over time are therefore essential before treatment. Atypical, asymmetric, newly developing, enlarging, irregular, or otherwise suspicious pigmented lesions require appropriate diagnostic evaluation rather than immediate cosmetic removal.

When physiologic pigmentation has been established and the patient desires aesthetic improvement, gingival depigmentation may be considered. The procedure aims to reduce visible pigmentation by removing or ablating the pigmented epithelial tissue, with the extent of treatment depending on the technique employed. Several approaches have been described, including scalpel surgery, rotary abrasion, electrosurgery, cryosurgery, and laser-assisted techniques. These methods differ in their instrumentation, intraoperative bleeding, postoperative discomfort, healing characteristics, treatment duration, and equipment requirements.

Conventional scalpel surgery remains an established method for managing physiologic gingival pigmentation. The technique involves controlled mechanical removal of the pigmented epithelium, with careful attention to tissue thickness and the anatomical boundaries of the treatment area. Its principal advantages include simplicity, accessibility, relatively low equipment costs, and direct visual control of the treated surface. However, intraoperative bleeding and postoperative sensitivity may be greater concerns than with some alternative approaches.

The comparative effectiveness of gingival depigmentation techniques has been evaluated in clinical studies and systematic reviews. Gul et al. conducted a systematic review and meta-analysis of treatment modalities for physiologic gingival hyperpigmentation. Their findings indicated no statistically significant difference between laser ablation and surgical stripping in the pooled outcomes for depigmentation and recurrence, although postoperative pain favoured laser treatment [1]. The authors also highlighted limitations in the available evidence and the need for better-quality clinical trials.

Chandra et al. compared scalpel surgery with semiconductor diode laser treatment in a randomised split-mouth clinical study. The investigators evaluated postoperative parameters, including pain, bleeding, wound healing, and repigmentation, providing evidence relevant to the selection of treatment techniques [2].

Mikhail et al. subsequently compared scalpel surgery, ceramic bur abrasion, and diode laser depigmentation, evaluating postoperative pain, operative duration, bleeding, epithelialisation, wound healing, and pigmentation indices [3]. Their findings demonstrated that all three approaches reduced pigmentation scores, although differences were observed in selected procedural outcomes.

In 2025, Chandrasekar et al. evaluated scalpel and diode laser depigmentation using a split-mouth randomised controlled design incorporating RGB photographic analysis [4]. Digital colour assessment represents a useful development in evaluating gingival depigmentation because it may improve the objectivity and reproducibility of outcome measurements. Nevertheless, the small sample size of that study and the need for standardised photographic conditions should be considered when interpreting its findings.

Although comparative studies provide useful evidence regarding treatment outcomes, case reports remain valuable for documenting the clinical presentation, management, and follow-up of individual patients. They illustrate the practical

application of established procedures and provide a chronological record of clinical outcomes. However, findings from a single case cannot establish comparative superiority or predict treatment outcomes in other patients.

The present case report describes the management of physiologic melanin pigmentation involving the maxillary gingiva of a 27-year-old patient who presented with a chief complaint of gingival discoloration. Scalpel-assisted gingival depigmentation was performed to address the patient's aesthetic concern, and a periodontal dressing was used to protect the surgical site during the initial postoperative period. The clinical outcome was assessed at one month and six months, with the aesthetic improvement maintained at the latter follow-up.

CASE PRESENTATION

Patient information and presenting complaint

A 27-year-old patient presented to the periodontal clinic with the chief complaint of gingival discoloration. The patient expressed a desire to improve the aesthetic appearance of the gingiva. The concern was associated with diffuse pigmentation involving the maxillary gingival tissues.

Clinical examination and photographic documentation revealed prominent, diifuse brown-to-dark pigmentation involving the maxillary gingiva. The pigmentation extended from the maxillary right second premolar (tooth 15) to the maxillary left second premolar (tooth 25), encompassing the anterior maxillary gingiva.

The clinical presentation was considered consistent with physiologic melanin pigmentation following the treating clinician's assessment. The patient sought treatment primarily to improve the appearance of the gingival tissues.

The medical and dental history was reviewed before treatment. No relevant medical or dental history was reported. The patient reported no known allergies and was not taking any medications at the time of treatment.

Clinical examination

Intraoral examination revealed diffuse brown-to-dark pigmentation involving the maxillary gingiva from tooth 15 to tooth 25. The pigmentation was distributed across the gingival tissues rather than presenting as a single isolated spot.

The adjacent gingival tissues showed no clinically evident inflammation, swelling, or ulceration. Oral hygiene status was assessed as fair, and plaque deposits were minimal.

The absence of clinically evident inflammation, swelling, and ulceration was documented as part of the local examination. The overall clinical presentation was considered consistent with physiologic melanin pigmentation.



Figure 1. Baseline intraoral photograph demonstrating diffuse physiologic melanin pigmentation involving the maxillary gingiva from tooth 15 to tooth 25.

Treatment planning

The principal treatment objective was to reduce the visible pigmentation and improve the uniformity of gingival colour in response to the patient's aesthetic concern.

Following clinical assessment, conventional scalpel-assisted gingival depigmentation was selected as the treatment approach. The selection of the technique took into consideration the distribution of pigmentation, the patient's aesthetic concern, the clinical condition of the gingival tissues, and the availability of conventional periodontal surgical instruments.

Scalpel surgery was selected as a practical approach that did not require specialised laser equipment.

The treatment aimed to reduce visible pigmentation rather than guarantee permanent elimination of melanin-producing cells. The possibility of residual pigmentation or subsequent recurrence was an important consideration because melanocytes may persist in adjacent or deeper tissues following treatment.

Written informed consent for the procedure was obtained and documented in the clinical record.

SURGICAL PROCEDURE

Preoperative preparation
Before surgery, the maxillary gingiva was examined, and the treatment area was assessed for plaque accumulation, calculus, gingival inflammation, and other local factors that could interfere with healing.

Oral hygiene status was recorded as fair, with minimal plaque deposits. No inflammation, swelling, or ulceration was observed in the adjacent gingival tissues.

The patient was positioned comfortably, and adequate illumination and retraction were established to facilitate visualisation of the maxillary gingiva. Standard infection-control measures were followed during the procedure.

Local anaesthesia was administered before tissue removal.

Scalpel-assisted gingival depigmentation
Conventional scalpel-assisted gingival depigmentation was performed over the pigmented maxillary gingiva extending from tooth 15 to tooth 25.

Following administration of local anaesthesia, the treatment area was exposed and visualised. A conventional scalpel technique was used to remove the visibly pigmented epithelial layer through controlled, superficial strokes.

Tissue removal was performed systematically across the planned treatment area, with attention to gingival thickness and the underlying anatomical structures. Care was taken to preserve the gingival architecture while removing the visibly pigmented surface tissue.

Particular attention was directed towards the gingival margins and interdental papillae to minimise unnecessary tissue trauma and preserve the gingival contour.

Bleeding was an important intraoperative consideration because the procedure exposed the underlying tissue surface. The treated area was inspected following tissue removal.

The surgical intervention was completed using the conventional scalpel technique using #15 blade.

Placement of periodontal dressing
Following completion of the depigmentation procedure, a Coe-Pak periodontal dressing was placed over the treated maxillary gingiva.

The dressing was maintained for one week to provide a protective covering over the surgical site during the initial postoperative period.

Periodontal dressings may help reduce direct mechanical irritation of an exposed wound surface. In the present case, Coe-Pak was used as part of the postoperative management, and postoperative instructions were provided.

Postoperative instructions
Postoperative instructions were provided to support healing and minimise trauma to the treated gingival tissues.

The patient was instructed to follow the clinician's recommendations regarding oral hygiene and care of the surgical area.

The patient was also instructed to avoid unnecessary manipulation of the periodontal dressing and to return for review after one week for assessment and management of the and to follow a soft diet for 2 days .

Analgesia consisted of Ibuprofen 400mg TDS for 3 days. An antiseptic mouth rinse containing 0.2% chlorhexidine was prescribed for 10 days.

The patient was instructed to report persistent bleeding, increasing pain, swelling, fever, purulent discharge or other unexpected symptoms. Follow-up examinations were scheduled at 2 weeks and 1 month, with the final documented clinical evaluation at 6 months.

FOLLOW-UP AND CLINICAL OUTCOMES

One-week postoperative review
The Coe-Pak periodontal dressing was maintained for one week following surgery. A review was scheduled at the end of this period for assessment and management of the dressing.

One-month postoperative evaluation
At the one-month follow-up, clinical examination demonstrated a noticeable improvement in gingival colour compared with the baseline presentation.

The previously prominent pigmentation was less visually apparent, and the treated maxillary gingiva exhibited a more uniform appearance. This finding was consistent with the intended aesthetic objective of the procedure.

The one-month assessment provided an opportunity to evaluate the appearance of the gingiva after the initial postoperative healing period.

However, no validated pigmentation index, digital colour measurement, or numerical patient-satisfaction score was available. The outcome was therefore described qualitatively rather than as a quantified reduction in pigmentation or melanin concentration.



Figure 2. Clinical appearance of the maxillary gingiva one month after scalpel-assisted gingival depigmentation, demonstrating the reported improvement in gingival colour compared with the baseline presentation.

Six-month postoperative evaluation
At the six-month follow-up, the aesthetic improvement observed at the one-month review remained evident according to the clinical information available.

The follow-up photograph documented the appearance of the treated maxillary gingiva. Maintenance of the improved appearance at this time point indicated that the aesthetic result was not limited to the immediate postoperative period.

Nevertheless, the six-month observation did not establish permanent stability. Recurrence of pigmentation may occur after scalpel depigmentation because pigment-producing cells may persist in adjacent or deeper tissues and subsequently become clinically visible.



Figure 3. Clinical appearance of the maxillary gingiva six months after scalpel-assisted gingival depigmentation, demonstrating maintenance of the reported aesthetic improvement.

Summary of the clinical outcome
The clinical course demonstrated an improvement in the appearance of the maxillary gingiva following scalpel-assisted depigmentation. The improvement was evident at one month and remained apparent at six months.

The outcome was consistent with the intended effect of removing the visibly pigmented gingival epithelium.

The use of a Coe-Pak periodontal dressing for one week formed part of the postoperative management. Postoperative instructions were provided to support healing and minimise trauma to the treated tissues.

DISCUSSION

Clinical significance of physiologic gingival pigmentation

Physiologic gingival pigmentation is a normal biological variation and is generally not associated with disease. Nevertheless, the aesthetic significance of pigmentation varies among individuals according to its intensity, distribution, visibility, and personal preferences.

The anterior gingiva contributes substantially to smile aesthetics. Prominent pigmentation in this region may be perceived as undesirable by some individuals, particularly when the gingiva is visible during smiling. For patients who experience dissatisfaction with their gingival appearance, depigmentation may offer a means of improving the uniformity of gingival colour.

The decision to undertake elective depigmentation should be patient-centred. Pigmentation that appears acceptable to one individual may be a significant aesthetic concern for another. Treatment should therefore be based on the patient's expressed preference, a clinical diagnosis, and an informed discussion of the expected benefits and limitations.

The present case illustrates this approach. A 27-year-old patient presented with a chief complaint of gingival discoloration and underwent scalpel-assisted depigmentation of the maxillary gingiva extending from tooth 15 to tooth 25.

The adjacent gingival tissues showed no inflammation, swelling, or ulceration, while oral hygiene status was fair, with minimal plaque deposits. These findings provided a description of the local clinical condition at presentation.

The postoperative assessment demonstrated improvement at one month, with the result maintained at six months.

The significance of the case lies in its documentation of an established procedure used to address a patient-reported aesthetic concern. It does not establish that scalpel surgery is superior to other depigmentation techniques or that a similar outcome would necessarily occur in other patients.

Biological basis of gingival pigmentation

Melanin is produced by melanocytes through a biochemical pathway involving the conversion of tyrosine into melanin precursors. The pigment is subsequently transferred to neighbouring keratinocytes, where it contributes to the colour of the gingival epithelium.

The visible appearance of gingival pigmentation depends on several factors, including the distribution and amount of melanin, its localisation within the epithelial layers, and the optical properties of the surrounding tissues.

Physiologic pigmentation may be diffuse or localised and may vary in intensity across different regions of the gingiva. This variability is relevant to treatment planning because the visible surface appearance does not necessarily indicate the precise depth or distribution of pigment-producing cells.

Conventional scalpel depigmentation removes the pigmented epithelial surface and may include a superficial layer of underlying connective tissue, depending on the technique.

Following tissue removal, healing occurs through repair of the exposed surface and epithelial migration from adjacent tissues. The newly formed epithelial surface may display less pigmentation, resulting in the desired aesthetic improvement.

However, the procedure does not necessarily eliminate all melanocytes capable of producing melanin. Pigment-producing cells may persist in adjacent or deeper tissues and subsequently become evident in the treated area.

Reappearance of pigmentation may therefore occur even after an initially satisfactory result.

This biological limitation is important when counselling patients. Gingival depigmentation should be described as a procedure intended to reduce visible pigmentation, with the possibility of recurrence, rather than as a guaranteed permanent elimination of melanin production.

Rationale for selecting the scalpel technique

The conventional scalpel technique remains an established approach to gingival depigmentation. Its principal advantages include simplicity, availability of standard surgical instruments, direct visual control of tissue removal, and relatively low equipment costs.

Unlike laser-assisted techniques, scalpel surgery does not require specialised laser equipment. This may be particularly relevant in clinical settings where purchasing or maintaining such equipment is impractical.

The technique also allows the operator to inspect the surgical surface directly during treatment. Residual pigmented areas can be identified and addressed where clinically appropriate, provided that further removal can be undertaken without unnecessary tissue injury.

However, the technique requires careful control of tissue-removal depth. Excessive removal may cause unnecessary trauma, whereas insufficient removal may leave residual pigmentation.

Bleeding during surgery can affect visibility and complicate assessment of the wound surface. Postoperative discomfort is another consideration because removal of the epithelial surface exposes underlying tissue and may result in temporary sensitivity during healing.

The extent of discomfort may depend on the size of the treated area, the surgical technique, the amount of tissue removed, and individual pain perception.

The comparative literature supports the continued use of scalpel surgery while recognising that alternative techniques may offer advantages for selected procedural outcomes [1–3].

In the present patient, the scalpel technique provided a practical treatment approach, with a clinically evident improvement documented at one month and maintained at six months.

The use of Coe-Pak for one week formed part of the postoperative management.

Comparison with alternative depigmentation techniques

Several techniques have been described for managing physiologic gingival pigmentation. These include rotary abrasion, electrosurgery, cryosurgery, and laser-assisted depigmentation.

Although the methods differ in their mechanisms of tissue removal or destruction, they share the objective of reducing visible pigmentation.

Rotary abrasion involves mechanical removal of the pigmented surface using a rotary instrument. It may allow relatively rapid tissue removal, but the clinician must control the depth and extent of abrasion to avoid unnecessary tissue injury.

Electrosurgery uses electrical energy to cut or ablate soft tissue and may provide improved intraoperative haemostasis. However, thermal injury to adjacent tissues is an important consideration, and appropriate equipment and operator training are necessary.

Cryosurgery uses controlled freezing to damage targeted tissue. Its effectiveness depends on the appropriate delivery of the freezing process and adequate control of the treated area.

Laser-assisted depigmentation uses concentrated light energy to remove or ablate the targeted tissue. Different laser systems have different tissue-interaction characteristics, and their clinical effects depend on the wavelength, energy settings, exposure parameters, and treatment protocol.

Laser techniques may offer advantages in haemostasis and early postoperative comfort. However, these benefits must be considered alongside equipment costs, training requirements, treatment duration, and the possibility of thermal injury if the procedure is not appropriately controlled.

The choice of treatment should therefore be based on the patient's needs, the clinical situation, the operator's expertise, and the resources available rather than on an assumption that newer technology is inherently superior.

Gul et al. reviewed the available clinical evidence and found no statistically significant difference between laser ablation and surgical stripping in the pooled outcomes for recurrence and depigmentation, although postoperative pain favoured laser treatment [1].

These findings suggest that the selection of a technique should take account of multiple outcomes rather than pigmentation reduction alone.

Evidence from comparative clinical research

Comparative clinical research has examined the effectiveness of scalpel surgery and alternative techniques, particularly diode laser depigmentation. The findings provide useful context for interpreting the outcome of the present case.

In a split-mouth randomised clinical study, Chandra et al. compared conventional scalpel surgery with semiconductor diode laser treatment in patients with gingival melanin hyperpigmentation [2]. The investigators assessed clinical parameters including bleeding, pain perception, wound healing, recurrence, and the intensity of repigmentation.

Their study provides a basis for comparing conventional surgical treatment with laser-assisted depigmentation.

Mikhail et al. compared scalpel surgery, ceramic bur abrasion, and 980-nm diode laser treatment in 24 individuals with physiologic gingival hyperpigmentation [3]. Their assessment included postoperative pain, operative duration, bleeding, epithelialisation, wound healing, and pigmentation indices.

The investigators found that all three techniques reduced pigmentation scores compared with baseline. The diode laser group completed the procedure more quickly than the scalpel and ceramic bur groups, while the ceramic bur and diode laser groups showed less bleeding than the scalpel group.

These findings support the interpretation that scalpel surgery can achieve satisfactory aesthetic outcomes, even though alternative methods may offer advantages in selected procedural outcomes.

Gul et al. conducted a systematic review and meta-analysis that included 25 clinical studies evaluating different methods for managing physiologic gingival hyperpigmentation [1].

The review found no statistically significant difference between laser ablation and surgical stripping in the pooled outcomes for recurrence and depigmentation. Postoperative pain favoured laser treatment, although the authors emphasised the need for additional high-quality clinical trials.

More recently, Chandrasekar et al. compared scalpel and diode laser depigmentation in a split-mouth randomised controlled trial incorporating RGB photographic analysis [4].

The study involved five participants with bilateral maxillary gingival pigmentation. The investigators evaluated bleeding, postoperative pain, wound healing, pigmentation indices, and photographic colour changes.

Postoperative pain was lower in the laser-treated sites on the first day, although the difference was not significant by day seven. The authors also reported differences in pigmentation reduction at six months, while the between-group difference was not significant at 12 months.

The study provides an example of the use of objective photographic analysis to evaluate gingival colour. However, its very small sample size limits the generalisability of the findings.

Collectively, these studies support the continued use of scalpel depigmentation as a clinically reasonable option. Nevertheless, the evidence must be interpreted carefully because studies differ in sample size, follow-up duration, treatment protocols, pigmentation indices, and definitions of recurrence.

Interpretation of the present case outcome

In the present case, scalpel-assisted depigmentation was performed to address the patient's concern regarding physiologic melanin pigmentation of the maxillary gingiva.

The clinical appearance improved at one month, and the improvement was maintained at six months.

The result was consistent with the intended biological effect of removing the visibly pigmented epithelial tissue. The clinical photographs provide a visual record of the treatment outcome and allow comparison between the pre treatment and postoperative appearances.

The six-month follow-up adds value to the report because it documents the outcome beyond the initial healing period. It indicates that the aesthetic improvement was not limited to the immediate postoperative phase.

Role of periodontal dressing in postoperative management

A periodontal dressing may be used after gingival surgery to cover an exposed wound surface and reduce direct mechanical irritation during the initial healing period. Its use is determined by the nature and extent of the surgical wound, the clinician's preference, and the patient's needs.

In the present case, a Coe-Pak periodontal dressing was placed over the treated maxillary gingiva and maintained for one week. Postoperative instructions were provided to support healing and minimise trauma to the surgical site.

The dressing formed part of the postoperative management rather than the depigmentation mechanism itself. The reduction in visible pigmentation was associated with the surgical removal of the pigmented tissue, whereas the dressing was intended to protect the wound during early healing.

The use of a periodontal dressing should not be interpreted as proof of faster healing or reduced postoperative pain unless these outcomes were specifically measured.

Long-term stability

Recurrence of pigmentation is an important consideration when planning gingival depigmentation. Although removal of pigmented tissue may produce an aesthetically satisfactory result, the procedure does not necessarily eliminate the biological potential for melanin production.

The reappearance of pigmentation may be associated with residual melanocytes, migration of pigment-producing cells from adjacent tissues, and differences in the depth and complete of tissue removal. Individual biological variation may also influence the timing and extent of recurrence.

Re-pigmentation has been documented following both conventional surgical and laser-assisted depigmentation. The available literature does not support a guarantee that one technique will permanently prevent recurrence in every patient.

Wise et al. reported a case of physiologic gingival pigmentation treated with a surgical blade in which no recurrence was observed at a 25-year follow-up [5]. This report demonstrates that a durable result is possible. However, a single long-term case cannot establish the typical recurrence rate or predict the outcome of treatment in other patients.

Conversely, the systematic review by Gul et al. found no statistically significant difference between laser ablation and surgical stripping in the pooled outcomes for recurrence [1].

The findings emphasise the importance of counselling patients about the possibility of recurrence regardless of the selected technique.

In the present case, maintenance of the aesthetic improvement at six months was encouraging. Nevertheless, the observation period was insufficient to establish long-term stability. Continued follow-up would provide additional information about the persistence of the result.

Patient-centred treatment planning

Elective periodontal aesthetic procedures should be guided by the patient's concerns and expectations. Physiologic gingival pigmentation is generally benign, and treatment is usually undertaken to improve appearance rather than to address a pathological condition.

The clinician should therefore discuss the patient's reasons for seeking treatment, the anticipated aesthetic benefit, and the potential limitations of the procedure.

Relevant considerations include the distribution of pigmentation, the visibility of the gingiva during smiling, the patient's tolerance for postoperative discomfort, and their understanding of the possibility of recurrence.

Informed decision-making also requires discussion of alternative treatment approaches. The availability of laser equipment, the clinician's experience, the extent of the treatment area, and the patient's preferences may influence the choice of technique.

For patients selecting scalpel depigmentation, counselling should include the possibility of intraoperative bleeding, postoperative sensitivity, wound-care requirements, residual pigmentation, and recurrence.

These considerations do not negate the value of the procedure but help ensure realistic expectations.

In the present case, the patient sought treatment for gingival discoloration and experienced a clinically evident improvement following scalpel-assisted depigmentation. This supports the relevance of patient-centred treatment planning in aesthetic periodontology.

Future reports could be strengthened by incorporating validated patient-reported outcomes, such as a numerical rating of satisfaction with gingival appearance before and after treatment. Such measures would complement clinical photographs and provide a more comprehensive assessment of treatment benefit.

Clinical implications

The principal clinical implication of this case is that conventional scalpel-assisted gingival depigmentation remains a practical option for patients seeking aesthetic improvement in physiologic gingival pigmentation.

The technique is accessible, economical, and does not require specialised laser equipment. Comparative studies demonstrate that scalpel surgery can reduce visible pigmentation, although alternative methods may provide advantages in selected outcomes, including bleeding, postoperative discomfort, and operative duration [1–3].

Careful diagnosis remains essential before treatment. Pigmentation should not automatically be classified as physiologic solely because it appears brown or black. Atypical lesions require appropriate diagnostic evaluation.

For patients with confirmed physiologic pigmentation, treatment should be individualised according to their concerns and expectations. Appropriate surgical technique, postoperative care, and follow-up are necessary to optimise the outcome and monitor for recurrence.

The present case contributes a clinical illustration of improvement following scalpel depigmentation, with maintenance of the aesthetic result at six months. Its principal contribution is descriptive rather than comparative, and the findings should be interpreted within the limitations of a single-patient report.

LIMITATIONS

The present report has certain limitations that should be considered when interpreting the clinical outcome.

First, the report describes the treatment of a single patient. Although a favourable aesthetic outcome was observed, the findings cannot establish the effectiveness of scalpel depigmentation in a broader population or demonstrate superiority over other treatment modalities.

Second, the postoperative outcome was evaluated through clinical observation and photographic documentation. No numerical pigmentation score or objective colourimetric measurement was available for inclusion. Consequently, the degree of pigmentation reduction could not be quantified.

Third, the available clinical information did not include validated patient-reported outcomes, numerical pain scores, or formal wound-healing assessments. These measures could have provided a more comprehensive assessment of the patient's postoperative experience.

Finally, the six-month follow-up provides evidence of maintenance of the aesthetic improvement over the observed period but does not establish permanent stability. Longer follow-up would be required to evaluate the possibility of delayed repigmentation.

Future case reports could address these limitations through standardised photography, recognised pigmentation indices, objective colour analysis, patient-reported outcomes, and extended follow-up.

CONCLUSION

Scalpel-assisted gingival depigmentation is an established and accessible periodontal surgical technique for patients seeking aesthetic improvement in the appearance of physiologic gingival pigmentation.

In the present case, a 27-year-old patient presented with a chief complaint of gingival discoloration and underwent scalpel-assisted depigmentation of the maxillary gingiva extending from tooth 15 to tooth 25. Oral hygiene status was fair, with minimal plaque deposits, and no inflammation, swelling, or ulceration was observed in the adjacent gingival tissues.

A Coe-Pak periodontal dressing was placed over the treated area and maintained for one week, and postoperative instructions were provided. A noticeable improvement in gingival colour was observed at the one-month follow-up, and the aesthetic improvement was maintained at six months.

The case illustrates the clinical application of a conventional surgical approach for addressing patient-reported aesthetic concerns associated with physiologic melanin pigmentation. Appropriate diagnosis, careful surgical execution, informed consent, postoperative management, and follow-up remain important components of treatment.

Although the observed outcome was favourable, the findings are limited to one patient and a six-month observation period. Longer follow-up and objective outcome assessment would be required to establish the durability of the result.

Within these limitations, this case demonstrates a clinically evident aesthetic improvement following scalpel-assisted gingival depigmentation, maintained through six months of follow-up.

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