## GINGIVAL DEPIGMENTATION BY GINGIVAL CERAMIC TRIMMER- A CASE SERIES

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#### **ABSTRACT:**

Cosmetic desires have improved with time and current trends speak volumes about gingival esthetics and smile designing. Gingival hyperpigmentation plays a negative role in an otherwise acceptable 'smile window'. In the present world, people are concerned more about their esthetics. Several techniques have been employed such as scalpel, electrosurgery, cryosurgery, chemical agents, abrasion, and laser method for the removal of melanin hyperpigmentation. The present case series were aimed to assess the efficacy of gingival soft tissue ceramic trimmer in gingival hyperpigmentation. Pain index (VAS), healing index (Landry, Turnbull & Howley index) and pigmentation index (Takashi et al. 2005) were evaluated to assess its efficacy. The results showed that ceramic trimmer has a lower pain index and a better healing index and delayed re-pigmentation index than rest all other procedures. Thus, it can be concluded that ceramic trimmer might prove to be a boon in achieving aesthetic satisfaction and could be used for depigmentation as it is very cost effective, readily available and acceptable to the patient.

INTRODUCTION: Currently in the modern world, with the uprising aesthetic concerns among the patients require the removal of unesthetic hyperpigmented gingival areas to create an aesthetically-pleasant and confident appealing smile. The harmony of the smile is determined not only by the shape, position and colour of the teeth or lips but also by the gingival tissues.[1] Although, melanin pigmentation of the gingiva does not present a medical problem, but still some patients complain of 'black gums'. The gingiva is most frequently pigmented intraoral tissues (Syed Wali Peeran et al 2014).[2] The most common location was the attached gingiva (27.5%) followed in decreasing order by the papillary gingiva, the marginal gingiva and the alveolar mucosa (Bhanu Murthy M et al 2012).[3] The total number of melanophores in the attached gingival was approximately 16 times greater than in the free gingiva (Bhanu Murthy et al 2012).[3]

Surgical bur abrasion technique is a simple method that does not require any sophisticated equipment. Initially, ceramic trimming burs have been introduced for gingivoplasty but recently, it is used for gingival depigmentation as well. These trimmers are made up of mixed ceramic composed of Zircondioxide partly stabilized by Yttrium and Aluminium ceramic. It secures a nice and gentle cut while the heat development creates a good hemostasis, minimal bleeding and the risk of University Journal of Dental Sciences

# Case Series

#### Key words:

Gingiva, Pigmentation, Gingival Ceramic Trimmer, Pain and Healing index

Source of support : Nil Conflict of interest: None

necrosis is virtually eliminated. It can be sterilized by any method (max 135 degree C). The present case series describe the effectiveness of gingival ceramic trimmer on gingival hyperpigmentation.

#### MATERIALS AND METHODS:

A total of 10 patients with age range between 18 and 30 years were selected in the study. Periodontally healthy patients presenting with uniformly dense bands of bilateral gingival hyperpigmentation, score-2 (according to Takashi et al Pigmentation Index 2005)[4] having a primary concern for aesthetics in the anterior region were included. Clinical intervention wasthen done and the outcome was evaluated as follows-

Pain Index at-  $1^{st}$ ,  $3^{rd}$ ,  $7^{th}$  and  $15^{th}$  day using Visual Analogue Scale (1990)[5]

Healing Index at- 7<sup>th</sup>, 15<sup>th</sup> and 30<sup>th</sup>day using Landry, Turnbull & Howley index (1988)[6]

Re-pigmentation index at-6 months and 1 year using Melanin pigmentation index, Takashi et al. (2005).[4]

#### CASE PROTOCOL

Phase I therapy comprising of ultrasonic scaling was done and Oral Hygiene instructions were given to the patients following which depigmentation was done using gingival Ceramic Trimmer. Later, the patient was kept on periodic follow up.

#### **PROCEDURE:**

Extra oral (by 5% Betadine solution) and intra oral (by 0.2% Chlorhexidine mouthwash, 10ml for 1 minute) antisepsis were performed. The procedure was done under local anesthesia with 2% lignocaine hydrochloride and 1:1,00,000 adrenaline. After adequate anesthesia the depigmentation procedure was performed. The ceramic trimmer was used on the pigmented gingiva using high speed rotary instrument. The instrument was operated at 3,00,000-4,50,000 rpm, gently in intermittent mode. It was used without water coolant so that the heat generated during rotation will lead to thermal coagulation. Pressure applied was minimum with feather light brushing strokes without holding the bur in one place for too long to avoid pitting of the gingival surface or to remove too much tissues. Gingival remnants were removed at regular basis with moist gauze piece. After completion of the surgical procedure, the exposed site is washed well with normal saline and thereafter Co-Pak was applied.





Fig 1- Gingival Depigmentation by Ceramic Trimmer







Fig 2- Gingival Depigmentation by Ceramic Trimmer

Parameters evaluated are described in table 1, 2 and 3.

Observations and results-

Pain Index (VAS)-

Cases	1 <sup>st</sup> day	3 <sup>rd</sup> day	7 <sup>th</sup> day	15 <sup>th</sup> day
1.	0	0	0	0
2.	0	0	0	0
3.	1	0	0	0
4.	1	0	0	0
5.	1	0	0	0
6.	2	0	0	0
7.	2	0	0	0
8.	2	1	0	0
9.	1	0	0	0
10.	2	0	0	0

## Table 1- Pain Index (VAS)

Healing Index (Landry, Turnbull and Howley)-

Cases	7 <sup>th</sup> day	15 <sup>th</sup> day	30 <sup>th</sup> d ay	90 <sup>th</sup> day
1.	4	5	5	5
2.	5	5	5	5
3.	5	5	5	5
4.	5	5	5	5
5.	4	5	5	5
6.	4	5	5	5
7.	4	5	5	5
8.	4	5	5	5
9.	4	5	5	5
10.	4	5	5	5

### Table 2- Healing Index

Repigmentation Index (Takashi et al)-

Cases	6 months	12 months
1.	1	1
2.	1	1
3.	1	1
4.	2	2
5.	1	1
6.	1	1
7.	1	1
8.	1	2
9.	1	0
10.	1	1

Table 3- Repigmentation Index

### **RESULTS:**

In the present case series, out of 10 patients treated (age group 18-30 years), 7 were female and 3 were male. 1. Mean Pain Index (VAS)[5] values are 1.2 on 1<sup>st</sup> day, 0.1 at 3<sup>rd</sup> day, 0 at 7<sup>th</sup> day and 0 at 15<sup>th</sup> day respectively (Table 4). 2. Mean Healing Index (Landry, Turnbull & Howley index 1988)[6] values are 4.3 on  $7^{th}$  day, 5 on  $15^{th}$  day, 5 at  $30^{th}$  day and 5 at  $90^{th}$  day (Table 5).

3. Mean Repigmentation Index (Melanin pigmentation index, Takashi et al[4]. 2005)[4] value is 1 at 6<sup>th</sup> month and 1.1 at 1 year (Table 6).

## Pain Index-

Case	1 <sup>st</sup> day	3 <sup>rd</sup> day	7 <sup>th</sup> day	15 <sup>th</sup> day
Results	1.2	0.1	0	0

Table 4- Mean value of Pain Index (VAS) Healing Index-

Case	7 <sup>st</sup> day	15 <sup>th</sup> day	30 <sup>th</sup> day	90 <sup>th</sup> day
Results	4.3	5	5	5

Table 5- Mean value of Healing Index Repigmentation Index

Case	6 <sup>th</sup> months	12 <sup>th</sup> months
Results	1	1.1

Table 6- Mean value of Repigmentation Index

### **DISCUSSION:**

Melanin hyperpigmentation usually does not present as a medical problem, but patients may complain of black gums that seems to be unaesthetic.[7] This problem is aggravated in patients with a gummy smile or excessive gingival display. Depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques.[8] The selection of a technique should be based on clinical experience and individual preference along with patient's affordability. Various treatment modalities have been used for this aim as stated earlier. The present case series is done to determine the efficacy of gingival ceramic trimmer on gingival depigmentation.

Surgical bur abrasion technique is a simple method that does not require any sophisticated equipment. Initially, the burs have been introduced for gingivoplasty but recently, it is used for gingival depigmentation as well. These trimmers are made up of mixed ceramic composed of Zircon-dioxide partly stabilized by Yttrium and Aluminium ceramic. It secures a nice and gentle cut while the heat development creates a good hemostasis- minimal bleeding and the risk of necrosis is virtually eliminated. It can be sterilized by any method (max 135 degree C). Mean Pain index (VAS) values are 1.2 at baseline, 0.1 at  $3^{rd}$  day and 0 on  $7^{th}$  and  $15^{th}$  day respectively (table 4). Landry, Turnbull and Howley mean healing index values are 4.3 on  $7^{th}$  day and 5 on 15, 30 and 90 days respectively (table 5). Mean Repigmentation Index (Takashi et al. 2005) values are 1 on  $6^{th}$  month and 1.1 at  $1^{st}$  year (table 6).

In the present case series, less bleeding and immediate tissue coagulation was observed par and post operatively. This may be due to thermo-coagulation effect by the heat generated by the bur. Pain index was also low which might be due to the fact that the ceramic bur removes only the superficial epithelial surface without hampering the underlying lamina propria containing the nerve terminals. However, in this study 4 out of 10 patients complained of mild pain as shown in table 1 that may be attributed to individual pain tolerance.

 Table 7-Comparison of Ceramic Trimmer with other

 treatment modalities.[9]

Pain Index (VA	5)	
1. Scalpel		
Serial No	Authors	Mean Pain Index
1.	Bakutra (1 <sup>st</sup> day, 7 <sup>th</sup> day)	3.8, 0
2.	Narayankar	2.44
3.	Suragimath (1 <sup>st</sup> day, 7 <sup>th</sup> day)	3.5, 0.4 16
4.	Basha (1 <sup>st</sup> day, 7 <sup>th</sup> day)	5.10, 1.15
5.	Ribeiro (1 <sup>st</sup> day)	5.05
6.	Gupta (1 <sup>st</sup> day)	3.81
7.	Grover (1st day, 7th day)	3.75, 1.85
8.	Kaarthakiyaan (1st day, 7th day)	1.9, 0.82
2. Laser		
Serial No	Authors	Mean Pain Index
1.	Bakutra (1 <sup>st</sup> day, 7 <sup>th</sup> day)	1.8, 0
2.	Suragimath (1 <sup>st</sup> day, 7 <sup>th</sup> day)	1.5, 0.0833
3.	Basha (1 <sup>st</sup> day, 7 <sup>th</sup> day)	3.45, 0.5
4.	Ribeiro (1 <sup>st</sup> day)	2.75
5.	Grover (1 <sup>st</sup> day, 7 <sup>th</sup> day)	2.5, 1.25
6.	Kaarthakiyaan (1st day, 7th day)	1.7, 1.08
3. Cryosurger	y	
Serial No	Authors	Mean Pain Index
1.	Narayankar	1.32
2.	Patil P. K	No pain
3.	Singh V	Mild pain
4.	Parvez M	Mild pain
Healing Index		
1. Scalpel		
Serial No	Authors	Mean Healing Index
1.	Bhanu Murthy M (1st week, 1 & 3 months)	5, 5, 5
	<b>1</b> .	

Table 7 shows that Ceramic Trimmer has a lesser pain and a better healing index compared to the mostly used techniques for gingival depigmentation

Study	Treatment comparison	Follow- up period	Results
Patel et al.	Scalpel technique bur method electrosurgery laser	3 months	Post- operative healing and patient comfort were better with lasers in comparison to other techniques
Basha et al.	Scalpel technique vs laser	6 months	Patient preference and post- operative comfort were higher with laser treatment
Ahmed et al	Gryosurgery	30 months	No evidence of repigmentation and adverse effects of the treated areas
Murthy et al.	Bur abrasion laser scalpel technique	3 months	Lack of repigmentation and uneventful healings were seen with laser treatment than other methods
Narayankar et al	Cryosurgeryscalpel technique	6 months	Recurrence rate for pigmentation is higher after scalpel treatment
Sedeh et al	Cryosurgery	18 months	No recurrence of pigmentation
Gupta et al	Electrosurgery scalpel technique	24 months	Increased pain levels and delayed healing were associated with electrosurgery whereas repigmentation was morefrequent with scalpel treated sites.
Verma et al.	Scalpel surgery	6 months	Scalpel surgery causes unpleasant bleeding.
Kumar et al.	Cryosurgery, gingival abrasion	2 years	High rate of recurrence is seen with gingival abrasion than cryosurgery
Arikan and Gürkan	Gryosurgery	30 months	No side effects were observed with improved esthetics
Elavarasu et al.	Laser electrocautery	3 months	Recurrence rate was lesser with lasers when compared with electrocautery.

Table 8- Comparison of different depigmentation techniques.[10]

The following table represents the history, advantages and disadvantages of various depigmentation procedures.[11]

Technique	History	Advantages	Disadvantages
Scalpel surgical technique	First illustrated by Dummet and Bolden in 1963	Simple, easy to perform, noninvasive, cost effective, does not require any extensive armamentarium and faster healing	Causes unpleasant bleeding during and after the operation, more chances of infection in scalpel surgery.
Bur abrasion method	The first documented case using this technique was reported by Ginwallaet al in 1966.	It is relatively simple, safe, non- aggressive method, shows less discomfort, easy to perform, can be readily repeated, does not require any sophisticated equipment and it is economical.	The procedure requires 45 min to 1 hour for completion. It is difficult to control the depth of de- epithelialization. Moreover, bleeding and post-operative pain are anticipated.
Electro surgery	The first documented case report using electro surgery for de- pigmentation was by Gin walla <i>et al</i> in 1966	It was found that this method controls hemorrhage, permits adequate contouring of tissues, causes less discomfort to patient, less scar formation and lesser chair time.	Requires more expertise than scalpel surgery. Prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. This technique is uncomfortable to patients due to foul o dor.
Cryosurgery	First cryosurgical de-pigmentation was documented by Tal <i>et al</i> in 1987.	Easy and rapid to apply. Does not need anesthesia or suturing. It does not cause any bleeding or scars.	Depth control is difficult, and optimal duration of freezing is not known. Prolonged freezing increases tissue destruction. Expensive specialized equipment is required. Cryosurgery is followed by considerable swelling and increased soft tissue destruction.
Laser	Trelles <i>et al</i> , (1992) were the first to treat patients with gingival pigmentation by Argon laser	Dry and bloodless surgery Instant sterilization of surgical field Reduced bacteremia. Reduced mechanical trauma Minimal post- operative swelling and scarring Minimal post-operative pain	Epithelial regeneration is delayed. Treatment is very expensive. Loss of tactile feedback while using lasers. Gingival fenestration and bone exposure may occur. More time is required for the healing of the periodontal tissues.
Free gingival graft	Tamizi M and Taheri M in 1996 documented the treatment of physiologic gingival pigmentation with free gingival autografts	More esthetic results. Less recurrence rate	This technique required the use of additional surgical sites with added discomfort Healing is slow and painful. The amount of tissue available in the donor area is limited. Furthermore, the presence of a demarcated line commonly observed around the graft in the recipient site may itself pose an esthetic problem.

Table 9- History, Advantages and Disadvantages of different treatment modalities for depigmentation

The present case series show that ceramic trimmer has a low pain index compared to other procedures which are not in accordance with the study conducted by Negi R et al (2019)[12] and Lagvide et al (2009)[13]. Similarly, ceramic trimmer has a better healing index compared to other procedures. Same results are also seen in the study conducted by Negi R et al (2019)[12]. Re-pigmentation index was also seen better in case of ceramic trimmer in this case series, however statistically no significant results were seen in the studies conducted by Negi R et al (2019)[12] and Kumar S et al (2013)[13]. However, more studies are required with long time follow up with other treatment procedures to state that ceramic trimmer as the best alternative to all other treatment modalities for gingival depigmentation.

## Conflicts of Interest

Nil

Ethical Clearance

Yes (Ethical committee of Kothiwal Dental College & Research Centre)

### **REFERENCES:**

- Sharath K.S., Shah R, Thomas B, Madani S. M, Shetty S. Gingival depigmentation: case series forfour different techniques. Nitte University Journal of Health Science. NUJHS Vol. 3, No.4, December 2013, ISSN 2249-7110
- Peeran S.W, Ramalingam K, Peeran S. A, Altaher O. B,Alsaid F. M, Mugrabi M. H. Gingival pigmentation index proposal of a newindex with a brief review of current indices. European journal of dentistry · April 2014. DOI: 10.4103/1305-7456.130640 · Source: PubMed
- Bhanu Murthy M, Kaur J, Das R. Treatment of gingival hyperpigmentation with rotary abrasive, scalpel, and laser techniques: a case series, J Indian Soc Periodontol 2012;16(4):614-9
- 4. Takashi H, Tanaka K, Ojima M, Yuuki K. Association of melanin pigmentation in the gingiva of children with parents who smoke. Paediatrics 2005; 116:186-90
- 5. Wewers ME, Lowe NK. A critical review of visual analogue scale in the measurement of clinical phenomena. Res Nurs Health 1990;13:227-36
- Landry RG, Turnbull RS, Howley T. Effectiveness of benzydamyne HCl in the treatment of periodontal postsurgical patients. Res Clinic Forums 1988; 10:105-18

- Roshna T, Nandakumar K. Anterior esthetic gingival depigmentation and crown lengthening. Report of a case. J Contemp Dent Pract 2005;6:139-147
- Chandna S, Kedige S.D. Evaluation of pain on use of electrosurgery and diode lasers in the management of gingival hyperpigmentation: a comparative study. J Indian Soc Periodontol 2015;19(1):49-55
- Gul M, Hameed H. M, Nazeer M. R, Ghafoor R, Khan F. R.Most effective method for the management of physiologic gingival hyperpigmentation: A systematic review and meta-analysis. J Indian Soc Periodontol2019;23:203-15
- 10. Alasmari D. S. An insight into gingival depigmentation techniques: The pros and cons. Int J Health Sc. 2018;12:5
- Suchetha A, Shahna N, DivyaBhat, Apoorva SM, Sapna N. A review on gingival depigmentation procedures and repigmentation. International Journal of Applied Dental Sciences 2018; 4(4): 336-341
- Negi R, Gupta R, Dahiya P, Kumar M, Bansal V, Samlok J. K. Ceramic soft tissue trimming bur: A new tool for gingival depigmentation. Journal of Oral Biology and Craniofacial Research. 2019;9:14-18
- Ladvig S, Doshi Y, Marawar PP. Management of gingival hyperpigmentation usingsurgical blade and diode laser therapy: a comparative study. J Oral Laser Appl.2009:941–947
- Kumar S, Bhat SG, Bhat MK. Development in techniques for gingival depigmentation-An update. Indian J Dent. 2012;3:213–221

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