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Review Article

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Laser assisted vestibuloplasty with second stage free gingival unit graft : A case report

1.Dr.G. Vishnuvarthan,

Postgraduate,

Department of periodontology

Sree Balaji dental college and hospital

Chennai

Email id : drvishnuvarthang@gmail.com

Phone no : 8667393316

2.Dr. Krithika

Postgraduate,

Department of periodontology

Sree Balaji dental college and hospital

Chennai

Email id : krithika27748@gmail.com

Phone no: 7358617077

3. Dr. Anitha Balaji

Head of the department

Department of periodontology

Sree Balaji dental college and hospital

Chennai

Email Id:dranithabalaji12@gmail.com

Phone no:9840017004

4. Dr. Ramya

Professor

Department of periodontology

Sree Balaji dental college and hospital

Chennai

Email: drramya@yahoo.co.in

Phone no:8754487982

5.Dr.Rudhra

Senior lecturer

Department of periodontology

Sree Balaji dental college and hospital

Chennai

Email id: rudhrakannan97@gmail.com

Phone no: 8838991033

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Abstract :

Gingival recession is a major problem in periodontal therapy, necessitating new ways for effective management. The current study evaluates the use of laser-assisted vestibuloplasty and second-stage free gingival unit (FGU) grafts in the treatment of gingival recession in two individuals. The use of laser technology has several benefits, including less pain, faster healing, and improved patient adherence. In the second example, a 39-year-old male patient with gum recession in the mandibular anterior area underwent laser vestibuloplasty, followed by depapillation and FGU graft procedure, resulting in increased aesthetics and stability. Conversely, the second case involved a 40-year-old female patient experiencing gingival recession and sensitivity, who underwent laser vestibuloplasty and FGU grafting, leading to notable enhancements in vestibular depth and attached gingival width. This comprehensive treatment approach yielded satisfactory results, highlighting the transformative capabilities of contemporary techniques in periodontal management. The integration of lasers facilitated precise adjustments and graft placements, ultimately improving treatment efficacy and patient contentment. Further exploration is imperative to evaluate the long-term clinical and aesthetic results, alongside patient-centered metrics, when comparing laser-assisted FGU grafts to traditional methodologies. Moreover, additional research into the biological benefits of FGU grafts is essential for a deeper comprehension of their influence on tissue regeneration and vascularization. To conclude, the application of laser-assisted vestibuloplasty and second-stage FGU grafts emerges as a promising strategy for addressing gingival recession, offering predictable results and effectively addressing patient apprehensions. This amalgamated approach harbors the potential to redefine the landscape of mucogingival surgery and refine practices in periodontal care.

KeyWords: : Free gingival unit graft, vestibuloplasty, gingival recession , laser , PRF , mucogingival surgery

Introduction:

For good oral hygiene and periodontal health, it's important to have well-developed keratinized gingiva. Anatomical variances can cause a decrease in vestibular depth, impacting plaque management and leading to pathologic outcomes such as gingival inflammation, Edlanplasty, Kasanjian difficulties, severe recession, vestibuloplasty, and pocket development. Traditional and Clark's vestibuloplasty can cause pain, discomfort, and relapse (2).

The use of lasers in delayed healing dentistry has resulted in a change from aggressive to less invasive procedures. Erbium:YAG lasers are commonly used for vestibuloplasty treatments due to their compact size and cost, whereas Nd:YAG lasers are more expensive.

Keratinization is required to protect the periodontium from frictional forces while chewing, which can extend the gingival groove, allowing plaque collection and accelerating gingival recession(1).

Diode lasers offer clinical advantages over conventional surgery in vestibuloplasty, providing sterilized working areas, reducing the need for anesthesia and sutures, and offering excellent control of hemostasis due to high hemoglobin absorption(3).

Vestibuloplasty is a mucogingival surgery that aims to surgically modify the gingiva-mucous membrane interactions by deepening the vestibular trough, changing the location of the frenulum or muscle attachments, and increasing the zone of connected gingiva

Mucogingival problems classified as Class III Miller provide considerable complications in periodontics since they involve the loss of both soft tissue and underlying bone. Traditional methods frequently fail to successfully treat these variations because of decreased tissue quality, changed anatomy, and patient-specific factors. (5). Second surgeries have emerged as a pivotal component in managing Class III Miller cases, enhancing the aesthetic and functional aspects of the soft tissue, and reconstructing lost bone when necessary.(6)

Laser integration in free gingival unit graft procedures is the next frontier in mucogingival surgery, aiming to optimize outcomes, ensuring both esthetic and functional success(3)The clinical application of laser technology in vestibuloplasty involves accurate incisions and minimal bleeding, resulting in a clean surgical area and reduced postoperative complications(8).

The second stage of free gingival unit graft using a scalpel involves careful harvesting of donor tissue, typically from the palate, and precisely placing the graft in the recipient site to augment keratinized gingiva and improve tissue quality(4). Combining laser and scalpel approaches in the second stage gives an improved method that makes use of both laser and scalpel techniques(7).

The application of laser technology in both vestibuloplasty and the second stage of free gingival unit graft processes indicates a significant development in mucogingival surgery, resolving problems with initial tissue changes and subsequent grafting. This combined procedure indicates great promise for offering optimal results, increasing satisfaction among patients, and contributing to long-term oral hygiene.

Case report :

A patient reported with the complaint of receded gums in the lower front tooth region for one year to the Department of Periodontology at Sree Balaji Dental College and Hospital. This case report discusses the successful management of gingival recession in two patients using a comprehensive approach involving laser vestibuloplasty and second-stage free gingival unit grafts harvested from the palate region. The first patient, a 39-year-old man, had a two-year history of gum recession in the lower front tooth region.. Examination revealed missing teeth, attrition, and gingival recession classes 1 and 2. Under local anesthesia, laser vestibuloplasty was performed in the 33-43 region with power 1W, surgical tips(white color), followed by depapillation from 42-32 after a two-month healing period. A free gingival unit graft was harvested from the palate's 24,25 region, delicately placed from 2-42, secured with 3-0 Vicryl sutures, and complemented with a platelet-rich fibrin (PRF) clot. The patient experienced

effective resolution of complaints, achieving not only improved gingival aesthetics but also enhanced stability.

The second case involved a 40-year-old female with a three-year history of recessed gums and sensitivity while consuming cool drinks. Examination revealed missing and carious teeth, as well as inadequate vestibular depth and width of associated gingiva in the lower anterior area. Laser vestibuloplasty under local anesthesia has taken place in the 43-33 area. 1W, surgical tips (white color), followed by depapillation from 41-31 after a two-month interval. A free gingival unit graft harvested from the palate's 24 region was intricately placed in the 31 region, secured with 3-0 Vicryl sutures, and augmented with a PRF fibrin clot. The patient reported relief from sensitivity, accompanied by a significant improvement in vestibular depth and attached gingival width.

These cases underscore the successful application of laser vestibuloplasty and free gingival unit grafts in addressing gingival recession, emphasizing not only aesthetic enhancements but also the resolution of patient complaints. The multidimensional treatment strategy, incorporating laser techniques, depapillation, and grafting procedures, demonstrated satisfactory outcomes, encouraging further exploration of its applications in clinical practice.

Discussion:

The Proper management of gingival recession. using a comprehensive approach involving laser vestibuloplasty and second-stage free gingival unit grafts harvested from the palate region underscores the transformative potential of modern techniques in periodontal care. The cases presented in this report demonstrate the efficacy of laser technology in addressing mucogingival issues, emphasizing not only aesthetic improvements but also the resolution of patient complaints.

Laser vestibuloplasty has emerged as a minimally invasive alternative to traditional methods, offering several advantages in terms of reduced pain, discomfort, and faster healing. The use of diode lasers in vestibuloplasty procedures provides precise incisions, efficient hemostasis, and a sterilized surgical field. These benefits contribute to a more comfortable patient experience and may encourage better compliance with postoperative care, ultimately improving treatment outcomes.

The first case, involving a 39-year-old male with a two-year history of gum recession, highlights the successful application of laser vestibuloplasty in conjunction with depithelization and free gingival unit grafting. The meticulous integration of laser technology in the initial phase created a conducive environment for subsequent grafting procedures. The utilization of 3-0 Vicryl sutures and PRF fibrin clot further enhanced the stability and healing process, resulting in improved gingival aesthetics.

In the second case, a 40-year-old female with recessed gums and sensitivity benefited from laser vestibuloplasty in the 43-33 region, addressing both inadequate vestibular depth and width of attached gingiva. The subsequent second-stage free gingival unit graft from the palate's 24 region, combined with 3-0 Vicryl sutures and PRF fibrin clot, showcased the versatility of the integrated approach. The patient reported relief from sensitivity, indicating a positive impact on the quality of life.

The multidimensional treatment strategy employed in both cases, incorporating laser techniques, depithelization, and grafting procedures, yielded satisfactory outcomes. The cases not only emphasize the successful application of laser technology in mucogingival surgery but also shed light on the importance of a personalized approach tailored to each patient's unique clinical presentation.

Class III Miller mucogingival issues present complex challenges, requiring innovative solutions to achieve optimal outcomes. Traditional approaches often face limitations in addressing compromised tissue quality and altered anatomy. The integration of lasers in both vestibuloplasty and free gingival unit graft procedures represents a significant advancement, allowing for precise modifications and graft placement, enhancing the overall success of the treatment(10).

The discussion highlights the potential of combining laser vestibuloplasty and second-stage free gingival unit grafts to address gingival recession, improving aesthetics and addressing patient complaints. The integration of laser technology in periodontal care holds promise for shaping the future of mucogingival surgery, optimizing patient outcomes, and contributing to periodontology advancement.

Results:

The study demonstrates the effectiveness of laser vestibuloplasty and second-stage free gingival unit grafts in managing gingival recession, highlighting the potential of this comprehensive approach in periodontal care. The results demonstrate positive outcomes in both cases, with the first case involving a 39-year-old male with a two-year history of gum recession in the lower front tooth region and the second case involving a 40-year-old female with a three-year history of recessed gums and sensitivity. The multidimensional treatment strategy employed in both cases yielded satisfactory outcomes, with the meticulous integration of laser technology in the initial phases facilitating a conducive environment for subsequent grafting procedures. The use of 3-0 Vicryl sutures provided secure fixation of the grafts, contributing to stability during the healing process. The aesthetic improvements achieved in both cases were evident in the postoperative outcomes, showcasing enhanced gingival aesthetics and improved stability. The successful resolution of patient complaints, including sensitivity and aesthetic concerns, underscored the holistic impact of the integrated approach in addressing gingival recession. Class III Miller mucogingival issues present inherent challenges in periodontics due to compromised tissue quality and altered anatomy. The integration of lasers in both vestibuloplasty and free gingival unit graft procedures emerged as a pivotal advancement, allowing for precise modifications and graft placement, resulting in an overall enhancement of treatment success and patient satisfaction.

Additional long-term research comparing the clinical, aesthetic, and patient-centered results of GUG with standard methods such as FGG should be conducted. The biological benefits of GUG resulting from increased vasculature of marginal gingival tissues should be further confirmed utilizing postoperative timing and blood flow characteristics during the healing phases of the graft..

Conclusion :

Laser vestibuloplasty and second-stage free gingival unit grafts are revolutionary developments in gingival recession management, resulting in less discomfort, faster healing,

and more patient compliance. The two-pronged method, which combines laser and scalpel treatments, demonstrates the versatility and accuracy of the treatment plan. The effective treatment of patient problems, like better aesthetics and sensitivity reduction, demonstrates the treatment's general effectiveness. As a result, GUG is a predictable RC technique for Miller's class 2 and class 3 recession defects in isolated single or two adjacent recession defects in the mandibular anterior region.

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Figure 1: Biolase diode laser