

Laser assisted Gingival Procedures - A Review.

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Abstract: Soft tissue laser are increasing in population among the dentist. Now days, for many intraoral soft tissue surgical procedures the laser become a desirable and dependable alternative to traditional scalpel surgery. The advantages of the laser over the traditional surgical procedures are discussed below.

Keywords: Laser assisted, Gingival Procedures.

INTRODUCTION:

LIGHT AMPLIFICATION BY STIMULATED EMISSION OF RADIATION

A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation.

Laser have many important applications. They are used in various fields eg:- In industries for cutting and welding materials. In dentistry laser is used for laser surgery and treatment.

Laser is used in 2 gingival procedures:-

1. Esthetic crown lengthening.
2. Treatment in periodontal diseases.
3. Gingival depigmentation.

ESTHETIC CROWN LENGTHENING:

Prior to treatment, the area should be probed and bone sounding (ie; biological width) should be performed. The amount of attached gingiva, the location of crest of bone, howmuch crown lengthening is needed is determined.

Impression procedure is important factor in fabrication of indirect restorations. Exposure of sub gingival finish line and adequate moisture control are important for achievement of accurate impression. (1, 8)

There are 3 methods available, they are

1. Mechanical method
2. Electrosurgical method
3. Laser (1, 2)

MECHANICAL METHOD:

BY double cord retraction technique:-

It mechanically displaces the sulcus, providing access to the finish line so that it is adequately captured by the impression material. Although this method gives excellent results, the double retraction cord technique is considered cumbersome by many clinicians.

SCALPEL:

It is a surgical method. This method uses scalpel blade which causes bleeding.

ELECTRO SURGICAL METHOD:

It resects the gingival wall of the sulcus, therefore creating a trough along the finish line where the impression material can be syringed. It provides adequate homeostasis. (1)

Disadvantage:-heat generated with this technique causes irreversible damage to the alveolar crest which may in turn lead to recession and exposure of the restorative margins which affects the esthetic zone. (1, 3)

LASER:

We use 810nm diode laser.

PARTS OF DIODE LASER:

1. FIBER TIP:-It can be used in contact or in close proximity to treat the target area.
2. AIMING LIGHT:-To facilitate guidance of the laser beam during non contact use.
3. POWER SETTINGS:-Are adjusted and the laser beam can be delivered in a constant or pulse mode. (7)

ADVANTAGES:

1. Laser exhibits high degree of precision and control than a scalpel blade due to fine tip of the diode laser.
2. It also gives a clean surgical field. (6)
3. Laser incision is completed with excellent moisture control so that adequate moisture control is not a factor interfering with the fabrication of temporary restoration.
4. Diode exhibits little or no affinity for the dental hard tissue, metal alloy or porcelain and therefore can be used in close proximity to the root surface or existing restoration or implant. (4)
5. It has little or no affinity for cementum.
6. Facilitate homeostasis.
7. It has decreased biological side effects.
8. Diode laser specifically operates at a wavelength that is easily absorbed by the gingival tissue, hence minimal collateral tissue damage. (4)
9. Tissue penetration is shallow.
10. The laser beam can be applied in a constant mode to provide faster cutting, but this could increase the thermal transfer to the adjacent tissue. (6)
11. It simplifies the impression procedure.
12. Necrosis of the alveolar crest is avoided.
13. Healing following gingival incision with a diode laser leads to the regeneration of the dento alveolar complex to preparative or near preoperative gingival margin level.

14. Thermal energy generation and transfer are controlled by using laser beam in a pulse mode whenever possible, as well as implementing the use of cooling methods such as running an air current or incorporating a water spray throughout the procedure. This results in accurate impression.
15. Esthetic (5).

TREATMENT FOR PERIODONTAL DISEASE:

Laser can be done to treat periodontal disease and can retrieve the lost bone without pain, swelling, incision and suturing of conventional periodontal surgery.

PERIODONTAL DISEASE:

Periodontal disease is a group of disease that affects the tissue that support and anchor the teeth. Left untreated, periodontal disease results in destruction of the gums, alveolar bone (the part of the jaw where the teeth arises), and the outer layer of the tooth root. Which in turn results in loss of tooth? In adults, periodontal disease is the most common cause of tooth loss.

PATHOGENESIS OF PERIODONTAL DISEASE:

Bacteria accumulates on the teeth and forms dental plaque, if this plaque is not removed throughly,it will attach to the root surface inside the gum and produce a pocket, this causes irritation of the adjacent gum. The gum becomes swollen, appears red and results in frequent bleeding. This stage is known as gingivitis.

If gingivitis is not controlled, the bone will begin to resorb in order to avoid bacteria, once the bone resorbs the stage is known as periodontitis.Eventually, the teeth become loose and may form abscess or be lost.

TREATMENT:

Surgical.

non-surgical.

TRADITIONAL PERIODONTAL SURGERY (OSSEOUS/POCKET REDUCTION SURGERY):

1. Done when the pocket depth is greater than or equal to 5mm.
2. Non-surgical treatment(deep cleaning) is no longer effective.
3. Instrument cannot reach the bottom of the pocket to completely remove plaque and calculus on the root surface,In this situation, periodontal surgery is necessary.
4. Traditional periodontal surgery consist of cutting the gum and pulling the gum away from the teeth and the bone so that the dentitist has a direct view and access to the diseased bone and the root surface.
Having the direct view also allow the dentist to throughly remove the plaque and tarter from the root surface.
5. In certain situations, bone can be placed into the bony defects, which will promote bone regeneration.

DISADVANTAGE: Traditional periodontal surgery removes both healthy and diseased tissue, so that frequently the teeth will appear longer after surgery.

LASER PERIODONTAL THERAPY

Most patients experience pain with traditional periodontal surgery .To eliminate this anxiety, LANAP (Laser Assisted New Attachment Procedure) is introduced. A laser light is used to gently remove pathogenic bacteria and diseased tissue from the gingival pocket. This allows the body to heal naturally so that the gingival pocket improves and the teeth become stable.

ADVANTAGES:

1. Less traumatic.
2. Easy recovery with minimal bleeding and minimal pain.
3. Preserves gingival tissue instead of cutting it away.
4. Reduce root exposure and sensitivity.
5. Reduce infection.

SELECTION OF PATIENT:

Patient with healthy gingiva donot need this treatment.

Patient with superficial gingivitis donot need this treatment, because these patients have red swollen gingiva but have pockets less than 5mm, these patients are class1.

Class2, 3, 4 periodontal disease patients need this treatment. All these patients have a pocket depth 5mm or greater. They also have more loss of bone support to the teeth.

GINGIVAL DEPIGMENTATION:

Gingival depigmentation is a procedure used in cosmetic dentistry to remove black spots or patches on the gums caused by excessive melaninLaser Gingival Depigmentation Techniques (Laser Gum Bleaching)

Melanocytes are cells which reside in the basal layer of the gingival epithelium. These cells produce melanin, which are pigments that cause discoloration or dark spots in gums. A dental laser can target and ablate the melanocytes, thus reducing the production of melanin in the gingival tissue. Following laser depigmentation, the gingiva heals by secondary intention. This results in a lighter and more uniform color of the gums.(9,10)

CONCLUSION:

Thus diode laser units are compact and are low cost. Treatments can be finished in a short duration and are more effective than the surgical method.It is widely used in patients were esthetic is the main concern.

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