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TRI- Immunophasic Therapy: A Future Landscape

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Abstract:- The chronic, multifactorial inflammatory disease known as periodontitis is linked to dysbiotic plaque biofilms and is defined by the gradual breakdown of the structure that supports teeth. Its main characteristics are gingival bleeding, periodontal pocketing, radiographically measured alveolar bone loss, and clinical attachment loss (CAL), which indicate a decrease of periodontal tissue support. Owing to its high prevalence, periodontitis is a major public health concern since it can lead to tooth loss and impairment, negatively affect one's look and ability to chew food, exacerbate social inequality, and diminish one's quality of life. Improvements have been made in the diagnosis and treatment of periodontal infections using a variety of contemporary methods that are currently accessible.Controlling the etiological causes and bacteria, reducing inflammation, and replenishing the lost alveolar support are the main goals of periodontal therapy. The main components of periodontal treatment is the surgical and non-surgical therapy. Dissatisfaction with the conventional therapy for protecting oral microbiota and replacing lost alveolar bone support may prompt medical professionals and researchers to investigate the novel and cutting-edge Bone One Session Treatment (BOST). It is an aerobic therapy that supports the alveolar bone and eradicates periodontal disease in the deepest pocket without requiring an intrusive operation. This review paper provides a novel approach, emphasis, and assessment of the important pathway for treating periodontal disease using the Bone One Session Treatment.

Keyword:- *Periodontitis, Periodontal Therapy, BOST, Aerobic Periodontics.*

I. INTRODUCTION

Knowledge of periodontal illnesses has seen a significant transformation in the last ten years due to advancements in periodontal research and practice. This has created new and exciting opportunities for the treatment of periodontal diseases, both surgical management as well as non-surgical management. For many years, the gold standard of periodontal therapy has been mechanical sub-gingival scaling performed by extensive scaling and root planning, followed by oral hygiene maintance protocols. The bacterial etiology of periodontal disease is a persistent inflammatory process. It causes the tooth's supporting tissues to gradually and specifically degrade, leading to the development of a characteristic pathological lesion [1].Dissatisfied with traditional approaches to safeguarding microorganisms and rebuilding damaged alveolar bone, industrious physicians, scientists, and investigators have turned to unconventional, sometimes expensive methods and explored uncharted territory. Dr. William Hoisington has developed a revolutionary treatment strategy called Tri Immuno phasic Periodontal Therapy (TIP) and Bone One Session treatment, which is a part of TIP method [1] to address periodontal disease in a novel way. Clinicians can eradicate anaerobic bacteria, which are virulent microorganisms that not only erode gingiva and alveolar bone but also enter the bloodstream and cause systemic issues like osteoporosis, coronary heart disease, and preterm low birth, by using Bone One Session Treatment, or BOST.[2].

- *Objective and Rationale of TRI-Immuno-Phasic Therapy (Tip)*

The premise behind this treatment is that by treating periodontitis in the defensive phase system, the body can regrow lost periodontium in the same manner that it does during the repair and healing phase. TIP periodontal therapy helps the host body during the defense, repair, and regeneration phases as well as the alert readiness phase of immunity. Additionally, it modifies the individual and local factors that alter the progression of periodontal disease and encourage recovery.The goal is to manage periodontal diseases without the need for surgery. The major objective of this therapy is to improve the bone's ability to recover with new, healthy tissue. This new, healthy tissue fills the periodontal pockets that are formed during periodontal diseases.

Various kinds of bacteria, viruses, yeasts, and parasites are all important, but anaerobic pathogens—because of their virulence and intrusive nature—are the ones that allow other organisms to work in concert to disrupt the connective tissue's bond and create pathological periodontal pockets. Bacteria and other organisms enter the circulation through this opening into the deeper tissues. Researchers have discovered periodontal infections in the coronary artery atherosclerotic plaques (Fiehn et al. 2005).

- *Bone One Session Treatment (BOST)*

Usually, a full mouth BOST procedure requires four to five hours in a single day. BOST reduces damages to the periodontal apparatus, bone, and gingiva during healing. Stretch flap method is use(3).

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➢ *Steps of Bost*

- Bacterial DNA testing
- BOST treatment
- Controlling biting forces
- Aerobic oral hygiene regimen
- Lifestyle, nutrition, and exercise.

Bacterial DNA testing: The first step in modern periodontal therapy is identifying the type and quantity of bacteria that are causing the periodontal disease. We are able to identify the specific bacteria responsible for the periodontal infection according to the bacterial DNA test. In most cases, the results of the DNA test would confirm that thetypeof bacteria found in the gingiva can be targeted without the need for medicines [(3)]. Antibiotic avoidance is advisable in certain situations to prevent the immune system from deteriorating. Certain bacterial species are so hardy that they can't be managed with just conventional therapies. Porphyromonas gingivalis and Aggregatebacter actinomycetemcomitans are two examples of this category's aggressive bacterial species.In the test reveals the presence of these bacteria, the treatment plan will include enough antibiotics to ensure full recovery.

A paper point is inserted under the gingiva for approximately 15 seconds in order to perform the bacterial DNA test. The process is quick, easy, and painless. Plaque, also known as biofilm, is habitat to bacteria and covers the tooth roots at the attachment level. After the bacteria are gathered on the paper point, the sample is transferred to a lab where its DNA is compared to profiles found in the lab's reference database to identify the bacterium.

II. BOST TREATMENT

A. *Stretch Flap Technique* [4]

- First Step: With the working end toward the tooth surface, a universal 4R–4L curette is placed into the sulcus. In order to start stretching the tissue and remove superficial calculus and plaque, a little pressure is applied to it.
- Second Step: To mobilize the tissue and prevent yanking the papilla free, which would essentially create an incisional flap, the direction is adjusted to a circumferential motion beginning at the cornerSecond Step: The direction is changed to a circumferential motion starting at the corner to mobilize the tissue and avoid pulling the papilla free and in essence creating an incisional flap.
- Third Step: In this step, the curettes are inverted to enable the rounded tip to plasty the bone's surface and remove any deteriorated attachment or connected granulation tissue. Toxins and bacteria are to be removed from the porosities by means of fresh bleeding and a smooth, regular bone surface. This method guarantees that the periodontium will be left in an incredibly healthy state that will promote rapid healing. Stretching the tissue will prevent scarring from forming throughout the healing process. Scar development always aims to keep the bone from adhering to the tooth surface, meaning that even with conventional non-invasive periodontal therapy, the bone will remain weak. Additionally, it allows the microbes to re-infect the tissue.However, stretch flap technique provide a powerful attachment to the tooth surface and healthy tissue starts filling the sub gingivally.

There are certain similarities between curettage and the BOST method, notwithstanding their differences. The curative treatment removes the diseased granulation tissue and pocket lining without expanding the flap, but in this technique the flap has been gradually expanded and the diseased granulation tissue removed to enable the activation of stem cells.[7].

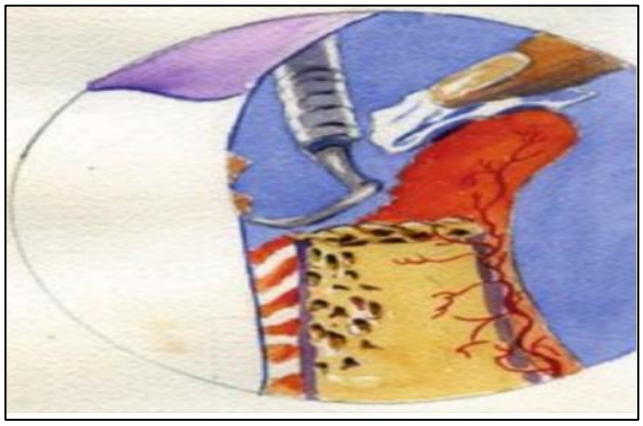

Fig 1: Using Curettes' Rounded Backs, the Gingiva is Purposefully Stretched (5)

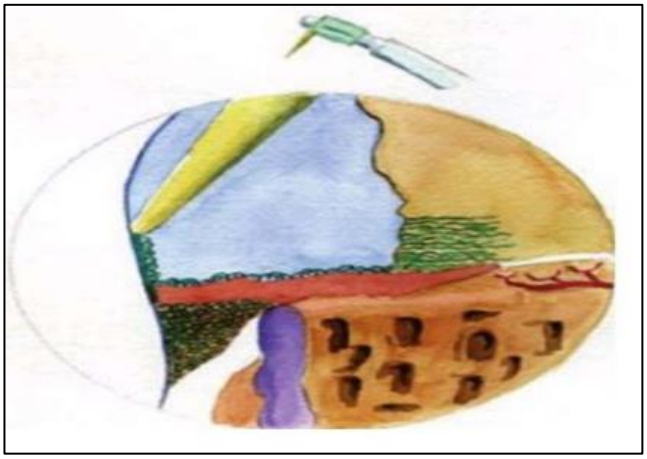

Fig 2: A Scaffold is Formed by the Clot that is Securely Affixed to the Clean Bone. For Eight Days, the Stem Cells can Thicken the Layer on the Clot by Moving along it and up the Root Surfaces at a Pace of 0.5 mm Each Day [(4).]

B. *Healing after Bost*

Healing should come first, following the completion of the BOST treatment. As a scaffold, the clot is securely attached to the clean bone surface. Usually composed of partially mineralized connective tissue, the compartment eventually becomes acellular.

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In a month, the (MAC) connection will form, and the bone will mend on its own. There are four phases of therapy following bone healing (Fig-3).

- Stem cell migration during the defensive phase involves cleaning the bone aerobically to get rid of periodontal bacteria as a BOST immunological response. This phase created the framework necessary for the host body to transition from the defensive phase it was in against periodontal infections and other microbes to the regeneration phase, which allowed for the healing of a new attachment. The clot layer thickened as the stem cells within the pocket traveled 0.5 mm every day along the root surface. Maintaining a stringent oral hygiene regimen that keeps the pocket open and the epithelial attachment distant is important (Figure- 3).

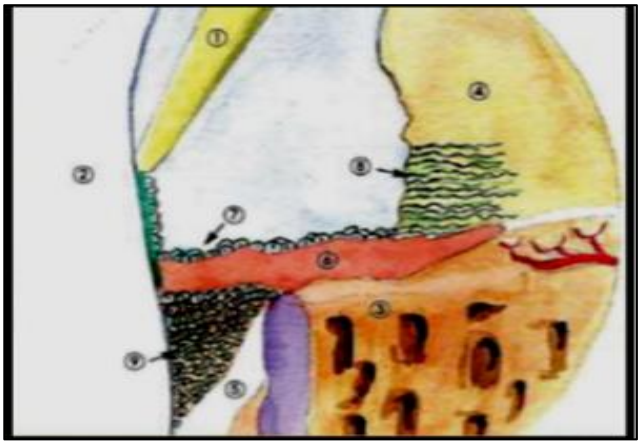

Fig 3: The Clot that Attached to the Bone Serves as a Scaffold. (1) Perio-Aid, (2) Tooth, (3) Alveolar Bone, (4) Gingiva,
(5) Desmodont, (6) Callus, (7 and 9) Pluripotent Stem Cells, and (8) Fibers

- Phase of Regeneration and Maturation of attachment: **(Figure 4)** -During the course of four to six weeks, when the root surface heals, the pockets progressively fill with mineralized connective tissue and turn acellular (Figure 4).

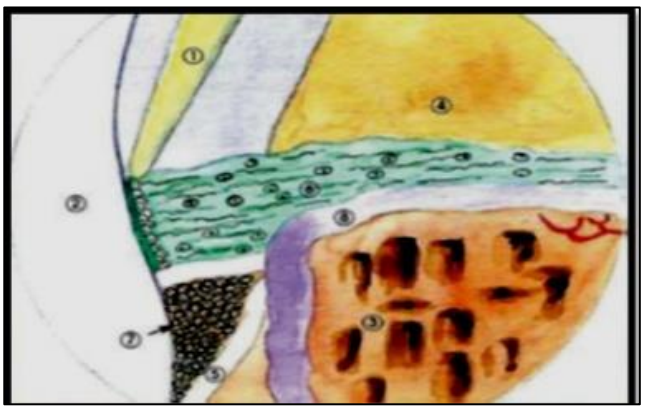

Fig 4: Phase of Regeneration and Maturation of Attachment

The pockets fill in from the bottom with very dense, partially mineralized connective tissue. (1) Perio-aid, (2) tooth, (3) bone, (4) gingiva, (5) desmodont, (6) mineralized acellular connective tissue, (7) pluripotent stem cells (8) New dense layer of osteoid formation.

- New Attachment Healing: (Figure 5)-Within a month of its formation, bone heals spontaneously beneath the newly formed mineralized MAC. After eight months, the healed inner cancellous bone is covered with a dense new layer of cortical bone (Figure 5.).[4] The full healed result, where the bone crest cortical layer is repaired, takes about nine months to show on X-rays.

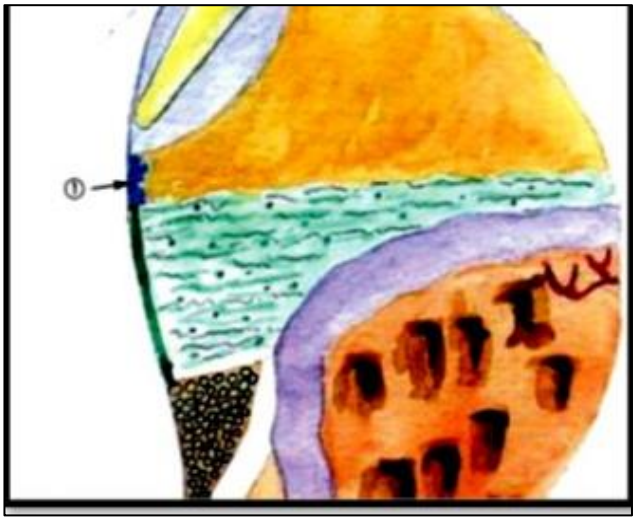

Fig 5: (1) Zone of Attachment -Mineralized Acellular Connective Tissue Attachment

- Regulating Occlusal Pressures and Using Splints: Traumatic normal occlusal forces result from periodontium weakening. To evenly distribute the forces, the treatment plan consists of splinting, enameloplasty, and coronoplasty. Controlling the occlusal forces stops additional tissue injury and tooth movement.

- Aerobic Oral Hygiene Regimen of BOST : How the patient follows a regular oral hygiene routine is entirely up to them at this step. To maintain oral hygiene, dental floss, interdental tooth brushes, and other conventional oral hygiene products are employed. Because the deeper pockets, furcation, and root concavities are difficult to access with dental floss or a toothbrush, the aerobic oral hygiene kit (Perio-aid) (Figure 6) is used to clean the area subgingivally and eliminate the disease-causing anaerobic periodontal microorganisms in these locations. The cells at the pocket's base are stimulated by this Perio-aid (Figure 6).

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Fig 6: Perio-Aid Assisting in New Attachment Formation

- Exercise Lifestyle and nutrition–ToMaintain a balanced diet by consuming frequent meals, limiting the intake of sugar and snacks, and staying away from granular foods like chips, whole grain breads, nuts, and seeds. Boost protein and vitamin and mineral consumption. Zinc and vitamin C are crucial. Steer clear of smoking; it lowers circulation and suppresses some immune cells. You must exercise on a regular basis.

➢ *Advantages of Bost*

- Non-invasive surgical procedure and full-fledged aerobic therapy
- Complete degranulation from the pockets without incisions and suture
- Minimal underlying tissue damage.
- Single session treatment Quick and reliable method.
- Improved Healing.
- Reasonably pleasant for a patient
- Least complications and there is no requirement of surgery.
- No necrosis of bone.
- Aesthetically more acceptable.
- Less sensitivity.

III. CONCLUSION

The BOST technique was introduced to address the drawbacks of conventional periodontal treatment modalities by altering the pathway of pathogenesis and removing etiological factors, which further facilitates regeneration, repair, and new attachment during the healing phase. As technology and science continue to advance, so too will the development of newer advancements in diagnosis and treatment modalities in dentistry. Clinicians should continue to develop newer advancements in diagnosis and treatment modalities as it is the main criteria to prevent periodontal infection progression.

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