ORIGINAL RESEARCH PAPER

Volume-8 | Issue-6 | June-2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

GENTLE WAVE (GW) SYSTEM – A REVIEW OF THIS NOVEL SYSTEM FOR ROOT CANAL DISINFECTION

Dental Science

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ABSTRACT

When a patient is undergoing the root canal treatment, the utilization of the apparatuses and treatment conventions is to expel the presence of any form of debris, microscopic organisms, and biofilm from the canal. In any case, the root canal treatment including the process of disinfection is multifaceted and complex because the apical-thirds and another complex anatomically inaccessible zones make it extremely difficult to disinfect and hence reduces the possibility or chances of the success of the treatment. Recent advancements in disinfecting the root canal has led to the utilization of innovation which have the capacity to disinfect the canals completely. This article projects an in-depth study and exploration about the new development namely the Gentle Wave System, which is popular in market.

KEYWORDS

Root canal; the Gentle wave system; Root canal disinfection

INTRODUCTION-

Diverse structures and complexities of the root canals are key difficulties that a clinical observe while trying to attempt for powerful disinfection.[1] The utilization of several dominant antimicrobials like the sodium hypochlorite as a part of endodontic treatment to battle microbial biofilms have been employed vastly.[2] Nevertheless, be that as it may, the anatomical intricacies that are presented often due to the anatomy strongly restricts their adequacy in the process of disinfection. As far as the branch of endodontics is being considered, it is important to consider the fact that the process of disinfection and debridement are the key to make sure that the root canal is free of any necrotic tissue and is in a healthy state for re-vitalization through the root canal filing.[3] While the intricacy of the structure of a canal poses a strong challenge, the disinfection cannot solely rely on the process of instrumentation. It is advised that the use of instruments, liquid, and anti-septic solution be done together to obtain the optimum results.

As of the current trends that have been observed so far, sodium hypochlorite is the most widely used solution for irrigation and is more commonly used in the concentration that ranges from 0.25% to nearly 6%.[4] The solution is valuable in aiding to dissolve the necrotic tissue. There are two major disadvantages associated with it which include the need for frequent renewal for it to be viable and the fact that it could pose a serious threat to the tissues if it finds its way outside the canal.[5]

The state-of-the-art Gentle Wave (GW) system which is industrialized by the Sonendo Inc. in California uninterruptedly conveys energized treatment solution with the help of a hand piece that is placed on the occlusal surface of the tooth to get access to the root canal.[6] The handpiece conveys a surge of treatment liquid into the chamber, and the implicit suction evacuates the outflowing liquid making negative weight inside the system.

Mechanism of Irrigation process via Gentle Wave system

This framework is made out of a support console and a clean expendable handpiece. It conveys a flood of the desired liquid from the tip of the piece into the chamber, and at the same time, the excess liquid is expelled from the chamber through the implicit vented suction through the piece into a waste canister inside the support. It works on several different mechanisms that include the strong force of the sound waves to disinfect the root canal. Such waves are usually created at the tip which is in direct contact with the pulp chamber.

As indicated by the instructions in the manual, endless supply of the liquid through the tip causes a strong interface between liquid from the tip, and the static content in the pulp chamber. The strong interface creates a shear compel and forms a term referred to as the cavitation cloud. The constant arrangement and collapse of tons and tons of micro-bubbles within the shear interface create an acoustic arena that movements through the liquid into the whole root canal framework. When the rinse is being produced and delivered, the solution is initially kept at about 3% of the NaoCl and followed by a small wash by water in between and then moved on to 8% of the EDTA solution.[7]

The tip has been specifically manufactured and designed to make sure that the bulk of the solution is targeted at the orifices of all of the root canals. This stream prompts delicate vertical stream and also a minor negative pressure inside the canal framework. The vitality and the vertical stream scatter as they pass apically into the canal.

Outcomes and Evaluations of Gentle Wave system

As indicated by the investigative study undertaken by Haapasalo et al.[4], the disintegration of the tissue structures was found to be nearly eight to nine times faster and swifter as compared to any other sort of ultrasonic gadgets and nearly ten times quicker than the process of irrigation with the help of a needle. As per the investigative study that was undertaken by Molina et al.[6], the results showed that the cleaning, disinfecting and disintegration of the debris was much higher when compared to several other types of conventional techniques of disinfection.

The adequacy of Gentle Wave framework to expel out the separated apparatuses from the root canal has also been distinguished as additive property.[8] In a multi-focus scientific investigation, Sigurdsson et al. revealed that the Gentle Wave Arrangement had shaped nearly 97% fairer results in the teeth treated in a single calendar year.[8] The technique has been anticipated to improvise the changing aspects of the irrigation process, especially in a small and relatively narrow canal. Several experimental studies are being undertaken to check if the system is also effective to remove the biofilms present within the canal.[9]

One of the biggest fears with using any form of disinfecting solution is the toxicity if it spills out or extrudes out of the canal. Expulsion of the fluid has been tried in a variety of assortment of in vitro conditions. Within the limitations of this in vitro study, Gentle Wave failed to cause any form of extrusion as far as the pressure was maintained to a certain limit. [10]

CONCLUSION:

Some of the most contemporary advances in the process of disinfection of the root canal sterilization with the aid of new innovation and recent exploratory research investigations have proved that there is a chance to enhance the current capacity to completely disinfect the root canal. Further research and utilization based on clinical outcomes could revolutionize the process and could outdate the traditional and conventional methods.

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