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Electrically Advanced Oral Cleaning Device

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ABSTRACT: ***Toothbrush aids in maintaining the oral hygiene by cleaning the teeth, gums and tongue. Dental plaque is the primary causative factor of gingival and periodontal disease. Thus good oral hygiene by effective tooth brushing has a key role in oral health. Mechanical plaque removal by tooth brushing are over-the-counter products that need specific brushing technique by an individual to achieve plaque control. It remained undisputed until the discovery of the electric toothbrush. Electric toothbrushes are comfortable and they improve the efficacy of plaque control and gingivitis. They simulate the manual motion of tooth brush. The new era of smart sensing technology toothbrush is empowering dental professionals and patients to make positive and transformative changes to their oral health. Even an average individual will benefit from its use thereby improving the standard in maintaining oral hygiene. Henceforth overall health of an individual will also be protected.***

KEYWORDS: ***Electrically, Tooth brush, Plaque, Tooth, Sensor, Oral Care, Dental hygiene, Ultrasonic wave.***

INTRODUCTION

In 1939, Fredrick Tonberg, a Swedish watchmaker in the US, invented a powered toothbrush that made plaque control easier. For disabled and hospitalized patients, powered toothbrushes are recommended. It has a multi-directional power brush that decreases the frequency of plaque and gingivitis relative to plaque. Side-to-side cleaning daily. An electric toothbrush rotates the bristles and cleans areas that are difficult to reach. Most studies show performance comparable to that of manual brushing, with a substantial decrease in plaque and gingivitis in driven brushing. A more effective cleaning process can be facilitated by an extra timer and pressure sensors. Studies comparing the effectiveness of plaque removal between manual and powered toothbrushes have yielded conflicting findings, with few studies reporting dominance over manual toothbrushes although few studies have found no such distinction, toothbrushes According to their speed of movement, electric toothbrushes can be defined as: normal power toothbrushes, sonic toothbrushes, or ultrasonic toothbrushes[1].

VARIOUS GENERATION OF POWERED TOOTHBRUSHES

First generation: The first generation of power toothbrushes had a head resembling manual toothbrushes, and moved back and forth to simulate manual brushing. The problems encountered with these products included short working time and mechanical breakdown.

Second generation: It had a special revolving head for the second generation and was powered by long-life/rechargeable batteries. Compared to manual toothbrushes, it had greater effectiveness. Vibrating and reciprocal motion and additional characteristics such as pressure sensor and timer were integrated into the new types.

Third generation: Sonic-powered toothbrushes and ultrasonic-powered toothbrushes were introduced. They were shown to remove more plaque in comparison to manual toothbrushes, especially in long-term studies.

ULTRASONIC-POWERED TOOTHBRUSH

It is the newest form of powered toothbrush which cleans the teeth using ultrasonic waves. Vibrations that are very high in frequency but low in amplitude are emitted by ultrasonic toothbrushes. These vibrations break up dental plaque-forming bacterial chains and eliminate their methods of attachment up to 5 mm below the gum line to the tooth surface[2]. Certain toothbrushes that provide both ultrasonic and sonic motion make it possible to decrease the speed of the sonic motion, or even to turn off the sonic motion completely so that only ultrasound is emitted. This environment may be suggested for patients who may not be appropriate candidates for traditional sonic or power toothbrush vibration, but who need the extra cleaning power of an ultrasonic toothbrush, such as patients who have recently undergone periodontal surgery, because ultrasound movements are very low in amplitude[3].

There are various optional features of powered toothbrush such as a number of the new generation powered toothbrushes also incorporated design features which are aimed at improving the efficacy of cleaning and reducing the likelihood of toothbrush abrasion and gingival trauma in the long term. These features include:

Timer: Many modern electric toothbrushes have a timer that, usually after two minutes, and often every 30 seconds, buzzes or momentarily interrupts control. For each of the four quadrants of the mouth, this is combined with a normal recommendation to brush for two minutes, 30 seconds.

Display: To promote optimum brushing, some electric toothbrushes have LCD screens that display brushing time and often smiley face icons or other images. These characteristics could enable individuals to brush more accurately.

Pressure sensor: Brushing too hard on the teeth does damage to enamel and gum. A pressure sensor is offered for most modern top-end sonic toothbrushes, which prevents users from brushing too vigorously. Two types of pressure sensors exist. Some sensors create a sound alarm and some interrupt the sonic toothbrush's movements automatically when it is used too aggressively.

Ultrasound indicator: Due to the fact that ultrasonic frequencies are outside the audible range and the amplitude of motion produced by an ultrasonic toothbrush is normally too small to be perceived, the ultrasound is imperceptible to humans and it may not be noticeable that it is turning on a brush that runs in pure ultrasound. An indication to warn the patient that ultrasound is being released can be used in ultrasonic toothbrushes.

ADVANTAGES

1. Powered toothbrush increases patient motivation resulting in better patient compliance and increases accessibility in interproximal and lingual tooth surfaces.
2. It uses less brushing force than manual toothbrushes.

3. Brushing timer is incorporated in some brushes.

DISADVANTAGES

1. The cost and maintenance of powered brushes is more than manual toothbrushes.
2. It also results in noise and discomfort due to vibration

On a global scale, dental caries and periodontal disorders impose a massive social, economic and financial burden. Dental plaque, the precursor of dental caries and periodontal disease, remains an enigma despite a multitude of preventive measures available. Dental plaque is a sticky layer of bacteria that can harden into tartar, irritate the gums, resulting in gingivitis, a swollen tissue of the gum bleeding. If effectively carried away, dental plaque can be the most effective way to preserve good oral hygiene, decrease tooth decay, and to encourage better protection of the gum. Craft and materials from Toothbrush have come a long way[4]. In order to preserve good oral hygiene, several factors interact. The important role of dental plaque in the etiology of gingivitis was shown by Loe et al. and that plaque removal can reverse this process.

The nature of the toothbrush, the ability of the person to use the brush, the amount of tooth brushing, the length of use are key factors in managing plaque accumulation, effectively preventing gingivitis and/or periodontitis and decaying. The last two factors represent individual tooth brushing behavior and are affected by learning experience, motivation and manual capacity and can of course be improved with good cooperation established between dentists and patients. However, the first factor represents technology improvement and is affected by the physical and mechanical properties of the toothbrush bristles, shape, size and morphometric of the tooth brush heads and handles[5].

At present, many have used fixed orthodontic toothbrush treatment. Infants and adults must not only use a set orthodontic toothbrush for dental treatment, but instead, and it is part of the lifestyle. Based on previous studies, the result showed that the treatment for appearance factor was performed by most adult orthodontic patients. Orthodontic treatment is not only part of dental care to correct malocclusion, but also to enhance dental health, function of chewing, verbal capacity, and aesthetics. Orthodontic b treatment is split into two forms that are orthodontic fixed and orthodontic removable. Centered on many components such as a bracket, arch wire, band, auxiliary and many more.

CONCLUSION

In order to prevent the incidence of dental diseases such as dental caries, gingivitis and periodontal disease, routine mechanical removal of bacterial plaque is necessary. The comprehensive regular removal of dental plaque and debris using intra-oral cleaning devices includes oral hygiene activities. Tooth brushes are the oral hygiene aids most widely used. As technology improved, as an alternative to manual tooth brushing, powered toothbrushes came into being. Tooth brushing is generally accepted as the most efficient oral hygiene method of cleaning teeth. Powered toothbrushes have been developed to improve and facilitate oral hygiene. Different types of powered toothbrushes with various power supplies and various

modes of action are currently available. Power toothbrushes are successful for plaque removal and gingivitis reduction. They are as safe and well adhered to as manual toothbrushes. Motivation to enhance oral hygiene seems to be a key factor in the purchasing of powered toothbrushes by patients.

REFERENCES

[1] W. A. Khalil, "Comparing Effectiveness of Soft, Medium and Hard Bristle Tooth Brushes on Oral Hygiene," *Int. J. Sci. Res.*, vol. 6, no. 7, pp. 1897–1901, 2017, doi: 10.21275/art20175619.

[2] A. Rahardjo *et al.*, "Measurement of Tooth Brushing Frequency, Time of Day and Duration of Adults and Children in Jakarta, Indonesia," *J. Dent. Indones.*, vol. 21, no. 3, pp. 85–88, 2015, doi: 10.14693/jdi.v21i3.251.

[3] Kumar G., "Tooth Brush and Brushing Technique," *J. Adv. Med.*, vol. 2, no. 1, p. 5, 2013.

[4] K. Baruah, V. Kumar Thumpala, P. Khetani, Q. Baruah, R. V. Tiwari, and H. Dixit, "A Review on Toothbrushes and Tooth Brushing Methods," *Int. J. Pharm. Sci. Invent. ISSN*, vol. 6, no. 5, pp. 29–38, 2017.

[5] J. Asadoorian, "CDHA Position Paper on Tooth Brushing," *Can. J. Dent. Hyg.*, vol. 40, no. 5, pp. 1–14, 2006.