

Efficiency of Professional Tooth Brushing before Ultrasonic Scaling

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ABSTRACT

Regular dental check-ups and routine scaling are recommended to prevent periodontal diseases and to maintain oral health. For the removal of dental plaque which usually remains even after careful tooth brushing and flossing, teeth cleaning or prophylaxis is carried out. Tooth brushing is also an effective way for the routine cleansing of the teeth but sometimes food debris are not removed especially in areas which are not accessible to normal tooth brushes. Professional tooth brushing includes the use of electric toothbrushes, interdental brushes, and dental floss. The present review throws a light on the general features of these three aids and also discusses the effectiveness of electric toothbrushes, interdental brushes, and dental floss prior to ultrasonic scaling.

KEYWORDS: Dental Floss; Tooth Brushing; Ultrasonic Scaling

INTRODUCTION

Teeth cleaning are a part of oral hygiene and involve the removal of dental plaque from teeth with the intention of preventing cavities (dental caries), gingivitis, and periodontal disease. Deposits on the teeth can be removed by two ways. Either the people can clean it by themselves with the use of tooth brushes and interdental cleaning agents but sometimes they become hard or mineralized (tartar). In such situations dental professionals can help in removing the deposits which are not removed by routine cleaning.¹ Plaque is a bio-film which is formed by the colonies of bacteria that live in our mouth. Acid produced by the plaque bacteria is destructive to our teeth and gums. Calculus or tartar forms when plaque is not properly removed and the bacterial colonies calcify and mineralize into a hard substance, which then attracts more harmful bacteria. Gingivitis is a gum disease which is caused by the active and destructive bacteria. Our gums become inflamed, swell and redden in response to the infection and to prevent advancement to periodontal disease, this condition must be aggressively treated. Blood on the toothbrush or when rinsing after brushing is a sign of gingivitis. Periodontal disease i.e. Periodontitis, if left untreated can cause so much bone loss that our teeth become loose and may exfoliate. Periodontal disease can be diagnosed by measuring the depth of the pockets, checking for bleeding sites, and by assessing bone loss through digital x-rays and clinical observation. Though periodontal disease is irreversible but it can be managed by dental professionals. Pockets are the sites where bacteria can colonize and ultimately can lead to loss of attachment and hence periodontitis.²

PROFESSIONAL TOOTH CLEANING

A tooth cleaning (preventive treatment) is basically a

procedure for the removal of tartar (mineralized plaque) that may develop in areas that are difficult to clean by routine tooth brushing. It is often done by a dental hygienist and includes tooth scaling and tooth polishing and debridement if too much tartar has accumulated. This involves the use of various instruments or devices to loosen and remove deposits from the teeth. As far as frequency of cleaning is concerned, research on this matter is still inconclusive. That is, it has neither been shown that more frequent cleaning leads to better outcomes nor that it does not. A review of the research literature on the question concluded "the research evidence is not of sufficient quality to reach any conclusions regarding the beneficial and adverse effects of routine scaling and polishing for periodontal health and regarding the effects of providing this intervention at different time intervals".^{1,3} This conclusion was reaffirmed when the 2005 review was updated in 2007.⁴ Thus, any general recommendation for a frequency of routine cleaning (e.g. every six months, every year) has no empirical basis. Moreover, as economists have pointed out, dentists (or other dental professionals) have an incentive to recommend frequent cleaning because it increases their revenues. Most dental hygienists recommend having the teeth professionally cleaned every six months. More frequent cleaning and examination may be necessary during treatment of dental and other oral disorders. Routine examination of the teeth is recommended at least every year. This may include yearly radiographic examination.¹

PROBLEMS ENCOUNTERED IN PROFESSIONAL TOOTH CLEANING

Regular dental check-ups and routine scaling are recommended to prevent periodontal diseases and to maintain oral health.⁵ However, dental treatment

How to cite this article:

Shah RA, Patel BK. Efficiency of Professional Tooth Brushing before Ultrasonic Scaling. Int J Dent Med Res 2015;1(6):202-205.

generates different types of anxiety among dental patients. Patients are reluctant to receive scaling, particularly because of hypersensitivity, noise and discomfort in the mouth from the water coolant, among other reasons.^{6,7} Tooth hypersensitivity, which commonly occurs during the ultrasonic scaling procedure, may result from tooth problems, including the exposure of root or dentin. Hypersensitivity may also occur because of an excessive number of scaling procedures and the operation of the ultrasonic scaler on the tooth surface with improper tip angulations.⁸ Using an ultrasonic scaler reduces treatment times by allowing a shorter amount of time to remove the dental plaque biofilm and dental calculus compared with using manual periodontal instruments. Moreover, the scaler relieves clinician fatigue and easily reduces subgingival micro-flora.⁸

However, an ultrasonic scaler causes patient discomfort because of pain, vibration, noise and a large volume of water coolant; excessive operation of the instrument may also prove to be detrimental to periodontal health by roughening the root surface.^{8,9} Although routine scaling is a cost-effective method of preventing periodontal diseases and dental caries, various burdens of scaling impede patients from undergoing scaling.^{6,10} The usage rate of periodontal scaling among dental patients is particularly low. Thus, various measures must be devised to reduce patient burden by incorporating easier and safer scaling procedures.^{6,7,11}

EFFICIENCY OF ELECTRIC TOOTHBRUSH

During tooth brushing the mechanical removal of dental plaque is achieved mainly because of direct contact of bristles with the teeth and the scouring action of bristles across tooth and gum surfaces. Reaching an optimal level of supragingival plaque control is one of the treatment goals for establishing a healthy periodontium.¹² The effectiveness of certain electric toothbrushes in reducing signs of gingival inflammation has been proven in numerous studies over the past decade.^{13,14} Recently a variety of electric toothbrushes have been developed to improve the efficiency of plaque removal using increased bristles velocity, brush stroke frequency and various bristle patterns and motions.¹² These designs including rotary, oscillating/rotating with pulsation and brush heads which move at high frequencies, have shown in controlled clinical studies to be more effective in removing plaque and stain in a shorter time than that which is achieved with a standard manual brush.^{15,16} Also, some modern electric brushes appear to remove plaque from approximal surfaces significantly more effectively than conventional manual brushes.¹⁷ Studies¹² have shown that use of tooth brushes before ultrasonic scaling helps in reducing the time of ultrasonic device use.

EFFICIENCY OF INTERDENTAL TOOTHBRUSH

Today the general community is becoming more aware

about the importance of plaque removal for the prevention of dental and systemic diseases. However, daily habits such as interproximal plaque removal have yet to be followed by many people. Though routine tooth brushes can remove deposits from various tooth surfaces but they are not much effective interproximally. Dental floss, which is quite effective for interproximal plaque removal, is not much used by the majority of the population on a regular basis. Therefore, other alternatives should be investigated so as to maintain lower interproximal plaque levels.¹⁸

Interdental brushes can serve as a better alternative to flossing and can be used daily for lowering the interproximal plaque levels. They are more effective than dental floss. The effectiveness of Interdental brushes further depend on their size, shape as well as the surfaces of the teeth. Other considerations include an individual's manual dexterity, how easy and fast a product is to use, and an individual's motivational level.¹⁸

In a study conducted for investigating the effectiveness of manual devices (specifically that of TePe Interdental Brushes and Ultra Floss) in comparison to that of a mechanically automated InterClean Interdental Plaque Remover (Oral-B Braun), it was found that while both the devices decreased the amount of plaque interproximally, manual devices were more effective in reducing the interproximal plaque and bleeding, and interdental brushes were better accepted by the study population.¹⁹ Five different TePe interdental brush sizes were used during the investigation, which alludes to the importance of having access to multiple sizes of interdental brushes. Different sizes allow for access to different sites within the mouth. For healthy gingiva and smaller embrasures, the smallest interdental brushes are more effective and relevant. As proved by this study the use of interdental brushes on a daily basis give the best results. So this study basically supports the daily use of manual devices.^{18,19} However, as mentioned, motivation is also an important key to effectiveness.¹⁸

In comparison to simple brushing both the manual devices i.e. floss and interdental brushes are more useful in removing plaque from the interproximal area.²⁰ A study was conducted which compared the efficacy of floss and interdental brushes. In this study one-month time period was given from the initial visit and data collection. At the one-month mark, it was determined that the mean difference for supragingival plaque for interdental brushes was 58.43 and 50.21 for flossing indicating that interdental brushes are more effective in interproximal plaque removal than the dental floss.²⁰

EFFICIENCY OF DENTAL FLOSS

Dental floss is a cord of thin filaments used to remove food and dental plaque from between teeth. The floss is gently inserted between the teeth and wiped along the teeth sides, especially close to the gums or underneath them. Toothbrushes do not clean between teeth or below the gum line. Used as an addition to tooth brushing as

part of regular oral hygiene flossing can reduce gingivitis and halitosis compared to tooth brushing alone. In dentistry, floss is classed as an interdental (between teeth) cleaning aid. According to the American Dental Association, flossing in combination with tooth brushing can help prevent gum disease and halitosis.²¹ A 2012 review of trials concluded that flossing in addition to tooth brushing reduces gingivitis compared to tooth brushing alone. In this review, researchers found "some evidence from twelve studies that flossing in addition to tooth brushing reduces gingivitis compared to tooth brushing alone" but only discovered "weak, very unreliable evidence from 10 studies that flossing plus tooth brushing may be associated with a small reduction in plaque at 1 and 3 months."^{22,23} A 2008 systematic review of 11 studies concluded that adjunctive flossing was no more effective than tooth brushing alone in reducing plaque or gingivitis.²⁴ It has been suggested that these outcomes are caused by the rarity of proper flossing technique,²⁵ although two studies found no effect of floss even among dental students.²⁴ One review reported that professional flossing of children reduced dental caries risk, but self-flossing did not.²⁶

Although flossing is commonly used as a means of disrupting the oral biofilm between the teeth and therefore preventing gingival disease (gingivitis, periodontitis, etc.), its effectiveness is determined by the clients preference, technique and motivation to floss daily.^{27,28}

Flossing has been considered a more difficult method of interdental cleaning than using an interdental brush. Interdental brushes are said to be preferred due to their one-handed method of use and time efficiency compared to flossing.²⁷

According to Berchier et al. (2008) "The dental professional should determine, on an individual patient basis, whether high-quality flossing is an achievable goal." Berchier et al. (2008) also state that "routine instruction of flossing in gingivitis patients as helpful adjunct therapy is not supported by scientific evidence."²⁴

CONCLUSION

Thus, from the present review article we can conclude that minimizing the dental scaling procedure by professional brushing before scaling will shorten the treatment time and resolve client discomforts, such as potential dental injury and noise, allowing minimal use of ultrasonic devices. A toothbrush is a proper instrument to remove dental plaque biofilm on the tooth surface; however, clinicians rarely use it during dental practice. The present review indicates the effective use of a toothbrush in the dental clinic. It is advised that methods should be devised to boost subject satisfaction and shorten the treatment time by changing the dental scaling procedures.¹¹

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Source of Support: Nil
Conflict of Interest: Nil