Review Article

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TONGUE CLEANING METHODS: A REVIEW

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ABSTRACT:

Tongue scraping and brushing are being established as excellent tools for reducing the levels of mutans streptococci and plaque in the oral cavity. Hence, it would be of great interest to review tongue cleaning and its effects on oral health and hygiene.The following review attempts to highlight the origin, development and current status of research with regard to tongue cleaning methods.

Keywords: Tongue cleaning, Tongue scraping, Tongue brushing

INTRODUCTION:

The effect of mechanical oral hygiene techniques on salivary levels of microorganisms, especially mutans streptococci and on plaque is of great interest to dentists focused on preventive care. Saliva enters the mouth essentially sterile from the salivary glands, but expectorated saliva contains over 10^8 cultivable CFU per ml. This means that large numbers of bacteria are constantly being shed into the saliva from the oral surfaces. The contributions of various surfaces approximate the size of their surface areas with tongue making the greatest contribution and teeth perhaps only a 5% contribution. It has also been well established that increased bacterial growth on the tongue is the reason why there are increased numbers of bacteria in the saliva.[1] Also, there is continuous shedding of cells of the surface layer of epithelium from the tongue and palate. [2] Thus, oral hygiene measures should include the dorsum of the tongue, and tongue brushing seems to have a more dramatic effect on the salivary levels of mutans streptococci as compared to tooth brushing alone. [3] Moreover, the concept of tongue cleaning is so logical and so simple that prevention oriented people should need only minimal encouragement to incorporate tongue cleaning into their oral hygiene routine. [4] It is important that research prove the need to include the tongue in all oral hygiene measures.

Origin:

Although initially, largely an unknown practice in the West, many ancient religions emphasized cleanliness of the entire mouth, tongue included.

The ‘Datana’ or Indian toothbrush made of a tree twig from an aromatic plant, was about 8 inches long and equal in circumference to the little finger. This green twig was crushed and chewed at the end until it became a soft brush. After 20 to 30 minutes of up and down brushing of the teeth, the twig was split,

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bent in an inverted “V” shape and used as a tongue scraper. This procedure was used twice a day. The ancient Hindus also used tongue scrapers with sharp curved edges made of silver, gold, copper, tin or brass.

The Mohammedans used the siwak (or miswak) wood brush once a day in a manner specified in the Koran; the final stage of oral cleansing involved vigorous tongue brushing.

According to the noted dental historian, Menzies Campbell, tongue scrapers were often sold separately in Europe and were in great demand because of the prevalence of thickly coated tongues. Tongue scrapers were of various sizes and shapes. They were often thin, long, flexible metal spatulas, to be bent in the shape of a “U” during use; they also were shaped like sugar tongs, hoes, or shovels or circular in outline. [5]

Tongue scraping and Tongue brushing

In 1892, Joseph King (York County, England) patented an improved instrument for cleansing the tongue. The head was a thin piece of metal, bent to form a circle or oval with 2 inches long handle. The scraper was curved a little, and there was a hollow ground inside to collect tongue debris. In 1895, a British patent was awarded to Will and Finck Co., a San Francisco firm, for a tongue scraper built into and attached to a toothbrush handle so as to fold into a channel or slot when the blade was not in use. [5]

Few references appear in the early 20th century dental literature about tongue scraping or cleaning. The Army and Navy Cooperative Society’s 1907 catalogue listed bent and straight tortoise shell and ivory tongue scrapers for 9 and 8 shillings respectively. Only a brief allusion to tongue brushing was made by one participant in the celebrated National Preventive Symposium of 1915. [5] Sarrazin JJ (1920) presented bacteriologic evidence that the dorsum of the tongue is hardly ever free from staphylococci and streptococci, which frequently consists of as much as 90% of the mass. He recommended daily tongue scraping, stating that the best time for it was in the morning- on an empty stomach so that no vomiting ensued or gagging occurred. [5]

In 1951, a combined toothbrush-tongue scraper was marketed. Butler in 1964 developed a two-handled, U-shaped plastic bristle tongue brush. He claimed that, by means of two handles, the brush could firmly be held in both hands during the brushing procedure. In this way, gagging could be avoided because the brush would pull the tongue forward. [5]

Arnim S et al (1963) advocated routine tongue oral physiotherapy for prevention of dental caries and periodontal disease. [6]

Wright WE and Temple TR (1971) performed a study designed to evaluate the effect of oral hygiene on soluble bacterial products in saliva that are chemotactic for polymorphonuclear

neutrophils. They concluded that optimal oral hygiene, indicated by maximum reduction of chemotactic activity, could not be achieved without thorough cleaning of the dorsum of the tongue. [7] Gilmore EL and Bhaskar SN (1972) presented convincing evidence that plaque forming streptococci counts increased tenfold after a week of not brushing the tongue. They investigated the effect of tongue brushing on the clinical appearance and bacterial populations on the dorsum of the tongue and concluded that, habitual tongue brushing reduced the number of organisms while its cessation increased their number and eliminated the organisms on the tongue, which formed plaque *in vitro*. Habitual tongue brushing also produced a clinically clean (pink) tongue and should be recommended as a necessary part of oral procedure. [8] Gilmore EL, Gross A and Whitley R (1973) studied the effects of tongue brushing on plaque bacteria (a Streptococcus salivarius variant) and concluded that the numbers and types of plaque organisms were altered by a regimen of daily tongue brushing. [9] Jacobson SE et al (1973) investigated the effects of adjunctive one minute tongue and palate oral physiotherapy on thirty adult patients. They concluded that two weeks of tongue and palate brushing (in addition to tooth brushing) twice a day significantly reduced oral debris, which in turn, retarded the initial rate of plaque formation and total plaque accumulation. [6] Gross A et al (1975) in their study concluded that tooth brushing alone was effective in reducing the bacterial counts in the mouth, but not dramatically, however, tongue brushing seemed to have a more dramatic effect on the salivary levels of caries causing bacteria such as mutans streptococci. They also observed a reduction in plaque formation on teeth when cleaning the tongue. [3] Tonzetich J and Ng SK (1976) demonstrated that toothbrushes were inferior to scraping debridement implements in their ability to remove debris and microorganisms. They showed that cleansing the dorsoposterior surface of the tongue caused the most pronounced reductions in the variables than did toothbrushing. [10]

Vasilakis GJ et al (1985) evaluated the effects of daily mechanical tongue cleaning of the rat on dental plaque and found that tongue scraping or brushing reduced plaque scores in the mouth. [11] Axelsson P et al (1986) repeatedly found high numbers of Streptococcus mutans on the dorsum of the tongue after thorough scrapings. Significant immediate reduction of Streptococcus mutans after professional tooth cleaning and tongue scraping was also noted, indicating that dorsum of the tongue was an important reservoir for Streptococcus mutans. [12]

Menon MV and Coykendall AL (1995) estimated the effect of tongue scraping from the tongues of 22 volunteers just before and after the tongues were scraped with a plastic strip. They reported small changes in

bacterial load (Streptococcal counts) after tongue scraping which were neither statistically nor bacteriologically significant. They concluded that, although tongue scraping certainly may impart a feeling of cleanliness and health to its practitioners, the procedure does not significantly reduce the population of streptococci on the tongue. However, it should be noted that their observations were based on a one-time tongue scraping by the volunteers with samplings done before and after the tongue scraping procedure. The effects of tongue cleaning practiced as part of routine oral hygiene protocol and over a longer period of time were not evaluated. [13] De Boever EH and Loesche WJ (1995) in a study investigating the role of tongue surface characteristics and oral bacteria in halitosis. Each morning after breakfast and every evening before going to bed, participants brushed their teeth with a dentifrice of their choice, brushed their tongues with a toothbrush dipped in chlorhexidine gluconate and rinsed for 60 seconds with chlorhexidine gluconate. The authors reported a 74% decrease in the bacterial load of the tongue after successful treatment; However, in their study, tongue cleaning was combined with the use of Chlorhexidine (both as rinse and as paste), which by itself might explain the tremendous bacterial reduction. [14] Gulati MS and Gupta L (1998) evaluated the role of supplementing tongue brushing to the most advocated regime of tooth brushing. The study conducted on 20 female students aged 18-23 years, consisted of two phases, with each phase lasting 8 days. In phase 1, the subjects followed a twice-daily tooth brushing routine. In phase 2, tooth brushing along with tongue brushing was performed by the subjects twice daily. Thorough oral prophylaxis was done at the start of each phase so as to ensure that participants started with zero plaque score. There was 61.44% reduction in total plaque accumulation with brushing of tongue and teeth as compared to brushing of teeth alone. The authors concluded that supplementing tongue brushing to the regime of tooth brushing significantly reduced the initial rate of plaque formation and total plaque accumulation. [15]

Dawes C et al (2001) studied the effects of four oral hygiene procedures (including tongue scraping and brushing), on the output of bacteria into human whole saliva. The authors concluded that various oral hygiene procedures had similar effects on bacterial output into saliva. [16] Quirynen M et al (2004) studied the impact of twice daily tongue scraping and tongue brushing on tongue coating, microbial load and taste. They found that 2 weeks of tongue brushing or scraping resulted in only negligent reductions in aerobic and anaerobic bacteria on the tongue. The study, however, did not focus on mutans streptococci; rather, the focus was on overall microbial load of the oral cavity, recovered with non-selective blood agar plates. [17] White GE and Armaleh MT (2004) compared the

efficacy of tongue scraping, Listerine oral care strip and saturated saline rinse as adjuncts to the normal twice daily tooth brushing routine in reducing salivary mutans streptococci levels. All treatment groups showed a significant reduction in colony counts from baseline and one or more post treatment periods and at one or more time periods between treatment groups. The most effective treatment in reducing colony counts was seen with tongue Scraping which demonstrated the greatest change and the least effective was Listerine Strip which showed a statistically insignificant increase in colony count from baseline to 1-hour and a significant decrease from baseline at the 7-day period only. [18] Roldan S et al (2005) evaluated the effects of a combined mechanical and pharmacological approach to treat oral halitosis on clinical and microbiological outcomes on patients followed for 3 months. They concluded that the proposed clinical protocol significantly affected the microbial composition in tongue coating, saliva, and subgingival microflora. [19]

Rupesh et al (2012) evaluated the effects of tongue scraping and tongue brushing on salivary mutans streptococcus levels in children and concluded that both the methods were equally effective in significantly reducing colony counts. [20] Winnier et al (2013) compared the effects of tongue scraping and tongue brushing on existing plaque levels in children and reported that both tongue scraping and brushing resulted in significant reductions in plaque load. [21] Jacob et al (2015) evaluated the effects of tongue cleaning on plaque and salivary mutans streptococcus levels and concluded that though tongue scraping and tongue brushing were equally effective in reducing salivary mutans streptococci counts, their effect on reducing plaque levels was not significant. [22]

From the above review it can be concluded that though effective twice tooth brushing results in reduced bacterial load in oral cavity, supplementing brushing with routine tongue cleaning would result in dramatic and significant improvement in dental health and hygiene.

CONCLUSION:

Prevention of dental caries is at the forefront of the field of Dentistry. It is especially important that the prevention rituals we teach our patients are both efficient and patient friendly. The oral hygiene methods highlighted in this review can be carried out fast and the benefits for most patients may far outweigh the small investment and time required to accomplish the procedure.

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