

# Tooth brushing, oil pulling and tissue regeneration: A review of holistic approaches to oral health

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## ABSTRACT

Even though dentistry was not a specialized branch of Ayurveda, it is included in its Shalaky Tantra (system of surgery). Problems such as deformities of the oral cavity, plaques and infections were managed in ancient India. Traditional medicine can treat various infectious and chronic conditions. Research has shown that all kinds of chewing sticks described in ancient Ayurveda texts have medicinal and anti-cariogenic properties. Its oil pulling (Kaval, Gandush) practice is claimed to cure about 30 systemic diseases. Amla (Emblic myrobalan), is a general builder of oral health. Bilberry fruit (*Vaccinium myrtillus*) and hawthorn berry (*Crateagus oxycanthus*) stabilize collagen, strengthening the gum tissue. Liquorice root (*Glycyrrhiza glabra*) promotes anti-cavity action, reduces plaque, and has an antibacterial effect. Use of safe, quality products and practices should be ensured based on available evidence if traditional medicine is to be acknowledged as part of primary health care. Scientific validations of the Ayurveda dental health practices could justify their incorporation into modern dental care. Publicity of these techniques using appropriate media would benefit the general population by giving more confidence in the ancient practices, thus preventing tooth decay and loss.

**Key words:** Ayurveda, kaval, oral health, oil pulling, traditional medicine

## INTRODUCTION

Ayurveda is a holistic system of medicine which evolved in India some 3000-5000 years ago, a system of traditional medicine native to the Indian subcontinent, now practiced in other parts of the world as a form of complementary medicine.<sup>[1]</sup> The earliest literature on Indian medical practice appeared during the Vedic period in India. The *Suśruta Samhitā* and the *Charaka Samhitā* are its earliest authoritative texts.<sup>[2]</sup> Over the centuries, Ayurvedic practitioners developed large numbers of medicinal preparations and surgical procedures for the treatment of

various ailments and diseases.<sup>[3]</sup> Even though dentistry was not a specialized branch of Ayurveda, it was included in its system of surgery. In ancient India, problems such as deformities of the oral cavity, plaques and infections could be managed and even cured.

Traditional medicine is the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses. Traditional medicine that has been adopted by other populations (outside its indigenous culture) is often termed complementary or alternative medicine. Herbal medicines include herbs, herbal materials, herbal preparations, and finished herbal products that contain parts of plants or other plant materials as active ingredients.

In some Asian and African countries, 80% of the population depends on traditional medicine for primary health care. In many developed countries, 70% to 80% of the population has used some form of alternative or complementary medicine. Herbal treatments are the most popular form of traditional medicine, and are highly lucrative in the international marketplace. Annual revenues in Western Europe reached US\$ 5 billion in 2003-2004. In

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China sales of products went to US\$ 14 billion in 2005. Herbal medicine revenue in Brazil was US\$ 160 million in 2007.<sup>[4]</sup>

### Ayurveda and oral health

In Ayurveda, dental health (danta swasthya in Sanskrit) is held to be very individualistic, varying with each person's constitution (prakriti), and climatic changes resulting from solar, lunar and planetary influences (kala-parinama). The body constitution is classified based on the predominance of one or more of the three doshas, vata, pitta and kapha. The dominance dosha in both the individual and nature determines health care in Ayurveda, including dental health.<sup>[5]</sup>

### CHEWING STICKS

Ayurveda recommends chewing sticks in the morning as well as after every meal to prevent diseases. Ayurveda insists on the use of herbal brushes, approximately 9 inches long and the thickness of one's little finger. These herb sticks should be either 'kashaya' (astringent), 'katu (acid), or 'tikta' (bitter) in taste. The method of use is to crush one end, chew it, and eat it slowly.<sup>[6]</sup>

Toothbrushing is an activity carried out with a 'toothbrush' which is a special little brush designed for use on teeth. Chewing a medicinal stick of a kind recommended by a Vaidya, or other traditional practitioner, may validly be held to be equivalent to the western-pioneered activity of 'brushing the teeth', but it is not sufficiently similar to be given the same name, specifically because sticks that are chewed are used entirely differently from brushes.

It is recommended that chewing sticks be obtained from fresh stems of specific plants. The neem (margosa or the *Azadirachta indica*) is a famous herbal chewing stick. The stems should be healthy, soft, without leaves or knots and taken from a healthy tree. Chewing on these stems is believed to cause attrition and levelling of biting surfaces, facilitate salivary secretion and, possibly, help in plaque control, while some stems have an anti-bacterial action. With reference to the individual's constitution and dominant dosha, it is stated that people with the vata dosha dominance may develop atrophic and receding gums, and are recommended to use chewing sticks with bitter-sweet or astringent tastes, such as liquorice (*Glycyrrhiza glabra*) and black catechu or the cutch tree (*Acacia Catechu* Linn.), respectively.<sup>[7]</sup> Pitta dosha dominant individuals are recommended to use chewing sticks with a bitter taste such as the twigs from the margosa tree (*Azadirachta indica* or neem) and the arjuna tree (*Terminalia arjuna*). Those with the kapha dosha dominant are likely to have pale and hypertrophic gums and are asked to use chewing sticks with

a pungent taste, citing the fever nut (*Caesalipinia bonduc*) and the common milkweed plant (*Calotropis procera*). Present-day research has shown that all the chewing sticks described in ancient Ayurveda texts (circa 200 BC) have medicinal and anti-cariogenic properties.<sup>[8]</sup>

Saimbi *et al* (1994) tested the antiplaque efficacy of Neem extract, Ayurvedic tooth powders and commercial tooth pastes. Neem extract came out on top and commercial tooth pastes were the last.<sup>[9]</sup> In another study Venugopal *et al* (1998) analyzed a total of 2000 children (1-14 year age group) in Mumbai for caries prevalence. Those children who were using neem datun were found to be less affected with dental caries.<sup>[10]</sup>

In southern India, mango leaf is widely used for cleaning teeth. A fresh mango leaf is washed and the midrib is removed. Leaf is then folded lengthwise with glossy surfaces facing each other. It is rolled into a cylindrical pack. One end of this pack is bitten off 2-3mm to create a raw surface which is rubbed on the teeth - pack is held between the thumb and the index finger. At the end, the midrib, which was first removed, is used as a tongue cleaner. Sumant *et al* (1992) evaluated the efficacy of mango leaf as an oral hygiene aid and obtained interesting findings.<sup>[11]</sup> Higher soft deposit scores were reported in group that used mango leaf. Caries experience in this group using mango leaf was similar to the group that used tooth brush. Mangiferin a compound present in mango leaves had significant antibacterial property against certain strains of Pneumococci, Streptococci, Staphylococci, and Lactobacillus acidophilus.

The miswak (*miswaak, siwak, sewak*) is a teeth cleaning twig made from a twig of the *Salvadora persica* tree, also known as the arak tree or the peelu tree and features in Islamic hygiene jurisprudence. The *miswak* is predominant in Muslim areas but its use predates the inception of Islam. Almas and Atassi (2002) conducted research to assess the effect of miswak and tooth brush filaments end-surface texture on enamel. Twenty-one specimens were prepared; they were divided into Aquafresh toothbrush group, Miswak group and control group. Results showed that filaments end-surface texture play major role in abrasive active activity and enamel tooth surface loss. Miswak showed lesser effect on enamel as compared to Aquafresh toothbrush.<sup>[12]</sup> Almas and Zeid (2004) in a study to assess antimicrobial activity of miswak chewing stick in vivo, especially on streptococcus mutans and lactobacilli concluded that miswak had an immediate antimicrobial effect compared to toothbrush. Streptococcus mutans were more susceptible to miswak than lactobacilli.<sup>[13]</sup>

Eid MA (1991) in a study to examine relationship between

chewing sticks (Miswak) and gingival recession concluded that miswak users had significantly more sites with gingival recession than did toothbrush users. Severity of recession was significantly more pronounced in miswak users than in toothbrush users.<sup>[14]</sup> A 2003 scientific study comparing the use of *miswak* with ordinary toothbrushes concluded that the results clearly were in favor of the users who had been using the miswak, provided they had been given proper instruction in how to brush using it.<sup>[15]</sup>

### Oil pulling

Oil pulling, in CAM (Complementary and Alternative Medicine), is a procedure that involves swishing oil in the mouth for oral and systemic health benefits. It is mentioned in the Ayurvedic text Charaka Samhita where it is called Kavala or Gandusha, and is claimed to cure about 30 systemic diseases ranging from headache, migraine to diabetes and asthma. Oil pulling has been used extensively as a traditional Indian folk remedy for many years to prevent decay, oral malodor, bleeding gums, dryness of throat, cracked lips and for strengthening teeth, gums and the jaw.<sup>[16,17]</sup>

Oil pulling therapy can be done using oils like sunflower oil or sesame oil. The sesame plant (*Sesamum indicum*) of the Pedaliaceae family has been considered a gift of nature to mankind for its nutritional qualities and desirable health effects. Sesame oil is considered to be the queen of oil seed crops because of its beneficiary effects.<sup>[18]</sup>

Brushing is contra indicated in the cases of mouth ulcer, fever, indigestion, those who have tendency to vomit, asthma, cough, thirst.<sup>[18]</sup> Oil pulling can be used to clean the oral cavity in all these cases. Gandusha and Kavala Graha are two primary oral cleansing techniques; specialized therapy to treat as well as to prevent oral diseases. Gandusha involves filling the mouth completely with fluid so that gargling is impossible. In Gandusha, the oral cavity is filled completely with liquid medicine, held for about 3-5 minutes, and then released. In Kavala Graha, a comfortable amount of fluid is retained with the mouth closed for about 3 minutes, and then gargled. It is a simple rejuvenating treatment, which, when done routinely, enhances the senses, maintains clarity, brings about a feeling of freshness, and invigorates the mind. These oral cleansing techniques can also benefit bad breath, dry face, dull senses, exhaustion, anorexia, loss of taste, impaired vision, sore throat, and all kapha related imbalances.

A study was conducted by Asokan S *et al* (2009) to evaluate the effect of oil pulling with sesame oil on plaque-induced gingivitis, and to compare its efficacy with chlorhexidine mouthwash.<sup>[19]</sup> A total of 20 age-matched adolescent boys with plaque-induced gingivitis were selected for this

study. They were divided randomly into the study or oil pulling group (Group I) and the control or chlorhexidine group (Group II) with 10 subjects in each group. Plaque index and modified gingival index scores were recorded for the 20 subjects and baseline plaque samples were also collected. There was a statistically significant reduction of the pre- and post-values of the plaque and modified gingival index scores in both the study and control groups ( $p < 0.001$  in both). The oil pulling therapy showed a reduction in the plaque index, modified gingival scores, and total colony count of aerobic microorganisms in the plaque of adolescents with plaque-induced gingivitis.

Oil pulling is a powerful detoxifying Ayurvedic technique that has recently become very popular as a CAM remedy for many different health ailments. Using this method, surgery or medication could be prevented for a number of chronic illnesses. The oil therapy is preventative as well as curative. The exciting aspect of this healing method is its simplicity. Ayurveda advises oil gargling to purify the entire system; as it holds that each section of the tongue is connected to different organ such as to the kidneys, lungs, liver, heart, small intestines, stomach, colon, and spine, similarly to reflexology and TCM.<sup>[18]</sup>

### TISSUE REGENERATION

In Ayurveda, the well-known Rasayana herb, amla (the fruit of a tree) is considered a general builder of oral health. Amla works well as a mouth rinse as a decoction. One to two grams per day can be taken orally in capsules for long-term benefit to the teeth and gums. Herbs such as amla that support the healing and development of connective tissue when taken internally also benefit the gums. The healing effect of these tonics take longer to become apparent since they must saturate the whole body in order to work on the gums. The results, however, are more lasting.

Bilberry fruit and hawthorn berry stabilize collagen, strengthening the gum tissue.<sup>[20]</sup> Liquorice root promotes anti-cavity action, reduces plaque, and has an antibacterial effect. In Ayurveda, teeth are considered part of Astidhatu - bone tissue, so that their sockets are like joints. Herbs taken internally to strengthen Astidhatu, i.e. the skeleton and the joints, are good for long-term health of the teeth. Outstanding examples include yellow dock root, alfalfa leaf, cinnamon bark, and turmeric root.

### Efficacy and safety

Many people believe that because medicines are herbal (natural) or traditional they are safe (or carry no risk for harm). However, traditional medicines and practices can cause harmful, adverse reactions if the product or

therapy is of poor quality, or it is taken inappropriately or in conjunction with other medicines. Increased patient awareness about safe usage is important, as well as more training, collaboration and communication among providers of traditional and other medicines.

Traditionally, Ayurveda uses many metals in therapeutics, but that is only after due purification process strictly followed in accordance with authentic traditional methods. Lead, mercury, and arsenic intoxication have been associated with the use of Ayurvedic herbal medicine product (HMPs). Robert *et al* conducted a study to determine the prevalence and concentration of heavy metals in Ayurvedic HMPs manufactured in South Asia and sold in Boston-area stores. They concluded that one of 5 Ayurvedic HMPs produced in South Asia and available in Boston South Asian grocery stores contains potentially harmful levels of lead, mercury, and/or arsenic. Users of Ayurvedic medicine may be at risk for heavy metal toxicity, and testing of Ayurvedic HMPs for toxic heavy metals should be mandatory. Saper *et al* from Harvard Medical School have reported heavy metal content of Ayurvedic herbal preparations and have recommended mandatory toxic heavy metal testing. Neither report allows for the fact that there have been few reports of heavy metal toxicity following traditional medicine use.<sup>[21]</sup>

Such studies are important and needed, however they are more related to the quality control failures of mass manufacturing activities. Often they are wrongly used to limit the use of traditional medicine. In reality, such a quality control failure should not be considered as a general negative notion to create a bias against traditional medicine. More broadly, in addressing safety in herbal medicines a basic question is 'safe with respect to what'? Research has found that in US, 51% of FDA approved drugs have serious adverse effects not detected prior to their approval. 1.5 million people are sufficiently injured by prescription drugs annually that they require hospitalization. Once in hospital the problem may be compounded. The incidence of serious and fatal adverse drug reactions (ADRs) in US hospitals is now ranked as between the fourth and sixth leading cause of death in the United States, following next after heart disease, cancer, pulmonary disease, and accidents. Thus the safety of and risks associated with medical interventions is an issue across all categories of health care.<sup>[22]</sup>

## CONCLUSION

Countries with a history of traditional medicine should support and integrate traditional medicine into national health systems in combination with national policy. Use of safe, quality products and practices must be ensured, based on available evidence, and traditional medicine has

to be acknowledged as part of primary health care. It is also required to ensure patient safety by upgrading the skills and knowledge of traditional medicine providers. Scientific validations of the Ayurveda dental health practices given above could justify their incorporation into modern dental care. Publicity of these techniques using appropriate media would benefit the general population by giving more confidence in the ancient practices, thus preventing tooth decay and loss.

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