

PERIODONTICS

Time-Tested Botanical Remedies for Modern Periodontal Therapy

By Bernard Schechter, DDS

Most dental researchers agree that periodontal disease is the result of bacterial infection. Much of the damage to the bone and soft tissue is due to the inflammatory response of the body. In a susceptible patient, changes occur in the metabolism of the connective tissue and bone that can result in the eventual destruction of hard and soft tissues of the periodontium.¹ Obligate and facultative anaerobes living subgingivally excrete endotoxins during the course of their metabolic cycles. The body responds to these bacterial toxins by secreting enzymes such as collagenase, hyaluronidase, and elastase. Breakdown of the collagen and elastic fibers, and hyaluronic acid leads to metabolic breakdown of the periodontium, which is the result of the patient's immunostimulatory response to pathogenic plaque bacteria.

Whether to treat a particular periodontal patient surgically has become a serious issue in general dentistry. Although initial pocket depth reduction seems to be more dramatic after surgical procedures, this apparent difference evens when viewed through long-term studies.²⁻⁴ Maintenance of periodontal health is a function of

patient compliance with home care, recall, and the types of supportive therapy, rather than the surgical or nonsurgical treatment modalities used.^{5,6}

Both approaches usually include mouthwashes, rinses, or irrigating solutions containing chemical antimicrobials, such as chlorhexidine gluconate, or triclosan, and some have alcohol content as high as 26.9%. Antibiotics are often prescribed systemically and/or locally for the periodontal patient. It seems that whether we attempt to cut away the pathogens or scrape them away, they often return. Frequently, they are more virulent and resume participation in the destruction of the periodontium and contribute to systemic diseases such as stomach ulcers, cardiovascular disease, stroke, aspiration pneumonia, or low-birth-weight babies.⁷⁻¹⁰

Increasingly, dental patients are providing medication histories that include herbal, homeopathic, Chinese herbal medicines,¹¹ and essential oils or aromatherapy. It behooves dental practitioners to familiarize themselves with and incorporate into their practices effective natural alternatives that will satisfy the requirements of this patient population.

ESSENTIAL OILS IN DENTISTRY

The overuse of antibiotics has caused microorganisms to develop resistance to these drugs and become virulent. Microorganisms, however, do not appear to develop tolerance or resistance to the antibacterial effects of essential oils.¹² The antimicrobial power of these essences does not diminish or become blunted with the passing of time.¹³

The use of essential oils (mainly through their supposed principle active components) is well known to dentists. Eugenol, thymol, and carvacrol have been used in dentistry since the 19th century for root canal therapy, temporary fillings and cements, periodontal therapy, alveolar abscesses, and stomatitis.^{12,14}

Essential oils are contained in the glands, veins, sacs, and glandular hairs of aromatic plants. They are most often obtained by the steam distillation of these plants. The role of the distiller is to recover an oil as close as possible to the oil as it exists in the plant.¹⁵

Complete undiluted essential oils are preferable. Oil of cloves is sometimes preferred over eugenol in impression pastes because it is less irritating to the oral tissues.^{12,16}

Pure, complete essential oil molecules are extremely minute and can penetrate the oral mucosa between the cells, through lipids (saturated fats), through salivary ducts, or via an electrical charge. This accounts for their high degree of substantivity and the long-lasting effect in very low-dosage concentrations. The proper combination of pure essential oils potentiate each other, forming multifaceted compounds that are dramatically superior to fractionated oils or chemically synthesized derivatives.

Products that contain pure essential oils must be packaged in dark glass bottles or cans with nonreactive epoxy phenolic liners. They should not be stored in plastic.

Structural Components of Essential Oils

The functional aspects of the various essential oils have been classified by the structure of the primary active group. The structural units may be either aliphatic chains or aromatic rings.

Phenols

Examples include carvacrol, eugenol, and thymol. These powerful bactericides, antiseptics, and immunostimulators are found in oils of clove (bud and leaf), oregano, and red thyme. Because they are very powerful, use of low concentrations are recommended.

Aldehydes

Examples include cinnamaldehyde or citral. These are antimicrobial, anti-inflammatory, hypotensive, and temperature reducing, and are found in oils of cinnamon bark and lemon. Complete use of the oil is recommended, not just the aldehyde.

Alcohols

Examples include geraniol and linalool. These are mildly anti-infectious, stimulating, and warming. They are found in oils of lavender and white thyme, and are safer than phenols and aldehydes in higher concentrations. These oils are used for wound healing, ie, tissue repair.

Ketones

These include camphor, menthone, thujone, and verbenone. These oils are moderately antibacterial and encourage healing of wounds by formation of scar tissue. They lower the tempera-

ture of infected, inflamed, swollen, or bleeding tissue, and are found in oils of camphor, peppermint, rosemary, and sage.

Oxides

Examples include 1,8 cineole or eucalyptol. These are antibacterial oils (slightly less than phenols but still very powerful) that aid in tissue congestion, and are found in oils of camphor and eucalyptus.

Patient Homecare Use of Essential Oils in Dentistry Oral Rinses

The best way for patients to use pure essential oil-containing mouthwashes is to rinse vigorously, forcefully swishing between the teeth and gargling. The solution needs to come into contact with the dorsum of the tongue and all the intraoral mucous membranes. This is very important, because the mucous membranes can serve as a source of subgingival reinfection after periodontal treatment is completed.¹⁷ Essential oils are ideal antimicrobials for keeping the supragingival structures and mucous membranes from reinfesting the subgingival periodontium. The anti-inflammatory and wound-healing properties of certain oils can soothe painful tissue, especially when it is carried in a base containing natural vegetable glycerin.

Subgingival Irrigation

This technique has made a comeback in the past 15 years or so. It has been shown to provide an efficient means of subgingival application of antiplaque and antimicrobial agents, and it has also been used to apply anti-inflammatory compounds.¹⁸ Many studies have demonstrated that patient home use of irrigation devices are an effective means to reach areas inaccessible to tooth brushing and flossing.¹⁹ Pure essential oil formulations, especially when combined with the proper adjunctive natural herbal ingredients, make ideal irrigating solutions for patient homecare use in oral irrigators or hand-held syringes.

CHAIRSIDE PROCEDURES

The in-office use of natural rinses and irrigating solutions is an effective adjunct to chairside dental therapy.

1) **Preoperative Rinse** - to reduce the

intraoral microbial count. This reduces the risk to the dental team of potential contamination by pathogenic organisms from the patient's oral cavity.

2) **Through Ultrasonic Scalers** - an effective way to enhance the results of this instrumentation technique.

3) **Chairside Subgingival Irrigation**

ANTIHALITOSIS EFFECTIVENESS

Many of the microorganisms associated with periodontal disease are the same pathogens found in patients who suffer from halitosis. Approximately 80% of physiological malodor which is attributed to the volatile sulfur compounds hydrogen sulfide (H_2S) and methyl mercaptan (CH_3SH), originates from sites and causes within the oral cavity. The principal source of this odor emanates from the dorsum of the tongue. However, the microorganisms within the periodontal pocket also have a high capacity for VSC production. Levels of H_2S and CH_3SH increase with the severity of periodontal disease. Production of large amounts of these compounds can have destructive effects on connective tissue via suppression of collagen synthesis and an increase in collagen degradation.²⁰

The powerful antimicrobial, penetrating, and highly substantive qualities of essential oils coupled with their aromatic structure and scent make them effective, long-lasting remedies for halitosis. The proper combination of various pure essential oils (also known as the aromatic oils), both in correct proportion and functional aspects, allows them to relieve the suffering of halitosis for long periods. They don't mask odor; they treat the condition.

HERBS IN DENTISTRY

The most potent and effective medicinal application of herbs involves the use of herbal extracts, a concentrated form of the herb made by mixing crude plant material with an appropriate solvent or menstruum. Alcohol/water mixtures are the most commonly used solvents, but glycerin or vinegar are also used to extract the bioactives from plants.

The process of soaking plant material in a menstruum is called maceration. Some plants are optimally macerated when they are freshly harvested, while others need to be partially or

completely dried so the maceration process can yield the highest concentration of bioactives. Different parts of various plants yield the medicinal extracts.

Depending upon the species, leaves, flowers, stems, roots, or bark may be used. A plant should be harvested when the part of the plant to be used contains the highest level of active compounds. Maceration time varies according to the plant type. It may be hours, days, weeks, or even months in some instances. Skilled herbalists, botanists, or pharmacognicists know which plants require which methods.

After soaking is completed, the plant material is pressed out. The resultant liquid is called an herbal tincture. Fluid extracts are more concentrated than tinctures and are made by distilling off or roto-evaporating some of the alcohol. Solid extracts are produced by further concentration of the liquid extracts. Dry solid extracts can be produced by further concentration of the liquid extracts using methods such as thin-layer evaporation. Removing all the solvent can result in viscous soft solid extracts or dry solid extracts that can be ground into powder. The solid extracts can be placed in capsules or tablets. Standard dried extracts, also known as guaranteed potency extracts or guaranteed bioactive extracts, can ensure the same repeated dose for medicinal use. Standardization is more consistent and accurate.²¹ The use of modern analytical techniques combined with age-old wisdom makes it possible for this to occur.

The validation of herbal medicine has been happening for hundreds of years. Reliable verification has been obtained only in modern times because of the advent of the scientific method. Most of the studies, however, come from countries that have not entirely rejected natural medicine.²² The United States has not been heavily involved in research on natural products, but it is now beginning.

Antimicrobials

Wild indigo in classical herbology is used to treat focal infections of the ear, nose, and throat. This is the best herbal antimicrobial in relation to periodontal infections and oral ulcers. It can be included in mouthwashes, but periodontally its effectiveness

seems to be best when taken internally. The dosage of tincture is 1 to 2 mL 3x/day.

Myrrh is a resinous plant that has a direct antimicrobial effect. It can be used in mouthwashes (need some alcohol to dissolve it), and is effective in ointments for infected or ulcerated tissue. The internal dosage of tincture is 1 to 2 mL 3x/day.

Usnea is a lichen that has a positive effect on periodontal infections, although it is not quite as strong as wild indigo or myrrh. It should be prescribed only if others are not available or ineffective. The dosage of tincture is 1 to 3 mL 3x/day.

Anti-Inflammatory and Tissue Regeneration

Echinacea has been the subject of more than 350 scientific studies. It had been listed in the National Formulary of the United States until 1950, and has been used by millions of people in the United States and Europe for various clinical conditions. Its main constituents consist of polysaccharides, flavinoids, echinacoside, unsaturated isobutyl amides, and some essential oils. Although it is sometimes referred to as an antimicrobial, it works more as a stimulator of the immune system to fight infection, rather than having a direct antimicrobial effect. The primary effect of echinacea in restoring and maintaining the health of the periodontium is through its inhibition of the enzyme hyaluronidase, the spreading factor. In response to the endotoxins of periodontal pathogens, the body secretes hyaluronidase. The purpose of hyaluronidase is to breakdown hyaluronic acid, the ground substance or intracellular cement that holds cells together in tissue. By inhibiting hyaluronidase, echinacea maintains the structure of the connective tissue. Echinacea also stimulates fibroblasts, which are the cells that manufacture the ground substance.²¹ It has been shown to have a cortisone-like effect and accelerate the formation of granulosus tissue. Echinacea can be included in mouthwashes and irrigating solutions and used daily.

For systemic use in a healthy person, continual administration is not indicated. When taken systemically for therapeutic purposes the general recommendation is 7 weeks on, followed by 1 week off. The systemic dosage of tincture is 2 to 4 mL 3x/day, and solid

extract (powdered) is 300 mg 3x/day.

Gotu kola has been used for centuries to treat collagen and skin diseases such as leprosy, psoriasis, lupus, eczema, and scleroderma, and for its ability to heal wounds. Active constituents consist mainly of triterpenes. The prime therapeutic action of *Centella asiatica* (gotu kola) is an enhanced development of normal connective tissue matrix. It does this by increasing blood vessels into connective tissue, and it increases formation of mucin and structural components such as chondroitin sulfate and hyaluronic acid.²⁰ Healing and rebuilding of connective tissue is the prime use of gotu kola in dentistry. Research has shown that gotu kola is effective in the treatment of periodontal disease when combined with laser therapy.²³ My own research and experience has shown gotu kola to effectively aid in the rebuilding of the periodontium.

Gotu kola can be included in mouthwashes and irrigating solutions and used daily. It is best to have an effective antimicrobial included in topically administered Gotu kola formulations. A dosage of tincture is 5 mL 3x/day.

Calendula does not have much of a connective tissue-rebuilding capability, but is a soothing anti-inflammatory herb. Local treatments are best in ointments and lotions or for gentle mouth rinsing.

Astringents

In general, astringents don't deal with periodontal problems. They tend to mask symptoms and reduce bleeding. It is preferable to have reduced gingival bleeding be the result of tissue improvement rather than constriction of blood vessels. However in certain instances it is necessary to have a strong astringent remedy to proceed further with patient treatment. In the presence of extremely hyperemic tissue where discomfort is high, the use of astringent herbs may be indicated. For in-office deep scaling in the presence of hyperemic, bleeding tissue, it may also be indicated.

Rhatany is rich in astringent, antiseptic tannins. If you can obtain the tincture, apply it with a fine brush or cotton pledget to the gums before scaling. Patients can use 1 teaspoon of dried herb in a cup of boiling water, and use the tea as an astringent mouthwash. This should only be done

on a short-term basis, such as a week.

Sage is an anti-inflammatory, mildly antiseptic astringent. One to 2 teaspoons of the herb are placed in a cup of boiling water, and steeped for 15 minutes. It should be used in moderation as a soothing astringent rinse 2x/daily for a maximum of 7 days.

AN OLD REMEDY TAKES ON NEW MEANING

I have 1 or 2 cups of green tea nearly every day since 1968, having used it these past 30 years as an antioxidant for my own health. Studies have begun to appear detailing the efficacy of green tea extract in dental therapy. The polyphenolic catechins found in green tea (*camellia sinensis*) has been shown to reduce the pathogenicity of periodontopathic bacteria.²⁴ Green tea extract has also been shown to have a marked anticaries effect.²⁵ It is a truly natural source of fluoride.²⁶

CONCLUSION

Modern medicine and dentistry are beginning to acquire more of an understanding about the relationship between health and disease. They are adopting modalities of therapy that are less toxic, more natural, and produce results. Lifestyle modifications including dietary changes, nutritional supplementation, stress reduction, exercise, and meditation coupled with certain naturopathic techniques are now used more in traditional medical circles.

A powerful rebirth has erupted in the use of botanical medicines in Europe and Asia and concomitant with it is a large amount of scientific research. In Germany the use of herbal medicines is so widespread that insurance companies reimburse patients for them if they are prescribed by a physician and sold in pharmacies.

In the United States, because a plant cannot be patented, the large pharmaceutical firms have done very little research on whole plants or their complete extracts in relation to their value as medicines. Instead the pharmaceutical firms concentrate on isolating the so-called active constituent (perhaps even chemically reproducing it as a synthetic) and then spending years and possibly hundreds of millions of dollars attempting to patent it. This substance still does not work as well as the whole plant and may have undesirable side effects.

In an attempt to capitalize on consumer demand, some companies are marketing products which they claim are all natural. Much of this is marketing hype, however. All natural does not necessarily mean you are getting truly natural ingredients.

Natural therapeutics in periodontal therapy is quite different than newer bonding agents, bleaching systems, or dental porcelains. We are dealing directly with the biological response of our patient's tissues and the relationship of those tissues to systemic disease. The potential side effects of many of the chemicals we use in our periodontal programs is becoming more known to us. The dramatic worldwide proliferation of antibiotic-resistant microorganisms is a fact!

There is no need to wait 10 to 20 years for some pharmaceutical firm to extract the actives from a plant, get a patent and FDA approval, and then charge the patient a small fortune so the company can recoup its hundreds of millions and make hundreds of millions more in profit. As dental practitioners, we owe it to patients to try some natural botanical remedies now. There is no problem recommending these medicinal foods or using them in your practices today.

Do a little experimental study in your own office. Start off with half a dozen patients, perhaps the ones who are always asking about natural approaches. Measure their pocket depth, bleeding index, and tooth mobility patterns. Have them rinse daily with a product containing truly natural, herbal, and essential oil ingredients. If you or your hygienist feel it is necessary, have the patient irrigate subgingivally at home with a truly natural irrigating solution, using either a mechanical irrigator or a handheld syringe. The bottom line for any practitioner or patient is the result. You and your patients may be pleasantly surprised at those results. ♦

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