Nonsurgical Treatment Modalities

By Colleen Rutledge, RDH

According to the Surgeon General's 2000 report, *Oral Health Care in America,* a silent epidemic of oral diseases plagues our nation. Despite the information disseminated at dental conventions, webcasts, Internet forums, and peer-reviewed publications, integrating nonsurgical therapies eludes many practices.

This article will highlight contemporary treatment modalities, including the role of ultrasonics and locally applied antimicrobials, and the rationale behind the new trends in periodontal therapy.

A shift in the research and our thinking

In the 1980s, quadrant scalings (quads) or scaling and root planing (SRP) procedures with anesthesia were slowly making their way into hygiene schedules. Ultrasonics were primarily used for gross supragingival calculus debridement.

By the mid-1990s, host modulation ushered the dental community into a whirlwind of controversy and fervor. Peer-reviewed publications burst with terms such as enzyme suppression, C-reactive proteins, and lipopolysaccharides.(1,2,3) For many insightful clinicians, 20mg doxycycline hyclate dispelled the paradox of long overdue, plaque-laden patients with no bone loss and the impeccable periodontal maintenance patient with deteriorating bone levels.

Equally controversial is the emerging research concerning the periodontal-systemic diseases link. Studies volley between a true causal or merely casual relationship.(4) Regardless of a definitive stance within the dental community, controlling inflammation in any part of the body is a reasonable and prudent treatment goal. Assessing risk factors such as diabetes, smoking, and heart disease is equally important and integral to treatment planning nonsurgical periodontal cases.(5)

Full-mouth disinfection

Contemporary periodontal therapy employs a different approach. Full-mouth disinfection offers a *medical model* by which the periodontal infection is approached aggressively, decreasing the bacterial load throughout the entire oral cavity (tongue, tonsils, and other intraoral niches) within 24 to 48 hours.(6)

Many clinicians confuse full-mouth disinfection with gross debridement. The difference is simple: gross debridement is removing gross supra- and/or subgingival calculus from root surfaces and *is not definitive*. Full-mouth disinfection *is definitive*, which includes scaling and root planing (SRP) all four quadrants, tongue brushing with 1% CHX, mouth rinsing with 0.2% CHX, and pocket irrigation with 1% CHX gel within 24 to 48 hours.(6) Many studies reveal improved clinical outcomes in chronic periodontitis patients compared to the traditional approach.(6,7) Subsequent case studies and systematic reviews have encouraged visionary hygiene departments to implement a medical model resulting in better clinical outcomes, higher quality of service, and increased production.(8,9,10)

Evolution of ultrasonics

Ultrasonics is currently the most widely used technology in contemporary periodontics, but the technology was not always used for root surface debridement and instrumentation. In the 1950s, the first ultrasonic units were bulky and designed for decay removal and cavity preparation. As the technology evolved, it seemed better suited for the removal of large pieces of calculus.

Power scaling gained popularity in the ’60s and ’70s as magnetostrictive (Cavitron) and sonic (Titan S Scaler) were the most widely used sonic and ultrasonic units in the United States. The efficacy of debris removal and the healing benefits of lavage support the use of ultrasonics for periodontal debridement.

Benefits of ultrasonics vs. hand scaling

According to the *Journal of Periodontology*, 2004, both hand scaling and ultrasonics are equally effective and produce similar clinical outcomes. As a former “hand scale only” advocate, I recall the impact of this research. The era of root planing and total cementum removal — yielding glasslike

surfaces — was no longer accepted protocol.(11) Maybe the “Cavitron Queens” were on to something?! Since then, the use of ultrasonics has been on the rise.

Research reveals some obvious advantages over hand scaling only.(8,11) Below are some of the benefits of ultrasonics:

1. Lavage of water promotes excellent healing benefits
2. Tongue disinfection using the back of the insert tip decreases volatile sulfur compounds
3. Acoustics promote lysis of the cell by compromising the cell wall
4. Better ergonomics decreases operator fatigue
5. Requires less time
6. Little or no tissue trauma
7. Can be used for amalgam overhangs and orthodontic cement removal
8. Easier access to difficult areas: furcations, third molars, deep occlusal grooves, and concavities

Choices in ultrasonic technology

Magnetostrictive technology creates mechanical movement using a low voltage magnetic signal. The handpiece is internally auto-tuned and has interchangeable inserts that contain coils that vibrate. The inserts are available in 25K and 30K (25,000 to 30,000 cycles per second). The movement of the tip is elliptical (like a figure eight), with all surfaces of the tip being active. The handpiece has flexible power settings.

The stacks move by elongation and contraction (like a rubber band, not an accordion) and create heat. Filling the handpiece with water before putting the insert in the handpiece keeps the stacks cool. Ergonomic swivel handpieces with LED lights are now available for greater working adaptability and visibility.

Piezoelectric technology is the first choice in Europe and gaining popularity in the United States. Piezo works by using a high voltage electrical signal which activates the crystals, resulting in tip movement. This technology is quieter and requires less water than magnetostrictive technology.

Thin, probelike tips move in a linear pattern that enhances tactile sensitivity and is conducive to patient comfort — greatly reducing (if not eliminating) the need for anesthesia in early-to-moderate periodontal therapy cases. Microultrasonic inserts with blades may replace hand curettes for clinicians implementing accelerated instrumentation protocols.

Locally applied antimicrobials

Clinical outcomes are enhanced by incorporating locally applied antimicrobials after all calculus and biofilm are removed. Locally applied antimicrobials are FDA-approved, biodegradable, bioadhesive, and require no refrigeration. They are used as an adjunct to optimize clinical outcomes in periodontal therapy procedures in pockets 5mm or greater.

Chlorhexidine gluconate

Distributed by *MIS Implants,* PerioChip is 2.5mg of chlorhexidine gluconate. It is the veteran locally applied antimicrobial and used as an adjunct in the treatment of periodontitis.(12) It is an effective nonantibiotic with no bacterial resistance. The solidified gelatin is a 4x5mm orange-brown, rectangular chip that is placed in an infected pocket and suppresses pocket flora for up to 11 weeks post-treatment.

PerioChip is often confused with Peridex, which is also comprised of chlorhexidine gluconate in the form of a mouth rinse. Irrigators deliver Peridex medicament to the base of the pocket but have no substantivity due to the gingival crevicular fluid (GCF) replenishing itself every 90 seconds. This is the main difference in a time-released antimicrobial and a medicament in an irrigator.

PerioChip may be reinserted after three months with no interdental cleaning for 10 days after placement. The chlorhexidine gelatin chip can be efficiently placed with cotton pliers or a Laschal pressure-sensitive instrument.

Minocycline hydrochloride

Distributed by Schein, Arestin employs 1mg minocycline powder in a microsphere technology. It is used in single-site periodontal pockets and

may be reinserted three months after placement. It was traditionally suggested that patients avoid interdental cleaning for seven days; however, as of March 2008, the recommendations have changed. Patients are now advised to floss after placement, under the premise that traditional flossing cannot disturb the product at the base of the pocket.

The handle/cartridge system makes placing minocycline powder easy, with the best results obtained when the end of the cartridge is flattened. To achieve the best outcome, the product must get to the base of the pocket where the red-complex bacteria are the most virulent.(13) Holding the agent in the pocket too long before depressing the handle may hydrolyze the powder while it remains in the cartridge.

Doxycycline hyclate

Currently distributed by Tolmar, Inc., Atridox is 10% doxycycline hyclate in a gel that forms a flowable substance when the two separate syringes are thoroughly mixed for one minute. A recent randomized trial concluded that when Atridox is used in conjunction with host modulation (Periostat), scaling and root planing results in significant reductions in pocket depth, inflammation, and bleeding.[14]

Atridox can be reapplied four months after initial placement and can be used in both single and multiple sites. Patient post-treatment instructions are the most restrictive as no brushing or interdental cleaning is recommended in the treated area for one week.

The impact of nonsurgical periodontal therapies in private practice

Futurist hygiene departments devote a separate day in the hygiene schedule to focus on nonsurgical periodontal cases. Although longer appointments are necessary, proper use of ultrasonics increases efficiency, rendering one or two one-and-a-half-hour appointments rather than four one-hour appointments.

Incorporating ultrasonics, host modulation, and locally applied antimicrobials enhances clinical outcomes and substantially augments the services and profitability of the hygiene department. Practices offering services based on current research and trends in periodontal therapy see

hourly production rates soar from $120-$170 to $170-$400, with the average patient producing $400-$700-plus. Embracing a medical model, hygiene departments will flourish with both quality and profitability.(15)

Today's women dentists have little time and increasing workloads. Equip your practice with comprehensive nonsurgical therapy modalities and help eliminate the epidemic of poor oral health in America. Make a commitment to your patients and your practice today!

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