

“Regenerative Periodontal Endoscopy™: The Future is NOW!”

presented by:

Diane Brucato-Thomas, RDH, EF, BS

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"...In the future, regenerative therapies could be as simple as the local delivery of regenerative molecules placed subgingivally to promote repair of periodontal and gingival defects. New drug delivery systems to stimulate wound repair of soft tissue and extraction defects may be as simple as applying medicaments directly to wounds..."

~ William Giannobile, Dimensions of Dental Hygiene, April 2007.

Definitions:

Regenerative Periodontal Endoscopy™ (RPE™): An innovative non-surgical periodontal protocol developed by Judy Carroll, RDH, utilizing the synergistic application of three advanced periodontal technologies: Dental Endoscopy (Perioscopy™), Host Modulation Therapy (HMT) with an enzyme inhibitor medication, and regenerative proteins.

~ www.periopeak.com

Synergy: *The interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects.*

~ The American Heritage© Stedman's Medical Dictionary, 2002.

Regeneration: The reproduction or reconstitution of a lost or injured part.

Periodontal Regeneration: The histological regeneration of the tooth's supporting tissues including alveolar bone, periodontal ligament, and cementum over a previously diseased root surface.

Repair: The healing of a wound by tissue that does not fully restore the architecture or the function of the part.

New attachment: The union of connective tissue or epithelium with a root surface that has been deprived of its original attachment apparatus. This may be epithelial adhesion and/or connective tissue adaptation or attachment and may include new cementum.

Reattachment: The reunion of epithelial and connective tissue with a root surface.

Bone fill: The clinical restoration of bone tissue in a treated periodontal defect. Bone fill does not address the presence or absence of histologic evidence of new connective tissue attachment or the formation of new periodontal ligament.

~ *American Academy of Periodontology*. Glossary of Periodontal Terms. Chicago. 2001.

HOST MODULATION THERAPY

Subantimicrobial Dose Doxycycline (SDD):

“SDD as an adjunct to SRP results in statistically and significant gains in clinical attachment levels and reductions in probing depths over and above those that are achieved by SRP alone.”

“SRP must be thorough and performed to the highest standard to maximize the benefits of adjunctive SDD”.

“SDD does not result in antibacterial effects, or lead to the development of resistant strains or the acquisition of multi-antibiotic resistance. The frequency of adverse events is low, and does not differ significantly from placebo.”

J. Clin. Periodontol. 2004 Sept.; 31 (9): 697-707. Subantimicrobial dose doxycycline as adjunctive treatment for periodontitis: A review. Preshaw PM, Hefti AF, Jepsen S, Etienne D, Walker C, Bradshaw MH. School of Dental Sciences, University of Newcastle upon Tyne, UK.

20mg Doxycycline Hyclate:

- ~ **Administer orally BID** on an empty stomach with a full glass of water
- ~ **Begin two weeks before treatment**
Acts as an anti-inflammatory agent to reduce granulomatous tissue and bleeding, thereby aiding in endoscopic visualization and efficacy of enamel matrix protein application.
- ~ **Continue for at least one year after treatment**
Inhibits collagenase activity allowing new collagen fibers an opportunity to mature.

PERIODONTAL ENDOSCOPY

Fiberoptic micro-endoscope irrigates, lights, and magnifies the subgingival anatomy up to 48X.

- ~ Provides real-time visualization of:
 - residual calculus
 - furcations
 - root anatomy
 - soft tissue inflammation
 - root fractures
 - subgingival caries
 - open crown margins
 - endodontic perforations
- ~ Allows for the highest standard of root instrumentation to create a root surface that is biocompatible to adjacent tissues.

Stambaugh, Myers, Ebling, Beckman, et al. Endoscopic Visualization of Submarginal Gingival Root Surfaces. Journal of Dental Research, April 2000.

<http://www.perioscopyinc.com/DVPapers10-04.pdf>

REGENERATIVE PROTEINS

Enamel Matrix Protein (Emdogain®):

- ~ Mediates the formation of acellular cementum on the root of the developing tooth, providing a foundation for all the necessary tissues associated with a true functional attachment.

- ~ Amelogenin of Porcine origin is the dominant protein
 - remarkably well-conserved throughout evolution
 - functionally consistent in many species

- ~ Attachment:
Mesenchymal cells attach to the formed matrix.

- ~ Proliferation and Growth:
The cells spread and populate the surface.

- ~ Cementum Formation:
The cells start to produce cementum with inserting collagen fibers.

- ~ Alveolar Bone:
Along the treated root surface, and at a certain distance, fibrous tissue condenses, creating a matrix for new alveolar bone to form.

Lyngstadaas SP, et al. Autocrine growth factors in human periodontal ligament cells cultured on enamel matrix derivative. J Clin Periodontol 2000; 27

Emdogain: http://www.straumann.us/us_index/pc_us_regeneration/pc_us_emdogain.htm

Bioactive Protein Platelet Derived Growth Factor (GEM 21S®):

- ~ Consists of highly purified recombinant human platelet-derived growth factor and a synthetic bone matrix (only the growth factor is used in RPE™)

- ~ Provides the biological stimulus for tissue repair by stimulating the proliferation and in-growth of osteoblasts.

- ~ Delivered on CollaTape (Zimmer Dental)
 - Bovine collagen
 - Fully resorbable in 10-14 days
 - Controls bleeding and stabilizes clots

GEM 21S: <http://www.osteohhealth.com/GEM%2021%20Evidence%20of%20Regeneration.html>

CollaTape: <http://www.sulzercalcitek.com/zimmerDental.asp>

CLINICAL TRIAL

Procedure	Clinical Attachment Level	Pocket Depth Reduction	Recession
Perioscopy w EMP	3.57mm	3.56mm	.01mm
Surgery	1.8mm	2.7mm	.9mm

Perioscopy aided Minimally Invasive Surgery (MIS) using Enamel Matrix Proteins compared to conventional surgery. Harrell, SK, Wilson, TG, Journal of Periodontology 2005, Vol. 76, No. 3. p380-384.

“REGENERATIVE PERIODONTAL ENDOSCOPY™: THE FUTURE IS NOW!”

SYNERGY! That is the key word in this protocol. Regenerative Periodontal Endoscopy™ is a science based protocol in which the interaction of each therapy in a specific order creates a combined effect that is greater than the sum of each individual effect.

Subantimicrobial dose doxycycline prescribed for two weeks before treatment acts as an anti-inflammatory. This notably reduces granulomatous tissue and bleeding during treatment, greatly enhancing visibility with the dental endoscope.

The endoscope allows the operator to see and thoroughly clean the root, obtaining a surface that is biocompatible with the tissue. Stambaugh's work showed that endoscopy with fiberoptic light allows visualization of embedded burnished calculus that cannot be seen with the naked eye (surgically), with 2.5X loupes, with 10X microscope, or 22X surgical microscope. A piece of calculus the size of a ten-foot period appears about an inch and a half in diameter on the screen. Using a two handed technique with micro ultrasonics, one can watch the removal of every speck.

With a biocompatible root surface, enamel matrix protein can be placed. Past research (Tom Wilson, also John Kwan) using Emdogain®, in closed therapy, failed, because of the difficulty of controlling the presence of blood and saliva on the subgingival root surface in closed procedures. In Regenerative Periodontal Endoscopy™, the protocol of starting subantimicrobial dose doxycycline two weeks prior to treatment for its anti-inflammatory effect, provides a brilliant solution to control bleeding. In addition, the irrigation and visibility provided by the endoscope guarantees a subgingival environment that is free of blood and saliva.

The protocol for using enamel matrix protein also involves chelating the root surface first with EDTA (PrefGel™). This results in exposed Sharpey's fibers on the root of the tooth. Because decalcification must take place before recalcification (cementum formation for regeneration), the regeneration process is accelerated, while the applied regenerative proteins stimulate cementum, connective tissue and bone regeneration.

RPE™ requires that the patient continues subantimicrobial dose doxycycline for at least one year following treatment, because of its advantageous effect as a collagenase inhibitor. Nyman and Linde showed that following periodontal surgery without maintenance, the connective tissue breaks down at a rate of 1 to 2 mm per year as opposed to if we do nothing. If we do nothing, the breakdown rate is .1-.3mm per year. This is because new collagen fibers take a long time to mature and they break down very easily. The inhibition of collagenase allows those new connective tissue fibers an opportunity to mature without constantly being bombarded by collagenase, the body's own "tissue machetes".

Using a diamond tipped micro ultrasonic to remove the epithelial lining of the pocket, exposes the underlying connective tissue to the enamel matrix protein known to inhibit epithelial downgrowth. With the Sharpey's fibers of the roots also exposed, a "Velcro" attachment begins between the underlying connective tissue and the root surface.

Each of these separate therapies have been studied in the past, alone or in partial combination, and are not new news; however, together, in this specific order, they have not been studied. When we take a look at what each individual therapy does biologically on its own, it becomes obvious that, if applied in combination in a specific order, the SYNERGY of the individual techniques together can create a result that, before, was not possible.

The innovative development of this brilliant protocol is credited to Judy Carroll, RDH, who has also taken care to document hundreds of RPE™ cases that resulted in rapid radiographic bone fill. These case studies are presently being compiled for publication.

Diane Brucato-Thomas, RDH, EF, BS
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