The New periodontal Disease: Inflammatory and Risky

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Gingivitis

• Condition is reversible
• But, if left untreated may progress to periodontitis with loss of attachment of connective tissue and eventual loss of supporting bone.

Periodontitis

• Disease of tooth supporting structure
• Exhibits pathologic changes in the periodontium (irreversible)
• Caused by bacterial plaque
• Usually develops from pre-existing gingivitis

Chronic Periodontitis

• Adult periodontitis
• Umbrella term for a number of disease syndromes
• 25 to 50% of the population
• Rapid or slow with periods of exacerbation and remission
• Variety of microbial flora
Aggressive Periodontitis

- Generalized or localized juvenile periodontitis
- Pre-puberty periodontitis
- Rapidly advancing periodontitis
- Refractory periodontitis

Refractory or Recurrent ??

The Choice is yours !!!

Factors Which Contribute to Refractory Periodontitis

- Pretreatment condition
- Patient Plaque Control
- Treatment technique
- Recall compliance
- Local Factors
  - * Immunologic response
  - * Microbial Flora

The True Refractory Patient

- Post surgical depth < 3mm.
- Plaque Assessment > 70% efficiency
- Maintenance recare 2-3 months
- Competent recare therapy
- No local or systemic factors
- Progressive attachment loss
- Progressive osseous resorption

Contagious or Transmissible?

Families

- Periodontitis aggregates within families
- Significant relationship among siblings for spirochetes on tongue and in pockets. Other organisms on gingivae and in saliva
  - Van der Velden, 1993
- P. gingivalis and A.A. organisms transmitted between parents and their children
Contagious or Transmissible?  
**Spouses**
- P. gingivalis can be transmitted between spouses
- P gingivalis isolated from saliva, tongue, tonsilar area
- 10 of 18 severe periodontal patients had spouses with same organism  
  Van Steenbergen, 1993
- Spouses of patients with advanced periodontitis have a higher prevalence of periodontal pathogens and worse periodontal status than spouses of healthy subjects  
  Asikainen, 1995

Periodontal disease is a common, chronic, and persistent infection
- Periodontal disease is:
  - A persistent infection that can spread rapidly throughout the periodontium
  - The most common chronic bacterial infection in adults
  - A problem that affects more than 35.7 million Americans
  - The #1 cause of adult tooth loss in the US
- Three out of 4 American adults develop a periodontal infection

Current Concepts of Periodontitis

1. **Biofilms**
2. **Sites**
3. **Episodic**

‘Latest’ Paradigm: Biofilm Management
- Ecological paradigm
  - Biofilm is needed for health & low levels of pathogens are normal
- Intervention
  - Key is maintaining balance to biofilm
  - Restore the balance: interfere with environmental factors that favor selection and growth of pathogens

Periodontal bacteria form dense biofilms
- The bacteria associated with periodontal disease reside within biofilms above and below the gingival margin
- Biofilms are dense mixtures of organisms resistant to natural antibodies and proteins that the body uses to fight infection

Model of Risk Factor Interaction in Human Periodontal Disease
The perio/systemic interface

- Perio disease modestly associated with atherosclerosis, MI and CVD
- Periodontal disease may be a risk factor for preterm/low birth weight
- A variety of oral interventions improving oral hygiene reduce pneumonia by 40%

2003 Contemporary workshop

Interaction of Risk Factors for Periodontal Disease

Association between Cigarette Smoking, Bacterial Pathogens, and Periodontal Status

- 615 adults, 28 to 73 years old
- Odds ratio of pocket depth > 3.5 mm was 5.3
- Bacteria not different

Stoltenberg, et al

J Periodontol, 1993

Nicotine ingestion as a risk factor for periodontal disease...

- Effects neutrophils and monocytes
- Increased oxidative burst
- Impaired phagocytosis and chemotaxis
- Prostaglandins, tissue necrosing factor, collagenase, and elastase increase

Periodontal Disease in Non-Insulin-Dependent Diabetes Mellitus

- 1,342 subjects, 15 years and older
- 19% with diabetes / 12% impaired glucose tolerance
- Odds ratio of 2.8 times for periodontal disease

Emrich et al

J Periodontol

Vol 62, 1991
Diabetes as a risk factor in periodontal diseases:
- Altered neutrophil and monocyte function
- Increased oxidative stress
- Impaired chemotactic and phagocytic function
- Neutrophils are primed
- Periodontal infections compromise glycemic control

Occlusion as a Contributing Factor
- Initial or progressive mobility is major factor
- Primary occlusal trauma
  - Occlusal adjustment
  - Occlusal guard
- Secondary occlusal trauma
  - Occlusal adjustment – no fremitus
  - Occlusal guard
  - Splint!

Predicting Periodontal Prognosis
1. Increasing pocket depth
2. Furcation involvement
3. Mobility
4. Crown root ratio
5. Smoking
6. Restorative dentistry
McGuire, 1995

Age

Local Factors
(subgingival calculus, plaque)

Periodontitis
(attachment loss, bone loss)

Resistance

Susceptibility
Validity and accuracy of a risk indicator in predicting periodontal disease

- PRC: score 1 to 5
- Routine data collection as age, smoking, diabetes, pocket depth, furcations and vertical bone lesions
- 15 year analysis of bone and tooth loss
- Reliable risk assessment tool

Page, et al
JADA May 2002

Periodontal Disease and Cardiovascular Disease

- 18-year study of 1,147 subjects
- Probing and bone loss are significant risk factors for coronary heart disease
- Odds ratio of 2.1 fold for CHD controlling all other factors
- Chronic systemic exposure to bacteria, endotoxin, and cytokines

Beck, et al
J Periodontol
Vol 67 No 10, 1996

Periodontal Infection as a Possible Risk Factor for Preterm Low Birth Weight

- Case control study of 124 pregnant or post partum mothers
- Parameter of clinical attachment levels
- 18.2% of all preterm low birth weight attributable to periodontal disease
- Pregnant mothers with severe periodontal disease have a 7.9 fold increased risk for preterm LBW

Offenbacher S, et al
J Periodontol
Vol 67, No 10, 1996
The perio/systemic interface

- Perio disease modestly associated with atherosclerosis, MI and CVD
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2003 Contemporary workshop

World Workshop of Periodontology, 1996

1. Wide variations of inflammatory response among subjects.
2. Microbial parameters explain a small amount of disease incidence or prevalence.
3. Half the variability in periodontal disease expression is controlled by genetic not microbial factors.

AETNA launches Dental/Medical Integration Program that includes Specialized Pregnancy Benefits

- Members who are pregnant, diabetes, coronary artery disease, or CVS (stroke)
- Reimburses for and increases the frequency of recare
- High risk members who seek early dental care lower their medical risk

Dental History is Critical in Formulating a Patient’s Periodontal Status

- Familial history
- Medical status
- Smoking habit
- Stress activity
- Parafunctional symptoms

Data Collection

- Etiology
- Diagnosis
- Prognosis
- Treatment Plan

Data Collection

- Radiographic Exam
- Probing
- Tissue Characteristics
- Mobility
**Vertical Bitewings**

- Alveolar Crest Height
- Pattern of Bone Loss
- CEJ
- Dentition Related Pathology

**D0180 Comprehensive periodontal evaluation**

- New or established patients
- Can be preceded by D0150 (PSR)
- Evaluation of periodontal condition:
  - Probing and charting
  - Dental and medical history
  - Overall health assessment

**Periodontal Probing**

2N Nabors
Furcation Probe

**Automated Probing**

**Which club………**

- **Green** Dot Club: Gingivitis
  - 67%
- **Red** Dot Club: Periodontitis
  - 33%

**“Risk factors”**

Patient characteristics associated with the development of the disease

**“Prognostic factors”**

Patient characteristics that may predict the outcome once the disease is present, but do not actually cause it.

Laupacis, et. al.
JAMA, 1994
Refractory Periodontitis Associated with Abnormal Polymorphonuclear Leukocyte Phagocytosis and Cigarette Smoking

MacFarlane, et al.
J. Periodontol., Nov. 1992

31 refractory patients
12 controls
- No chemotactic defects noted, but phagocytosis impaired
- 90% of refractory patients were smokers
- Strong association between peripheral blood PMN defect and refractory periodontitis

Refractory Periodontitis: Critical Questions in Clinical Management
Kornman
J. Clinical Periodontol, 1996

- Condition describes patient characteristic not site
- Two types of refractory
  a. localized non-responsive sites
  b. generalized non-responsive patients
- Clinical characteristics
  a. multiple sites show clinically detectable disease progression
  b. progression occurs even in sites of minimal or no previous disease
  c. disease progression not stopped by conventional treatment

Prognosis versus Actual Outcome II
The Effectiveness of Clinical Parameters in Developing an Accurate Prognosis
McGuire and Nunn
J. Periodontol., 1996

Predictive Factors in Determining a Poor Prognosis:
- Increased probing depth
- Severe furcation involvement
- Greater mobility
- Poor crown/root ratio
- Malposed teeth
- Smoking
- Teeth used as fixed abutments

Periodontal Recare

- Medical History
- Plaque Control PASS SCORE ____ % E
  - Recommendations:
    - Areas of Concern
    - Therapy Today
    - Next recare/ Comments

Supportive Periodontal Maintenance

Host
Radiographs
36 months → 18 months
Comprehensive Exam
36 months → 18 months

Increase Frequency
1. Poor plaque control performance.
2. Increasing pocket depth, bleeding, suppuration.
3. Radiographic increase of bone loss.
4. Increasing furcation involvement.
5. Complex restorative cases.
Indications for Systemic Antibiotics

- Juvenile Periodontitis
  - Localized vs. Generalized
- Rapidly Advancing Periodontitis
- Refractory Periodontitis

The Fundamentals of Ultrasonics in Periodontal Therapy

- Exam - PSR (0150)
  (0, 1, 2) FMX
- Gross Debridement (4355) P10
- Oral Hygiene
- Prophylaxis OHI P50 (01110)
- Prophylaxis OHI P50 (01110)
- Periodic Maintenance (01110) P50
  (6 month intervals)
Instrumentation Protocol

- **Debridement (Gross)**
  - Ultrasonic : P-10  P-50
- **Debridement (Gingivitis)**
  - Ultrasonic : P - 50 (option P 10)
  - Polish
- **Debridement (Periodontitis)**
  - Ultrasonic : P - 50  P - 100 (option P 10)
  - Gracey Curettes : thin
  - Polish

Sulcular Irrigation

- **Ultrasonic**
  - 9 : 1 ratio ---- water to Betadine
- **Manual**
  - 2 : 1 ratio ---- water to Betadine
  
  Slots, Jorgensen
  
  JADA, 9-2000

Local Delivery Antibiotics

- User - friendly
- Stays in place
- Requires no removal
- Enhances the effect of debridment

How to Use

Depress Handle to
Express Arestin
from the Cartridge

Indications for “SDA” Therapy

- Generalized sites !!!
- Limited on frequency of application
- Recurrent or Refractory
- Non-surgical options after Phase I
  - Marginal plaque control
  - Medical complications
  - Financial implications
  - Anatomical concerns with surgery
**Indications for “LDA” Therapy**

- Localized sites !!!
- Recurrent or Refractory
- Non-surgical options after Phase I
  - Marginal plaque control
  - Medical complications
  - Financial implications
  - Anatomical concerns with surgery
- Restorative site at risk

**Lasers and Periodontal therapy…**

- Carbon Dioxide
- Er:YAG
- Er:Cr:YSGG
- Nd:YAG
- Diode
- Ar

**Potential laser applications for periodontal therapy…**

**Different Absorption Characteristics:**

<table>
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<th>Wavelength (microns)</th>
<th>Blue: Water</th>
<th>Red: Hydroxyapatite</th>
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<tr>
<td>Nd:YAG 1.06um</td>
<td>Er:YAG 2.94um</td>
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<tr>
<td>Nd:YAG 1.064 nm</td>
<td>Er:YSGG 2.780 nm</td>
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<td>Tm:YAG 2.09um</td>
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<tr>
<td>Ho:YAG 2.12um</td>
<td>Ho:YAG 2.09um</td>
<td></td>
</tr>
<tr>
<td>CO2 10.6um</td>
<td>CO2 10.600 nm</td>
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**Advantages of Lasers in Surgical Procedures**

- Laser Cut More Visible To Eye / Dry Field
- Laser Sterilizes Wound As It Cuts
- Decreased Post Operative Pain And Edema
- Decreased Post Operative Infection
- The theory of “Sealing” and “Sterilizing” the wound?
- Less Wound Contraction And Scarring

**Pocket Sterilization**

- De-epitheliazie by using tip in up/down diagonal manner
- Blanch outer 5 mm. of epithelium
- Patient returns in 7 days to repeat until pocket is 3 mm.
- Subtract 3 from initial pocket depth=number of treatments needed
Assessing Success

- Radiographs
- Pocket depths
- Rentry
- Histology

Progression of Disease

Tooth Loss in Maintenance Patients in a Private Periodontal Practice, Wilson….1986

- 162 patients minimum of 5 years
- 36% compliant
  - No teeth lost
- 64% erratic compliance
  - 60 teeth lost
- Teeth lost:
  - Maxillary molars
  - Mandibular molars

Surgical Curettage

Flap Surgery

Compliance with Maintenance therapy in a Private Practice…Wilson et al, 1984

- 961 patients over 8 years
- 16% complied with recommended maintenance
- Erratic compliance in 49%
- 34% Never reported for maintenance after active treatment
Compliance with Supportive Periodontal Therapy Part I and II: Risk of noncompliance in a ten year period, Novaes..2001

- Factors of gender, age, surgery vs. non surgery
- 43.9% noncompliant in surgery
- 53.2% noncompliant in non surgery
- Highest risk for noncompliance:
  - Female
  - Under 30 years age
  - Over 51 years of age
  - Underwent non-surgical care

Effecting the “Host”

Conclusions

1. Past dental history and plaque control are critical in establishing the diagnosis of refractory periodontal disease
2. New patients with a history of previous periodontal surgery should be monitored for at least one year prior to additional surgery.
3. Adjunctive antibiotic therapy may be necessary only after culture and sensitivity.
4. The frequency of recare and the competency of debridement are crucial to stabilization.
5. Occlusal stability is a necessity.