WELCOME!
Managing the Non-Resolving Periodontal Pocket

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MANAGING THE NON-RESOLVING POCKET

COURSE PROGRAMME – 23 SEPTEMBER 2011, @ UPDA

0900   REGISTRATION
0910   Introduction
0920   Why Periodontal Care can fail to Succeed
1000   Management of the Residual Pocket
1040   COFFEE
1100   Antibiotics in Periodontal Care
1140   Secondary factors and Health influences

1240   LUNCH

1320   The problems of Mobility
1400   Practical splinting exercises
1530   TEA
1550   The Role of Surgery
1620   Supportive Care & Discussion
1700   CLOSE
Non-Resolving Pocket

- WHY ARE POCKETS LEFT?
- HOW DO THEY PRESENT?
- CAN WE LEAVE POCKETS?
- MANAGING THE RESIDUAL POCKET
- THE PATIENT’S APPROACH
- NON-SURGICAL APPROACH
- ADDITIONAL PROBLEMS
- MANAGING MOBILITY
- SURGICAL APPROACHES
- LONG TERM SUPPORT
Non-Resolving Pocket

WHY ARE POCKETS LEFT?

We need to consider why we are left with some pockets after our initial treatment.

- Are they simply too deep to resolve?
- Is it our poor treatment?
- Is it the patient’s lack of compliance?
- Periodontal treatment CAN fail to succeed.............
Periodontal Care Can Fail to Succeed
Periodontal Care Can Fail to Succeed

The 3 “R’s” of Perio....

Our treatment may not always succeed due to failures in:

- RECOGNITION
- RESOURCES
- RESOLVE

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RECOGNITION

- Making the correct DIAGNOSIS
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- Choosing the correct MANAGEMENT
  - SEVERITY
  - COMPLEXITY

- Believing in the VALUE OF TREATMENT
RECOGNITION

- **DIAGNOSIS**
  - The usual CLINICAL signs....

- Presence of deposits
- Gingival appearance
- Reliance on probing
  - Bleeding
  - Discharge
- Mobility
- Restorative influences
  - Restorability of compromised teeth
- Malocclusions
- Occlusal dysharmonies
RECOGNITION

- DIAGNOSIS
  - CLINICAL view
  - Appropriate RADIOGRAPHIC views
  - Distribution of bone loss
    - Regularity
    - Irregularity
  - Extent of root compromise
  - Apical/Endodontic status
  - Caries status
  - Restorability
  - Perio-Endo?
  - Bi-Furcations/?
  - Tri-furcations?
  - Infrabony defects?
Has there been any......

- Previous awareness
- Previous advice
- Previous treatment
  - “deep cleaning”
  - “root planing”
  - use of local
  - extraction(s)
  - surgery
- Previous response to treatment
- Previous Referral?
- Family history?

RECOGNITION

- DIAGNOSIS
  - CLINICAL view
  - RADIOGRAPHIC view
  - Comparison with HISTORICAL views......
RECOGNITION

- **DIAGNOSIS**
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- **MANAGEMENT**

  - How we care for a patient may be influenced by:
    - Patient’s attitude/interest
    - Dentist’s attitude/interest
    - Patient’s aspirations
    - Dentist’s aspirations
    - *Perceived* clinical limitations
    - Resource limitations

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RECOGNITION

- **DIAGNOSIS**
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- **MANAGEMENT**
  - SEVERITY
  - Have we misjudged the difficulties?
  - Have we overlooked some of the difficulties?
  - How effective was our chart?

Based upon:
- Number of sites
- Extent of probing
- Degree of bleeding

Related to:
- Age of onset
- Rapidity of onset
- Medical factors
- Medication
- Occlusal influences
- Restorative influences

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RECOGNITION

- **DIAGNOSIS**
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- **MANAGEMENT**
  - SEVERITY
  - COMPLEXITY
  - Have we thought of all the complicating factors present?
  - Can we manage these ourselves?

Based upon:
- Number of sites
- Extent of probing

Related to:
- Medical factors
  - Eg. diabetes
- Medication
  - Eg. Ca channel blockers
- Occlusal influences
- Restorative influences
- Resources
RECOGNITION

- DIAGNOSIS
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- MANAGEMENT
  - SEVERITY
  - COMPLEXITY

- VALUE OF TREATMENT
  - Have we explained the benefits to the patient?

BENEFITS to the patient
- Relief of pain
- Retention of teeth
- Aesthetics?
- Improved oral Comfort

But this always
Dependent upon Commitment
RECOGNITION

- **DIAGNOSIS**
  - CLINICAL view
  - RADIOGRAPHIC view
  - HISTORICAL view

- **MANAGEMENT**
  - SEVERITY
  - COMPLEXITY

- **VALUE OF TREATMENT**
  - Have we explained the benefits to the patient?
  - Have we discussed the benefits with colleagues?

  Value to the practice
  - Patient satisfaction
  - Restorative facilitation
  - Predictable and long term
    - Income Generation
  - Dependent upon Commitment
ADMIN understanding of:
- Treatment methods
- Treatment importance
- Treatment patterns

Thus ensuring effective treatment intervals and support regimes

The Hygienist/Therapist will prosper with:
- Regular use of LA
- Support staff
- Clear directions
- Reassurance
- “Referral”
- Decent kit!
RESOURCES

- STAFF COMPETENCE
- SKILL LEVELS

- Technique training
- Equipment provision
- Peer review, based on
  - Patient re-examination
  - Audit
- CPD
RESOURCES

- STAFF COMPETENCE
- SKILL LEVELS
- EXPERIENCE

- Is Not always related to competence!
- Is Not always related to age!
- Is best regarded as the recognition of one’s past failures, and
- Is best proven by the ability to avoid their repetition!
RESOURCES

- STAFF COMPETENCE
- SKILL LEVELS
- EXPERIENCE
- TIME, SOME BASIC FACTS........

- 15% OF PATIENTS WILL DEVELOP PERIODONTAL POCKETING >5MM
- THEREFORE 85% WILL NOT

- BUT THE 15% NEED 85% OF THE HYGIENIST’S TIME!

- ON AVERAGE THE 15% CANNOT BE TREATED INITIALLY IN LESS THAN 2 HOURS,

- NOR SUPPORTED WITH LESS THAN 30 MINUTES EVERY 3 MONTHS

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RESOLVE

Successful periodontal care requires resolve to:

- Persuade patients
- Encourage patients and staff
- Chastise patients (and staff!)
- Cajole patients (and staff!)
- Reassure patients and staff
- Reassess and rethink
- Re-treat or retreat!
- Refer, if in doubt or out one’s of depth
RESOLVE

Successful periodontal care requires resolve, but........

Nothing we do can or will overcome what the patient cannot, or will not do, so, ........

If they cannot do it, we must facilitate the teeth and tissues so that they can, but........

If they will not do it, must we continue to treat them........... or not?

And how can we do it if the patient makes the manageable pocket unmanaged?
Non-Resolving Pocket

HOW DO THEY PRESENT?

- Persistent swelling
- Persistent bleeding on sub-gingival brushing
- Persistent bleeding on probing
- Increasing probing depth
- Increasing mobility
- Acute episodes – perio abscesses
- Discomfort in function / parafunction
Non-Resolving Pocket

CAN WE LEAVE POCKETS?

If you believe that supra-gingival plaque is the main aetiological factor............... 
...............the answer is YES! 
...............as long as the patient’s supra-gingival plaque control is immaculate

BUT supra-gingival plaque has low periodontal (as opposed to gingival) pathogenicity.........

However sub-gingival plaque has the power to destroy and must be controlled

So, if you can ensure regular effective disturbance and disruption of the sub-gingival biofilm.......the answer is also ..........YES!
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
THE PATIENT’S APPROACH

- Can patients achieve this?
- Will patients achieve this?
- How often will they brush?
- What about pockets over 5mm?
- How effective is this technique?
- What is it achieving?
- Why are the anaerobes so important?
- Are adjunctive chemotherapeutics of value with the S T B?
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

- Diligent re-instrumentation
- Effective instruments
- Oral hygiene reinforcement
- Antiseptics - chlorhexidine
- Antibiotics - systemic / local
- Review frequency
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

- Diligent re-instrumentation
- **Effective instruments**
- Oral hygiene reinforcement
- Antiseptics - chlorhexidine
- Antibiotics - systemic / local
- Review frequency
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

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- Review frequency

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Time for Coffee!
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

- Diligent re-instrumentation
- Effective instruments
- Oral hygiene reinforcement

✓ Antiseptics - chlorhexidine

- Antibiotics - systemic / local
- Review frequency

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Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

- Diligent re-instrumentation
- Effective instruments
- Oral hygiene reinforcement
- Antiseptics - chlorhexidine
- ✔ Antibiotics - systemic / local
- Review frequency

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Topical Use and Delivery

When treating a ‘periodontal’ patient is there a role for

- Local antiseptics?
  - General bacterial reduction?
  - Acute episodes?

How specific are drugs against periodontal pathogens?
Systemic Use and Delivery

- When treating a ‘periodontal’ patient is there a role for Systemic antibiotics?
  - Acute infections
  - Aggressive periodontitis patients
  - Medically compromised patients

Diabetes influencing CIPD
Topical Use and Delivery

When treating a ‘periodontal’ patient is there a role for

- Local antiseptics?
  - General bacterial reduction
  - Acute episodes?

- Local antibiotics?
  - Specific bacterial reduction
  - Can we specify the causative bacteria?

How specific are drugs against periodontal pathogens?
Topical delivery systems

- Drugs can be delivered in:
  - Toothpastes
  - Mouthwashes
  - Specialised applicators

- How long do they stay in contact with the teeth and soft tissues?

How substantive are the applications in the mouth?
What about Colgate Total?

- There is scant evidence to show that any one Triclosan paste is better than another.
- There is conflicting evidence re- the anti-plaque efficacy.
- However, Triclosan is proven to have anti-plaque effects, these are enhanced with the presence of Co-polymer.
In patients with advanced periodontal disease, systemic antibiotic therapy without subgingival debridement may change the composition of subgingival microbiota, thus predisposing to the development of multiple abscesses.

(Topoll, Lange and Muller ‘90)

Remember the Ecological plaque theory?
Ecological Plaque Theory (Marsh)

Transmission

Major ecological pressure

Health

Health

Disease

Ecological Plaque Theory (Marsh)
CAUTION:

In patients with advanced periodontal disease, systemic antibiotic therapy without subgingival debridement may change the composition of subgingival microbiota, thus predisposing to the development of multiple abscesses.

(Topoll, Lange and Muller ‘90)

- Remember the Ecological plaque theory:
- Many plaque constituents are controlling the pathogens
- Disrupt these and the homeostasis is corrupted allowing the stronger pathogens to cause mayhem!

THEREFORE, IS ALL PLAQUE BAD........?
What can be used and when?

- **Local delivery:**
  - Localised recurrent and/or non responding sites where disease is stable elsewhere
  - Multiple sites in young patients with good superficial oral hygiene
  - Medically compromised patients
  - Diabetic patients
What can be used and when?

Systemic delivery:
- Generalised disease in the medically compromised or diabetic patient
- Recurrent and/or non responding sites where disease is stable elsewhere
- Acute periodontal abscesses
- Some gingival abscesses
- Some acute necrotising conditions
- Post-surgically
Advantages of local delivery of antibiotics

- High local concentration
- Low total dose
- Reduced option for resistance
- Prolonged duration of action
- Site specific
- Low toxicity
- Does not rely on patient compliance

Clinically advantageous in making the soft tissues more comfortable more quickly and thus permitting effective personal management of subgingival oral hygiene more rapidly
Disadvantages of local delivery

- Gel reservoirs deplete rapidly after placement, so require may repeated applications
- Cost
- Delivery vehicle possibly incompatible with the antibiotic
- By-products from vehicle breakdown
- Pain on application, associated with the temperature and pH of the gel
Local delivery systems

- **Dentomycin™** (2% minocycline hydrochloride gel).
- **Elyzol™** (25% metronidazole benzoate).
- **Actisite™** (inert fibre with 25% tetracycline hydrochloride).
- **Atridox™** (doxycycline gel which solidifies).

- Elyzol and Actisite are no longer commercially available in UK

Sustained drug release
Controlled delivery
Dentomycin™

- Flexible nozzle on syringe.
- Has a reported anti-collagenase effect.
- Requires 2-3 applications two weeks apart.

Example of a study using Dentomycin:
- Placed at baseline, 2, 4 & 6 weeks.
- There was a significantly greater decrease in probing depth (42% in pockets >7mm) in test group of chronic adult periodontitis patients when scaling and root planing carried out at baseline.
  - (Van Steenberghe et al. ‘93)

Anti-collagenase effect may be the most beneficial
Atridox™

This drug is not widely used in UK at present

- Flowable antimicrobial solidifying in minutes in pocket.
- Single application
- Bioabsorbable
- Sustained release of doxycycline
- Concentration in gingival crevicular fluid remains above Minimum Inhibitory Dose level for 7-10 days
Actisite™

- Impregnated cord
- Single application
- Partially Bio-absorbable
- Sustained release of doxycycline
- Concentration in gingival crevicular fluid remains above Minimum Inhibitory Dose level for 10-21 days
- Requires removal
Dentomycin v Elyzol v Actisite

- All three products were compared in a 6 month parallel study
- The delivery systems were used as adjuncts with root surface debridement only in the control group.
- Pockets were greater than 5mm.

Results:
- All three were better than root surface debridement alone.
- The Actisite group had statistically significantly better results including the greatest reduction in pocket depth.
- This was only 1mm.
- Is this clinically significant?

Kinane & Radvar ‘99
SYSTEMIC ANTIMICROBIALS .......

............is their use justified?
Amoxicillin

- Active against Gram +ve cocci and many Gram –ve bacilli
- Dose: 250 to 400mg t.d.s. For 5 days
- Side effects:
  - allergy
  - rashes
  - interference with oral contraceptive pill.

- Augmentin (amoxicillin and clavulanic acid) has been used in the treatment of “refractory” periodontitis.
Metronidazole

- Specific for anaerobes.
- Side effects:
  - Disulfiram type reaction with alcohol – promotes projectile vomiting
  - Can enhance anticoagulant effect of coumarins (warfarin)
- Should be avoided in pregnancy and breast feeding.
- Dose 200 to 400mg t.d.s. For 3 to 5 days
The ‘Perio Pill’

- Amoxycillin 250mg t.d.s. for 7 days
+ Metronidazole 200mg t.d.s. for 7 days

- The ‘Perio pill’ has been used successfully to treat advanced chronic periodontitis, particularly if A.a is known to be associated.
  - (Van Winklehoff et al. ‘89, ‘92, Pavicic et al. ‘92, ‘94)

This has found more favour in Europe (Holland especially) than in the UK or USA
Tetracycline

- Broad spectrum antimicrobial
- IT IS BACTERIOSTATIC - which may be an advantage in reducing the sudden release of bacterial endotoxin caused by bactericidal drugs
- Also has anti-collagenase and anti-inflammatory actions
- Inhibition of bone resorption
- Not effective against A.a.
- May lead to colonisation of opportunistic pathogens
- Has been recommended for use as an adjunct to treatment of the “juvenile” periodontal conditions
- Dose: 250mg q.d.s for 5-7 days
Doxycycline

- Broad spectrum antimicrobial
- IT IS BACTERIOSTATIC - which may be an advantage in reducing the sudden release of bacterial endotoxin caused by bactericidal drugs
- Also has anti-collagenase and anti-inflammatory actions
- Exhibits inhibition of bone resorption
- May lead to colonisation of opportunistic pathogens
- Has been recommended for use as an adjunct to treatment of the “aggressive” periodontal conditions
- Dose: 2x100mg stat. then 100mg daily for 21 days, during which all operative treatment should be completed

A very successful regime for the medically compromised patient or young patients with aggressive periodontitis
Doxycycline

- As PERIOSTAT
- 20mg sub-lethal dose
- Broad spectrum antimicrobial
- Anti-collagenase and anti-inflammatory actions
- Inhibition of bone resorption
- Dose: 20mg daily for 3 months, following operative treatment

NOTE: This product has not shown consistent results in research and is not widely recommended in periodontal treatment
CONCLUSIONS

- Chronic periodontitis should initially be treatable without antibiotics, but they may be useful in non-responding sites.

- We should confine the use of systemic antibiotics to cases of medical compromise, acute or advanced progressive disease.

- Antibiotics should NEVER be administered without completion of thorough mechanical debridement (a possible exception is acute disease such as ANUG if the tissues are too tender to approach initially).

- Optimal oral hygiene is essential for a favourable response to therapy, neither antibiotics nor antiseptics are a substitute for effective home care and regular supportive care.
Non-Resolving Pocket

MANAGING THE RESIDUAL POCKET
NON-SURGICAL APPROACH

- Diligent re-instrumentation
- Effective instruments
- Oral hygiene reinforcement
- Antiseptics - chlorhexidine
- Antibiotics - systemic / local

✔ Review frequency

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Non-Resolving Pocket

ADDITIONAL PROBLEMS

✓ ANATOMICAL VARIATIONS

☐ MEDICAL CONDITIONS

☐ PRESCRIBED MEDICATIONS

☐ PHYSICAL COMPROMISES

Initial bone thickness will influence the pocket anatomy: thick bone will be prone to infraction bony pocket formation.
Non-Resolving Pocket

ADDITIONAL PROBLEMS

☑ ANATOMICAL VARIATIONS

☐ MEDICAL CONDITIONS

☐ PRESCRIBED MEDICATIONS

☐ PHYSICAL COMPROMISES

FURCATIONS ARE NOT CONFINED TO MOLARS AND UPPER FIRST PREMOLARS (5% HAVE 3 ROOTS!)

UPPER SECOND PREMOLARS AND BOTH UPPER AND LOWER CANINES CAN BE INVOLVED
Non-Resolving Pocket

ADDITIONAL PROBLEMS

✔ ANATOMICAL VARIATIONS

☐ MEDICAL CONDITIONS

☐ PRESCRIBED MEDICATIONS

☐ PHYSICAL COMPROMISES

PERIO-ENDO LESIONS
Non-Resolving Pocket

ADDITIONAL PROBLEMS

✓ ANATOMICAL VARIATIONS

☐ MEDICAL CONDITIONS

☐ PRESCRIBED MEDICATIONS

☐ PHYSICAL COMPROMISES

ROOT-FILLED TEETH APPEAR TO RETAIN TOXIN MORE EASILY
Non-Resolving Pocket

ADDITIONAL PROBLEMS

✓ ANATOMICAL VARIATIONS

☐ MEDICAL CONDITIONS

☐ PRESCRIBED MEDICATIONS

☐ PHYSICAL COMPROMISES

ROOT GROOVES ARE COMMON ON THE PALATAL ASPECT OF THE UPPER INCISORS AND RETAIN SIGNIFICANT PLAQUE AND TOXIN
Non-Resolving Pocket

ADDITIONAL PROBLEMS

- ANATOMICAL VARIATIONS
- MEDICAL CONDITIONS
- PRESCRIBED MEDICATIONS
- PHYSICAL COMPROMISES

EXPECT THE UNEXPECTED!!!!!!!!!!
Anatomical variation

EXPECT THE UNEXPECTED!!!!!!!!!!
Non-Resolving Pocket

ADDITIONAL PROBLEMS

- ANATOMICAL VARIATIONS
- MEDICAL CONDITIONS
- PRESCRIBED MEDICATIONS
- PHYSICAL COMPROMISES

- PERIODONTITIS AND GENERAL HEALTH – A TWO - WAY RELATIONSHIP?
- PERIODONTITIS IS MAINLY ASSOCIATED WITH DISEASES OF NEUTROPHIL DYSFUNCTION
Periodontitis in neutrophil disorders

**Primary neutrophil**
- Agranulocytosis
- Cyclic neutropenia
- Chediak-Higashi syndrome
- Neutrophil adherence abnormalities
- Job’s syndrome
- “lazy leukocyte” syndrome
- Neutrophil functional abnormalities

**Secondary neutrophil**
- Diabetes mellitus type I
- Diabetes mellitus type II
- Papillon-Lefevre syndrome
- Downs syndrome
- Inflammatory Bowel disease: e.g. Crohn’s disease
- Pre leukaemic syndrome
- Addison’s disease
- AIDS
Diabetes and CIPD

- **Type I**
  - Early or late onset
  - Drug controlled
  - Dietary assistance
  - Frequently insulin dependent
  - Heavy calculus formation is common
  - Delayed healing
  - Gingival swelling is common
  - Excessive gingival bleeding

Female, 23 years old, for 6 years **Unstable** diabetic
Diabetes and CIPD

- **Type I**
  - Early or late onset
  - Drug controlled
  - Dietary assistance
  - Frequently insulin dependent
  - Heavy calculus formation is common
  - Delayed healing
  - Gingival swelling is common
  - Excessive gingival bleeding

After perio stabilisation becomes **Stable** diabetic
Diabetes and CIPD

- **Type I**
  - Does the whole periodontal/gingival inflammatory overload suppress the hormonal and humoral immune system?
  - Does the hormonal situation depress the immune system and thus reduce the inflammatory response?

  - Well controlled diabetics
  - show little side effects on CIPD

Stable after 5+ years

Should severe CIPD be tested for diabetes?
Inflammatory Bowel disease: e.g. Crohn’s disease

A view inside the bowel
Inflammatory Bowel disease: e.g. Crohn’s disease

Does worry worsen CIPD?

- The lining of the mouth and the gingival tissues are modifications of the same tissue lining the remainder of the gut
- It is not surprising that similar inflammatory conditions exist
- Stress is linked with Crohn’s and IBS and CIPD, especially desquamative gingival conditions
Thyroid Insufficiency

- Reduced thyroid activity can influence inflammation and bone repair
- Anecdotal evidence links this and prescribed Thyroxine with increased periodontal breakdown

- What symptoms do thyroid insufficient patients show that might impact on periodontal disease?
A link between circulatory disease and periodontal disease?

What circulatory disease?

- Atherosclerosis is the formation of fatty plaques in an artery
- These plaques may suddenly rupture leading to a clot
- This clot may block blood flow
A link between circulatory disease and periodontal disease?

What circulatory disease?

- In a cerebral (brain) artery this can cause a cerebro-vascular accident (CVA or stroke)
A link between circulatory disease and periodontal disease?

Cardio-vascular disease?

- In a coronary artery it can lead to coronary heart disease, (CHD) by progressive narrowing of the arteries supplying blood to the heart muscle, leading at least to angina (pain on exertion) or at worst cardiac arrest (a heart attack) on cessation of blood to a significant part of the “pump”
A link between circulatory disease and periodontal disease?

Such fatty plaques are particularly associated with dietary and lifestyle factors, particularly saturated fats, smoking and a lack of exercise.

Obesity has also been linked to a higher incidence of CIPD.
A link between arterial disease and periodontal disease?

- **Inflammation** has also been linked with the formation of atheromatous plaques – via pro-inflammatory cytokines.
- In recent times the question has been posed: Is the inflammatory response linked with inflammation elsewhere in the body?
A link between arterial disease and periodontal disease?

- This has been focussed on the national health and nutrition examination survey (NHANES) in the USA in the late 1990’s, which involved 10,000 men aged between 18 and 74.....
- This comprehensive survey of health, lifestyle and causes of death found that men with a history of established destructive periodontal disease were more likely to be diagnosed with heart disease than those without periodontal disease........

- A significant proportion of men who had died from CVA and CHD showed a history of destructive CIPD, leading to the first positive link between the conditions.......
A link between low pre term weight babies and periodontal disease?

- Some studies have established a link between women with periodontitis and the risk of a pre-term and/or a low birth-weight baby.
- Steven Offenbacher has postulated that Oral bacteria travel in the mother’s blood and breach the placenta; at the same time:
  - Hormonal changes of the gingiva may allow easier passage of bacteria or their products........
  - Once the placenta has been breached it triggers an immune and inflammatory response........
  - This is capable of causing stresses to the baby resulting in early labour........

There is considerable debate regarding this theory and several conflicting studies support both sides.
A link between pre-term low birth-weight babies, cardiovascular disease and smoking?

There are some common features:

- Pre-term low birth-weight has been linked with Smoking.
- Coronary artery disease has been linked with Smoking.
- Periodontitis has been linked with Smoking.
- Could Smoking be the common link?
- Smoking was certainly a common finding in the NHANES study in USA
- Are these links only present in smokers?
Is smoking the common link?

- When studying a multifactorial disease, such as CIPD, CVA or CHD, a common statistical method employed to try and eliminate confounding variables is Multiple Regression Analysis.
- This seeks to eliminate the possible influence of the factors on each other rather than the whole.
- Can this approach adequately compensate for the effects of smoking?
- Are there enough non-smokers showing the disease under consideration for a true comparison?
The scale of the problem

- 27% of UK adults aged 16 and over smoke
- 42% of men in the ‘unskilled or manual’ groups smoke compared with 15% in ‘professional’ groups.
- 30% of pregnant women smoke

1998 General household survey

However:
- In Russia 70% of adults smoke!
- And even worse....
- .....in Russia 60% of health professionals smoke!
Smoking has a profound effect on the immune and inflammatory systems, so that smokers have an increased number of leukocytes in the systemic circulation, but smokers have a decreased number of leukocytes migrating into the gingival crevice and/or pocket – the “lazy leukocyte syndrome”
Smoking is associated with chronic obstructive pulmonary disease

Many of the mechanisms that have been thought to cause tissue damage in lungs are similar to those that have been suggested to cause damage in the periodontal tissues

The neutrophil is thought to be the main cell type responsible for destruction of the lung parenchyma

The transit of neutrophils through the pulmonary vasculature is delayed

The neutrophil is stimulated to release proteases including elastase, cathepsins and matrix metalloproteases.... Sound familiar?
Clinical significance of these effects

- Smoking is a major risk factor for periodontitis, and may be responsible for more than half of the cases of periodontitis in the USA
- Tomar and Asma, 2000

Responsible or a major factor?????
Risk of Developing Periodontitis in Smokers

- Current smokers: 4X greater risk (than in non-smokers)
- Former smokers: 2X greater risk

Dose response relationship between cigarettes smoked and the odds of periodontitis:

- < 9/day: 3X greater risk
- ≥ 31/day: 6X greater risk

- Former smoker reduces risk with years since quitting:
  - 0 - 2 years: 3X greater risk
  - > 11 years: same risk as non-smokers

Practical information is that continuing smokers show a 6-7 x greater incidence of tooth loss than non-smokers!!!!

Tomar, J. Perio. May 2000
Effects of smoking on Epithelium

- Reduced blood flow
- Pale colour gingivae
- Reduced gingival bleeding – obstructive to diagnosis
- Can be confused with healthy appearance
- Palatal tissue often thickened, having a dry appearance and lined
- “Hot-spots” can be associated with localised recession,
  - eg. Palatal roots of upper first molars
Effects of smoking on the connective tissue

- Reduced blood flow
- Reduced vascularity
- Compromised healing rate
- Reduced elasticity
- Increased tendency to recession
Effects of smoking on Bone

- Reduced blood flow
- Reduced vascularity
- Increased osteoclastic action
- Subdued osteoblastic action
- Reduced healing rate
- Reduced response to growth stimuli
Effects of smoking on Cementum

- Staining is more difficult to remove atraumatically than on enamel
- May mimic root caries
- May mask root caries
- May exaggerate the “black holes” of recession

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Evidence for smoking as a secondary risk factor for periodontal diseases

- Progressive reports since the early 1990’s on:
  - Success of surgery in smokers
  - Success of non-surgical treatments
  - Plaque control in smokers
  - Influence of HRT/oestrogen in smokers
  - Implant failure rates are 60% higher in smokers
  - Increased periodontal disease in heart attack and stroke patients who smoked
  - And many, many others............
Practical aspects of oral hygiene in smokers

- Poor Oral Awareness
- Poor awareness of what a clean tooth/mouth feels like
- Reduced tactile sensation when cleaning sub-gingivally
- Drying effect reduces natural saliva’s protective role
- Reduced initial bleeding limits personal observation of changes and improvements
Setting goals for Cessation

- **Recognition** of Smoking Cessation as an aid to periodontal recovery

Or

- Periodontal disease and treatment – building on the desire not to lose teeth – as a **Motivation** for smoking cessation

Or

- Improving whole health awareness and introducing an **Understanding** of the effects of smoking

Alan Woodman @ UPDA
What smoking is acceptable?

- **HARD FACTS**
  - It takes 10 years for the effects of smoking to leave the body
  - It takes 1 year for the effects of smoking to leave the oral tissues
  - Treatment in a current or recent smoker *will be compromised*
  - Research suggests that influence on periodontal disease is only significant when 7 or more cigarettes are smoked per day

  CAN IT BE RIGHT TO TAKE A SOFT ROLE AND SUGGEST CUTTING BACK TO 6/DAY?

  - Timing of the goal is a personal matter
  - Professional advice is now more readily available than ever – and we should make it available.

- **CESSATION** NOT REDUCTION SHOULD ALWAYS BE THE GOAL
Non-Resolving Pocket

ADDITIONAL PROBLEMS

- ANATOMICAL VARIATIONS
- MEDICAL CONDITIONS
- PREScribed MEDICATIONS
- PHYSICAL COMPROMISES

PREScribed MEDICATIONS MOSTLY INFLUENCE THE SIZE AND TEXTURE OF THE TISSUES – DRUG INDUCED GINGIVAL OVERGROWTH - DIGO
DRUG INDUCED GINGIVAL OVERGROWTH (DIGO)

- Drugs that can cause gingival overgrowth
  - Phenytoin (Dilantin, Epanutin)
    - treatment of epileptic conditions
  - Cyclosporin
    - anti-rejection treatment in transplants and some severe skin conditions
  - Calcium channel blockers (Nifedipine group)
    - blood pressure regulators
  - Possibly Tacrolimus
    - which is a new anti rejection drug,
    - but it may be that patients who are swapped from cyclosporin to tacrolimus have a residual effect from the cyclosporin.
  - Sodium Valproate and Erythromycin
    - but these are both case reports only
NON-SURGICAL care for DIGO

- Reduce the inflammatory component in the tissues
  - (Montebugnoli et al JCP 2000, Seymour and Smith JCP 1991)

- Case reports show that the non surgical management can result in complete resolution of drug induced gingival overgrowth, especially calcium channel blockers

- All patients at risk benefit from a course of non surgical management and extensive follow up. They should ideally receive such treatment before they start the medication but this is often impractical especially for the organ transplant patients

Amlodipine patient treated non-surgically with intense supportive care
Antiseptic mouthwash is used as an adjunct to the non surgical management. Animal studies have shown that chlorhexidine can reduce the cyclosporin drug induced gingival overgrowth.

Systemic antibiotics have also been studied. The two that have been looked at are metronidazole (Wong et al, Lancet 1994, Chand et al 2004), and azithromycin (Najar et al 2003). It was postulated that as they reduced the bacterial infection and hence the inflammation it also reduced the activity of the fibroblasts as well.

Phenytoin does inhibit folic acid metabolism so a folic acid mouthwash may be of use in patients who are low in folate.
Non-Resolving Pocket

ADDITIONAL PROBLEMS

- ANATOMICAL VARIATIONS
- MEDICAL CONDITIONS
- PRESCRIBED MEDICATIONS

✓ PHYSICAL COMPROMISES

- ARTHRITIS
- RESTRICTED VISION
- MENTAL INCAPACITY
- JUST POOR DEXTERITY
Time for Lunch!
Non-Resolving Pocket

MANAGING MOBILITY

Mobility is often overlooked as an obstacle to thorough cleaning:

- Professionally – can you scale or debride a moving surface well?
- Personally – can or will your patient brush firmly and effectively on a moving (possibly tender) tooth?

Reducing mobility increases the effectiveness of cleaning both personal and professional

Determining **WHY** the tooth is mobile is essential for a long-term successful outcome.
Who cares about mobility?

- The Patient
  - Pain on function
  - Pain after para-function
  - Drifting

- The dentist/hygienist
  - Cleansability
  - Restorability

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How do we measure mobility?

Miller’s Index:

Gentle side to side pressure with two instrument handles

- <1mm lateral movement = grade I
- 1-2mm lateral movement = grade II
- >2mm lateral mobility or
- any vertical mobility = grade III

- Some computer systems give ½ points on the scale, which is useful for monitoring changes, but the whole system is very subjective
- NEVER use your fingers!
Why are teeth mobile?

- Trauma – physical or occlusal
- **Reduced periodontium**
  - Weakened resistance to functional loading

- Complications:
  - short roots
  - bone dehiscences
  - lack of posterior support
  - existing prostheses
Managing Mobile Teeth

What are the options?
- Ignore
- Extract
- Recognise, reassure and monitor
- Recognise, analyse, adjust, reassure and monitor
- Recognise, analyse, adjust/fit occlusal splint and monitor
- Recognise, analyse, adjust/place periodontal splint and monitor
- Recognise, analyse, adjust/place periodontal splint, fit occlusal splint and monitor
Managing Mobile Teeth

- Why splint?
- What to use?
- Extra- or Intra-coronal?
- How to apply?
- How to maintain?
- Occlusal splints for stability?
- Combination splints or bridges?
WHY Splint?

- Patient comfort
- Improved stability for cleaning
- Functional support
- Occlusal protection
- Pre- & post-operative support
- Immediate bridgework
- Trauma:
  - short term stabilisation
  - long term retention
What to use?

- Composites-
  - these will be very short lived and oral hygiene nightmares
- Composites with wire –
  - these will fail on mobile teeth, but succeed post-orthodontically
- For a lasting result in periodontally compromised teeth:
  - Composites with metal grids
  - Composites with resin webbing
  - eg. “Ribbond”
  - Composites with “Rochette” casting
  - Composites with “Maryland” casting
An unorthodox splint!

How not to do it!

But these were applied by a “specialist”(!) Periodontist in Glasgow!

< After revision with Ribbond
An orthodontist’s idea from the USA!

The patient was expected to wear this all day and all night and still smile!

Lowers splinted, occlusal night time splint for the upper teeth
A calculus splint!

Easy to make at home if you have the time and patience......

....hiding an earlier dentist’s attempt!
A Ribbond splint – how it **should** look!

Mirror view of the splint on the incisal 1/3 of the anterior palatal surfaces
An essential surgical splint

Placed for pre- and post-operative stability
A natural pontic-carrying splint

UL2 is extracted and immediately refixed with Ribbond/composite

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An aesthetic splint

Mobile teeth may be gently persuaded to move together prior to splinting
The Italian Job!

Full arch splinting / bridgework and no oral hygiene follow up for 30 years

Upper bridge removed

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Managing active periodontal destruction

Hopeless teeth removed and partial denture fitted
Managing active periodontal destruction

Six remaining teeth prepared with “telescopic” crowns for the “Gothenburg” bridge
Managing active periodontal disease

- The periodontal splint / bridge offering a stable occlusion on the metal and replacing the failed first premolars.....

- If there is concern about retention/occlusal factors - a “Rochette” design allows easy re-application
Combination splints or *bridges*?

- Missing teeth can form part of a splint
- the original “Rochette”
Combination splints or *bridges*?

- Splinted teeth can be resected to convert to a bridge
  - on metal splints
  - on composite-webbing splints
Combination splints or *bridges*?

**Some basic engineering tips....**
- Resin bonded splints need more retainers when multiple abutments are mobile
- *Ideally* the most distal abutments should not be mobile
- Using flowable composite interdentally can help:
  - retention
  - aesthetics
  - and minimise the risk of de-bonding
Managing gingival deficiencies

Immediate, adjustable, Gradia composite, resin retained bridge
Managing gingival deficiencies

- **Pink porcelain** is tempting but may obstruct oral hygiene
- **Gradia composite** has added another aesthetic option when the soft tissues are reduced – and is adjustable
- **Labial acrylic veneers - gumslips** - are a safer alternative for periodontally susceptible patients
How to apply a “Ribbond” splint

- Check occlusion, prior to:
  - Careful surface preparation
  - Interdental preparation
  - Ribbond measurement:
    - use a foil template
    - choose width
    - crimp interdentally......

......

- Apply wedges to stabilise teeth
- Ensure slight interdental space
- Etch as usual for composites
- Wash and dry, do not dessicate
- Apply bonding resin,
- Air-blow excess resin, light cure......
How to apply a “Ribbond” splint

- Saturate Ribbond in bonding resin
- Place thin layer of flowable composite interdentally -
- Brush finish
- Cure to stabilise the teeth in the desired position
- Place small amount of composite on lingually prepared teeth......

- Apply “Ribbond” from the most distal tooth
- Gently press into the composite
- Light cure briefly - 10sec
- Work the webbing progressively along the teeth involved
- Indent the webbing into the proximal areas
- Cure progressively......
How to apply a “Ribbond” splint

- Cover webbing completely with composite
- Brush finish before curing
- Cure for at least 40sec
- Finish surface with diamond/white stone
- If in occlusion, remove dam if used, and check with GHM tape
- Adjust composite if needed, do not reveal webbing

- Check interdental margins and especially the distal interproximal areas with floss
- When surface is finished apply a thin layer of bonding resin as a “glaze”
- Give oral hygiene advice
- Review in 1-2 weeks, be prepared to refine surface on the evidence of the tongue!
How to apply a “Ribbond” splint
The “Ribbond” splint/ immediate bridge
The “Ribbond” splint/ immediate bridge
The “Ribbond” splint/ immediate bridge
How to maintain?

- Splinting teeth is very labour intensive.
- Checks on composite margins should be made at every review/exam.
- Occlusion should be reviewed and mobility recorded if appropriate.
- All splints will fail! The timing is unpredictable.
- Be prepared to repair and re-surface the splint occasionally.
- Bottle brushes or floss threaders are essential.
- Routine hygienist support is mandatory.
Extra- or Intra-coronal?

- Extra-coronal
  - Bulky
  - Less comfortable
  - Prone to wear
  - Prone to debonding
  - Impractical occlusally for posteriors
  - Non-invasive
  - Quicker to apply

- Intra-coronal
  - Contoured
  - More comfortable
  - Resist wear better
  - Debond rarely
  - Ideal for posteriors, esp. when restored
  - Time consuming
  - Invasive
Mobility

- don’t worry about it!
- do something about it!
Time for Tea!
Non-Resolving Pocket

SURGICAL OPTIONS

FOR SOME NON-RESOLVING POCKETS THE COMBINATION OF

- Anatomy,
- Tissue texture and
- Pathologic changes

CANNOT BE OVERCOME BY AN HYGIENIC APPROACH ALONE

SURGERY MAY BE EMPLOYED TO FACILITATE FUTURE HYGIENE CARE BY ALTERING THE CURRENT ANATOMY
Role of Surgery in Periodontal Care

- what can be achieved?
  - pocket elimination
  - pocket reduction
  - regeneration or approximation?
  - better restorative management
  - cosmetic changes
  - oral hygiene facilitation

- what to expect?
  - most surgical periodontal procedures are accompanied by gingival recession, desired or not!
  - absolute OH compliance is a necessity
  - smokers fare less well, but can be treated
  - regeneration can only treat “craters” in vertical defect, not horizontal loss
Role of Surgery in Periodontal Care

- Pocket elimination & Pocket reduction
  - With Regenerative materials
Role of Surgery in Periodontal Care

- Pocket elimination & Pocket reduction
  - With Regenerative materials

EMDOGAIN

PERIOGLAS

PRE-OP
9 MONTHS
6 MONTHS

Alan Woodman @ UPDA
Role of Surgery in Periodontal Care

- Removal of excess tissues
  - This can be done as a gingivectomy:
    - Incisional surgery
    - Electro-surgery (diathermy)
    - **Radio Wave Frequency surgery**
  - These approaches leave a raw surface and a protective periodontal dressing (“Pack”) may be required for 7-10 days

An extreme case of gingival obstruction treated with radio wave frequency surgery
Role of Surgery in Periodontal Care

- Removal of excess tissues
  - This can be done as a gingivectomy:
    - Incisional surgery
    - Electro-surgery (diathermy)
    - Radio Wave Frequency surgery
  - *These approaches leave a raw surface and a protective periodontal dressing (“Pack”) may be required for 7-10 days*

- Or a *flap approach*

An extreme case of gingival obstruction treated with a flap approach
Role of Surgery in Periodontal Care

Connective tissue grafting

- For restoration of gingival contour
- For aesthetic purposes, with sliding flap approach + palatal graft
Role of Surgery in Periodontal Care

Connective tissue grafting

- For restoration of gingival contour
- For aesthetic purposes, with sliding flap approach + palatal graft

Pre-op view

After three months healing
A SPECIFIC CASE:

- Ms C H
- Localised recession lesion labial to UL3, with associated pocketing, intended for connective tissue grafting and Emdogain application
A SPECIFIC CASE:

- Initial treatment for SUB-gingival cleaning with STB to:
  - Maximise the tissue firmness
  - Reduce the bleeding and
  - Increase surgical predictability
Procedure:

- LA to recipient site
- LA to donor site (UL78 edentulous ridge)
- Prepare recipient site to receive graft
- Remove graft from donor site, place in saline
- Suture donor site 1x continuous Vicryl 5/0 suture
- Pressure pack

- De-epithelialise graft
- Clean & Re-contour labial root surface (to be gently concave)
- Pre-suture graft (5/0 Vicryl)
- Place graft at recipient site
- Place Emdogain on root surface
- Suture graft and marginal flaps
- Pressure pack and Post-op
- Review at 10 days & 3/52
A CT grafting case
A regenerative case – BioOss & BioGide
Using Emdogain for reattachment
Non-Resolving Pocket
LONG TERM SUPPORT

Whether surgery is employed or a non-surgical approach is undertaken, long term supportive care is an ESSENTIAL part of therapy.

Is such care best described as:

- “Supportive”, or
- “Maintenance”?........

Or are the words interchangeable?........

........ I think not!

- **Supportive Care** is given to patients who are carrying out their own home care well and require reinforcement and regular encouragement on the long haul, but show a stable, but possibly reduced, periodontium

- Professional 15% vs. 85% home care!

- **Maintenance Care** refers to the ongoing professional attention to mainly subgingival deposits in the absence of effective patient home care and the risk of progression of disease

- Professional % exceeds 15%!

- Both approaches aim to maintain stability

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What is Periodontal Stability?

The rationale for long term supportive periodontal care:

- A stable periodontium is one where there is no progression of attachment loss
- To ensure periodontal stability, the periodontal tissues should be free of inflammation, which practically requires effective plaque control
- The patient should be comfortable with their, possibly reduced, periodontium within a functional dentition
How is stability monitored?

Stability is monitored by keeping progressive full sets of periodontal indices. These may include an assessment of:

- Plaque
- Gingivae
- Periodontal pockets
- Recession
- Loss of attachment
- Mobility
- Infection
- Alveolar bone levels
- Furcation status
Treatment options for Maintenance

- Once the review has been conducted and it has been decided that the patient requires maintenance treatment.....
- What do you think the patient will need from you to keep their periodontal condition maintained?

Nothing we do will overcome......

.................what the patient will not do!
Treatment options for Maintenance

- Support
- Guidance
- Encouragement
- Honest appraisal
- Careful plaque removal
- Diligent instrumentation
- Smoking cessation support
- Referral for advice and guidance

Nothing we do will overcome......

.........what the patient will not do!
Treatment options for Maintenance

- Oral hygiene motivation
- Review of OH regime
- Removal of all hard and soft deposits
If the patient is in **supportive care**, by definition the periodontal tissues should be stable

This means that the patient should have reached a ‘maintainable’ level of plaque

For each of us there is a “tolerable” level of plaque

An individual’s plaque susceptibility will vary that level
Oral hygiene motivation

- If the patient is in *maintenance care*, by definition the periodontal tissues are still at risk without regular “de-plaquing”
- This implies that the patient has struggled to reach a ‘maintainable’ level of plaque
- How much plaque can be present before the stability is lost?
Oral hygiene motivation

- There are subtle differences between oral hygiene motivation and oral hygiene instruction

- What are the differences?
  - UNDERSTANDING
  - FEELING THE BENEFIT
  - APPRECIATION OF NEED

INSTRUCTION WITHOUT MOTIVATION = FAILURE
Review of OH regime

- Although there has been a formal review of the patient before the maintenance treatment plan has been drawn up, it is important to check at each visit to see if anything has changed which may alter the treatment plan.

- This includes checking the medical history, especially new medication.

- It also includes checking other relevant factors, such as smoking status.
Removal of all hard and soft deposits

- To ensure that the patient is able to continue to maintain their periodontal health it is important that the teeth are as easy to clean as possible........

For any altered gingival anatomy the Sonicare powered brush wins first prize!
Removal of all hard and soft deposits

- To ensure that the patient is able to continue to maintain their periodontal health it is important that the teeth are as easy to clean as possible.

- It is important to remove or disrupt the biofilm at regular intervals to prevent the re-establishment of a pathogenic biofilm.

Is it more important to remove the hard or the soft deposits?
Removal of all hard and soft deposits

- To ensure that the patient is able to continue to maintain their periodontal health it is important that the teeth are as easy to clean as possible.

- It is important to remove or disrupt the biofilm at regular intervals to prevent the re-establishment of a pathogenic biofilm.

- Fine instruments, both hand and ultrasonic are ESSENTIAL for supportive and maintenance care........
Residual post-operative sensitivity

- Is less frequent than claimed!
- Should be manageable with a conservative, topical approach
- Can be minimised by avoiding instrumentation of the C E J!
- NB: not all teeth have an intact CEJ – at least 40% of teeth have, NATURALLY, up to 15% of their circumference with no overlap of enamel over cementum (or vice versa) – exposing dentine - thus predisposing them to sensitivity if the protective gingival cuff is relaxed.

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Residual post-operative sensitivity

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Frequency of review appointments

- How often should a review appointment be scheduled?
- Who is responsible for ..... 
- Deciding the time frame?
- Conducting the review?

- Who is responsible for treatment planning?
- What can a DCP do?
- What should a Dentist do?

Make sure the reception staff are motivated too!
Frequency of Maintenance appointments

What do you think is the ideal interval between maintenance visits for a patient...

- At high risk of periodontal breakdown?
- At moderate risk of periodontal breakdown?
- At low risk of periodontal breakdown?
- Is there any evidence to support this?
Managing the non-resolving pocket

- PROFESSIONAL
  - Periodontal treatment only succeeds with
    - Time
    - Commitment
    - Long-term enthusiasm

- PATIENT
  - Periodontal treatment only succeeds with
    - Time
    - Commitment
    - Long-term enthusiasm
Managing the non-resolving pocket

OUR TIME IS UP!

Thank you for your attention

Hopefully we have reassured you that long-term periodontal care is effective and worthwhile

Please take a few moments to evaluate the day

Alan Woodman @ UPDA
## References – Books that are relevant to UK practice, easy to read and digest and inexpensive

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