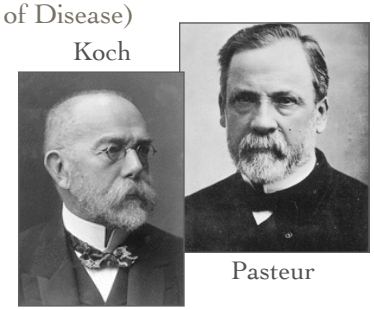
Antibiotics in Non-Surgical Periodontal Therapy

History

1880's: Robert Koch and Louis Pasteur (Germ Theory of Disease)



Koch

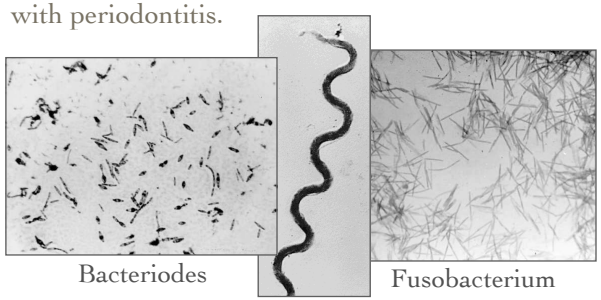
Pasteur

1928: Alexander Fleming (discovered Penicillin)

1944: Penicillin first used to treat Necrotizing Gingivitis

1970: Plaque accepted as bacteria-laden cause of gingivitis and periodontitis.

1976: Microbial specificity determined at sites with periodontitis.



Bacteriodes

Treponema

Fusobacterium

SRP is anti-infective

Scaling and root planing (SRP) removes subgingival bacteria and resolves infection in order to regain lost attachment levels. But 10-20% of the time, attachment loss still persists. Major reasons include ability of the bacterial pathogens to invade host tissue, reside in areas not accessible to our instruments (tonsils, dorsum of tongue, furcations or difficult tooth anatomy), or because the patient is immunocompromised (HIV, diabetes, or white blood cell defects) and unable to manage the bacterial load.

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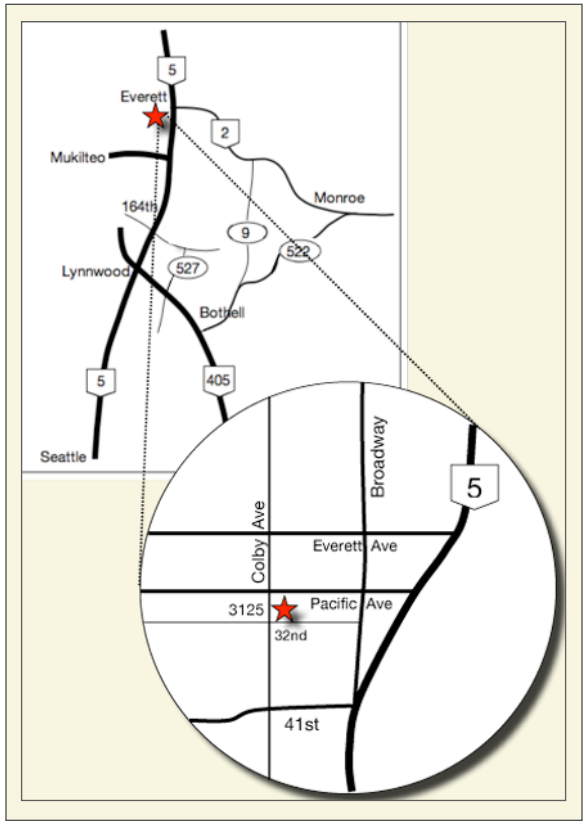

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Probe Tips

Antibiotics in Non-Surgical Periodontal Therapy

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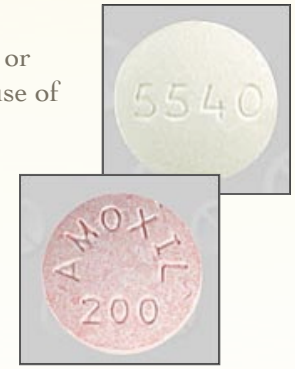
Antibiotics in Non-Surgical Periodontal Therapy

General Considerations:

The rationale for the use of antibiotics to control periodontitis is to support the host defense system by killing subgingival bacteria not affected by scaling and root planing.

Systemic Antibiotics:

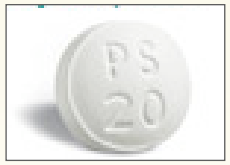
The most effective antibiotic used to treat periodontitis is actually a combination of two drugs: Amoxicillin and Metronidazole. A systematic review of the use of this and other systemic antibiotics in combination or alone concluded that the use of antibiotics was most beneficial (0.5mm average gain in probing depth) for patients with moderate to severe forms of aggressive or recalcitrant periodontitis, meaning that the 80% of patients with average chronic periodontitis did not have significant benefit from the combined use of antibiotics with scaling and root planing (SRP) beyond what was gained from initial SRP alone.



Factors limiting effectiveness of antibiotics:
Patient non-compliance, Altered patient metabolism, Drug interactions with medications patient is currently taking, Lack of blood supply to area of infection, Bacterial self-defense (biofilm), Lack of significant difference between bacterial flora in healthy vs diseased pocket.

Disadvantages of Antibiotic Use:
Dispersal of antibiotic to whole body rather than locus of infection, Irradication of 'good' bacteria (normal oral flora) leading to other infections (yeast infection), Development of antibiotic resistant organisms, Adverse reactions/allergy.

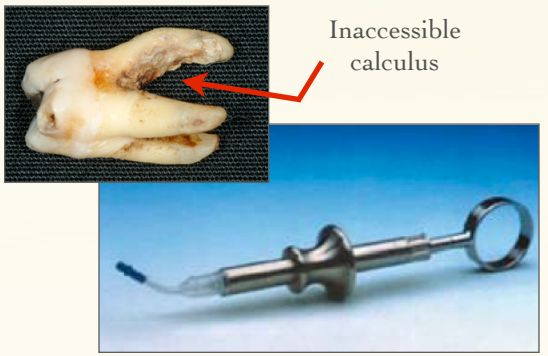
Periostat:



Of special mention is a drug called Periostat which is a form of doxycycline not used as an antibiotic, but instead prescribed at a low enough dosage to act as a host modulator rather than a bacteria killer. As with systemic antibiotic use, this drug is reserved for patients not responding well to initial therapy (SRP). This drug and other host modulators will be discussed in another issue of ProbeTips.

Local Antibiotics:

Of all the local antibiotics available, Arestin is the most commonly used in the US. Packaged as microspheres of minocycline, it is placed into a periodontal pocket and eliminates some of the problems inherent with systemic antibiotic use such as having adequate blood supply to the area, focus and maintenance of a cidal level of antibiotic in the area most needed, or patient compliance. In another systematic review of the use of local anti-infectives, it was concluded that these medicaments are most beneficial for patients with good hygiene compliance and a generally good response to scaling, but with unresolved residual bleeding pocketing in the 4-6mm range. The paper reports a 0.5mm gain in probing depth in patients on regular hygiene maintenance. It is to be used as an adjunct to initial therapy rather than the basis of initial therapy, as calculus remaining in a pocket can lead to return of the inflammation and pocketing and further attachment loss.



Factors limiting effectiveness:
Difficulty inserting antibiotic in correct location, inaccessibility to furcations

Disadvantages:
Foreign body reaction to carrier holding the antibiotic

Conclusion

The use of antibiotics should be limited to those patients who do not respond well to initial therapy despite good oral hygiene and lack of obvious bacterial plaque loads.

Jorgensen, Aalam, Slots. *Int Dent J* 2005
Haffajee, Socransky, Gunsolley. *Ann Perio* 2003
Hanes, Purvis. *Ann Perio* 2003;