

QUESTION 3

What is the role of systemic antibiotic therapy in periodontal treatment?

Background

Periodontal disease attacks the supporting tissues of the teeth, causing bleeding on probing, pocketing, loss of bone and eventual loss of the dentition. Accumulation of a bacterial plaque biofilm (a structured community of bacterial cells enclosed in a self-produced glycocalyx matrix) is a prerequisite for this disease process. Regular removal of the biofilm through good home care by the patient and regular maintenance by a dental professional is the primary means of preventing periodontal disease.^{1,2}

In spite of these measures, periodontal breakdown may continue (Fig. 1). Pockets continue to deepen, bleeding persists, support decreases and teeth are lost. At this point, it is necessary to reassess the case and determine the cause or causes for the ongoing periodontal breakdown. Refractory periodontitis may be diagnosed if conventional treatment has failed altogether, whereas recurrent periodontitis is diagnosed if conventional therapy was initially successful but the patient then failed to follow through with professional care at the suggested intervals or neglected his or her oral hygiene. The patient's systemic health may also be of concern. Diabetes, HIV/AIDS, cyclic neutropenia and other immunological conditions may leave the patient vulnerable to periodontal breakdown.³ A genetic predisposition may be present. Smoking and tobacco use may hinder conventional treatment.⁴

With these factors in mind, systemic antibiotic therapy can be a useful adjunct to conventional treatment. Before antibiotics are prescribed, the patient must be re-examined and specific goals set. The area of concern should then be reassessed at

appropriate intervals to ensure that the prescribed antibiotic has achieved these objectives.⁵ Many studies have looked at the effectiveness of various antibiotic therapies, specifically penicillin, amoxicillin, clindamycin, metronidazole and tetracyclines. Almost all of these studies have examined conventional treatment (mechanical debridement) with and without the addition of an antibiotic.

Benefits and Risks of Systemic Antibiotics

Tetracyclines (in particular, minocycline and doxycycline), clindamycin and erythromycin are broad-spectrum bacteriostatic agents. In addition to their antibacterial effects, tetracyclines are capable of inhibiting collagenase, thus preventing tissue breakdown. Another benefit of tetracyclines is their ability to bind to tooth surfaces, which allows them to be released over time. Their use in recurrent and refractory periodontal disease has been well researched.⁶ The primary drawback to clindamycin is its link to severe gastrointestinal disturbances, including colonization by *Clostridium difficile*, a potentially fatal condition.⁵ For this reason, caution is needed in prescribing this drug, especially for use by elderly patients. Erythromycin may interact with other commonly used medications, such as benzodiazepines, ranitidine, oral anticoagulants, digoxin and methylprednisone.⁷

Metronidazole improves results when used in conjunction with scaling and root planing. However, it has no such improvement effect when combined with periodontal surgery. Use of metronidazole is contraindicated for patients taking warfarin.⁸ Patients must also be advised to avoid alcohol, as they may suffer severe gastrointestinal upset, similar to the effects of disulfiram (Antabuse). Studies have shown that Augmentin (amoxicillin plus clavulanic acid) may improve clinical results when used in combination with scaling and root planing and, in rapidly progressive cases, surgery.

My 21 years of treating periodontal disease has led me to use antibiotic therapy only if conventional therapy has failed to control the disease. One potential exception occurs with patients who have diabetes, especially those with moderate to poor control of blood sugar. Diabetic control depends on eliminating chronic infections in these



Figure 1: Anterior bite collapse due to ongoing periodontal disease.

patients. The routine addition of antibiotics has enhanced the results achieved by scaling and root planing or periodontal surgery.

People who smoke may also benefit from the addition of antibiotic therapy to conventional treatment, as they have higher levels of periodontal pathogens in shallower pockets. It can be difficult to monitor periodontal disease in these patients at maintenance visits because the microvascular effects of tobacco products lead to a lack of bleeding on probing, even when periodontal disease is active. Serial radiographs and serial recording of pocket depth are necessary for monitoring these patients.

In conclusion, antibiotic therapy can be a useful adjunct in the treatment of periodontal disease. However, it cannot replace scaling and root planing, with or without periodontal surgery, and good oral hygiene on the part of the patient. Appropriate maintenance of all patients with periodontal disease is critical to ensure that the results achieved with active treatment are retained. Antibiotic therapy, when applied in cases of refractory or recurrent disease or in immunocompromised patients, can help achieve good long-term results. ✦

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References

1. Lindhe J, Nyman S. Long-term maintenance of patients treated for advanced periodontal disease. *J Clin Periodontol* 1984; 11(8):504–14.
2. Haffajee AD, Arquello EI, Ximener-Fyvie LA, Socransky SS. Controlling the plaque biofilm. *Int Dent J* 2003; 53(Suppl 3):191–9.
3. Mealey BL, Oates TW, American Academy of Periodontology. Diabetes mellitus and periodontal diseases. *J Perio* 2006; 77(8):1289–303.
4. Shimazaki Y, Saito T, Kiyohara Y, Kato I, Kubo M, Iida M, and other. The influence of current and former smoking on gingival bleeding: the Hisayama study. *J Periodontol* 2006; 77(8):1430–143.
5. Slots J. Selection of antimicrobial agents in periodontal therapy. *J Periodontol Res* 2002; 37(5):389–98.
6. Cortelli JR, Querido SM, Aquino DR, Ricardo LH, Pallos D. Longitudinal clinical evaluation of adjunct minocycline in the treatment of chronic periodontitis. *J Periodontol* 2006; 77(2):161–6.
7. Bartlett JG. Narrative review: the new epidemic of *Clostridium difficile*-associated enteric disease. *Ann Intern Med* 2006; 145(10):758–64.
8. Hersh EV, Morre PA. Drug interactions in dentistry: the importance of knowing your CYPs. *J Am Dental Assoc* 2004; 135(3):298–311.