VITAL GUIDE SERIES 15
Vital guide to periodontology

- Which diseases affect the periodontal tissues?
- How can periodontal diseases be treated?
- Is the wider dental team involved?

VITAL GUIDE TO Periodontology

Geoff Sharpe* explains why dental professionals should strive to promote excellent periodontal health for all patients.

Introduction

Periodontal diseases affect a significant proportion of the population. The most prevalent periodontal disease is chronic periodontitis, although it should be remembered that this condition is only one of a number of diseases that can affect the periodontal tissues (Table 1).[1] Chronic periodontitis is a plaque-induced inflammatory disease resulting from interactions between plaque bacteria and the immune system. These interactions result in loss of attachment to the root surface and pocket formation, allowing more bacteria to accumulate beneath the gingival margin. If left untreated, loss of supporting alveolar bone occurs, which can lead to increased mobility and tooth loss.[2] This process may be exacerbated by various systemic factors such as smoking, diabetes and some rare disorders of the immune system.

Common signs and symptoms of periodontitis include bleeding gums, halitosis, receding gums, tooth sensitivity and tooth mobility (Fig. 1). Unfortunately, periodontal diseases often don't cause obvious symptoms until the teeth begin to move or feel loose. Many patients think that it's perfectly normal to have bleeding gums when brushing!

There is emerging evidence of a significant association between periodontitis and other diseases, most notably cardiovascular disease.[3] Although a causal link has not been proven, the common risk factors between the two conditions are now well established and are subject to ongoing research activity. Some of this discussion has been published in the news media and many patients are becoming concerned over the possible link between periodontitis and their overall general health.

Fig. 1 Chronic periodontitis case showing plaque accumulation, marked gingival inflammation and bleeding after probing

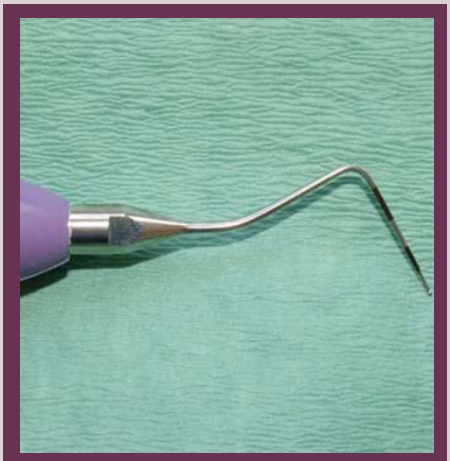

Fig. 2 A WHO periodontal probe used to carry out a Basic Periodontal Examination (BPE). All sites (excluding third molars) are examined and each sextant given a code depending on the worst site in that sextant (as described in Table 2)

Diagnosis of periodontal diseases

Since periodontitis is often asymptomatic, it is essential to screen all patients for periodontal diseases to allow early diagnosis and treatment. A simple and effective way of screening patients in general dental practice is to carry out a Basic Periodontal Examination (Table 2) using a WHO periodontal probe (Fig. 2). Patients who have signs of significant periodontitis will require a more comprehensive examination including pocket charting, bleeding scores and radiographs in order to assess the extent of the disease and periodontal bone levels (Fig. 3).[4]

Fig. 3 Radiograph showing advanced bone loss resulting from severe chronic periodontitis

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Table 1 1999 International Workshop Classification of Periodontal Diseases

I	Gingival diseases
II	Chronic periodontitis
III	Aggressive periodontitis
IV	Periodontitis as a manifestation of systemic diseases
V	Necrotising periodontal diseases
VI	Abscesses of the periodontium
VII	Periodontitis associated with endodontic lesions
VIII	Developmental or acquired deformities and conditions

Table 2 The Basic Periodontal Examination (BPE)

Code 0	Given to the sextant if there are no pockets exceeding 3 mm in depth (coloured area remains totally visible), no calculus or overhangs of fillings and no bleeding after gentle probing.
Code 1	Given to the sextant if there are no pockets exceeding 3 mm in depth (coloured area remains totally visible) and no calculus or overhangs of fillings but bleeding occurs after gentle probing.
Code 2	Given to the sextant if there are no pockets exceeding 3 mm in depth (coloured area remains totally visible) but dental calculus or other plaque retention factors are seen at, or recognised underneath, the gingival margin.
Code 3	Given to the sextant if the colour coded area of the probe remains partially visible when inserted into the deepest pocket.
Code 4	Given to the sextant if at one or more teeth the colour coded area of the WHO probe disappears into the inflamed pocket indicating pocket depth of 6 mm or more.
Code *	Given to a sextant if there is total attachment loss at any site of 7 mm or more, or if a furcation can be probed.

Initial periodontal therapy

Maintaining excellent oral hygiene on a daily basis is critical for successful treatment. This is an excellent opportunity to involve the whole dental team in providing educational materials and oral hygiene advice.

The conventional approach to periodontal treatment is to remove bacterial deposits from the teeth and root surfaces by scaling and root planing. This traditionally involves thorough subgingival debridement to remove all plaque and calculus using a combination of hand and ultrasonic instruments over a series of appointments.

Contemporary treatment places less emphasis on mechanical scaling of the root surface and a greater focus on subgingival decontamination and disruption of the subgingival biofilm, usually with ultrasonic instrumentation and often over fewer appointments. In the presence of adequate supragingival plaque control, this initial therapy allows resolution of inflammation and a reduction in probing pocket depths (Figs 4-5).[5] Full-mouth treatment protocols typically involve instrumentation within a very short timescale (usually within 24 hours) and often require significant adjunctive chlorhexidine application. The concept of 'full-mouth disinfection' has been very popular in recent times, although new research suggests that conventional staged treatment may be just as effective.[6]

Once the disease has been brought under control, most periodontal patients will require supportive periodontal treatment at regular intervals in order to monitor their oral hygiene, remove any deposits and re-instrument any residual sites that the patient is unable to access.[7] Much of this treatment may be carried out by a dental hygienist or therapist working under the guidance of a dentist or periodontist.

Various types of locally delivered antimicrobials are available to place into periodontal pockets and these can be useful to manage non-responding sites or areas of disease recurrence. Antibiotics are rarely indicated in the management of periodontitis except in exceptional circumstances, such as in cases of aggressive periodontitis.

Fig. 4 Chronic periodontitis case before initial periodontal therapy

Fig. 5 Chronic periodontitis case (seen in Fig. 4) after initial periodontal therapy

Surgical treatment

Further treatment may occasionally be necessary to deal with residual pockets or difficult anatomical features. This can involve periodontal surgery to allow better access to the root surface, eliminate periodontal pockets and re-shape the periodontal tissues to aid oral hygiene procedures by the patient.[8] In certain circumstances, it is possible to regenerate some of the periodontal tissues that have been lost due to destructive periodontal diseases by using specialist techniques and biomaterials.[9]

Rehabilitation of the periodontally compromised dentition

Periodontitis is a major cause of tooth loss and many patients will require replacement of missing teeth due to the effects of periodontitis. This requires careful treatment planning and often requires multi-disciplinary management with

Fig. 6 Gingival asymmetry case prior to cosmetic treatment

Fig. 7 Gingival asymmetry case (seen in Fig. 6) after crown lengthening surgery to improve gingival contours and provision of anterior veneers (restorations by Dr Darren Cannell)

input from periodontists, prosthodontists and dental technicians. Dental implants are becoming more widely available to replace missing teeth and are often the treatment of choice in the rehabilitation of the periodontally compromised dentition.[10] Since periodontitis results in the loss of alveolar bone, placement of implant fixtures in patients who have suffered periodontitis may be quite complex, sometimes requiring bone grafts or augmentation to provide sufficient bone for implant placement.

Peri-implant disease (peri-implantitis) is also becoming an increasing problem and can be difficult to manage.[11] It is very important to thoroughly treat any existing periodontal disease prior to implant treatment and arrange frequent review appointments to carry out any necessary supportive periodontal treatment.

Cosmetic periodontal treatment

There has been a significant growth in the market for cosmetic dental treatment in recent years. Many patients are requesting 'smile makeovers' involving tooth whitening, orthodontics or the provision of porcelain crowns or veneers. It is important that the soft tissue aesthetics are not overlooked when planning and discussing cosmetic dental treatment. Common problems include gingival asymmetry, excess gingival display and recession.[12]

Excess gingival display can be treated using crown-lengthening surgery to reduce the amount of soft tissue around the teeth and recreate a more natural gum line (Figs 6-7). Osseous recontouring is usually required to ensure maintenance of the biologic width and a stable outcome. This technique can also be helpful when restoring posterior teeth with subgingival restoration margins or when insufficient coronal tissue remains to provide a satisfactory restoration.

Gingival recession can be treated with soft tissue surgery using locally repositioned flaps or soft tissue grafts taken from elsewhere in the mouth to cover recession defects.[13] Soft tissue grafting may also be necessary to recreate a better soft tissue profile beneath bridge pontics or adjacent to implant fixtures to improve the aesthetic outcome.

Conclusions

Periodontology has evolved over the years to address not only the treatment of periodontitis, but also the functional and cosmetic rehabilitation of patients who have suffered periodontal diseases. Our approach to treating periodontitis has also changed to reflect a greater understanding of the disease process and the response to therapy.

The whole dental team can play an important role in managing periodontitis by becoming involved with patient education, providing oral hygiene advice, co-ordinating treatment and carrying out some of the initial non-surgical therapy. Most periodontal diseases are preventable with good oral hygiene and we should therefore strive to promote excellent periodontal health for all of our patients.

1. Armitage G. Development of a classification system for periodontal diseases and conditions. *Ann Periodontol* 1999; **4**: 1-6.
2. Offenbacher S. Periodontal diseases: pathogenesis. *Ann Periodontol* 1996; **1**: 821-78.
3. Friedewald V E, Kornman K S, Beck J D, Genco R *et al. The American Journal of Cardiology* and *Journal of Periodontology* Editors' Consensus: Periodontitis and atherosclerotic cardiovascular disease. *J Periodontol* 2009; **80**: 1021-1032.
4. The British Society of Periodontology. Periodontology in general dental practice in the United Kingdom. A Policy Statement. 2001. http://www.bsperio.org.uk/members/policy.pdf
5. Cobb C M. Clinical significance of non-surgical periodontal therapy: an evidence-based perspective of scaling and root planing. *J Clin Periodontol* 2002; **29 (Suppl 2):** 6-16.
6. Eberhard J, Jepsen S, Jervøe-Storm P M, Needleman I, Worthington H V. Full-mouth disinfection for the treatment of adult chronic periodontitis. *Cochrane Database of Syst Rev* 2008; **1**: 1-71.
7. Axelsson P, Lindhe J. The significance of maintenance care in the treatment of periodontal disease. *J Clin Periodontol* 1981; **4**: 281-294.
8. Heitz-Mayfield L J A, Trombelli L, Heitz F, Needleman I, Moles D. A systematic review of the effect of surgical debridement vs. non-surgical debridement for the treatment of chronic periodontitis. *J Clin Periodontol* 2002; **29 (Suppl 3):** 92-102.
9. American Academy of Periodontology Academy Report. Position Paper. Periodontal Regeneration. *J Periodontol* 2005; **76**: 1601-1622.
10. Wennström J L, Ekestubbe A, Gröndahl K, Karlsson S, Lindhe J. Oral rehabilitation with implant-supported fixed partial dentures in periodontitis-susceptible subjects. A 5-year prospective study. *J Clin Periodontol* 2004; **31**: 713-724.
11. Berglundh T, Persson L, Klinge B. A systematic review on the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. *J Clin Periodontol* 2002; **29 (Suppl 3):** 197-212.
12. Garber D A, Salama M A. The aesthetic smile: diagnosis and treatment. *Periodontol 2000* 1996; **11**: 18-28.
13. Zucchelli G, Cesari C, Amore C, Montebugnoli L, De Sanctis M. Bilaminar techniques for the treatment of recession type defects. A comparative clinical study. *J Clin Periodontol* 2003; **30**: 862-870.

Further reading

Lindhe J, Lang P L, Karring T. *Clinical periodontology and implant dentistry*, 5th ed. Blackwell Munksgaard, 2008.

Test yourself

1. Bone loss from chronic periodontitis may be exacerbated by:
- A. smoking
- B. alcohol intake

2. All patients should be screened for periodontal diseases by carrying out:
- A. a full mouth periodontal charting
- B. a Basic Periodontal Examination (BPE)

3. Supportive periodontal treatment may be carried out by:
- A. dental hygienists or therapists
- B. registered dentists only

4. Most periodontal diseases:
- A. are preventable with good oral hygiene
- B. do not require treatment

Answers: 1A, 2B, 3A, 4A.