PERIODONTAL THERAPY

Clinical Decisions Based on the 2018 Classification of Periodontal Diseases

Stephen K. Harrel, DDS; Charles M. Cobb, DDS, MS, PhD; John S. Sottosanti, DDS; Lee N. Sheldon, DMD; and Michael P. Rethman, DDS, MS

The absence of widely accepted treatment decision points for the management of periodontitis can be problematic for the dental profession and patients. After conducting a thorough review of published peer-reviewed studies, the authors developed basic therapeutic decision points for the management of periodontitis based on the 2018 classification of periodontal diseases. These decision points were utilized to outline appropriate treatments, which include: patient commitment to a thorough daily self-care regimen, the definitive elimination of etiological factors, professional treatment that includes the complete removal of residual bacterial biofilm (plaque), the definitive removal of both supragingival and subgingival calculus, and, in advanced disease, possible tissue augmentation and regenerative surgery. Advanced therapies to accomplish an acceptable therapeutic end point are indicated in stage III and stage IV periodontitis. The presented decision points for the treatment of periodontitis offer a basis for the ethical care and management of patients in all stages of periodontitis.

Introduction

Approximately 42% of the US adult population between the ages of 30 and 79 years suffers from untreated or inadequately treated chronic periodontitis.[1,2] Dentistry must recognize this problem and develop a strategy to address the issue at both a public health level and individual patient level. It is the authors' opinion, based on many decades as clinicians and academicians active in both public health and private practice, that the current level of care in the treatment of periodontitis is inadequate.

Periodontitis is characterized by progressive destruction of the tooth-supporting apparatus, and it manifests clinically as deepening periodontal pockets, clinical attachment loss (CAL), radiographic alveolar bone loss, and bleeding on probing (BOP).[3] In most cases, the disease is both preventable and treatable; however, if untreated or insufficiently treated, periodontitis may lead to tooth loss and, in some cases, systemic complications. The 2018 Classification of Periodontal and Peri-implant Diseases and Conditions classifies periodontitis, based on clinical severity and extent of disease, into stages I, II, III, and IV. Each case is further assigned a grade A, B, or C, dependent upon the rate of disease progression (grade A = slow progression, grade C = rapid progression), predicted response to treatment, and potential impact on systemic health.[4]

Periodontitis can best be described as a multi-microbial inflammatory disease in which the biota within the dental biofilm is in a dysbiotic state.[5-9] This dysbiosis favors the establishment of chronic

ABOUT THE AUTHORS

Stephen K. Harrel, DDS

Adjunct Professor, Department of Periodontics, Texas A&M College of Dentistry, Dallas, Texas

Charles M. Cobb, DDS, MS, PhD

Retired, Professor Emeritus, Department of Periodontics, School of Dentistry, University of Missouri-Kansas City, Kansas City, Missouri

John S. Sottosanti, DDS

Former Part-time Faculty, University of Southern California School of Dentistry, Los Angeles, California; Private Practice, San Diego, California

Lee N. Sheldon, DMD

Former Associate Clinical Professor, University of Florida College of Dentistry, Gainesville, Florida; Private Practice, Melbourne, Florida

Michael P. Rethman, DDS, MS

Adjunct Associate Professor, University of Maryland School of Dentistry, Baltimore, Maryland; Adjunct Assistant Professor, Ohio State University College of Dentistry, Columbus, Ohio

inflammatory conditions that can cause the destruction of tooth-supporting tissues. Inflammation is a complex immune response that can be modified by a variety of risk factors that may potentiate the overall disease process. Common modifying factors include smoking, diabetes, oral hygiene, obesity, and systemic disease.[10-13]

The inflammatory burden and/or bacteria related to undiagnosed and untreated or insufficiently treated periodontitis have been associated with multiple systemic diseases, such as atherosclerosis, stroke, diabetes, Alzheimer's disease, and others.[14-16] Such systemic involvements and/or the loss of function and esthetics can have devastating effects on quality of life, especially in stage III and stage IV disease.[17,18]

Ethical standards and standards of care obligate clinicians to stay current with both the clinical and scientific knowledge pertinent to periodontal treatment rendered for their patients. This includes an understanding of the role of local factors in the initiation and perpetuation of periodontal disease and providing definitive and complete therapy to arrest the inflammatory process and achieve health. This may include consultation and advanced therapy. The American Dental Association (ADA)'s *Principles of Ethics and Code of Professional Conduct* states: "Dentists shall be obligated to seek consultation, if possible, whenever the welfare of patients will be safeguarded or advanced by utilizing those who have special skills, knowledge, and experience."[19]

Rationale for Clinical Therapeutic Decision Points

The absence of widely accepted clinical decision points for the management of periodontitis has long been a concern for the dental profession and, ultimately, the patients for whom the profession exists to serve. It is the authors' shared opinion that many periodontally involved teeth are extracted that could be successfully treated and maintained. Although this is a clinical opinion, and as such cannot be directly supported by the scientific literature, there is ample literature to support the fact that teeth with extensive periodontal destruction can be maintained for extended periods of time.[20-24] A recently published example showed that in a group of periodontally compromised patients with a total of 2,323 teeth only 1.7% of those teeth had been lost due to periodontal reasons at 10 years post active periodontal treatment. The authors concluded that frequently, "Teeth with initially severe bone loss are not hopeless."[25]

Methods

Based on the findings of the 2017 World Workshop on periodontics held jointly by the American Academy of Periodontology and the European Federation of Periodontology and concurrently published in both groups' scientific journals, the authors of this article, who are clinicians/academicians with shared concerns regarding the current level of timely diagnosis and definitive treatment of periodontitis, have formulated the clinical therapeutic decision points presented here. None of the authors represent any organization and have nothing to gain materially from development of these clinical decision points. The authors' aim is to assist dental therapists in making effective therapeutic decisions.

A search for supporting articles, using keywords relevant to the subject (eg, periodontitis, dental scaling, root planing, dental calculus, biofilm, inflammation), was conducted via PubMed, Ovid Medline, Cochrane Reviews, and the ADA Center for Evidence-Based Dentistry databases. Additionally, references cited in relevant articles were also considered.

Clinical Therapeutic Decision Points

Stage I, Grade A or B Periodontitis

This level of disease is often treated by the primary practitioner using a nonsurgical protocol that usually includes:

1. Patient education regarding the presence, distribution, and severity of disease.
2. Self-care and oral hygiene instructions (OHI) that include customized training regarding how to most effectively use a toothbrush and interdental cleaning aids.
3. Definitive scaling and root planing (SRP) involving all sites exhibiting signs of inflammation with probing depths (PDs) of ≤4 mm, CAL of 1 mm to 2 mm, and/or radiographic bone loss of <15%.
4. Subsequent evaluation of treatment effects, contrasting initial data with new data on PDs, CAL, BOP, tooth mobility, furcation involvements, and gingival recession. Plaque staining at select sites may be repeatedly necessary to facilitate ongoing assessment of the etiology of persistent inflammation at sites of interest.
5. Depending on treatment effectiveness, patients may require further OHI, additional SRP, and reconsideration of other risk factors, etc.
6. When the patient's disease appears stable, the patient can be assigned to periodontal maintenance at intervals that depend on the level of self-care and other risk factors. Ideally, maintenance intervals are designed to meet each patient's individual needs and may change over time.
7. If the patient's disease does not resolve/stabilize, advanced treatment is indicated.

Stage II, Grade A or B Periodontitis

A patient initially diagnosed with stage II or who has progressed from stage I to stage II periodontitis should be carefully evaluated. These cases display PDs of up to 5 mm and include mostly horizontal bone loss between 15% and 33% of the root (or CAL of 3 mm to 4 mm). Limited (class I) furcation involvements may also be detected. Depending on risk factors, distribution of disease (ie, isolated teeth or generalized), furcation involvements, and architecture of bone defects (horizontal versus angular, with or without interdental cratering), the primary practitioner may choose to treat the patient with nonsurgical therapy. The primary practitioner might also provide advanced periodontal therapy if indicated, may consult with a specialist concerning the best treatment plan, or refer for treatment.

Treatment of stage II periodontitis involves a protocol similar to stage I, but in addition may require advanced periodontal care. Advanced care may include more sophisticated nonsurgical care, tissue augmentation, regeneration and/or tissue sculpting to provide a more disease-resistant oral anatomy. Advanced periodontal therapy equates to specialty-level care and management, regardless of who provides it. Some primary practitioners may possess these specialty-level skills. Periodontists are extensively trained during

a 3-year post-doctoral residency and specialize in treatment planning and providing advanced periodontal care.

Treatment of stage II periodontitis should include specific evaluation of the following considerations that suggest the need for advanced periodontal care: (1) persistent or progressing gingival recession that: (A) affects esthetics, (B) displays persistent inflammation, or (C) is painful; (2) any site that continues to show signs of inflammation (eg, BOP) where the patient is performing good self-care, (3) occlusal analysis that may reveal trauma from occlusion as a possible contributing factor for disease progression and occlusal therapy may be indicated.

As with stage I, repeated re-evaluations and adjustments to therapy based on re-evaluations and maintenance care are indicated. Periodontal maintenance at time intervals of every 3 to 4 months may be indicated for stage II patients.

Stage III, Grade A or B Periodontitis

Stage III periodontitis is an advanced stage of disease, characterized by PD of ≥6 mm, CAL of ≥5 mm, radiographic bone loss of 33% or more, multiple grade I to grade III furcation involvements, and/or loss of one to three teeth due to periodontitis. In addition, it is common to encounter multiple angular bone defects, interdental bony crater defects, and localized or generalized gingival recession. This level of disease severity almost always requires more than repeated episodes of traditional SRP. Therefore, it is usually appropriate to seek a specialist consultation and institute a team approach to patient care.

Treatment will often involve the following:

1. OHI, evaluation of risk factors, definitive SRP (perhaps repeated and/or performed using advanced instrumentation), and re-evaluation at 4 to 6 weeks. Subsequent treatment may include extraction of teeth with hopeless prognoses, primarily based on class 3 mobility on the Miller scale, root proximities, and/or class III and IV furcation involvements that prevent resolution of a periodontal lesion, resective and/or regenerative surgical procedures, re-evaluation, and maintenance.[26]
2. With few exceptions, more complex disease and treatment necessitate shorter maintenance intervals and increased emphasis on self-care, with a 3-month interval as a reasonable goal for a treated and stable periodontitis patient. In some cases, shorter intervals are indicated.
3. Because specialists receive extensive training in advanced diagnosis, advanced instrumentation for removing tooth-borne accretions (calculus and plaque), resective, regenerative, and tissue augmentation procedures, consultation, and/or referral is appropriate for a stage III periodontitis patient. Furthermore, because periodontal treatment often must dovetail with restorative needs, a team approach to planning active treatment and maintenance care is often in the best interest of such patients.

Scan with smartphone camera to download a PDF of this decision tree, or visit compendiumlive.com/go/cced1994.

Stage IV Periodontitis

Stage IV periodontitis is characterized by periodontal tissue degradation that exceeds what might be expected in light of local etiological factors (eg, plaque and calculus accumulations), patient age, and other risk factors. Furthermore, specific anatomic patterns may suggest previous intervals of rapid disease progression and/or early-onset periodontitis.

Patients with a diagnosis of stage IV periodontitis are likely to have missing teeth, alveolar ridge defects, drifting of teeth, bite collapse, etc. They often will require extensive restorative treatment

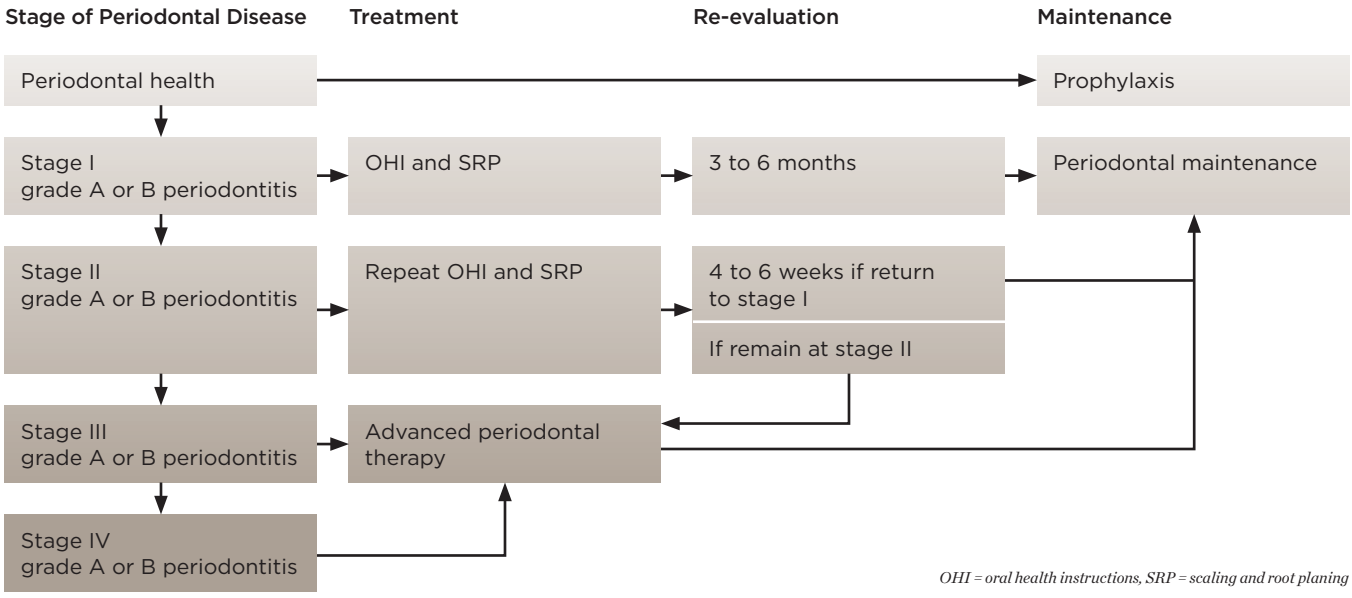

Fig 1. Decision tree for the treatment of periodontitis. The sequence of treatment shown is for grade A and grade B periodontitis. Any grade C periodontitis should immediately be considered for advanced periodontal therapy. Advanced periodontal therapy means specialty-level care and management, regardless of who provides it.

and/or orthodontic therapy to restore normal function and improve esthetics. Because of sometimes-complex etiologies, disease severity, and the unpredictability of disease progression, a team approach involving the restorative dentist and a periodontal specialist should be considered when addressing patient diagnosis, treatment planning, and maintenance care.

Given a diagnosis of stage III or stage IV periodontitis, the patient should be informed that routine nonsurgical therapy such as repeated SRP is unlikely to stop disease progression and that without more definitive and advanced treatment, possibly involving the use of sophisticated instrumentation, there is greater risk of tooth loss.[27] Referral to a specialist may be appropriate in these situations.

Sometimes patients may present with rapidly progressing periodontitis, termed grade C. CAL and bone loss can be rapid and in some cases may be accompanied by little or no calculus or other obvious local factors. Unless the dentist is specially trained to manage this type of periodontitis, such patients should be promptly referred to a specialist for advanced diagnosis and care.

A decision tree illustrating the discussed clinical decision points is presented in Figure 1. Table 1 shows a condensed version of the classification of periodontal and peri-implant diseases and conditions with the basic treatment recommendations described in this article. The therapist should consult the complete staging and grading criteria when making diagnostic decisions (perio.org/2017wwdc).

Discussion

Periodontitis is an infectious disease. As such, appropriate treatment of periodontitis routinely results in reduction of inflammation and stabilization of the disease at a maintainable level. Proper treatment includes the elimination or mitigation of etiological factors. For most patients, this requires a minimum of a thorough daily self-care regimen and adherence to the suggested maintenance therapy interval. Adequate professional care includes the complete removal of both supragingival and subgingival calculus, including residual bacterial biofilm (plaque).[28] The specialized instrumentation and skillsets required for complete removal of calculus, especially subgingival calculus, should not be underestimated and may amount to advanced therapy. Other aspects of advanced therapy may include surgical therapy for tissue regeneration, repositioning, or reshaping.

Periodontitis should be diagnosed as early as possible. This diagnosis requires recording full-mouth PDs and CAL. Following diagnosis, the patient should be informed of the existence of disease, distribution and severity of disease, risk factors, systemic associations, all treatment options, and related prognoses. Informed consent should be obtained, and treatment should be initiated as soon as possible. Re-evaluations should be performed indefinitely to assess the effectiveness of previous therapy, modulate subsequent care, and determine if referral to a specialist is warranted. Teeth with advanced periodontitis need to be evaluated exhaustively before they are diagnosed as hopeless, and the patient should be informed of the possibility of advanced therapy, such as regeneration of supporting tissue, before a tooth is extracted.

In most situations, the primary practitioners (general dentists and/or dental hygienists) will perform the initial phases of therapy. Some patients may elect to seek initial care directly from a specialist. In stage II, a team approach consisting of a primary practitioner and specialists may be indicated. In stages III and IV, having a specialist as part of the team is usually appropriate. Multiple specialists may be necessary regardless of the stage of disease.

Conclusion

The 2017 World Workshop on periodontics formulated a new classification of periodontitis based on disease severity and host factors. This article has described a set of clinical therapeutic decision points developed by the present authors for the practical application of the findings of the World Workshop to the daily practice of dentistry and the care and management of patients afflicted with periodontitis.

DISCLOSURE

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TABLE 1

Simplified Diagnostic and Treatment Summary

	Pocket Probing Depth	Interproximal CAL	Type of Bone Loss	Percent Bone Loss	Number of Teeth Lost	Other Factors	Probable Treatment Needs
Stage I	≤4 mm	1–2 mm	Mostly horizontal	Up to 15%	None	None	SRP
Stage II	≤5 mm	4–5 mm	Mostly horizontal	15%–33%	None	None	SRP or advanced periodontal care
Stage III	≥6 mm	≥5 mm	Vertical and horizontal	>33%	Four or less	Many	SRP and advanced periodontal care
Stage IV	≥6 mm	≥5 mm	Vertical and horizontal	>33%	Five or less	Many and complex	SRP and advanced periodontal care

This summary is drawn from the staging criteria from the 2018 Classification of Periodontal and Peri-implant Diseases and Conditions.[4] Full details of the staging criteria are available at perio.org/2017wwdc. The treatment recommendations are the authors' clinical opinion, and the rationale is discussed in the article.

CAL = clinical attachment loss, SRP = scaling and root planing

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