Chapter 6: Periodontics

Introduction

With the decline of school-based incremental care for children in the Indian Health Service (IHS) Dental Program, there has been a concurrent increase in the amount of adult care being provided. Periodontal diseases, once wholly ignored by the IHS, are now becoming increasingly important as adult- and family-oriented care is being emphasized. Recent oral health surveys conducted by the IHS have indicated a high prevalence of periodontal diseases throughout American Indian and Alaskan Native (AI/AN) populations. Much of the tooth and alveolar bone loss that occurs in Native American groups can be attributed to the high rates of another chronic disease, Type 2 diabetes mellitus. The backlog of periodontal prevention and treatment needs that has resulted from years of providing no adult care, combined with the existing high periodontal disease rates, now poses a significant challenge to the IHS Dental Program.

This chapter discusses some strategies and techniques for addressing this backlog of care and preventing future tooth loss among our treatment populations. This chapter is only a brief outline of common prevention and treatment approaches which should be considered in IHS programs.

This chapter will cover the following topics

Section A: Classification of Periodontal Disease

This section discusses the new system of classification of periodontal diseases. It is a redesigned framework that guides comprehensive treatment planning and allows for a more personalized approach to patient care than in the past[i].

As we learn more about the nature, progression and management of periodontal diseases, we must modify the ways in which we classify periodontal disease. The 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions released a new classification of periodontitis characterized by a multidimensional staging and grading system. The new classification system represents a collaboration between the American Academy of Periodontology and European Federation of Periodontology (EFP). The result of this landmark gathering is a redesigned disease classification framework that guides comprehensive treatment planning and allows for a personalized approach to patient care. Highlights from the updated classification include a multi-dimensional staging and grading system for periodontitis classification, a re-categorization of various forms of periodontitis, and the inaugural classification for peri-implant diseases and conditions. Please visit the American Academy of Periodontology (AAP) website (https://perio.org/2017wwdc) for the complete suite of reviews, case definition papers, and consensus reports.[ii]

As a background, the periodontal classifications were last revised in 1999 and categorized as chronic, aggressive (localized and generalized), necrotizing, and as a manifestation of systemic disease.[iii] New technology, research, and information has emerged in the past 18 years, which led to the new revisions. The new Periodontal Classifications includes 3 categories of disease:

- Periodontitis (now one category; formerly aggressive AND chronic),
- Necrotizing periodontitis, and
- Periodontitis as manifestation of systemic disease(s)

The new framework will help Dentists and Hygienists diagnose and treat periodontal diseases, and the guidelines ensure consistency in diagnosing.

Staging

Four periodontal stages were developed to differentiate between severity, complexity and extent, and distribution of periodontitis. Staging classifies the severity and extent of a patient's disease based on the measurable amount of tissue destroyed and/or damaged by periodontitis, and considers the specific factors that may affect the complexity of long-term case management. Staging should be determined using clinical attachment loss (**CAL**). If CAL is not available, radiographic bone loss (**RBL**) should be used. Tooth loss due to periodontitis may modify stage definition. One or more complexity factors may shift the stage to a higher level. The four stages are described below for review.

1. Stage I (initial): 1–2 mm clinical attachment loss (CAL), less than 15% bone loss (RBL) around root, no tooth loss due to periodontal disease, probing depth (**PD**) 4 mm or less, mostly horizontal RBL (figure 1).

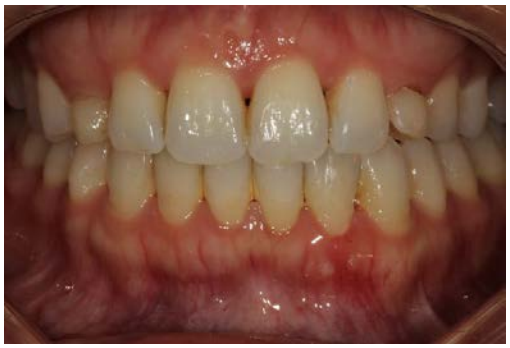


Figure 1: Stage I periodontitis

2. Stage II (moderate): 3–4 mm CAL, 15%–33% BL, tooth loss, PD 5 mm or less, mostly horizontal RBL (figure 2).

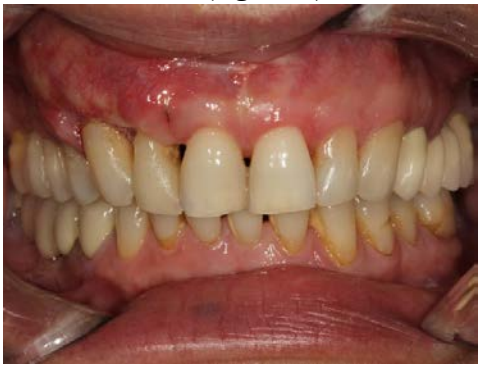


Figure 2: Stage II periodontitis

3. Stage III (severe with potential for additional tooth loss): 5 mm or more CAL, RBL beyond 33%, tooth loss of four teeth or less, with complex issues such as PD 6 mm or more, vertical RBL 3 mm or more, Class II–III furcations, and/or moderate ridge defects (fig. 3).

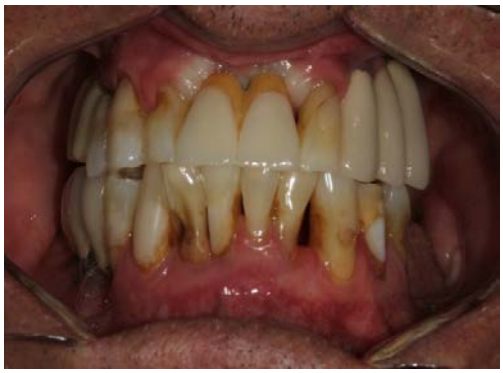


Figure 3: Stage III periodontitis

4. Stage IV (severe with potential for loss of dentition): Encompasses all of Stage III with additional features that will require the need for complex rehabilitation due to masticatory dysfunction, secondary occlusal trauma, severe ridge defects, bite collapse, pathologic migration of teeth, less than 20 remaining teeth (10 opposing pairs) (figure 4)

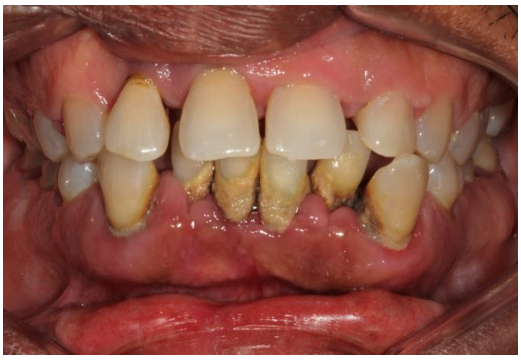


Figure 4: Stage IV periodontitis

Note: *Clinical photographs shown above are courtesy of* ***Scott Froum, DDS****, a graduate of the State University of New York, Stony Brook School of Dental Medicine, a diplomate and periodontist in private practice at 1110 2nd Avenue, Suite 305, New York City, New York [drscottfroum.com or (212) 751-8530]*

Grading

Grading indicates the rate of periodontitis progression, responsiveness to standard therapy, and potential impact on systemic health.

1. Grade A (slow progression)
    - No additional RBL or CAL over five years, no smoking, no diabetes, heavy biofilm but no destruction
2. Grade B (moderate progression)
    - Less than 2 mm additional RBL or CAL over five years, half pack or less per day smoking, HbA1c less than 7%, biofilm commensurate with destruction
3. Grade C (rapid progression)
    - Greater than 2 mm of additional RBL or CAL over five years, half pack or more per day smoking, HbA1c 7% or higher, destruction exceeds amount of biofilm

Clinicians should initially assume grade B disease and seek specific evidence to shift to grade A or C.

A quick summary of the three steps to staging and grading a patient is shown below:

- **Step 1: Initial Case Overview to Assess Disease** - the recommendation is to conduct a screening consisting of radiographs, probing depths, and missing teeth. Based on the findings from step 1, a determination of mild-moderate periodontitis is made, which is considered Stage I or Stage II. Severe or very severe periodontitis is considered Stage III or Stage IV.
- **Step 2: Establish Stage** - this is divided into two sections. For mild to moderate periodontitis, the focus will be on clinical attachment loss (CAL).
- **Step 3: Establish Grade** focuses on assessing risk factors, systemic considerations, and outcomes of non-surgical periodontal therapy.[3]

Periodontitis stage		Stage I	Stage II	Stage III	Stage IV
Severity	Interdental CAL at site of greatest loss	1 to 2 mm	3 to 4 mm	≥5 mm	≥5 mm
	Radiographic bone loss	Coronal third (<15%)	Coronal third (15% to 33%)	Extending to mid-third of root and beyond	Extending to mid-third of root and beyond
	Tooth loss	No tooth loss due to periodontitis		Tooth loss due to periodontitis of ≤4 teeth	Tooth loss due to periodontitis of ≥5 teeth
Complexity	Local	Maximum probing depth ≤4 mm Mostly horizontal bone loss	Maximum probing depth ≤5 mm Mostly horizontal bone loss	In addition to stage II complexity: Probing depth ≥6 mm Vertical bone loss ≥3 mm Furcation involvement Class II or III Moderate ridge defect	In addition to stage III complexity: Need for complex rehabilitation due to: Masticatory dysfunction Secondary occlusal trauma (tooth mobility degree ≥2) Severe ridge defect Bite collapse, drifting, flaring Less than 20 remaining teeth (10 opposing pairs)
Extent and distribution	Add to stage as descriptor	For each stage, describe extent as localized (<30% of teeth involved), generalized, or molar/incisor pattern			

Periodontitis grade			Grade A: Slow rate of progression	Grade B: Moderate rate of progression	Grade C: Rapid rate of progression
Primary criteria	Direct evidence of progression	Longitudinal data (radiographic bone loss or CAL)	Evidence of no loss over 5 years	<2 mm over 5 years	≥2 mm over 5 years
	Indirect evidence of progression	% bone loss/age	<0.25	0.25 to 1.0	>1.0
		Case phenotype	Heavy biofilm deposits with low levels of destruction	Destruction commensurate with biofilm deposits	Destruction exceeds expectation given biofilm deposits; specific clinical patterns suggestive of periods of rapid progression and/or early onset disease (e.g., molar/incisor pattern; lack of expected response to standard bacterial control therapies)
Grade modifiers	Risk factors	Smoking	Non-smoker	Smoker <10 cigarettes/day	Smoker ≥10 cigarettes/day
		Diabetes	Normoglycemic/ no diagnosis of diabetes	HbA1c <7.0% in patients with diabetes	HbA1c ≥7.0% in patients with diabetes

Source: American Academy of Periodontology – 2018

To summarize the new periodontal classification system, the AAP released the following three documents (which may prove useful as laminated references in your clinics) [iv]:

- Classification at a Glance: (https://perio.org/sites/default/files/files/Classification%20at%20a%20glance.pdf)

- "Staging and Grading Periodontitis" https://perio.org/sites/default/files/files/Staging%20and%20Grading%20Periodontitis.pdf

- "Three Steps to Staging and Grading a Patient" (https://perio.org/sites/default/files/files/Three%20Steps%20to%20Staging%20and%20Grading%20a%20Patient.pdf)

The new periodontal classification is a hot topic right now, and information will continue to emerge regarding the new guidelines. Now that the charts described above are available, implementation into schools, clinics, and private practices can occur.[v]

Section B: Diagnosis of Periodontal Disease

This section discusses the diagnosis of periodontal disease. Diagnosis consists of:

- Population-based high risk diagnosis and screening
- Individual-based periodontal disease diagnosis

Population-Based High Risk Diagnosis and Screening

Introduction

The establishment of an individual's risk for periodontal disease is not yet a perfect science. A body of evidence is building which supports the identification of high periodontal risk. This supportive information comes primarily from the few longitudinal studies on the natural history of periodontal disease. Determining individuals with moderate or low periodontal risk is also of significant interest. However, the slow progression of periodontal disease in moderate or low-risk individuals makes early detection of these categories nearly impossible.

Targeting Patients for Care

In public programs, determining whom to treat is as important as how to treat. Studies of the natural history of periodontal disease indicate that a range of susceptibility exists for individuals within a population. In general, individuals can be grouped into three risk categories for periodontal disease:

- High-risk group. The high-risk group is a relatively small number of individuals who demonstrate early and rapid periodontal breakdown and subsequent tooth loss.
- Moderate-risk group. The moderate-risk group represents the majority of the population which experiences slow periodontal breakdown over a life span with some tooth loss.
- Low-risk group. The low-risk group is also a small group of individuals who are relatively resistant to periodontal breakdown and require very little periodontal treatment.

Given the inability of the IHS Dental Program to provide continuous periodontal services to all eligible AI/ANs, prioritizing who receives care is essential. By targeting treatment to those who need care the most, and before severe periodontal destruction occurs, treatment resources can be used most effectively.

Attachment or Alveolar Bone Loss

Since past attachment loss or alveolar bone loss is a good predictor of future loss, early bone losers (14 to 35 years of age) may indicate lifelong high risk for periodontal disease.

The IHS Dental Program uses several routine diagnostic and screening tools, which can be helpful in determining early alveolar bone or attachment loss. These include:

- Bite-wing X-rays (diagnostic tool)
- Panoramic X-rays (diagnostic tool)
- Community Periodontal Index (CPI)/Periodontal Screening and Recording (PSR) System (screening tool)

Early alveolar bone loss can be determined in adolescent and young adult age groups (14 to 20 years) by assessing bite-wing radiographs. Although this technique requires a certain degree of precision, most diagnostic bite-wings will allow measurements to determine bone loss. Any single site on a posterior interproximal radiograph which measures greater than 2 mm between the cemento-enamel junction (CEJ) and the crest of the alveolar bone can be considered to be early bone loss.

Individuals 20 to 35 Years of Age

For individuals in the 20 to 25 year age range, CPI may be helpful in determining high periodontal risk. Since even an inflamed sulcus (no periodontal attachment loss) can measure 4 to 5 mm, actual attachment or bone loss may not be present until a probing pocket depth reaches 6 mm (CPI 4). Therefore, in this age group, a single site of CPI 4 would indicate early bone loss and high periodontal risk. High-risk individuals in this age group would be characterized by a mean attachment loss of 2 to 4 mm. An annual attachment loss rate of approximately 0.5 mm could be expected for high-risk individuals 20 to 25 years of age.

> **Note:** Remember that any isolated site of bone or attachment loss should be carefully examined to eliminate the possibility of local plaque retentive factors (e.g., calculus, open contacts, restorative overhangs, etc.) providing the etiology. Single, isolated lesions which are caused by plaque retentive features should not be considered a basis for establishing a high risk diagnosis.

For individuals 20 to 35 years of age, CPI can also be used. High-risk individuals at this age would be expected to show at least one site of CPI score of 4. In most high-risk individuals, multiple sites of CPI 4 would be observed. The mean attachment loss expected in this age group would be 4 to 6 mm, with an average attachment loss of 1 mm/year.

Individual-Based Periodontal Disease Diagnosis

Introduction

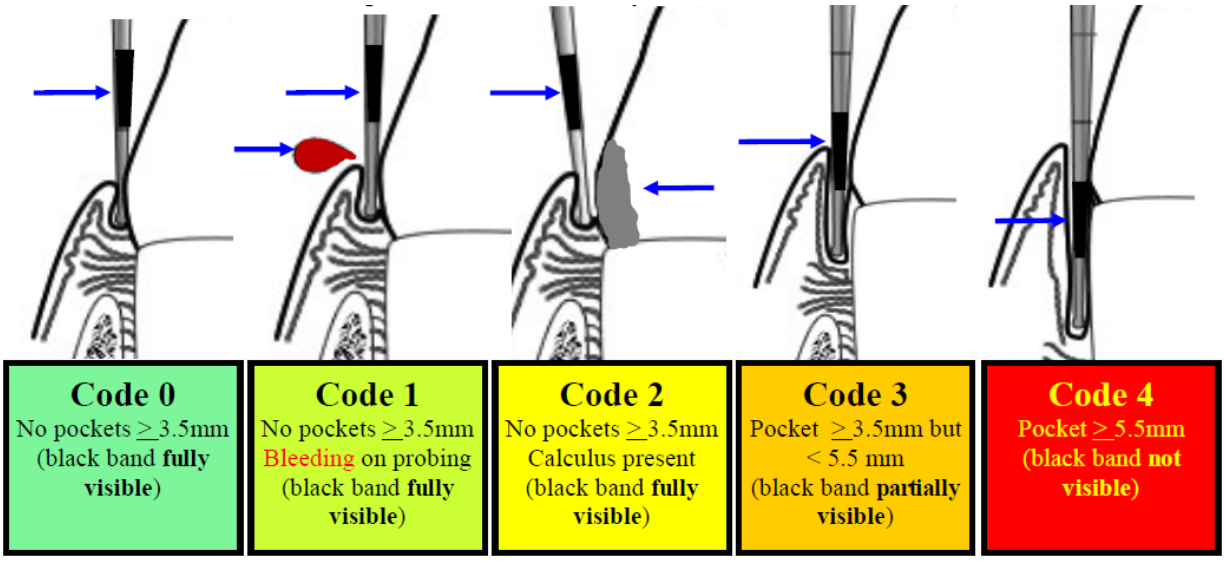
Early detection and treatment of patients who demonstrate signs and symptoms of periodontal disease are essential to establishing and maintaining periodontal health. An accurate clinical periodontal diagnosis is critical to providing appropriate treatment and maintenance care.

CPI

The IHS has adopted the use of the CPI as an initial screening examination for all patients presented for care. PSR has been promoted by the American Dental Association (ADA). The

PSR and CPI are essentially the same index. Additionally, all patients with identified periodontal pathology should have a written diagnosis.

- Limitations: Although CPI can be useful in clinical programs as a triage tool in determining how the patient is going to be scheduled and who will treat, etc., it is not specific enough to be considered as a diagnostic tool "Use of the Community Periodontal Index in IHS, Tribal, and Urban Dental Programs" is a useful guide that can be downloaded from the IHS Division of Oral health website.
- Indications: The CPI protocol can be used in all facilities.



ADA/AAP Classification

Classification	Description
Periodontal health	No pockets, no bleeding on probing
Gingivitis	3- to 4-mm pockets, bleeding on probing, no bone loss
Stage I Periodontitis (Mild)	≦ 4 mm pockets, up to 15% horizontal bone loss
Stage II Periodontitis	≦ 5 mm pockets, up to 30 % horizontal bone loss
Stage III Periodontitis (Severe with potential for additional tooth loss)	≥ 6 mm pockets, 30 to 50 % bone loss, furca, ≤4 teeth lost due to periodontitis
Stage IV Periodontitis (Severe with potential for loss of dentition)	≥ 7 mm pockets, > 50% bone loss, furca, ≥ 5 teeth lost due to perio; need for complex oral rehabilitation

In any of these categories, the condition is additionally classified as *localized* if it involves less than 30% of the dentition, and *generalized* if it involves greater than 30% of the dentition (i.e. generalized Stage II/Grade A periodontitis, localized Stage IV/Grade B periodontitis).

The written diagnosis should also recognize the presence of other less frequent periodontal diseases, such as necrotizing periodontal diseases and periodontitis as a manifestation of systemic disease. For a complete description of the new Classification System, see the American Academy of Periodontology (AAP) website (https://perio.org/2017wwdc) for the complete suite of reviews, case definition papers and consensus reports. [vi]

Diagnosis Requirements

To accomplish an accurate diagnosis using the above classifications and indices, the clinician must be able to identify and record when indicated:

- Abnormal visual gingival findings
- Probing depth
- Mobility
- Furcation involvements

These can be identified with a standard examination setup, which includes a periodontal probe and radiographs. Minimally, bite-wing and panoramic films should be available. In adults with periodontitis, vertical bite-wings are the most diagnostic

Other Factors

Other known factors can be used to determine the diagnosis for high-risk periodontal disease or need for special periodontal therapy. These include:

- Age
- Existing systemic diseases
- Other conditions (tobacco use, stress, altered saliva, physical/mental ability)
- Medications predisposing to gingival hyperplasia

Each of these factors is described in the following blocks.

Age

The following age factors contribute to the onset of periodontal disease

- Onset of periodontal disease in children and young adults (5 to 35 years)
  - Periodontitis associated with genetic factors (very rare), i.e. Papillon-Lefevre syndrome, cyclic neutropenia, Down's syndrome, etc.
  - Localized/generalized periodontitis in children and siblings of those with periodontitis. Localized can be described as "molar/incisor pattern." See Staging.
  - Adolescents with early alveolar bone loss
- Individuals who are over 50 years of age

Existing Systemic Diseases

The following existing systemic diseases contribute to the onset of periodontal disease

- Diabetes mellitus (DM)
  - Uncontrolled diabetes
  - Longstanding diabetes (greater duration increases risk)
  - Glucose intolerance disorders (prediabetics) (FPG > 126 mg/dl)
  - Controlled diabetes

  - Close genetic relatives of diabetics (immediate family)
- Diseases which Compromise the Immune System
  - HIV, or AIDS
  - Organ transplant recipients
  - Neutropenia
  - Leukemia
  - Autoimmune diseases (usually taking immunosuppressive drugs)

Other Conditions

Other conditions may also contribute to the onset of periodontal disease. They include:

- Tobacco use (most significant is smoked tobacco). See Grading: Grades B and C.
- Stress
- Altered salivary flow (usually drug side effect, diabetes, or radiation therapy)
- Physically or mentally handicapped (inability to perform oral hygiene procedures)

Medications Predisposing to Gingival Hyperplasia

Medications predisposing to gingival hyperplasia also contribute to the onset of periodontal disease. They include:

- Sodium dilantin (antiseizure drug)
- Nifedipine, amlodipine and some other calcium channel blockers (antihypertensive drugs)
- Cyclosporin (antirejection drug)

Using the Periodontal Examination Record

Introduction

An adequate record of the patient's periodontal status over time is essential for effective care. Therefore, the Dentrix EDR, or the IHS Periodontal Examination Record (IHS Form 514 (1993)) should be used for initial periodontal workups and recall or maintenance therapy for all high-risk individuals and patients who will receive definitive periodontal treatment. The North Carolina probe (UNC 15) with millimeter markings is preferred, but the Williams and Marquis (3-6-9-12) are also acceptable.

Form Design

The EDR or IHS Form 514 (1993), Periodontal Examination Record are primarily designed to provide a record of probing pocket depths, furcation involvement, and tooth mobility scores. Each box should contain three pocket depth measurements (mesial, mid-buccal/mid- lingual, and distal) for each tooth included in the periodontal exam. Although the form contains spaces for all possible teeth in both arches, many times the periodontal exam form can be utilized for recording pocket depths associated with only limited numbers of teeth, as in cases of localized disease.

Main Features of Periodontitis in the 2017 Classification Scheme

The following features identify and should support your diagnosis of “Periodontitis”:

- Periodontitis is a chronic multifactorial inflammatory disease associated with an imbalance between the types of organisms present in a person's natural bacterial microflora, characterized by progressive destruction of the tooth-supporting structures.
- Its primary features include the loss of periodontal tissue support, manifested through clinical attachment loss and radiographic bone loss, presence of periodontal pocketing and gingival bleeding.
- A patient is a "periodontitis case" if: interdental CAL is detectable at two or more non-adjacent teeth and buccal or oral CAL $\geq$3 mm with pocketing > 3 mm is detectable at two or more teeth.
- The observed CAL cannot be ascribed to causes other than periodontitis, such as gingival recession of traumatic origin, dental caries extending in the cervical area of the tooth, the presence of CAL on the distal aspect of a second molar and associated with malposition or extraction of a third molar, an endodontic lesion draining through the marginal periodontium and the occurrence of a vertical root fracture.

As described above in the new periodontal classification scheme, forms of periodontal disease previously recognized as "chronic" or "aggressive" are now grouped under a single category ("periodontitis") and are further characterized based on a multidimensional *staging* and *grading* system. S*taging* is largely dependent upon the severity of disease at presentation as well as on the complexity of disease management, while *grading* provides supplemental information about biological features of the disease including a history-based analysis of the rate of periodontitis progression; assessment of the risk for further progression; analysis of possible poor outcomes of treatment; and assessment of the risk that the disease or its treatment may negatively affect the general health of the patient. Staging and grading was inspired by a system used in oncology that individualizes the diagnosis and the case definition of a periodontitis patient, and aligns it to the principles of personalized medicine. Further, it takes into account the multifactorial etiology of the disease, the level of complexity of management, and the risk of disease recurrence or progression, to facilitate optimal care and improve prognosis.[vii]

"Aggressive periodontitis" is no longer a periodontal diagnosis. There is no evidence for specific pathophysiology that can distinguish between aggressive and chronic periodontitis or provide solid guidance for different types of intervention. Research data do not support the notion that aggressive and chronic are different diseases, although there is evidence that multiple factors have a role in what we observe as the phenotype. "Chronic" and "aggressive" are now grouped under a single category of "periodontitis" and are further characterized based on a multi-dimensional staging and grading system. A more restrictive definition might be better suited to take advantage of modern methodologies to enhance knowledge on the diagnosis, pathogenesis, and management of periodontitis.

On a population basis, the mean rates of periodontitis progression are fairly consistent across studies carried out in different parts of the world. While "Aggressive Periodontitis" is no longer a diagnosis, it is clear that certain subsets exhibit different levels of periodontitis severity and progression. For example, a high prevalence of periodontitis has been documented among certain Native American populations, particularly in the southwest.

Diagnosis

A diagnosis of Stage II or greater periodontitis, localized molar/incisor pattern, can be made if a teenage individual (usually 13 to 16 years) presents with one or more first molar or incisor teeth

demonstrating more than 2 millimeters of attachment loss. For this patient, the destruction may also exceed the expected amount, given the biofilm deposits. These patients should be presumed to higher periodontal disease severity (stage) and rate of progression (grade), C , and a treatment program should be initiated to address both the disease severity and its rate of progression.

Treatment

Treatment should be initiated as early as possible; therefore, teenagers should be routinely screened for the presence of periodontitis. CPI screening, along with an evaluation of radiographs, will usually identify affected individuals.

Treatment should include the following

- Patient education (understanding the significance of the problem)
- Home care instruction (often using an interproximal brush in infected sites)
- Root planing with anesthesia to smooth the root and to debride infected soft tissues

Because of the disease severity and rate of progression, root planing alone is usually not completely effective in treating these patients. The pocket often rapidly recolonizes and infection continues to progress. The use of antibiotics, in addition to the mechanical procedures discussed, offers a better chance of arresting the disease process. Metronidazole 250mg t.i.d and amoxicillin 500mg t.i.d for 10 day.

Other Considerations

The ability of the clinician to debride defects deeper than 6 mm needs to be considered. In patients with deep defects, it is generally more effective to treat via an open flap procedure (open flap curettage) and again, the result can be further enhanced with the addition of antibiotic therapy. These patients should also be placed on a chlorhexidine containing mouthrinse for at least 1 week post-treatment. When desired, questions regarding the treatment of individual patients may, and probably should, be discussed with a periodontal consultant.

Section C: Nonsurgical Periodontal Treatment

Introduction

Nonsurgical periodontal therapy generally consists of a combination of supragingival and subgingival plaque and calculus control measures utilizing hand instruments, sonic or ultrasonic scalers, and anti-infective agents. Surgical treatment is usually reserved for advanced cases (those with deep pocketing). Longitudinal studies have demonstrated similar pocket reductions after 3 to 5 years of follow-up when comparing surgical and nonsurgical therapy. The IHS will necessarily utilize nonsurgical treatment when definitive periodontal care is provided. Treatment includes:

- Clinical care
- Maintenance care

Caring for High-Risk Individuals

Individuals who are identified as at high risk for periodontal disease should be placed into a high-intensity therapy program consisting of:

- Clinical care
- Maintenance care

Clinical Care

A clinical care program for a high-risk patient should include the following

- Periodontal exam
- Intensive oral hygiene instructions (OHI)
- Nonsurgical approaches (e.g., scaling and root planing)
- Possible Antibiotics

Periodontal Exam

The establishment of full-mouth charting will provide a baseline for annual repeat full-mouth measurements. Probing records are essential for determining periodontal disease treatment effectiveness.

OHI

OHI are also essential at the initial treatment visit and at each subsequent patient visit. Patient education should be individualized with emphasis placed on plaque and bleeding self-assessment, use of cleaning devices (especially the interproximal brush where indicated), and (in specific case

Nonsurgical Approach

In community-oriented programs (e.g., IHS), clinical treatment should be based on a nonsurgical approach. Frequent root surface cleaning should be performed utilizing an ultrasonic scaler (See Scaling and Root Planing).

- Local anesthetics will be required frequently for adequate cleaning of deep pockets (CPI 4) with either hand or ultrasonic instruments. The use of local anesthetics may not be required for subsequent recall cleaning visits if root surfaces are relatively free of deposits.
- Chemotherapeutic agents may be used. These agents can be employed as a separate subgingival irrigation procedure following ultrasonic scaling. The chemotherapeutic agents currently recommended include:
  - 0.12% chlorhexidene (Peridex, Perioguard, or generic);
  - A combination of 10% povidone I_2 + 3% H_2O_2
  - 10% povidone I_2 (Betadine)

Note: Betadine is less expensive, but less convenient to use because of contraindications (i.e. iodine allergy, thyroid disease), the potential for staining, and its poor taste.

Antibiotics

Antibiotics may be considered for use on high- risk periodontal patients during their initial cleaning visits. The purpose of systemic antibiotic usage is to optimize healing by eliminating periodontal pathogens which have penetrated periodontal tissues. Antibiotic use without full-mouth root debridement is of very little benefit. Systemic antibiotic use should be considered during the initial cleaning visits on any high-risk individual 14 to 35 years of age who has two or more sextants of CPI 4 scores.

If there are no health related contraindications, in select cases antibiotics can be prescribed to high-risk individuals. During this period, the entire mouth should be thoroughly cleaned (usually two appointments). The antibiotic recommended for routine use is Doxycycline. If Doxycycline cannot be given, or if a refractory disease condition exists, Augmentin 500 mg can be substituted. Other systemic antibiotics such as clindamycin 150 mg QID or combinations of amoxicillin 250 mg TID plus metronidazole 250 mg TID or Ciprofloxacin 500 mg BID plus metronidazole 250 mg TID can also be used effectively for periodontal diseases. It is best to contact a periodontal specialist for a consult prior to using these drugs. Systemic antibiotics can be helpful in achieving maximum results from the initial patient prophylaxis. However, the benefits of systemic antibiotics in this usage scheme must be weighed against the associated problems. Frequent antibiotic use can promote resistant bacterial strains. Antibiotics often cause significant side effects (e.g., nausea, diarrhea, upset stomach, fungal overgrowths, etc.)

Doxycycline

Doxycycline is a long-acting tetracycline-class antibiotic, which is effective against most periodontal pathogens (gram negative facultative and anaerobic rods). Doxycycline, because of its long-term action, requires the patient to take only one capsule each day, thus enhancing patient compliance. Doxycycline is also relatively inexpensive since it has become a generic drug, and has been shown to be particularly effective in poorly controlled Type 2 diabetics. Doxycycline should be prescribed as follows

- RX Doxycycline 100 mg
  Disp. 28-42 capsules (2-3 weeks depending on severity of disease)
  Sig. 1 capsule q 12 until all are taken

Augmentin

If Doxycycline cannot be given, or if a refractory disease condition exists, Augmentin 500 mg can be substituted. Augmentin should only be given on a three times-per-day basis. The prescription should be

- RX Augmentin 500mg
  Disp 30 capsules
  Sig 1 capsule q 8 hours until all are taken

Enzyme Suppression

Another adjunct in treating periodontitis in high risk patients is prescribing Periostat®, a low dose doxycycline (20mg). Periostat suppresses enzymes of periodontal destruction such as collagenase without the antimicrobial property, which reduces or eliminates the risk of bacterial resistance and super-infection. It is effective in patients with generalized severe periodontitis, and can be started immediately after the 100mg doxycycline prescription is completed, or at the first recall in patients that did not respond well to initial periodontal therapy.

- RX Periostat
  Disp 180 capsules
  Sig 1 capsule q 12 hours for 3 months

Use of Local Delivery Antimicrobials

Local delivery of antibiotics will achieve very high levels of the antimicrobial compound directly to the affected site. They are most useful in patients with a few sites that do not respond to the standard therapy. There are currently three forms available. The first is Atridox® which is a doxycycline gel which is injected into the pocket where it polymerizes. Each syringe can treat several sites in the same patient. Arestin® is a minocycline delivery system that consists of microspheres delivered into the pocket using a special syringe supplied with the material. Each syringe tip carries 1 mg of material for a single site. The third type is the Periochip®, which is a chlorhexidine chip that is placed into the pocket with cotton pliers. In all cases the patient is advised to avoid vigorous cleaning of the site for about two weeks following therapy.

Maintenance Care

High-risk periodontal patients will require frequent individualized recall throughout their lives. Recall appointments should be between 2 and 6 months depending on the patient's individual needs. Maintenance appointments should emphasize OHI, subgingival scaling use of chemotherapeutic agents, follow-up pocket depth measurements, and appropriate encouragement of home care, including the home use of cleaning devices and irrigators. Additionally, high-risk individuals may also be targeted for informational mailings regarding their risk for periodontal disease and the need for frequent dental visits.

Caring for Non-High-Risk Individuals

Introduction

Individuals who do not fit into the high periodontal disease risk category may not require continuous care. It is currently unclear what levels and intensity of therapy are required to maintain individuals in the moderate risk category. Even if this information were known, it is doubtful that programmatic resources would support such an effort. Therefore, clinical care for moderate- to low-risk individuals should be provided on an as needed basis and in concert with local dental program resources. If the dental needs of the community are being met, then all patients can be recalled regardless of risk.

Treatment

Examination appointments should provide the following

- OHI
- CPI
- Assessment of the need to professionally remove plaque retentive factors (e.g., calculus and overhangs)

No intensive follow-up therapy need be pursued for non-high- risk patients. Recall intervals may be established for individuals who are non-high-risk. It is safe to assume that maintenance care can be provided much less frequently than for high-risk patients.

Scaling and Root Planing

Introduction

Scaling and root planing are general terms defining cleaning of the crowns (scaling) and the root surfaces (root planing) of the teeth. The goals of scaling and root planing are to achieve clean, hard tooth surfaces, which are biologically compatible with periodontal health.

Methods

There are several common methods of cleaning these tooth surfaces

- Hand instruments (e.g., scalers, curettes)
- Sonic and ultrasonic scalers

Comparisons between hand instrumentation and the use of powered scaling devices have indicated that both techniques are effective in producing clean tooth surfaces. Root smoothness was once thought to be a critical end product of the root planing process and was used to judge effectiveness of hand and ultrasonic instruments. However, root smoothness is considered now to be a less important part in the health of the periodontium when compared to other factors such as complete plaque and calculus removal.

Hand Instruments

Hand instruments have been in use for over 100 years to accomplish scaling and root planing tasks. The use of hand instruments requires sharp instruments and the technical expertise to use these tools on the various crown and root surfaces.

Powered Equipment

The following is a list of advantages supporting the routine use of ultrasonic cleaners in our programs

- Less technical skill is required. (Dental auxiliaries can be trained in the use of these instruments.)
- Less time is required. (For the ultrasonic instrument to be effective, the tooth surfaces need only to be touched by the instrument.)
- Wound healing is same as for hand instrumentation.
- This equipment is often more effective in furcation areas.
- Sharpening is *not* required.

IHS Preferred Method

In reality, scaling and root planing will generally include the use of both hand and ultrasonic instruments. However, for IHS practices, the use of the ultrasonic instrument should be encouraged.

Treatment flow chart

The IHS has a "Periodontal Treatment Guide" flow sheet that was developed as part of the Periodontal Initiative in 2016. It shows by diagram the flow of periodontal treatments to consider by severity of disease as detected by the CPI, such as when to do a periodontal exam, when to provide scaling and root planning, when to consider local and systemic antibiotics, etc. It can found on the IHS Division of Oral Health website and downloaded.

Basic and Supplemental Equipment and Supplies

The following equipment and supplies are recommended for each service unit dental program. Many of these supplies could be stocked as central warehouse items to simplify procurement.

Item	Comments		Item	Comments
Equipment				
Cavitron SPS	Excellent at calculus removal. Plenty of power. Disadvantage: 25K insert not compatible with this 30K unit.		EMS Piezon 250	Piezoelectric ultrasonic scaler. Highly mobile. Plenty of power.
Supplies				
Cavitron Slimline inserts	For subgingival instrumentation (10S, 10R, 10L, TFI-10 Universal, TFI-13 Beavertail			
Curettes and Scalers				
Columbia 13/14	Universal curette, double ended		Columbia 13/14C	Universal w/ greater blade length, posterior scaler, double ended

H6/H7	Anterior scaler, double ended		Gracey 1/2	Anterior curette, double ended
Montana Jack	Universal scaler, double ended			
Prophy Angles				
Right Angle	Prophy sheath, for Midwest Rhino		Prophy Stem	Shortys, snap-on head
Disposable Prophy Angle	Recommended – it's effective, inexpensive, and has better infection control. Replaces conventional prophy angles		Prophy Paste	Medium or fine w/ fluoride
Explorers				
Nabors #2	For furcation detection		Pigtail 3CH DE	For calculus detection, detection of overhangs.
11/12 Explorer	For calculus detection, detection of overhangs.			
Sharpening Stones				
HB 14 Arkansas	For sharpening curettes and scalers, etc. Hard, Fine		6 India Stone course, red	For sharpening curettes and scalers, etc. Hard, Fine
6A Arkansas Stone (fine white)	For sharpening curettes and scalers, etc. Hard, Fine			
Perio Aids				
Proxabrush	Interproximal cleaning brush. Extra fine, taper shape		Proxabrush Inserts	Extra fine, cylinder, taper shape
Floss Threader	EZZ-Tru floss threaders, 5/envelope		Disclosing Agent	Red-Cote tablets, red dye 28
Toothpaste	Over the counter, ADA approved, with fluoride		Tooth Brushes	SOFT. Adult, junior, adult w/ small head, rubber tip
Hand Mirror	One side plain, one side magnified		Chlorhexidine	0.12%, 16 oz bottles

Local Delivery Antibiotics				
Arrestin	Minocycline microspheres		Atridox	Doxyxycline
Desensitizing Agents				
Gel-Kam	Stannous fluoride gel		Gluma	Resin desensitizer
Prevident	NaFl 1.1%		Advantage Arrest	Silver diamine fluoride solution, in office
Protect	Monohydrogen monopotassium oxalate solution, in office		Desensitizing Toothpaste	Over the counter

Section D: Surgical Periodontal Treatment

Overview

Nonsurgical techniques are not always effective in treating periodontal disease. When nonsurgical treatment has failed and patients demonstrate acceptable levels of plaque control, surgical therapy may be considered.

Some of the more common surgical procedures used in treating periodontal diseases include:

- Surgical access
- Osseous correction
- Mucogingival surgery/gingival augmentation and free gingival graft
- Frenectomy
- Gingivectomy

Performing Surgical Access

Introduction

Surgical access is performed to gain access to otherwise unvisualized root surface areas for debridement, detoxification, grafting, osseous recontouring, regeneration procedures, and so on.

Flap Design (Figure 6-1)

Classification is based on the final position of the flaps (or at least the desired final position) after suturing. The surgical procedures are very similar, have the same objectives, and may be considered as one procedure. These classifications include:

- Repositioned flap
- Apically positioned flap
- Coronally advanced flap

Repositioned Flap Procedure

The repositioned flap is a simple envelope flap utilizing intra-sulcular incisions. It is an all-purpose flap procedure that may be modified as needed (vertical releasing incision for example), and should be considered a surgical starting point. This is the most frequently used flap for most practitioners during oral surgery, and is also useful for many periodontal surgical procedures. The flap is reflected to allow surgical access, then is replaced to its original position and sutured. Use this approach unless there are definite reasons for using other types of flaps.

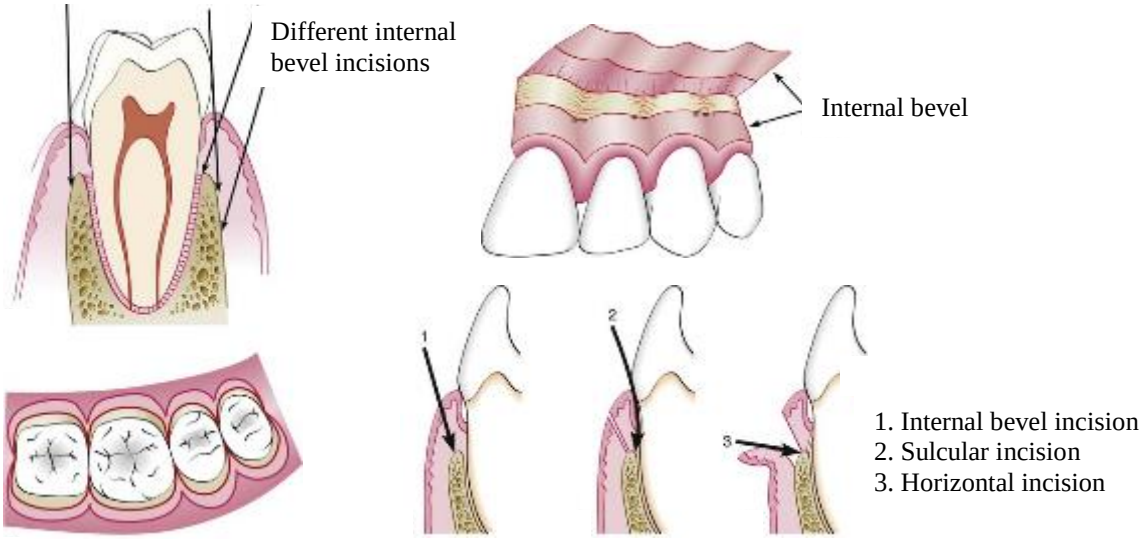


Figure 6-1

Note Apically positioned flap is a technique-sensitive procedure, and should be attempted only by practitioners trained in its use.

Apically Positioned Flap

This category of flap is reflected to allow surgical access, then is positioned apical to its original location and sutured. Depending on the desired surgical outcome, the flap can be positioned slightly coronal to the alveolar bone, at the bone level, or slightly apical to the bone level (to increase the amount of attached gingiva). Apical positioning can be achieved through suturing technique, and/or through scalloped incisions that remove a collar of attached gingiva. Scalloped incisions should not be used unless at least 2 mm of keratinized gingiva will be preserved. Apically positioned flaps are commonly used for periodontal pocket reduction – a rule of thumb is to scallop ⅓ to ½ of the pocket depth. There is a definite esthetic compromise to be considered with this procedure, and patients must be advised in all cases that an increase in tooth surface will show above the gingival margin when healing is complete. These flaps are most often used in non-esthetic areas, whereas repositioned flaps are most often used in esthetic areas.

Note Coronally advanced flap is a technique-sensitive procedure, and should be attempted only by practitioners trained in its use.

Coronally Advanced Flap

The coronally advanced flap is reflected to allow surgical access, then is positioned coronal to its original location and sutured. This type of flap is commonly used in mucogingival procedures involving gingival augmentation for root coverage and will be discussed later in this section.

Procedures for Performing Surgical Access

The following are procedures for performing surgical access.

Step	Action
1	**Make the initial incision.** **Note** The initial incision may be intrasulcular or scalloped. The scalpel blade should be held parallel to the long axis of the tooth in either situation. If scalloped incisions are used, measure the pocket depth (usually deepest interproximally) then make a bleeding point ⅓ to ½ of the pocket depth from the tip of the papilla to serve as a guide for the new papilla tip. The scalloping is continued across the straight buccal or lingual. Consider intrasulcular incisions when keratinized tissue is limited. (Figure 6-2)
2	Reflect flaps enough to gain visual access to the osseous crest. The flap will need reflection past the mucogingival junction if osseous resection is performed, or if needed for visualization. If flap debridement is being performed w/o osseous resection, do not reflect past the mucogingival junction. **Note** Since there is no mucogingival junction on the palate, a more generous reflection is possible.
3	If a scalloped incision was used, make a sulcular incision followed by a horizontal incision at the base of the gingival collar in order to remove. (Figures 6-1, 6-3).
4	Remove all granulation tissue and any remaining interdental tissue. Using the tip of the ultrasonic scaler to loosen this tissue (until it turns white) makes removal with a hand scaler/curette much easier.
5	Plane the root surfaces meticulously to a hard, smooth surface using a combination of hand and ultrasonic instruments to obtain the best results. **Note** Care must be taken to avoid pinching, perforating or tearing tissue flaps.
6	Recontour the restorations and smooth their margins to remove overhangs and Roughness.
7	Irrigate the surgical site with water or saline. **Note** No advantage has been demonstrated with the use of saline.
8	Reexamine the site for tissue tags, overlooked calculus, and marginal irregularities.
9	Perform final debridement, margin smoothing, and root planing.
10	Trim granulation tissue from the inside of all flaps with surgical scissors.
11	Perform osteoplasty/ostectomy at this time (if it is to be performed).
12	Position flaps in their appropriate positions.
13	Suture flaps with 3-0 or 4-0 sutures (Figure 6-4). **Note** Silk and gut are two of many acceptable materials. Some practitioners prefer resorbable materials, some prefer monofilament suture like gut or nylon; Suture options include continuous sling, simple interrupted or vertical mattress (to keep sutures out of the flap margin area). Suture technique is based on operator preference and has minimal effect on healing.
14	Hold firm pressure on the flaps for 5 to 8 minutes.
15	Place periodontal dressing (if it is to be used) at this time. **Note** There is no healing advantage to using dressings. They act as bumpers and, in some cases, are helpful in holding flap margins down. They do not accelerate healing or keep food debris or bacteria out of the surgery site.
16	Provide the patient with appropriate pain prescriptions, such as: **Analgesia** • Rx: Ibuprofen 800 mg x 21 tabs • Sig: One tab Q 8 h PRN pain • Have pt take every 8 h on schedule for the first 2-3 days, then as needed after that. (Do NOT exceed 2400 mg. per day)

	** Opioid pain medications are rarely needed **Topical antibacterial agent** • Rx: Chlorhexidine rinse x 1 pint • Sig: Rinse BID for 60 sec with 1/2 oz, then expectorate
17	Remove the sutures in 7 to 14 days unless healing has been delayed.
18	Swab the surgery site with equal parts of hydrogen peroxide and warm water.
19	Lightly scale to remove plaque, tissue tags, and missed flecks of calculus.
20	Polish the teeth with a commercial dentifrice to remove coffee, smoking and chlorhexidine stains.
21	Allow the patient to rinse with a commercial mouth rinse diluted with warm water. **Note** This will leave the patient's mouth feeling fresh and clean.
22	Instruct patients in home care.
23	Reevaluate the patient's progress at various intervals in the healing process. **Note** Most people should be seen at 30 and 90 days postoperatively. Probing should be avoided for at least 90 to 120 days. Again reinforce home care instructions at each visit during this interval.

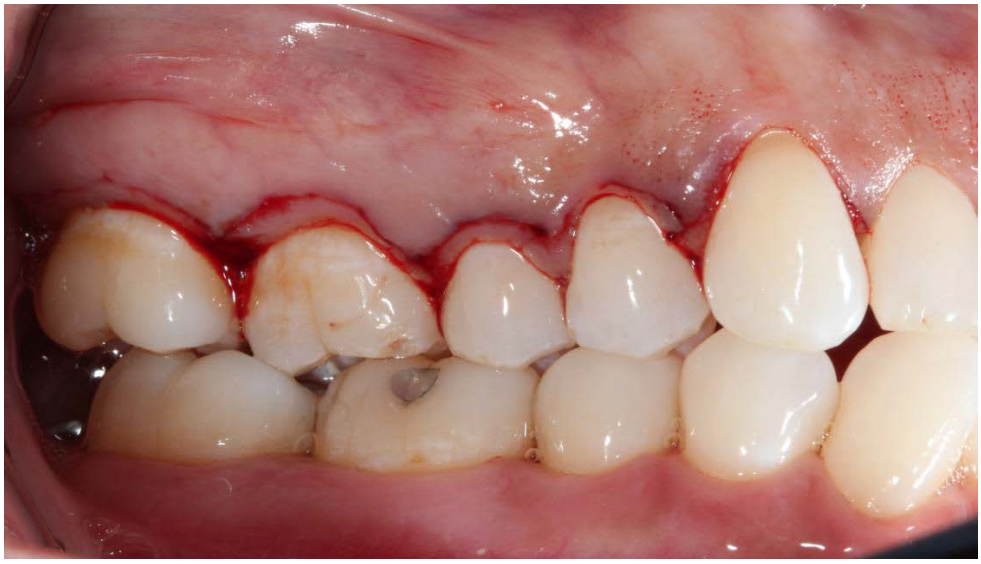


Figure 6-2: Scalloped incision

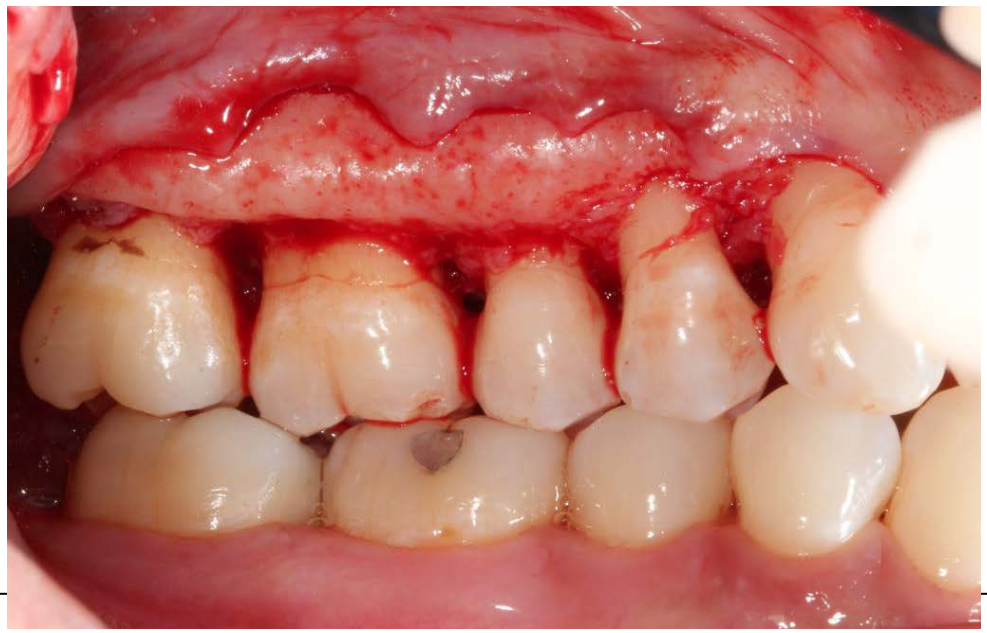


Figure 6-3: Tissue reflection (gingival collar has been removed)

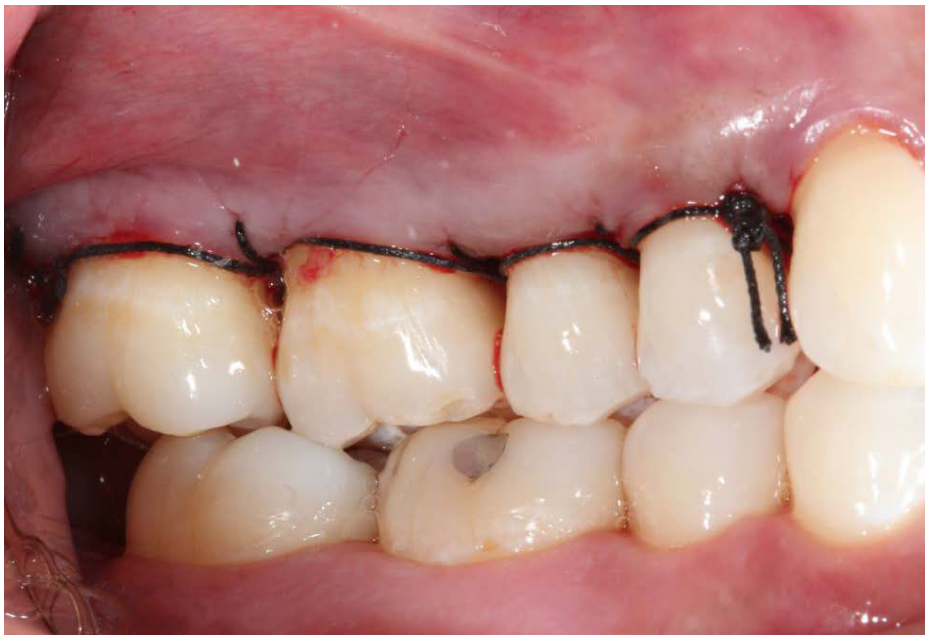


Figure 6-4: Tissue closure

Performing Osseous Correction

Introduction

Osseous corrections are performed to remove alveolar bone in minimally sufficient amounts to achieve proper physiologic contour and tissue adaptation amenable to good oral hygiene. The two procedures are:

- Osteoplasty
- Ostectomy

Definitions

Osteoplasty is the removal of non-supporting alveolar bone to provide a gradually contoured surface over which gingival tissue flaps will adapt and be maintained without the formation of pseudopockets or uncleansable areas.

Ostectomy is the removal of tooth supporting bone to mimic the gingival contour, thus obtaining a harmonious osseous and gingival topography that can be maintained by the patient.

Indications for Osteoplasty

The following are indications for osteoplasty:

- Exostosis and torus reduction
- Contouring of thick marginal ledges
- Contouring anatomical aberrations not requiring removal of supporting bone

Indications for Ostectomy

The following are indications for ostectomy:

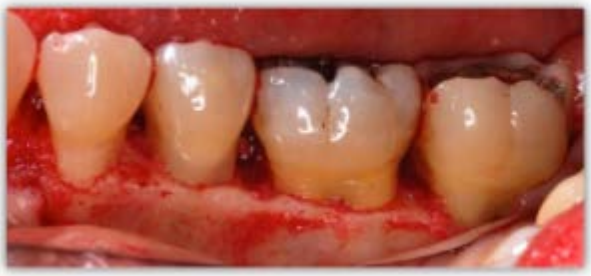
- Wide two-wall osseous defects or craters
- Inconsistent margins
- Hemisepta (one-wall defects)
- Furcation invasions
- Anatomical aberrations requiring removal of supporting bone

Procedures for Performing Osseous Correction

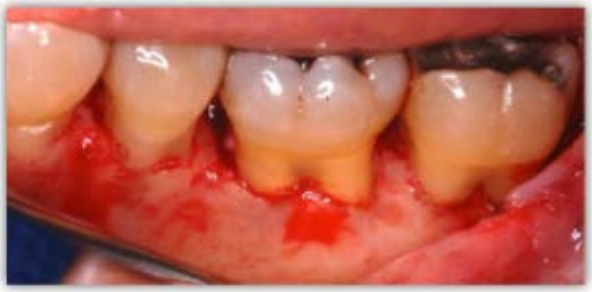
The following are procedures for performing osseous correction.

Step	Action
1	Remove all plaque, calculus, and tissue tags.
2	Smooth and recontour restoration margins as necessary.
3	Rinse and thoroughly inspect the surgical site. **Note** Osseous correction is planned to avoid exposure of furcations and removal of excessive amounts of tooth-supporting bone. Alternative treatment would include extraction, osseous grafting, and guided tissue regeneration.
4	Thin and contour the bone (if needed) by making vertical grooves between teeth, tucking the bone into the interproximals, and grooves apical to furcations. These grooves are then blended into a smooth contour that follows the contour of the roots and has knife edge margins. If the radicular bone is coronal to the interproximal bone at this point (negative architecture), ostectomy is performed on the radicular bone to achieve positive architecture. (Figures 6-5 & 6-6)
5	Use round burs, Neumeyer flame shaped and end cutting burs; Ocshenbein, back action, Fedi, and/or wedelstadt chisels with a slight rocking back and forth movement. **Note** These chisels must be sharp, and care taken to avoid nicking the root surface. A round bur in a high- or low-speed handpiece may be used, along with Neumeyer flame shaped burs and end cutting burs for the interproximals. Long-shank contra-angle burs are also recommended for better access to the alveolar crest. A water spray should bathe the contoured area to cool the bone (to prevent necrosis of the cellular component of the alveolar bone). Avoid touching the flap when the bur is rotating. Bone particle size resulting from high-speed osseous correction is optimum for autogenous grafting, and may be saved in a sterile dappen dish until all correction is completed. Then it may be placed into two- and three-wall defects or furcations as opposed to being discarded.
6	Rinse the surgical site and inspect the entire area (prior to graft placement--if this is done).
7	Fill the osseous defects. **Note** Osseous defects should not be overfilled. The optimum allograft to autograft ratio is 1:1.
8	Optimally cover grafts with flaps (without stretching them).
9	Suture the flap. Vertical mattress sutures will keep suture material away from the critical flap margin area during initial healing.
10	Avoid probing grafts for 6 months.

Figure 6-5

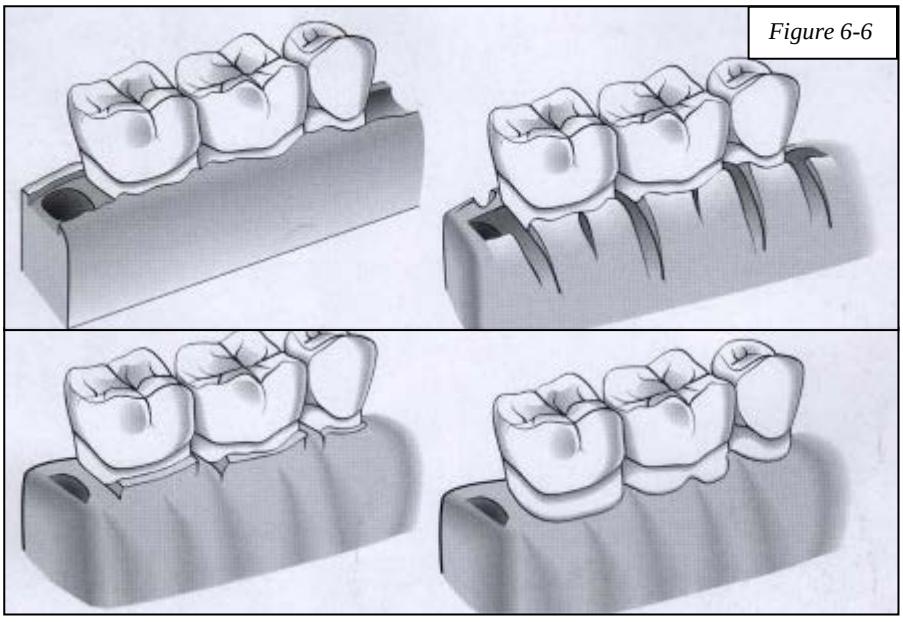


BEFORE
Negative architecture



AFTER
Positive architecture

Figure 6-6



Crown Lengthening

Overview

The procedures and instrumentation are generally the same between osseous surgery and crown lengthening. The major difference is that in crown lengthening surgery we are removing bone and soft tissue around teeth with a healthy periodontium.

Restorations with subgingival margins show larger amounts of plaque, more severe gingival lesions, and deeper pockets than margins level with or above the gingival crest. Subgingival restoration margins, especially those with overhangs, are associated with microflora commonly found in diseased pockets. Finish lines at or above the gingival margin are easier to assess for accuracy of fit and to polish, and are associated with gingival health in patients with good oral hygiene. Periodontal therapy should be performed prior to any subgingival margin placement in order to establish healthy marginal tissue.

Damage to the gingival complex is minimal when gingival retraction precedes tooth reduction. Crown Lengthening is a resective periodontal surgical procedure whose indications include: subgingival caries, perforations or fractures in the coronal third of the root, and inadequate retention for a restoration due to a short clinical crown.

Practical Crown Lengthening

Understanding Biologic Width

Violations of the crevicular or subcrevicular physiologic dimension by restorative dentistry will cause chronic inflammation, which in the presence of occlusal trauma, will result in more rapid periodontal destruction. Allow 4 mm from bone level to restorative margin:

- 1mm for connective tissue attachment
- 1mm for junctional epithelium
- 1-2mm for pocket depth

Contraindications for Crown Lengthening

- Single tooth anterior esthetic areas
- Roots with proximity closer than 1.5 mm
- Surgical crown lengthen only after gingivitis or periodontitis is under control!
- Bad oral hygiene
- Existing periodontitis
- Inadequate attached gingiva

Planning the Surgical Procedure

There are different procedures which can be used for crown lengthening. These are:

- Gingivectomy
- Apically Positioned Flap

- Apically Positioned Flap with Osseous Resection Before

surgery is begun, the following procedures must be completed:

- Remove all caries prior to elevating flap
- Remove temporary crowns
- Use bone sounding to determine estimated amount of lengthening required
- Plan to extend 1-2 teeth mesial and 1-2 teeth distal

The instrument tray:

- Cotton Pliers
- Tissue forceps
- Explorer
- Mouth Mirror
- Perio probe
- Bard Parker or cylindrical scalpel handle, #15 or 15c blades
- Gingivectomy knives
- Periosteal elevator
- Curettes
- Suture scissors
- Tissue scissors
- Hemostat
- Needle Holders
- Syringe for irrigation
- Aspirator tip
- Saline Irrigation
- Syringe for local anesthesia
- Chisels

Surgical Procedure–Soft Tissue

- Use #15, 15c or 12b blade to make incisions
- Reflect flap using periosteal elevator
- Expose 10 mm of alveolar bone

Initial Incision

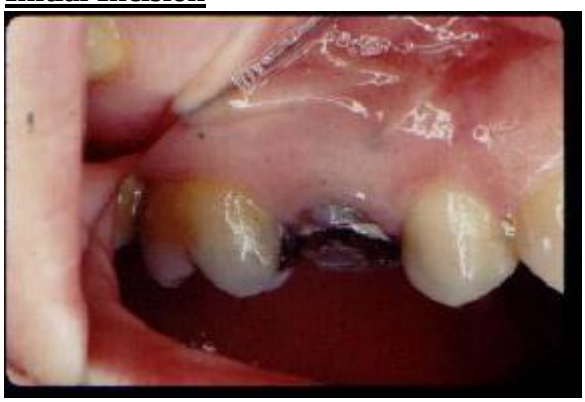


Figure 6-22: Preoperative

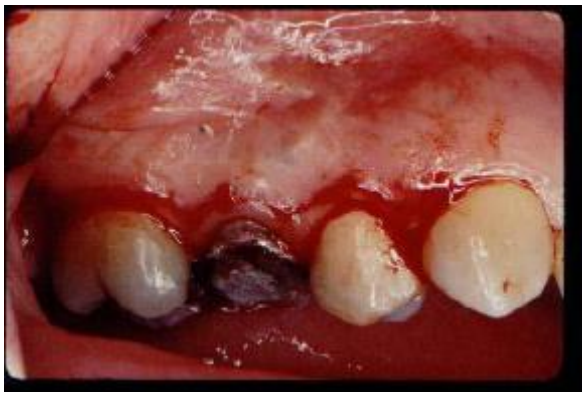


Figure 6-23: Buccal incision

Surgical Flaps

- First incision is placed 2 mm coronal to finished bone height (figures 6-22 to 6-24)
- Second incision is placed in sulcus
- Third incision perpendicular to long axis of the tooth at the apical extent of the gingival collar to release it
- Remove excess tissue with scaler

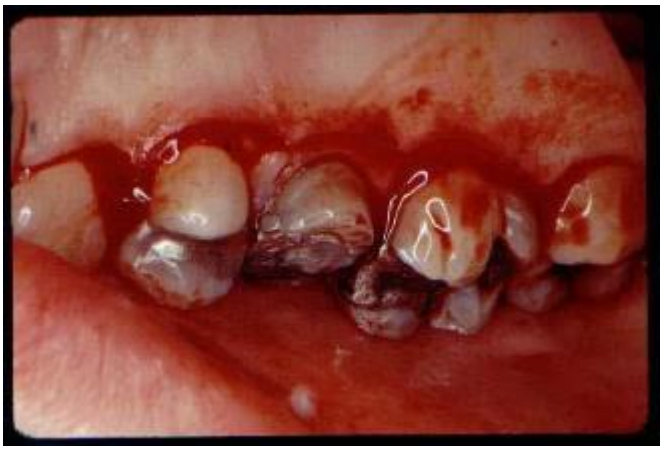


Figure 6-24: Palatal flap

Debridement

- Remove interdental tissue with ultrasonic & large scaler
- Remove all tissue tags with Gracey Curettes
- Control Bleeding
- Clean all roots with ultrasonics and curettes
- Circumferential ostectomy to 4mm from anticipated restorative margin
- Contour bone to achieve soft tissue fit (and blend to adjacent teeth)

Instruments for Bone Removal

- Back-action chisel
- Ochsenbien chisel
- Handpiece with #6 or 8 surgical round burs and end cutting burs
- Wedelstaedt chisel
- Sugarman File

Principles of Osseous Resection

- Same principals as osseous surgery for periodontal disease.
- Plan to remove supporting bone to 4 mm from anticipated restorative margin.
- Osseous resection cannot be limited to single teeth, especially in the anterior region.
- Do not touch tooth with bur; use Wedelstaedt chisel to remove any interproximal "widow's peaks" of bone.
- Blend bone contours
- One tooth mesial
- One tooth distal
- Use Sugarman file interproximally, if required

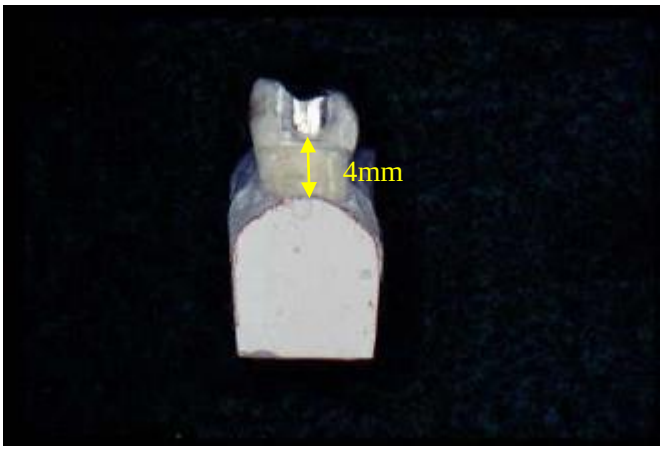


Figure 6-22: Interproximal bone contours

Closure

- Use 3-0 or 4-0 suture
- Use simple interrupted or sling sutures
- Small areas of bone may be left exposed
- Do not cinch sutures too tight (avoid tissue blanching)
- Cover with Coe-pak if needed to hold tissue in apical position

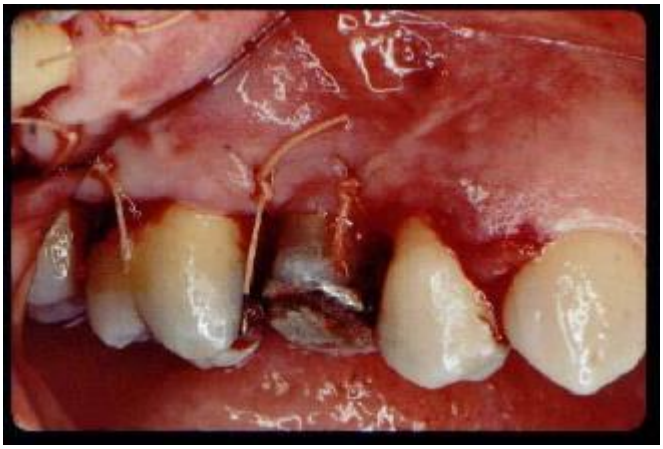


Figure 6-23: Sutures

Restorative Procedures

- Restore posterior teeth in 4-6 weeks
- Restore anterior teeth in 6–8 weeks
- Non-emergency endo treatment after 2 weeks

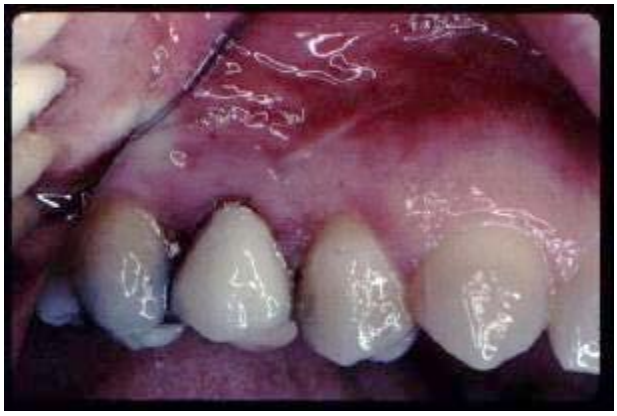


Figure 6-24: Restoration complete

Postoperative Medications

- Chlorhexidine b.i.d.
- Ibuprofen 800mg (or alternative if not able to take NSAIDs)
- Opioid pain medications rarely needed

- Generally, no systemic antibiotics required

Performing Mucogingival Surgery/Gingival Augmentation

Introduction

Mucogingival surgery has been a part of the periodontal surgical armamentarium for many years. The goals of these procedures follow:

- Increase the zone of attached gingiva.
- Increase vestibular depth.
- Cover denuded root surfaces (gingival recession).
- Eliminate muscle or frenum pull on the free gingival margin.

Abnormal Findings

Many of the above findings are common and the rationale for surgically correcting these is often difficult to define. These abnormal clinical findings may exist for a variety of reasons, including:

- Narrow alveolus
- Mechanical (overzealous tooth brushing, etc.)
- Chronic inflammation
- Crowding
- Postorthodontic movement

Considerations

The need to correct any mucogingival deformity is based on the:

- History of the defect
- Patient's ability to maintain the area (adequate plaque control)
- Esthetics
- Cemental sensitivity
- Existence of increased pocket depths

Indications

Practically, it is rare for teeth to be lost because of nonpocket mucogingival deformities. The rationale for performing the surgery should be one of the following

- Esthetics (usually maxillary anterior)
- Cemental sensitivity after conservative treatment has failed
- Where plaque control is compromised because of the morphology of the defect
- Prosthetic considerations especially where the margin of a crown or other restorations is to be placed into an unfavorable environment
- Other considerations

Corrective Surgical Procedures

If it is determined that correction is necessary, the following is a list of corrective surgical procedures to be considered

- Free gingival/connective tissue graft
- Lateral sliding flap with or without connective tissue graft
- Coronally positioned flap with or without connective tissue graft
- Soft tissue allograft (i.e. acellular dermal matrix)

This chapter does not attempt to cover all of these procedures. All have their place in therapy and can be accomplished predictably. Those who have had adequate training in the rationale for, and performance of, these procedures recognize their limited indications and may continue to employ their use when necessary. For those who have not, this brief discussion is not adequate preparation.

Performing a Free Gingival Graft

Introduction

Free gingival grafting may be considered if there is a demonstrated need to perform any of the following

- Increase the zone of attached gingiva
- Deepen the vestibule
- Eliminate abnormal muscle or frenum pull

The most common indication for this procedure is the labial aspect of the mandibular anterior, and this is the area that will be discussed.

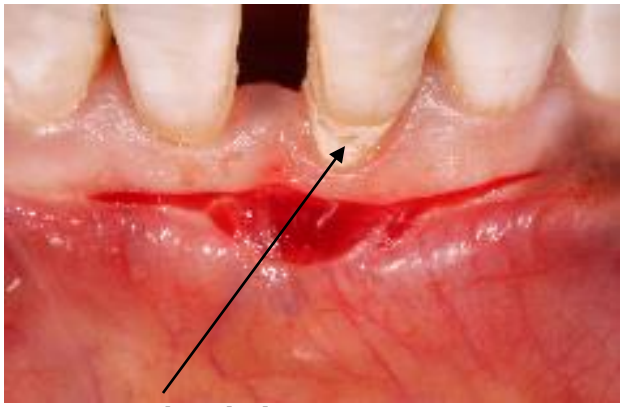
> **Caution** Mucogingival surgical procedures are very technique-dependent. Clinicians who feel inadequately trained and/or experienced in the use of these procedures should seek hands-on training before attempting them.

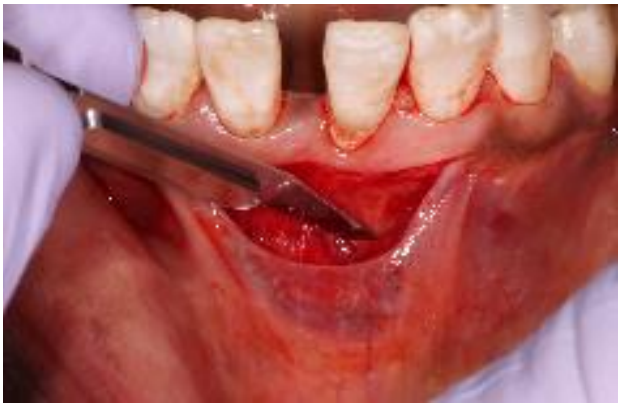
Procedures for Performing a Free Gingival Graft

The following are procedures for performing a free gingival graft. It is intended only as an outline.

Step	Action
1	Anesthetize both the recipient and donor sites with infiltration local anesthesia.
2	Make an incision just coronal to the mucogingival junction (Figure 6-7). **Note** This incision should be carried horizontally one to two teeth on either side of the area being treated.
3	Place the scalpel blade in this incision and prepare the recipient site by sharp dissection passing apically to the base of the area to be grafted (usually 5 to 10 mm). **Caution** Care should be taken during this split-thickness dissection to leave periosteum on the underlying bone but not leave significant other tissues as this may

	result in a graft that is not bound to bone but is floating.
4	Place a sterile, saline-soaked gauze on the wound.
5	Obtain donor tissue from the palate. **Note** The dimensions of the recipient site should be outlined on the palate with a scalpel and a graft elevated that is 3/4 to 1 1/4 mm thick (Figure 6-8). The donor site can be protected by a vacuum formed stent to be worn 24 hrs, then while eating.
6	Inspect the connective tissue side of the donor material and remove any fatty or glandular tissue (sharp scissors work well for this).
7	Place the graft immediately on the recipient bed (connective tissue side down) so as not to compromise its viability.
8	Suture the graft to the recipient site at its superior corners, then place periosteal sling sutures to hold graft against periosteal bed (Figure 6-9).
9	Carefully apply pressure to the graft for 5 to 10 minutes to squeeze out any pooled blood and initiate the fibrin clot to tack it to the recipient bed.
10	Place periodontal pack (necessary if the patient is not instructed carefully).
11	Give the patient postoperative instructions (Appendix) and have the patient return in 5 to 7 days. This is one of the few procedures where opioid medications may be indicated as the donor site can be quite painful. (Figure 6-10)





Remove the calculus
BEFORE you cut!

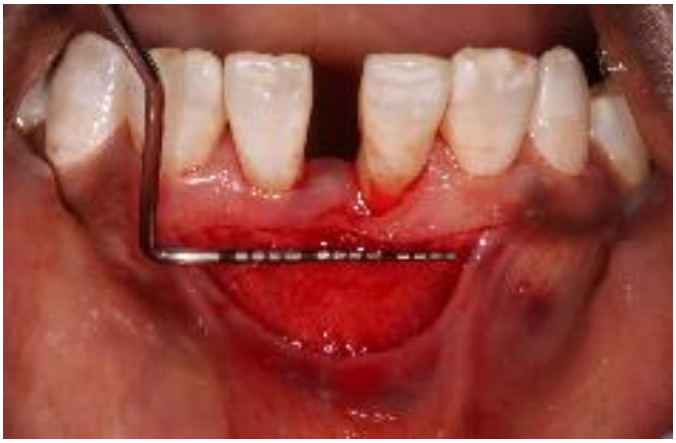
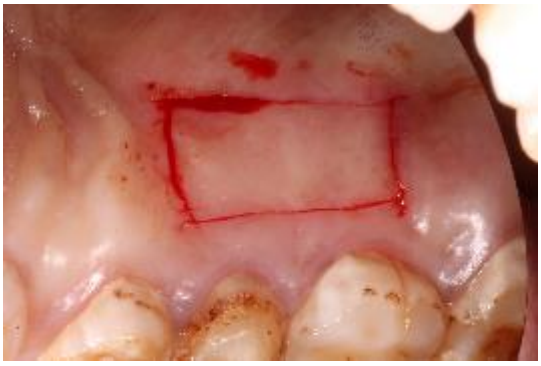
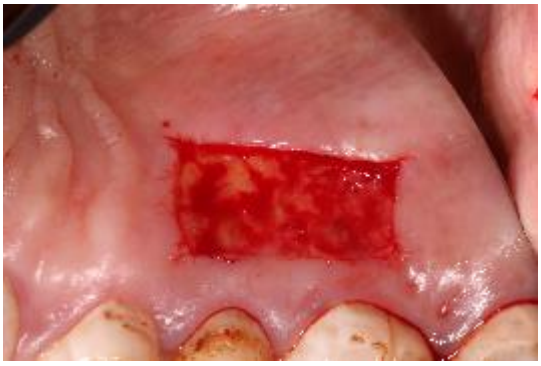
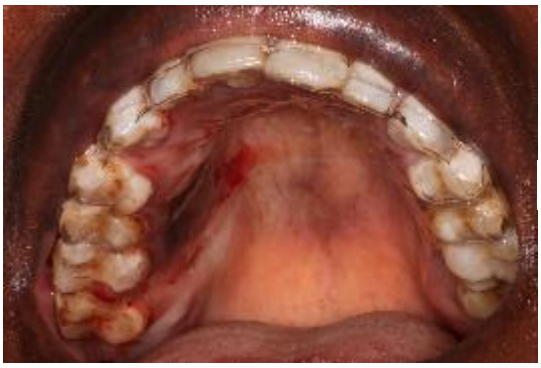


Figure 6-7: Surgical Site Preparation







Palatal stent in place

Figure 6-8: Donor site

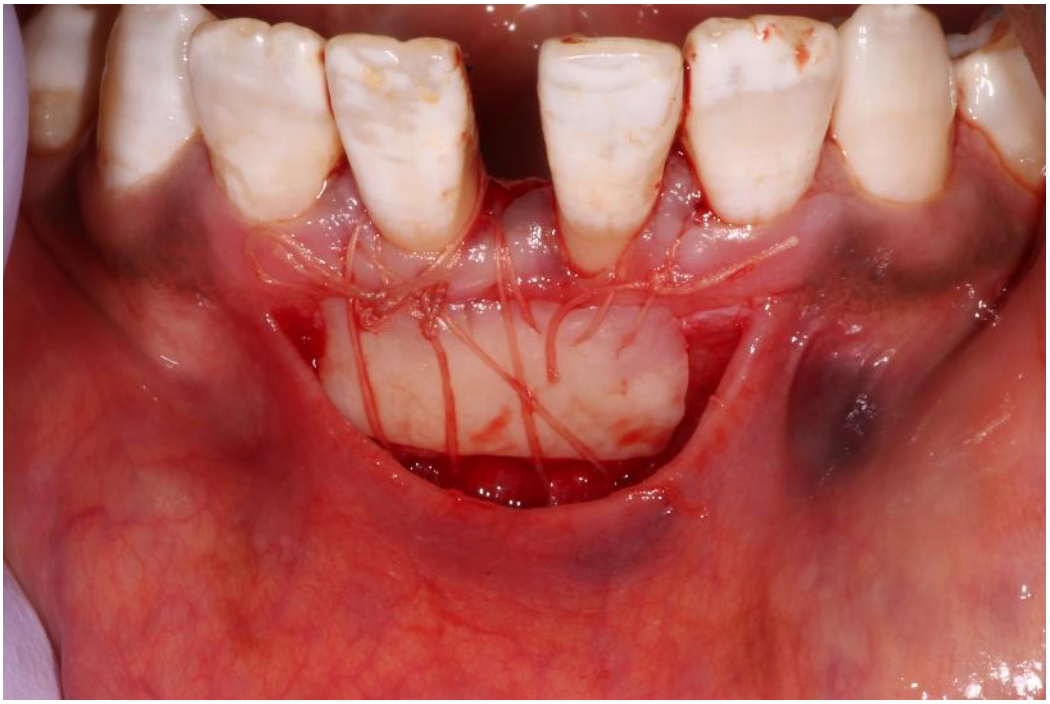


Figure 6-9: Donor tissue sutured in place

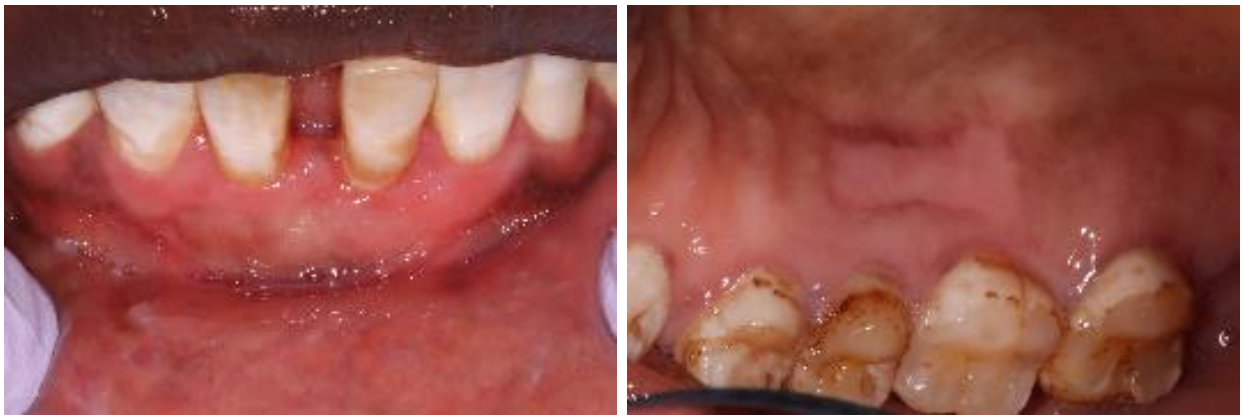


Figure 6-10: 5 weeks postoperative

Performing a Frenectomy

Introduction

A simple frenectomy should be considered when the presence of a frenum either:

- Significantly interferes with the patient's ability to maintain the area
- Compromises the labial flange of a maxillary denture
- Produces pull on the free gingival margin (that by history is causing progressive attachment loss)
- Interferes with the orthodontic closure of a diastema

If the abnormal frenum is associated with an inadequate zone of attached gingiva, the frenectomy is best accomplished in conjunction with a free gingival graft. The most common area where frenectomy alone is indicated is the maxillary labial frenum.

Procedures for Performing a Frenectomy

The following are procedures for performing a frenectomy. A laser such as CO2, diode, Er,Cr:YSGG can also be used (figures 6-17, 6-18)

Step	Action
1	Anesthetize the area (Figure 6-11) by infiltration using a local anesthetic. **Caution** Care should be taken not to distort the area with rapid injection.
2	Hold the lip upward and forward to visualize the extent and morphology of the frenum.
3	Grasp the frenum with a small curved hemostat with the tip of the beak to the base of the vestibule. **Note** The convex curve of the hemostat should face the lip (Figure 6-12).
4	Make an incision along the lateral borders of the frenum using a #15 scalpel blade (Figure 6-13). **Note** This will form a V-shaped incision which includes the lowest attachment (apex) of the frenum.
5	Excise the superior portion of the frenum from the upper lip following the outside curve of the hemostat (Figure 6-12). **Note** The tissue to be removed should now be free and held only by the hemostat. The wound created in the lip will be wide.
6	Undermine the lateral borders of the incision by blunt dissection using a periosteal

	elevator (Figure 6-13). **Note** This will aid in the placement of sutures and assist in minimizing recurrence.
7	Close the wound with 3-0 or 4-0 black silk sutures taking care to approximate the tissue and not purse the margins (Figure 6-14).
8	Apply pressure to the wound for approximately 5 minutes.
9	Have the patient return in 5 days for suture removal and follow-up care.

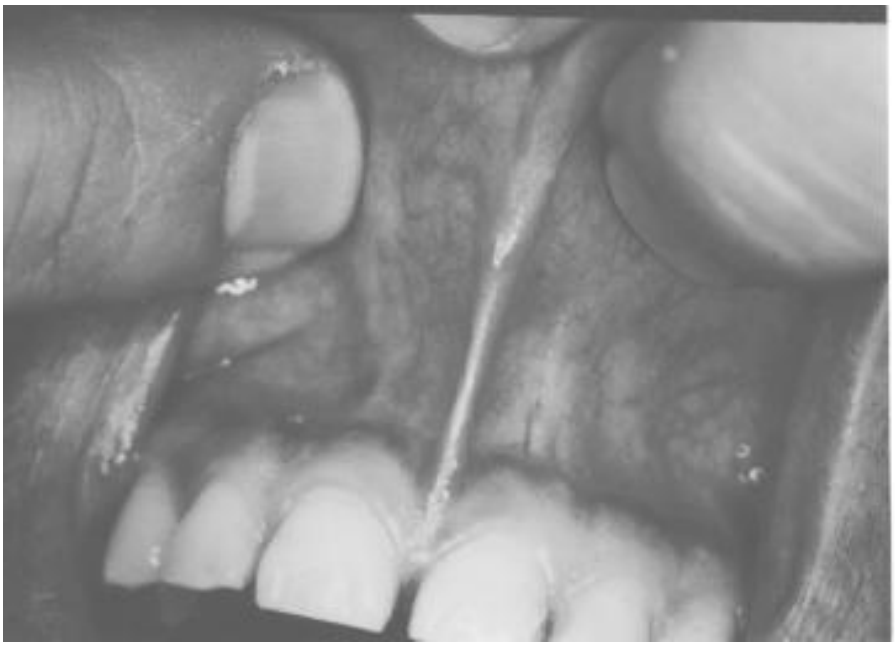


Figure 6-11: Operative site

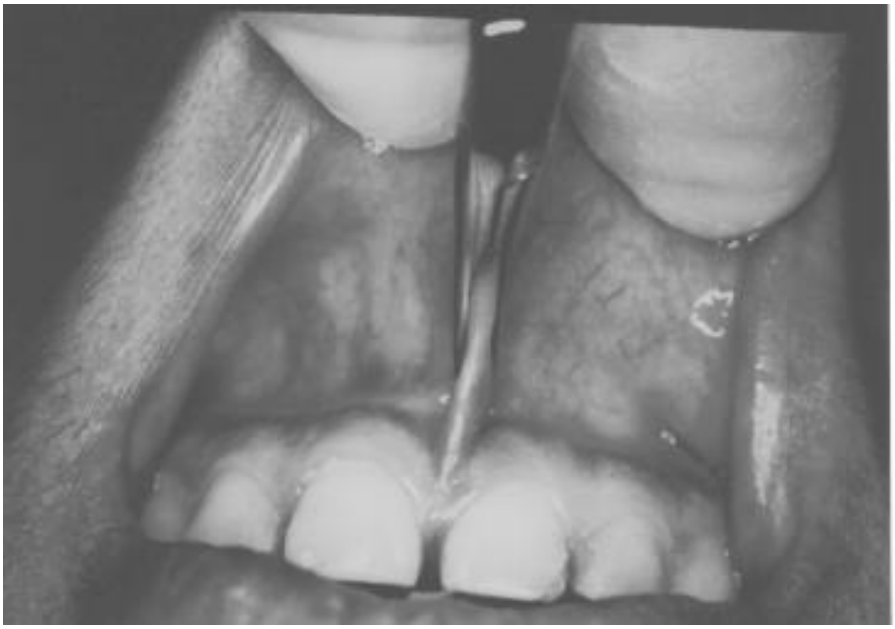


Figure 6-12: Hemostat in place

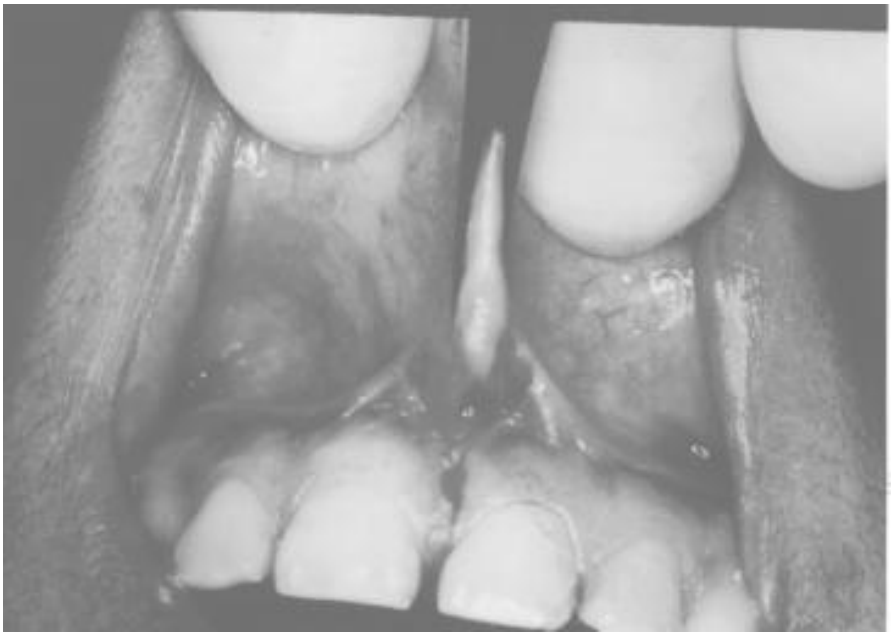


Figure 6-13: Incision on Either Side of Hemostat

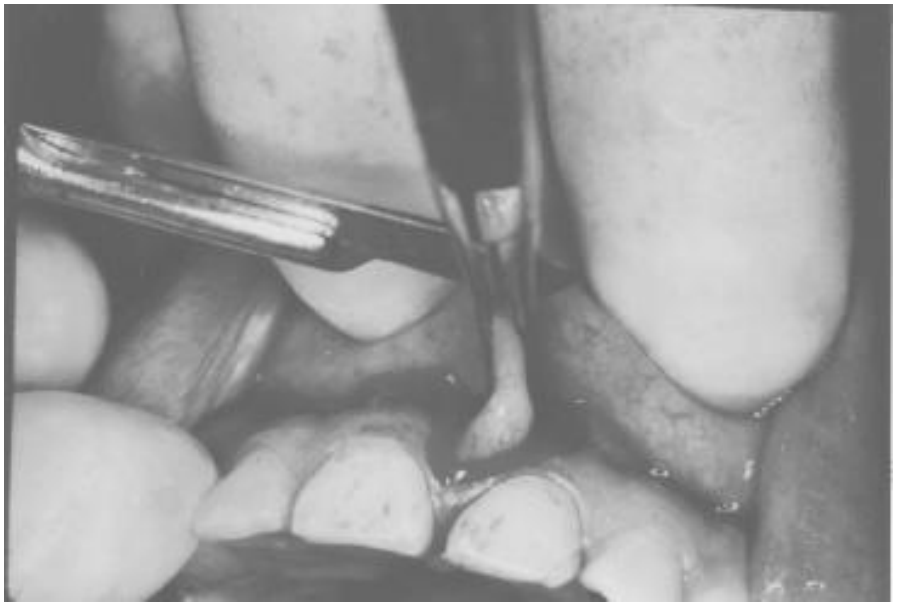


Figure 6-14: Removal of Frenum

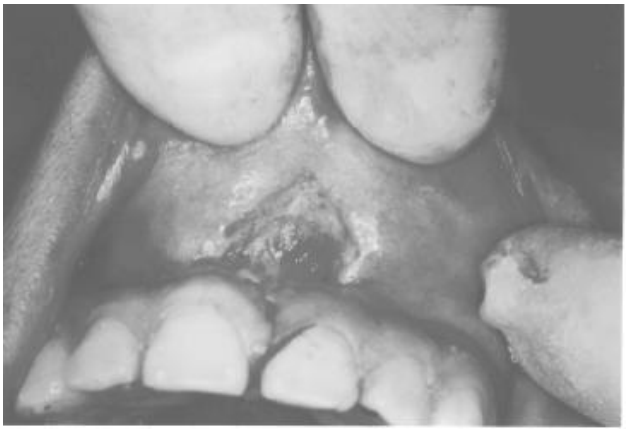


Figure 6-15: Frenum removed

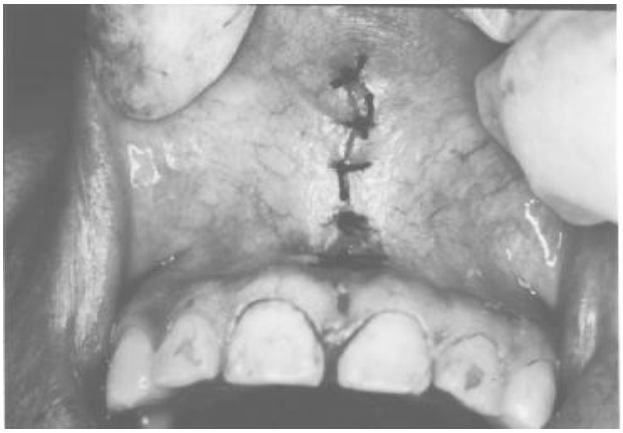


Figure 6-16: Surgical site closed

Figure 6-17: Maxillary labial frenum

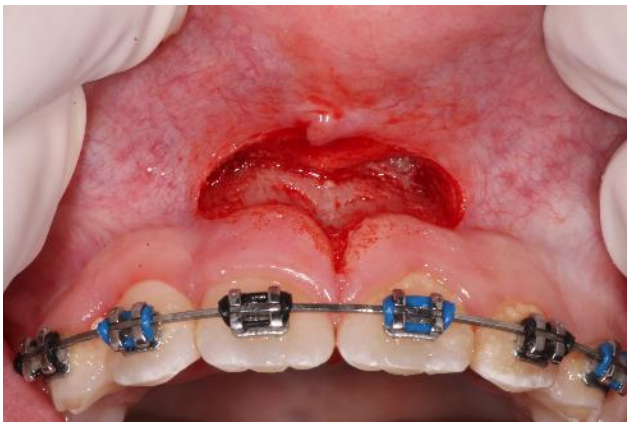


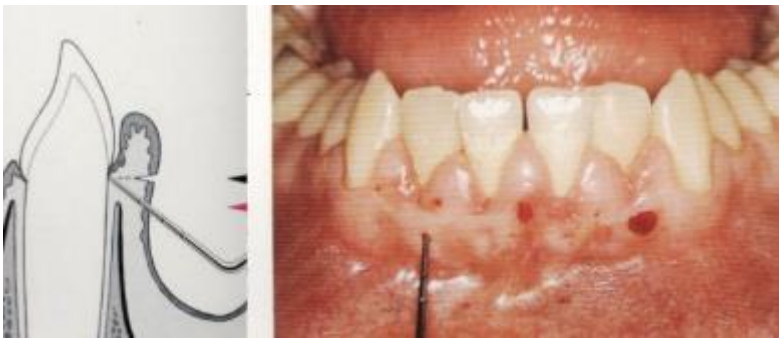
Figure 6-18: Frenum removed w/ Er,Cr:YSGG laser w/ minimal bleeding or post op discomfort

Performing a Gingivectomy

Introduction

The gingivectomy procedure is essentially the same as that for gingivoplasty, except the pockets are more pronounced with a diseased inner wall.

Figure 6-19



> **Note** Nifedipine, cyclosporin, dilantin and other medications may cause drug-induced gingival hyperplasia in some people. This is not a universal response to these medications. Bacterial plaque appears to initiate and aggravate this exaggerated response (growth) of fibroblasts and collagen fibers. The net result is usually a pseudo pocket (the epithelial attachment is at or near the CEJ, and the pocketing is coronal to them). Meticulous oral hygiene seems to be helpful in avoiding or retarding the growth of gingival tissue.

Indications

The gingivectomy is indicated in the following situations:

- Where the pocket is confined within the attached gingiva and there is enough attached gingiva so it will not all be removed during the surgical procedure
- If there are no osseous deformities

Contraindications

The gingivectomy is contraindicated if the postoperative zone of keratinized gingiva is less than 2 mm; consider using an apically positioned flap procedure. A second step free gingival autograft may be required to reestablish a cleansable comfortable zone of keratinized/ attached gingiva.

Procedures for Performing a Gingivectomy

The following are procedures for performing a gingivectomy:

Step	Action
1	Make bleeding points along the gingiva with a pocket marker, *or* probe to identify the base of the pockets prior to the initial incision.
2	Make an external beveled incision within the attached gingiva with the gingivectomy knife at a 45 degree angle to the tooth to the base of the pocket following the outline of the bleeding points. (figure 6-19)
3	Undermine and shape papilla and interproximal tissue with the interproximal knife. **Note** This will allow the gingiva to be removed in one piece.
4	Further contour the tissue with the side of the gingivectomy knife and abrasive diamond stones.

5	Remove tissue tags with a sharp curette.
6	Apply a periodontal dressing to the surgical area.
7	Give patient postoperative instructions, necessary pain medications, and a prescription for a chlorhexidine rinse as follows • Rx: Chlorhexidine rinse • Disp: 1 pint; refill x 3. • Sig: Rinse B. I. D. for 60 sec with 1/2 oz. then expectorate.
8	Reinforce home care instructions. **Note** Tell the patient that the best way to avoid or minimize further surgical treatment is to maintain a very clean mouth

Periodontal Surgical Instruments Setup

Introduction

There are a seemingly endless number of periodontal surgical instruments available. However, the instruments listed below should be adequate for most periodontal surgical procedures.

Instruments

The following periodontal surgical items should be included in the instrument setup:

- Periodontal probes, UNC 15
- Gracey curettes 5-6, 11-12
- Columbia curette 13-14
- McCall 13-14, 17-18*
- Prichard curette 1-2
- Small curved Kelly hemostat
- Cylindrical scalpel handle (2)
- Molt #2/4 periosteal elevator*
- Molt #9 periosteal elevator*
- Prichard periosteal elevator
- Suture material, 3-0 or 4-0 silk or gut
- Surgical length burs: #6 and #8 round (carbide & diamond), end cutting bur
- Double surface mirror (mirror on both sides)*
- Castroviejo needle holders (5-0 & smaller sutures)*
- Curved Iris tissue scissors
- Straight or curved suture scissors
- Sugarman file 1S/2S
- Fedi #2 chisel*
- Ochsenbein (#4) back action chisel
- Ochsenbein (#1/2) chisel
- Kirkland periodontal knife
- Orban periodontal knife
- Cotton forceps
- Minnesota retractor
- Bard Parker blades, # 15, 15c, and 12b
- Nippro tissue nipper*
- Sterile ultrasonic insert/tip

* Optional Item

Section E: Management of Periodontal Emergencies

Introduction

This section discusses emergency treatment of periodontal diseases. The discussion is limited to emergency treatment of:

- Necrotizing ulcerative gingivitis (nug)–periodontitis
- Periodontal abscess

Treating Necrotizing Ulcerative Gingivitis (NUG)

Introduction

NUG is a distinct periodontal disease with a complex and still poorly understood etiology. It most often affects patients continuously exposed to a severe systemic compromise, but can also affect patients with systemic compromise of limited duration (e.g. severe stress). It can be readily differentiated clinically from chronic inflammatory periodontal diseases.

Clinical Signs and Symptoms

The diagnosis of NUG can be made by a clinical examination of the gingiva and information obtained from the history of the disease. The two most significant clinical symptoms are:

- Interproximal necrosis and ulceration which has been frequently described as punched-out or eroded crater-like lesions involving the interdental papillae.
- History of gingival soreness and/or bleeding which is exacerbated by minor trauma such as eating or toothbrushing. The pain also can be spontaneous and constant. Onset of symptoms is usually rapid.

Without these two signs, the diagnosis of NUG cannot be made.

Other Symptoms

The following clinical signs and symptoms are characteristic of NUG:

- Pseudomembrane
- Foul odor
- Lymphadenopathy
- Increased salivation
- Fever
- Malaise
- Anorexia

Predisposing Factors

The clinical signs and symptoms of NUG appear to be of microbial etiology; however, most patients presenting with the disease usually exhibit one or more of the following predisposing factors:

- Psychological stress
- Fatigue and physical debilitation
- Poor dietary habits
- Smoking
- Trauma
- Poor oral hygiene
- Immunocompromise

> **Note** Psychological and/or physical stress seem to be the most significant predisposing factors.

Procedures for Treating NUG

The following are procedures for treating NUG:

Step	Action
	First Visit
1	Conduct diagnosis of disease by obtaining history and evaluating the patient's oral health.
2	Discuss etiology and predisposing factors with the patient.
3	Perform an initial debridement (as tolerated by the patient). **Note** This is best accomplished with the use of an ultrasonic scaler and local anesthesia.
4	Place the patient on a chlorhexidine-containing mouth rinse. **Note** Frequent warm saline rinses may be recommended as an alternative.
5	Provide plaque control instruction *(critical)*.
6	Use antibiotic therapy (usually penicillin) *only* if there is evidence of systemic involvement such as fever or lymphadenopathy.
	Second Visit (after 24 to 48 hours)
7	Evaluate response.
8	Perform definitive scaling and root planing.
9	Review oral hygiene procedures with the patient.
	Third Visit (at approximately 1 week)
10	Evaluate response.
11	Check adequacy of root debridement.
12	Reinforce oral hygiene.
13	Appoint for recall in 3 to 4 months to check for recurrence and evaluate extent of permanent tissue damage. **Note** Ideally, some gingivoplasty may be required in a small percentage of post-NUG patients.

Treating Periodontal Abscess

Introduction

Individuals with chronic inflammatory periodontal disease may occasionally present with an acute periodontal abscess (Figure 6-20). Certain procedures may be followed to treat periodontal abscesses.

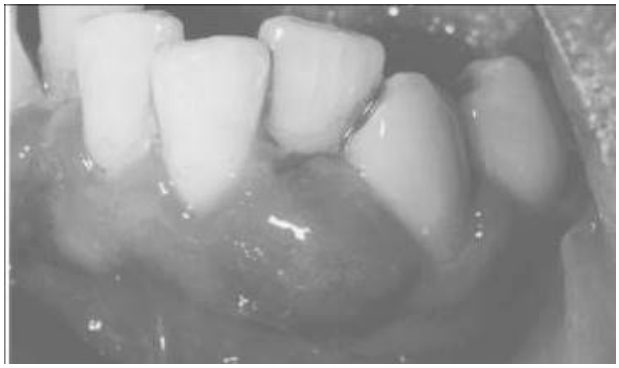


Figure 6-20

Symptoms

The following symptomatology can be identical for periapical lesions of pulpal origin and periodontal abscesses:

- Pain on percussion
- Gingival swelling
- Fistulation
- Increased mobility

Diagnosis

The differential diagnosis of the two lesions is usually simple; however, on occasions when it is not, the important criteria to evaluate include:

- History and clinical examination (probing)
- A periodontal abscess is usually closer to gingival margin than a periapical abscess

> **Note:** When the diagnosis is difficult, adequately assessing the periodontium with a periodontal probe is critical. The pattern of the probable area as the probe is "walked" around the tooth should be noted. Areas where the probing pattern is broad and deep are suggestive of preexisting periodontal pathology. A pattern that is very narrow and deep may be indicative of periapical communication, vertical root fracture, or the presence of a morphologic defect such as a palatogingival groove. These narrow defects may be further evaluated with the use of gutta percha cones and radiographs with cones in place.

- Tooth vitality tests (See Chapter 10, Endodontics)

- Radiographic appearance

Tips for Treating Acute Periodontal Abscess

The extent of periodontal destruction in these lesions is rapid and often clinically severe. The clinician needs to be aware that these lesions do have an excellent capacity for repair if treated properly as follows

- The acute exacerbation often can be eliminated by establishing drainage through the sulcus.

> **Note:** This is often accomplished by closed curettage of the pocket and root planing the pathologically exposed root surfaces. As an emergency procedure, this will usually eliminate the patient's acute symptoms.

- Where possible, the debridement of these defects is best accomplished via an open flap procedure. An inverse beveled incision (Figure 6-21) should be made from near the free gingival margin to the base of the defect to allow complete debridement of the acutely inflamed pocket contents. This flap should be carefully elevated to visualize the extent of the defect and to assure adequate visibility for root planing. Vertical releasing incisions may be used if adequate access cannot be obtained by carrying the incision one tooth either side of the abscess.

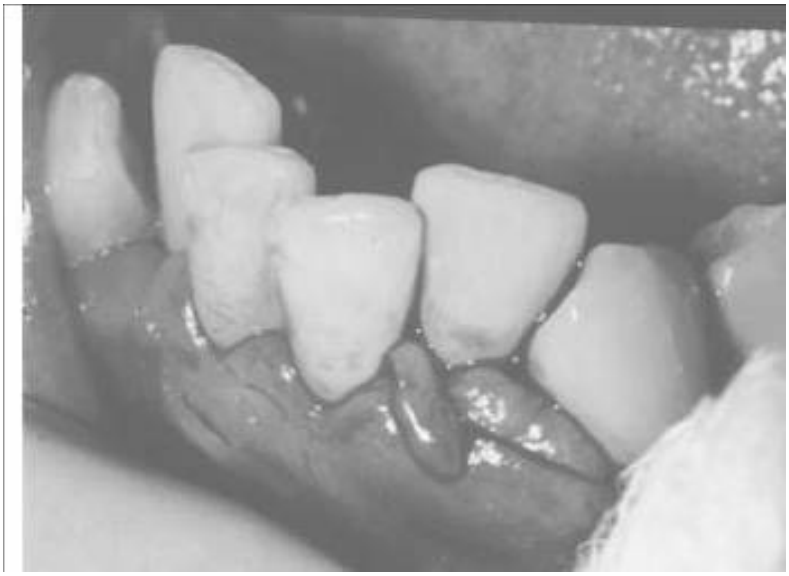


Figure 6-21

- The wound should be closed with sutures (Figure 6-22) and the patient given standard periodontal postoperative instructions including the use of a chlorhexidine-containing mouthrinse for at least 5 days postsurgery (Figure 6-23).

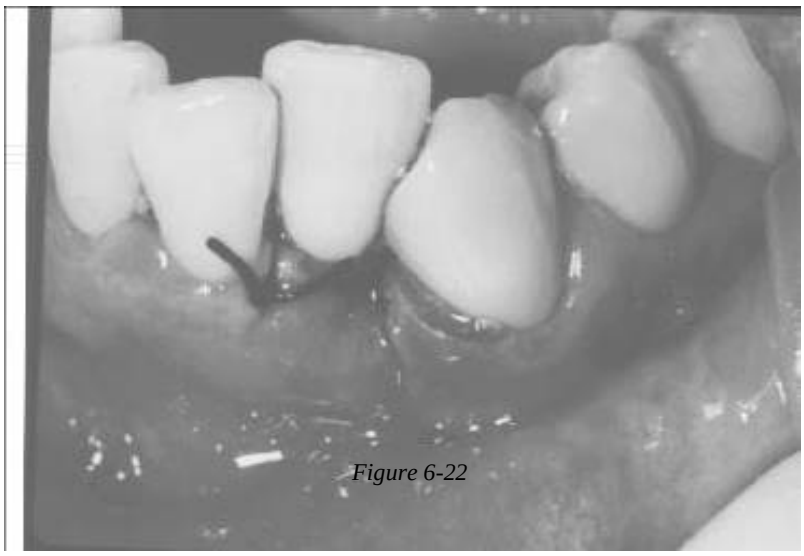


Figure 6-22

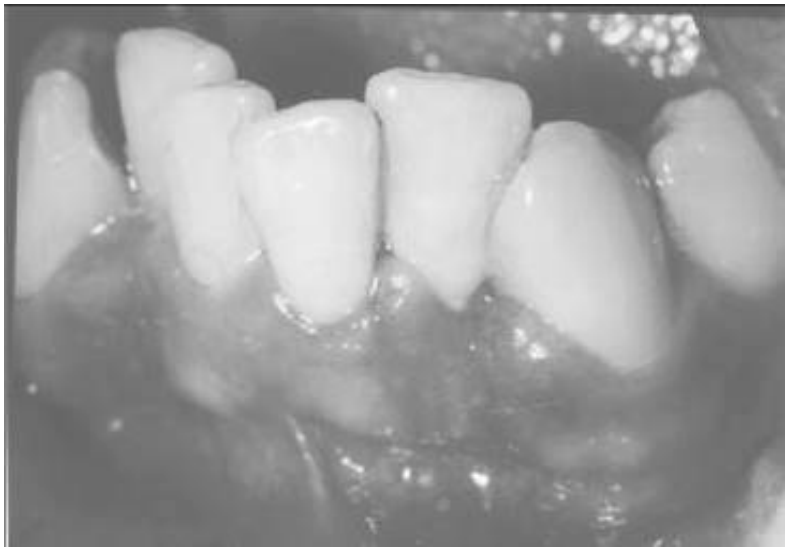


Figure 6-23

Appendix

Periodontal Post-Surgical Instructions

1. BLEEDING: Blood mixed in with your saliva is normal for several hours after a procedure. However, if significant bleeding resumes later in the day, contact your Doctor as soon as possible. Pressure with a small gauze will usually be all that is required to stop any post-operative bleeding that occurs.

2. DISCOMFORT: Take pain medication exactly as instructed by your Doctor. It is a good idea to take the first dose before your local anesthetic has completely worn off if possible. Sometimes narcotics are prescribed to treat post-surgical discomfort. If this is the case, avoid alcohol consumption, driving a car, or operating any sort of dangerous machinery while under the influence of these drugs.

3. SWELLING: Expect some swelling in the surgical area and possibly also around lips and cheeks for 3 to 4 days. Swelling normally peaks on the 2nd or 3rd day, then starts to go away over the next few days. Icing the area (10 minutes on, 15 minutes off) for the first post-surgical day can minimize this.

4. EATING: Avoid coarse or crunchy foods for the first 2 weeks. You may eat softer foods like eggs, mashed potatoes, soft cooked meats & vegetables, but try to chew on the other side of your mouth. Also, the roots of your teeth may be extra sensitive to hot or cold after treatment.

5. ORAL HYGIENE: You can clean your teeth as you normally do in all areas except the surgical site. Do not brush the surgical site until your Doctor tells you to. Use the medicated mouth wash as directed twice daily, but do not swish vigorously.

6. STITCHES: If stitches (sutures) were placed, these will usually be removed in about 1-2 weeks. In some cases sutures need to stay for up to 3 weeks. Occasionally sutures become loose before your post-operative appointment. Please contact the clinic if they become bothersome.

7. PERIODONTAL DRESSING: A periodontal dressing (perio-pack) is placed in some cases. Attempt to keep this in place as long as possible. These often come out during eating, but are harmless if swallowed. They often come loose prior to the scheduled post-operative appointment.

8. INFECTION: Since bacteria cause periodontal disease, a post-operative infection can rarely occur. The signs of this may include pain and/or swelling getting worse after the 3rd or 4th day, pus drainage at the surgical site, or a fever. If any of these occur, contact the clinic as soon as possible.

If you have any questions, please CALL. If there is something you don't understand or if you just need some reassurance, do not hesitate to contact the clinic.

[i] Tonetti, M. S., Greenwell, H., & Kornman, K. S. (2018). Staging and grading of periodontitis: Framework and proposal of a new classification and case definition. Journal of Clinical Periodontology,45. doi:10.1111/jcpe.12945
[ii] AAP Website: https://perio.org/2017wwdc
[iii] Berglundh, T., Armitage, G., Araujo, M. G., Avila-Ortiz, G., Blanco, J., Camargo, P. M., . . . Zitzmann, N. (2018). Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. Journal of Periodontology, 89. doi:10.1002/jper.17-0739.

[iv] PROCEEDINGS FROM THE 2017 WORLD WORKSHOP ON THE CLASSIFICATION OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS; https://perio.org/2017wwdc

[v] Ostrander, S; New AAP Periodontal Classification Guidelines. Today's RDH; July 31, 2018; https://www.todaysrdh.com/new-aap-periodontal-classification-guidelines/
[vi] AAP Website: https://perio.org/2017wwdc
[vii] http://reenawadia.com/category/periodontology/