فصل پنجم

CASE SCENARIO 5.1

Patient: A 55-year-old male, controlled type II diabetes, latest HbA1c = 5.8%

Chief Complaint: "The dentist and hygienist told me that I have gum disease."

Background Information

The patient had not been to the dental office in over 3 years. After reviewing periodontal charting results and radiographs, the dentist told the patient that he has to be seen by a periodontist.

Clinical Findings: The patient has 28 teeth and all third molars had been extracted. Bleeding on probing is 45% of sites, and 52% of sites exhibited plaque. Teeth #s3, 14, and 19 have clinical attachment loss up to 5 mm, probing depth up to 6 mm and radiographic bone loss up to 40%. Teeth #s 3 and 14 have distal furcation involvement class I, and tooth #19 has lingual furcation involvement class II. Other teeth have 1–3 mm clinical attachment loss, 3–5 mm probing depth and 15%–25% radiographic bone loss. Generally, all teeth have horizontal bone loss.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the periodontal diagnosis of this patient following 2018 periodontitis classification? A. Localized Stage II, Grade B Periodontitis B. Localized Stage II, Grade C Periodontitis C. Generalized Stage II, Grade B Periodontitis D. Generalized Stage II, Grade C Periodontitis E. Localized Stage III, Grade B Periodontitis F. Localized Stage III, Grade C Periodontitis G. Generalized Stage III, Grade B Periodontitis H. Generalized Stage III, Grade C Periodontitis	**Answer: E** **Explanation:** Stage is determined by the tooth/teeth with greatest clinical attachment loss, greatest radiographic bone loss, deepest probing depth and presence of complexity factors (e.g., furcation involvement class II or III). In this case, Stage III is the correct answer because three teeth have 5 mm clinical attachment loss, 6 mm probing depth or 40% radiographic bone loss. Grade can be determined by the % bone loss/age ratio (40/55 = .72, Grade B) of the most affected tooth/teeth when the longitudinal records are not available. The controlled diabetes status also determines Grade B for this case. Regarding the extent, determination of localized and generalized should be based on the teeth (three teeth, <30% of teeth involved) defining the specific Stage (Stage III) even the patient has generalized periodontal tissue destruction in all teeth.

CASE SCENARIO 5.2

Patient: 55-year-old male, nonsmoker

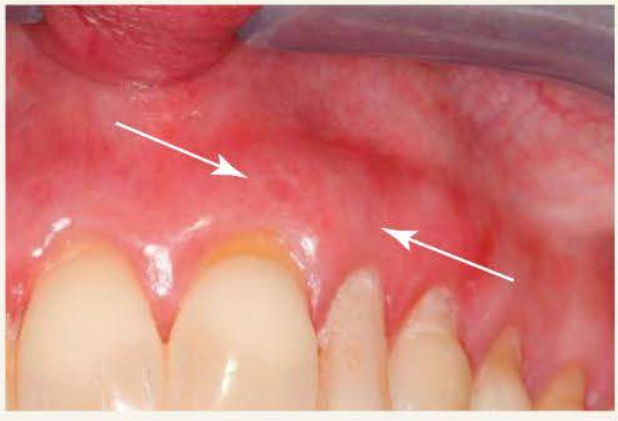
Chief Complaint: "My gum has receded and it's bleeding."

Background Information

The patient presents with aesthetic complaints associated with gingival recession and associated root exposure on the upper central incisors. The patient also reports occasional sensitivity and bleeding from the area.

The patient was treated with repeated sessions of subgingival root instrumentation (scaling and root planing) as well as periodontal flap surgery several years ago. He has since been very compliant with a 3-month maintenance schedule.

Current Findings: White striations on the gingiva facial of teeth #9 and #10 were noted. During clinical examination, gentle finger rubbing of the mucosa coronal to tooth #9 led to exfoliation of the epithelium.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Do you expect subgingival root instrumentation (scaling and root planing) to treat this condition? A. Yes B. No	**Answer: B** **Explanation:** This mucocutaneous lesion was biopsied and the diagnosis of lichen planus was confirmed following clinical assessment and positive Nikolsky's sign. Appropriate corticosteroid treatment led to remission.

CASE SCENARIO 5.3

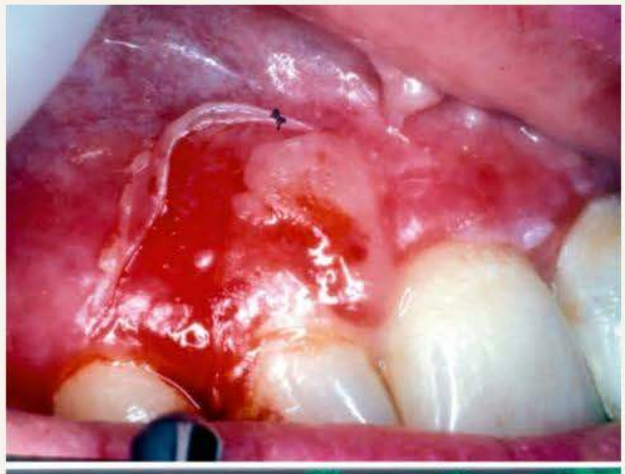
Patient: A 62-year-old postmenopausal female

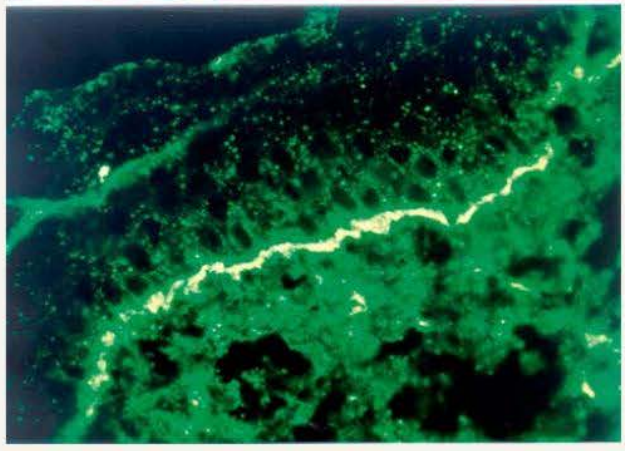
Chief Complaint: "I have noticed that I have halitosis, and my gums bleed."

Background Information

The patient says that she cannot brush her teeth because her gums have been painful for 6 months.

Current Findings: Gingiva sloughs following the application of a cotton swab.





CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the most likely diagnosis? A. Acute necrotizing gingivitis B. Toothbrush abrasion C. Mucous membrane pemphigoid D. Sarcoidosis	**Answer: C** **Explanation:** Immunofluorescence-labeled antibodies are used to mark an antigen/antibody complex in the basement membrane where autoimmune reaction causes degeneration of basal lamina, hemidesmosomes, and anchoring fibrils, thereby resulting in sloughing of epithelium.

CASE SCENARIO 5.4

Patient: A 28-year-old male

Chief Complaint: "My lower front teeth are mobile."

Background Information

Progressive recession through dentition over the past 2 years. Painful rampant recession in the anterior mandible recently.

Current Findings: Cratered papillae, ulcerative gingiva with exposed interproximal bone.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. When you consult with the patient's physician, what is the most likely medical diagnosis? A. Osteoporosis B. Diabetes mellitus C. AIDS D. Medication-related osteonecrosis of the jaw	**Answer: C** **Explanation:** Necrotizing ulcerative periodontitis may be observed among HIV+ patients with very low CD4 counts (AIDS) and be manifested as local ulceration and necrosis of gingival tissue with exposed bone.

CASE SCENARIO 5.5

Patient: A 59-year-old postmenopausal female

Chief Complaint: "My lower jaw is sore and aches."

Background Information

Lower first molar extracted ~ 4 months ago.

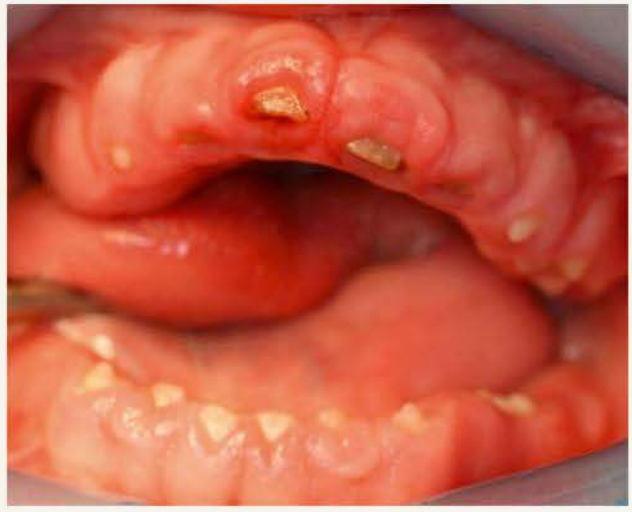
Current Findings: Medication-related osteonecrosis of the jaw (MRONJ) with exposed alveolar bone.

Radiographic Findings: Within normal limits.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the most likely medical diagnosis associated to MRONJ? A. Osteopenia B. Osteoporosis C. Malignant myeloma D. Localized osteomyelitis	**Answer: C** **Explanation:** Bisphosphonates (BPs) inhibit osteoclast-mediated bone resorption. BPs are used to manage osteolytic bone disorders such as osteoporosis, Paget disease, metastatic bone cancers, and multiple myeloma.

CASE SCENARIO 5.6

Patient: A 6-year-old male
Chief Complaint: "My classmates tease me and call me 'gummy.' I have difficulty chewing my food and talking."
Background Information
Patient has had a kidney transplant.
Current Findings: Severe gingival overgrowth.
Radiographic Findings: Within normal limits.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. All of the following drug categories have been associated with gingival overgrowth EXCEPT which one? A. Antiarrhythmic, digoxin B. Anticonvulsant, phenytoin C. Calcium channel blocker, nifedipine D. Immunosuppressant, cyclosporine	**Answer: A** **Explanation:** Phenytoin, nifedipine, and cyclosporine have all been associated with gingival overgrowth, while digoxin has not been associated with overgrowth.

CASE SCENARIO 5.7

Patient: A 27-year-old female

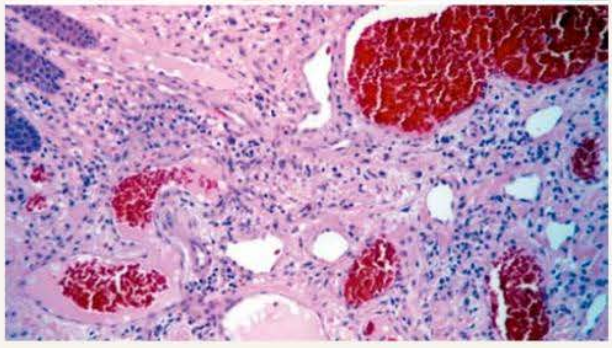
Chief Complaint: "There is a bump on my gums that bleeds when I brush and floss."

Background Information

Lesion developed over the past ~ 2 months.

Current Findings: Biopsy depicted in lower image.

Radiographic Findings: Within normal limits.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the most likely diagnosis? A. Fibroma B. Lateral periodontal abscess C. Epulis fissuratum D. Pyogenic granuloma	**Answer: D** **Explanation:** Biopsy depicts inflammatory cell infiltrate within the connective tissue and numerous capillaries engorged with erythrocytes.

فصل نهم

CASE SCENARIO 9.1

Patient: A 17-year-old male

Chief Complaint: "I lost all my primary teeth, and now I am rapidly losing my permanent teeth."

Background Information

When presenting to the clinic for periodontal evaluation, the patient was partially edentulous and missing many permanent teeth (Fig. A). The patient was a nonsmoker and reported having dermatologic lesions on the palms of the hands and soles of the feet (Fig. B). Patient was not taking any medication. He reported brushing once a day, but not flossing. His complete mouth radiographic series, which was taken 1 year before the periodontal evaluation, demonstrated extensive generalized bone loss (Fig. C).

Current Findings

Probing depths were in the range of **2** to **10 mm**; bleeding on probing was 39% and exhibited fair oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Based on oral and dermatologic findings, what is the most likely diagnosis? A. Gardner syndrome B. Papillon–Lefèvre syndrome C. Peutz–Jeghers syndrome	**Answer: B** **Explanation:** The oral and dermatologic findings in this patient are characteristic of Papillon–Lefèvre syndrome. Gardner syndrome is characterized by osteomas, multiple soft tissue tumors, and gastrointestinal (GI) polyps, whereas patients with Peutz–Jeghers syndrome typically present with GI polyps and hyperpigmented macules on the lips and oral mucosa.
2. Mutations in which gene causes this syndrome? A. COL1 A1 (collagen) B. Adenomatous polyposis coli (APC) C. Osteopontin D. Cathepsin C	**Answer: D** **Explanation:** The cathepsin C gene encodes for a lysosomal cysteine protease. It plays a pivotal role in regulating serine proteinases in immune and inflammatory cells. Activated cathepsin C degrades extracellular matrix components causing tissue damage and chronic inflammation.
3. Is palmar–plantar keratoderma (dermatologic lesions) unique to this syndrome? A. Yes B. No	**Answer: B** **Explanation:** Apart from Papillon–Lefèvre syndrome, palmar–plantar keratoderma also occurs in several other syndromes such as Huriez syndrome and Olmsted syndrome.
4. Which of the following genetic disorders is not associated with periodontal disease? A. Down syndrome B. Cyclic neutropenia C. Hypophosphatasia D. Oral–facial–digital syndrome E. Ehlers–Danlos syndrome	**Answer: D** **Explanation:** Except for oral–facial–digital syndrome, periodontal disease is a common finding in all of the conditions listed.

Clinical images courtesy Dr. Robert J. Gorlin, Minneapolis, Minnesota.

فصل دهم

CASE SCENARIO 10.1

Patient: A 32-year-old female patient

Chief Complaint: Heavy pain in the gums for the last 3 days. The pain does not allow the patient to sleep or to brush.

Background Information

The patient is systemically healthy. Her last professional dental cleaning was 4 years ago. The patient smokes currently 20 cigarettes a day. She was recently fired and has financial problems.

Current Findings: Yellow-grayish matter on top of the gingival margin. Punched-out appearance. Spontaneous bleeding. Too painful to probe.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the yellow-grayish matter? A. Dental plaque B. Materia alba C. Necrotic tissue D. Food remnants	**Answer: C** **Explanation:** This patient has necrotizing periodontal disease. Please refer to Chapter 30.
2. What would a plaque sample look like under a phase contrast microscope? A. All coccoid bacteria B. All filamentous bacteria C. Combination of motile rods and coccoid bacteria D. Combination of filamentous and motile spiral bacteria	**Answer: D** **Explanation:** Necrotizing periodontal diseases typically show filamentous and motile spiral bacteria under a microscope. This relates to the specific microbiology of these diseases.
3. Which specific bacteria could you primarily expect in a plaque sample of affected lesions? A. *P. gingivalis* and *P. intermedia* B. *P. gingivalis*, *T. denticola*, and *T. forsythia* C. *F. nucleatum* and *T. denticola* D. *F. nucleatum* and *P. gingivalis*	**Answer: C** **Explanation:** Although all mentioned bacteria will be present in the sample, the sample will be dominated by *F. nucleatum* (filamentous) and treponemes (motile spiral). This combination is a microbiologic hallmark of necrotizing periodontal diseases.

CASE SCENARIO 10.2

Patient: A 68-year-old male patient who is edentulous and wears a removable prosthesis in the upper and lower jaw.

Chief Complaint: No complaint

Background Information

The patient is systemically healthy. The patient currently smokes 10 cigarettes a day. The patient has no pain. He wears his prosthesis day and night.

Current Findings: Primarily white-yellowish matter on top of a red, inflamed surface. The matter covers the whole base of the prosthesis. It can be removed with a swab.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Which is the most plausible origin of the white-yellow matter? A. Microbial infection B. Allergic reaction C. Cancer D. Smokers palate	**Answer: A** **Explanation:** The matter can be removed by a swab.
2. How would a smear look like under a phase contrast microscope? A. Primarily epithelial cells B. Primarily filamentous organisms C. Primarily motile bacteria D. Primarily nonmotile bacteria	**Answer: B** **Explanation:** This is typically a case of denture stomatitis. One would expect large, filamentous-like organisms.
3. Which specific microorganisms would you expect in a sample of affected lesions? A. *F. nucleatum* and *T. denticola* B. *C. albicans* C. *T. tenax* D. *F. nucleatum* and *P. gingivalis*	**Answer: B** **Explanation:** Although bacteria and epithelial cells will be present in the sample, the sample will show elongated ellipsoidal cells and hyphae forms.

CASE SCENARIO 10.3

Patient: A 23-year-old male patient

Chief Complaint: Painful swelling at the lip since 1 day ago

Background Information

The patient is systemically healthy. The patient does not smoke but is tired because of school exams. His oral health and oral hygiene are optimal.

Current Findings: Vesicular swelling at the border of the lip that is painful.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Which is the most plausible origin of the vesicular lesion? A. Bacterial infection B. Cancer C. Viral infection D. Fungal infection	**Answer: C** **Explanation:** All other options typically do not result in vesicular lesions.
2. What would an aspiration biopsy sample look like under a phase contrast microscope? A. Viral particles B. Inflammatory cells C. Bacteria D. Clear fluid	**Answer: B** **Explanation:** Viruses cannot be seen under a phase-contrast microscope due to their small dimensions. The fluid will contain inflammatory cells. Normally superinfection with bacteria will occur if the vesicle has not erupted.
3. Which specific virus would you expect? A. Picornavirus B. EBV C. HPV D. HSV-1	**Answer: D** **Explanation:** HSV-1 is the most common cause of herpes labialis.

فصل دوازدهم

CASE SCENARIO 12.1

Patient: A 30-year-old male

Chief Complaint: "My gums are inflamed."

Background Information

A healthy patient with crowding presents with localized plaque and generalized inflammation. Patient is a graduate student and has reported stress affecting his sleep.

Patient oral hygiene index (OHI) is average. Patient avoids brushing where inflammation and bleeding persists. He would like his gums to be "healthy" prior to orthodontic treatment.

Current Findings: Probing depths were in the range of 2–3 mm, BOP was 42%. Recession noted in the mandibular left canine, lateral incisor, and central incisors.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the most probable etiology for the erythematous gingival margin of mandibular left canine (#22)? A. Plaque-induced inflammation B. Puberty C. Plaque only D. Stress E. Orthodontic treatment	**Answer: A** **Explanation:** The buccal gingival margin of the mandibular left canine (#22) has plaque-induced gingivitis. Redness, swelling, and bleeding upon probing are all signs of inflammation. The region has been more prone to plaque **accumulation** due to adjacent recession, tooth and tooth anatomy, and crowding. Stress and hormonal influences impact the magnitude of gingivitis but are not primary etiologic factors.
2. All of the following conditions modulate gingivitis EXCEPT: A. Diet B. Inflammation C. Biofilm D. Bone loss E. Medications	**Answer: D** **Explanation:** Bone loss is not characteristic of gingivitis. Gingivitis is a reversible inflammatory mechanism that is modulated by hormones, genetic factors, medications, and environmental factors. Upon removal of the etiologic challenge, resolution of inflammation ensues, which returns the tissue to a healthy state.
3. All of the following are resolution of inflammation mediators, EXCEPT: A. Resolvins B. Protectins C. Lipoxins D. Maresins E. Prostaglandins	**Answer: E** **Explanation:** Prostaglandins are proinflammatory mediators derived from COX-2 responsible for increasing inflammation. Proresolution lipid mediators are active lipids responsible for activating cells to return to homeostasis. Upon binding to cells, resolution lipids are capable of increasing phagocytosis and activating the clearance of dead cells and microbes.

فصل سیزدهم

CASE SCENARIO 13.1

Patient: 72-year-old male

Chief Complaint: "My gums are receding."

Background Information

Patient is a past smoker (quit smoking 20 years ago), he did not report any systemic conditions, and he is not on any medications except iron supplements. He drinks three cups of coffee a day. His last dental cleaning was done 3 years ago, and patient denies flossing but reports brushing once a day. He reports consuming orange juice every day.

Current Findings

Probing depths were in the range of 2 to 7 mm; bleeding on probing % was 47 with poor oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Based on the history presented by this patient, the following are likely sources of the black staining noted on his teeth EXECPT: A. Orange juice intake B. Coffee consumption C. Intake of iron supplements D. Tobacco use	**Answer: A** **Explanation:** Except orange juice, the rest, if ingested for a prolonged period of time, causes brown to black staining of teeth.
2. Does aging influence the microbiology of dental plaque? A. Yes B. No	**Answer: B** **Explanation:** Scientific evidence indicates that aging has minimal influence on the microbiology of dental plaque.
3. Is aging a risk factor for periodontal disease? A. Yes B. No	**Answer: B** **Explanation:** Aging does not appear to be a true risk factor for developing periodontitis.

فصل چهاردهم

CASE SCENARIO 14.1

Patient: A 62-year-old female.

Chief Complaint: "I have trouble going to sleep because my mouth and throat are dry."

Background Information:
The patient is a heavy smoker and has difficulty sleeping. She only sleeps 4 h per night and drinks minimal alcohol socially. The patient has a history of allergic rhinitis, for which she takes over-the-counter antihistamines and decongestants.

Current Findings: **Probing depths** were in the range of 3–4 mm, **bleeding on probing** was 38%, and the patient has poor oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the most probable etiology for this condition? A. Xerostomia B. Dry mouth syndrome C. Gingivitis D. Aging E. Sjögren's syndrome	**Answer: A** **Explanation:** The patient presents with dry mouth, lack of sleep, and poor oral hygiene. Xerostomia is the primary cause of this condition. Lack of normal salivary flow reflects mucosal inflammation. The xerostomia in this case, is from Sjögren's syndrome.
2. All of the following conditions present xerostomia EXCEPT which one? A. Dry mouth syndrome B. Sjögren's syndrome C. Amyloidosis D. Sarcoidosis E. Mucous membrane pemphigoid (MMP)	**Answer: E** **Explanation:** MMP, formerly known as cicatricial pemphigoid, is an autoimmune condition that is immune mediated. Autoantibodies against basement membrane antigens attack the tissue, causing the disease.
3. All of the following are saliva stimulants EXCEPT which one? A. Pilocarpine B. Cevimeline C. Anethole trithione D. Artificial saliva (Oralube)	**Answer: D** **Explanation:** Artificial saliva (Oralube) is a saliva substitute, not a stimulant. Artificial saliva or saliva substitutes can be used to replace moisture and lubricate the mouth. Saliva stimulants such as pilocarpine act as cholinergic parasympathomimetic agents with predominantly muscarinic M3 action that causes stimulation of residual-functioning exocrine glands.

فصل پانزدهم

CASE SCENARIO 15.1

Patient: A 37-year-old female

Background Information

Patient has no underlying medical condition that would affect her oral health. Her last dental cleaning was done 6 years ago. Patient denies flossing and reports brushing once each day. Patient reports sensitivity while brushing.

Current Findings: Probing depths were in the range of 2 to 3 mm, BOP was 43%, poor oral hygiene

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the most probable cause of this gingival condition? A. Extensive restorations B. Dental plaque C. Chemical injury D. Uncontrolled diabetes	**Answer: B** **Explanation:** In this patient with no known underlying systemic conditions and presenting with extensive plaque and poor oral hygiene, dental plaque seems to be the primary cause.
2. Reddish gingiva is noted in all of the following systemic conditions EXCEPT: A. Leukemia B. Addison disease C. Mouth breathing D. Lichen planus	**Answer: B** **Explanation:** In Addison disease, brown pigmentation of gingiva occurs due to increased melanin production, not reddening of gingiva.
3. What is the likely treatment for addressing this gingival condition? A. Dental prophylaxis/plaque debridement B. Root debridement (previous words: Scaling and root planing) C. Flap surgery D. Periodontal regeneration	**Answer: A** **Explanation:** Removing plaque and improving the patient's oral hygiene compliance will lead to resolution of gingivitis

CASE SCENARIO 15.2

Patient: A 44-year-old male

Chief Complaint: "My gums in the lower front area are sore and bleed when I brush."

Background Information

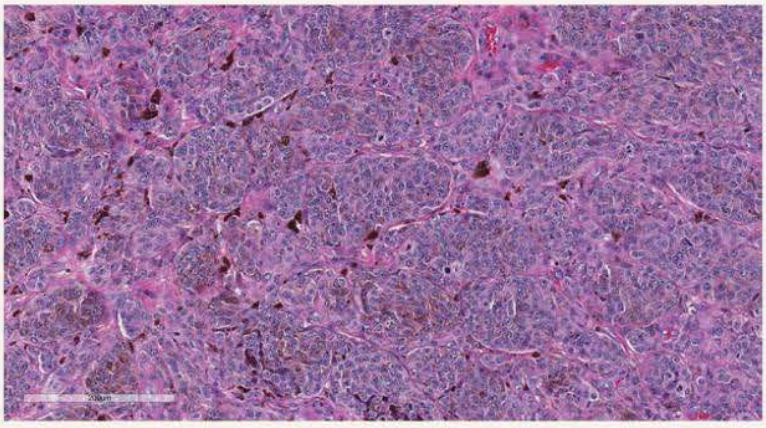
Patient has no underlying medical condition that would affect his oral health. His last dental cleaning was done 3 years ago. Patient reports brushing at least once daily but denies flossing. Patient reports sensitivity and bleeding of the gingiva in the mandibular anterior sextant while brushing.

Current Findings: Probing depths were in the range of 2 to 3 mm, BOP was 37%, poor oral hygiene

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. The early signs of gingival inflammation that precede established localized gingivitis include which of the following? A. Increased gingival crevicular fluid production B. Bleeding from the gingival sulcus on gentle probing C. Suppuration on gentle probing D. A and B only E. All of the above	**Answer: D** **Explanation: Suppuration** (i.e., discharge of purulence) on gentle probing is an uncommon early sign of gingivitis. Suppuration indicates active infection and is a common sign of gingival or **periodontal abscess.**
2. Localized marginal gingivitis normally A. Extends from the gingival margin to the mucobuccal fold in limited areas B. Extends from the gingival margin to the mucobuccal fold in the entire mouth C. Extends only interpapillary D. Extends on the lingual surfaces only	**Answer: A** **Explanation:** Localized marginal gingivitis is typically restricted to the gingival margin on one side and mucobuccal fold on the other side in localized areas of the dentition.
3. Blood supply to the gingiva in the mandibular anterior buccal sites includes which of the following? A. Supra-periosteal vessels B. Vessels from periodontal ligament C. Blood supply from the alveolar process D. All of the above	**Answer: D** **Explanation:** Buccal gingiva is supplied by all groups of blood vessels

فصل شانزدهم

CASE SCENARIO 16.1



Patient: 42-year-old male

Chief Complaint: Referral for evaluation and treatment of periodontal disease

Background Information: The past medical history of the patient was significant for episodes of diarrhea, constipation, and low blood pressure.

Clinical Findings: Head and neck examination was within normal limits. Oral examination revealed the presence of abnormal discoloration of the alveolar mucosa and gingiva.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What condition(s) should be included in the differential diagnosis? A. Addison's disease B. Peutz-Jegher's syndrome C. Amalgam tattoo D. Melanoma E. Heavy metal pigmentation	**Answer(s): A, B, C, D** **Explanation:** All conditions should be included except heavy metal pigmentation.
2. What is the next step? A. Periapical film B. MRI of the kidneys and adrenal glands C. Exfoliative cytology D. Biopsy E. Colonoscopy	**Answer: D** **Explanation:** A biopsy should be the next step for evaluation and diagnosis.
3. What is the diagnosis? A. Physiological pigmentation B. Amalgam tattoo C. Peutz-Jegher's syndrome D. Pigmented nevus E. Melanoma	**Answer: E** **Explanation:** Microscopic examination shows nests of epithelioid malignant cells with intracellular melanin pigmentation.

فصل هفدهم

CASE SCENARIO 17.1

Patient: 38-year-old male

Chief Complaint: "I have pain in my gums that suddenly got worse."

Background Information

Patient denies serious illness but reports that he has been under a lot of stress recently. He denies any history of smoking. He brushes daily and flosses sometimes. He has not been to the dentist for years and cannot recall his last professional dental cleaning.

Current Findings: Tissues were too tender to probe effectively. There is generalized marginal erythema and edema with localized necrosis of interdental tissue between the mandibular central incisors.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Does this patient have necrotizing ulcerative gingivitis? A. Yes B. No	**Answer: A** **Explanation:** Necrotizing ulcerative gingivitis (NUG) is characterized by a sudden onset of symptoms with typical punched-out, craterlike depressions of the interdental papilla.
2. Should this patient be evaluated for other systemic diseases? A. Yes B. No	**Answer: A** **Explanation:** The role of an impaired host response in NUG has long been recognized. All predisposing factors for NUG are associated with immunosuppression. The clinician should determine the predisposing factors that lead to immunodeficiency in patients with NUG to address the continued susceptibility of the patient and to determine whether an underlying systemic disease is present.

CASE SCENARIO 17.2

Patient: A 24-year-old male

Chief Complaint: "It hurts to bite, and my gums are swollen in the back."

Background Information

Patient is a nonsmoker. He is overweight but denies serious illness. He brushes almost every day. He does not floss. He has never been to the dentist.

Current Findings: Examination reveals a flap of tissue overlying the distal aspect of both mandibular third molars. There is no keratinized attached tissue and very little vestibular depth. There is generalized inflammation of the gingival margins. Probing depths are in the range of 2–4 mm with localized areas of 5–7 mm. Bleeding on probing is 84%. Oral hygiene is poor.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Does this patient appear to be suffering from pericoronitis? A. Yes B. No	**Answer: A** **Explanation:** Pericoronitis refers to inflammation of the excess flap of soft tissue overlying the crown of an incompletely erupted tooth, most often a mandibular third molar.
2. Initial treatment of acute pericoronitis is excision of the excess flap of soft tissue. A. True B. False	**Answer: B** **Explanation:** Simply excising the occlusal portion of the pericoronal flap without managing the distal tissue leaves a deep periodontal pocket on the distal surface, which invites recurrence of acute pericoronal involvement.
3. Treatment of pericoronitis depends on which of the following factors? A. Severity of inflammation B. Quality of surrounding tissues C. Risk of systemic complications D. Consideration of whether to extract tooth E. All of the above	**Answer: E** **Explanation:** Several factors must be considered when deciding on treatment for pericoronitis, including all of those listed and the advisability of retaining or removing the partially erupted tooth.

فصل هجدهم

CASE SCENARIO 18.1

Patient: A 65-year-old white female

Chief Complaint: "I have canker sores in my mouth, and I can't brush my teeth."

Background Information
Patient has a significant medical history of hypertension, hypercholesterolemia, anxiety, and lower back pain. These conditions are controlled with appropriate pharmacologic therapy. Her oral lesions began 12 months earlier, and symptoms continued to worsen. The patient consulted several dentists and specialists to no avail.

Current Findings: The patient has prominent painful erythema and erosion of the gingiva and attached mucosa in the maxillary and mandibular soft tissues.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Is the next step in treating this patient prescribing antibiotics? A. Yes B. No	**Answer: B** **Explanation:** Establishing a definitive diagnosis is the next step. Because the clinical presentation is consistent with desquamative gingivitis, a biopsy for hematoxylin and eosin (H&E) and direct immunofluorescence (DIF) staining is warranted.
2. The H&E examination showed hyperkeratosis, basal cell degeneration of the epithelium, serrated rete ridges, and a superficial bandlike infiltrate in the lamina propria. DIF studies revealed a shaggy, linear signal of fibrin at the epithelial–connective tissue interface. What is the diagnosis? A. Pemphigus vulgaris B. Mucous membrane pemphigoid C. Chronic ulcerative stomatitis D. Erosive lichen planus E. Squamous cell carcinoma	**Answer: D** **Explanation:** The clinical, histopathologic, and DIF findings support a diagnosis of erosive lichen planus.
3. After removal of calculus, what is the mainstay of treatment for this patient? A. Systemic steroids B. Topical steroids C. Steroid-sparing medications D. Antibiotics	**Answer: B** **Explanation:** After the diagnosis is established, the mainstay of treatment is the use of topical steroids such as 0.05% fluocinonide gel or ointment applied four times daily.

فصل نوزدهم

CASE SCENARIO 19.1

Patient: A 25-year-old female

Chief Complaint: "My teeth move, and my gums are swollen."

Background Information

The patient does not receive any antiepileptic, antihypertensive, or immunosuppressive medications known to cause fibrotic changes in the gingiva. Possible systemic diseases such as leukemia were ruled out after consultation with the referring physician and based on laboratory analyses of peripheral blood. Local factors, such as mouth breathing or overhanging restorations, are not contributory.

Current Findings: Intraoral examination reveals moderate to severe gingival overgrowth, particularly in the maxillary and mandibular anterior areas. Significant and generalized periodontal probing depths and severe generalized bone loss were observed. Available immediate family members (her mother and brother) were examined; both exhibited clinically significant gingival overgrowth. In addition to overgrowth, the patient's brother had significant bone loss around incisors and first molars. A family pedigree is created.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the preliminary diagnosis for gingival overgrowth? A. Drug-induced gingival overgrowth B. Hereditary gingival fibromatosis C. Idiopathic gingival overgrowth	**Answer: B** **Explanation:** Hereditary gingival fibromatosis is a non–drug-induced fibrotic form of gingival overgrowth with strong familial linkage.
2. Considering the age, clinical findings, and extent of bone loss, what is the preliminary diagnosis for periodontitis? A. Aggressive periodontitis B. Chronic periodontitis	**Answer: A** **Explanation:** The extent of bone loss is severe and suggests that periodontal bone loss is aggressive.
3. What would the treatment plan include for long-term maintenance of outcomes? A. Surgical removal of overgrowth B. Regenerative treatment C. Anti-infective treatment D. Orthodontic treatment E. Implants F. All of the above	**Answer: F** **Explanation:** This is a complex case of hereditary gingival fibromatosis and aggressive periodontitis. A multidisciplinary approach should maintain treatment outcomes.

From Casavecchia PM, Uzel I, Kantarci A, et al. Hereditary gingival fibromatosis associated with generalized aggressive periodontitis: a case report. *J Periodontol.* 2004;75:770–778.

CASE SCENARIO 19.2

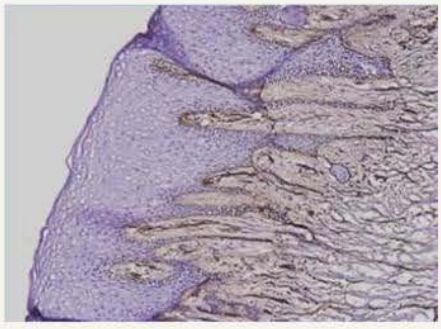
Patient: A 37-year-old male

Chief Complaint: "My gums are swollen, and I cannot eat anything. I cannot see my teeth."

Background Information

The patient was diagnosed with epilepsy and had been using phenytoin for grand mal seizures. He does not smoke and does not have any other systemic condition. He had minor restorative procedures (i.e., occlusal fillings).

Current Findings: Intraoral examination revealed extensive gingival overgrowth in the maxillary and mandibular anterior segments. Gingival tissues were minimally inflamed with minimal plaque. There are pseudopockets of 4–6 mm with no sign of bone loss. The patient was treated with gingivectomy and gingivoplasty, and tissue biopsies were obtained for histologic analysis. The patient has follow-up visits every 6 months.



CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Which of the following is the major finding in histopathology? A. Extensive inflammatory cell infiltration B. Collagen fiber bundles and fibroblast	**Answer: B** **Explanation:** Phenytoin-induced gingival overgrowth is characterized by increased fibrosis and a low level of inflammatory cell infiltration.
2. Which of the following is true for the epithelial layer? A. Thick and stratified squamous tissue B. Long and thin rete pegs extending deep into the connective tissue C. All of the above	**Answer: C** **Explanation:** The epithelial layer of the gingiva demonstrates thickening with rete peg extensions, which is thought to be associated with the epithelial-mesenchymal transition.

فصل بیست و دوم

CASE SCENARIO 22.1

Patient: A 37-year-old male

Chief Complaint: "I have swollen gums, and they bleed when I brush."

Background Information

Patient is a nonsmoker and is hypertensive, which he reports to be controlled with amlodipine that he has been taking for the past 5 years. Other than hypertension, the patient did not report any other systemic condition and reports no known drug allergies. His last dental cleaning was done 2 years ago, and he denies flossing but reports brushing twice a day.

Current Findings: **Probing depths** were in the range of 3 to 7 mm. **Bleeding on probing** percentage was 55 with moderate oral hygiene. Radiographs revealed normal alveolar bone levels.

CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. Based on the presented information, what kind of a pocket is this? A. Gingival B. Periodontal	**Answer: A** **Explanation:** Gingival pocketing occurs when the gingival margin migrates coronally toward the incisal edges, increasing the probing depths but with no noticeable changes in the bone level. Severe inflammation of the gingiva or drug-induced gingival hyperplasia can lead to such gingival pocketing.
2. Which drugs commonly lead to gingival hyperplasia? A. Calcium channel blockers B. Cyclosporine C. Anticonvulsants D. All of the above	**Answer: D** **Explanation:** All of the mentioned classes of medications can cause gingival hyperplasia. Because this condition is medication induced, recurrence after surgical treatment is common, if the patient continues to take them.
3. What will be the appropriate surgical treatment for this condition? A. Gingivectomy B. Guided tissue regeneration C. Flap-osseous resective surgery D. All of the above	**Answer: A** **Explanation:** Gingivectomy is the surgical excision of excess gingiva. Options B and C are used to treat periodontal pockets associated with bony defects and therefore are not applicable in this situation.

Image courtesy Drs. M. Cenk Haytac and Onur Ozcelik.

CASE SCENARIO 22.2

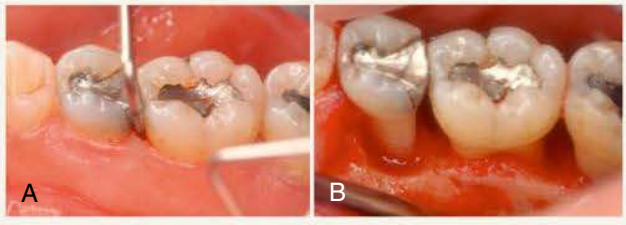
Patient: A 54-year-old male

Chief Complaint: "My gums bleed and I have bad breath."

Background Information

The patient has neglected oral care for about 10 years, a period during which he only received treatment for symptomatic teeth. For several years, he has noticed blood on the toothbrush when brushing his teeth. More recently, his wife has noticed a foul odor from his mouth. The patient describes himself as an "intense" person who cannot help his clenching habit.

Current Findings: The patient presents with moderate to advanced **chronic periodontitis**. He received Phase I periodontal therapy consisting of oral hygiene instructions and scaling and root planing. At reevaluation, the gingival tissues of the lower left segment presented with increased pocket depths and bleeding upon probing. The area was treated surgically, and the osseous profile upon flap elevation is shown below.



CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. What is the effect of trauma from occlusion in the rate of bone loss and development of intrabony defects as shown in this case? A. None B. Primary C. Secondary	**Answer: C** **Explanation:** Trauma from occlusion does not initiate clinical attachment loss. In the presence of inflammation induced by the bacterial biofilm, trauma from occlusion may accelerate the rate of clinical attachment and bone loss and induce the formation of vertical/angular defects.
2. The first molar and second bicuspid present with premature contacts on excursive mandibular movements. If performed as single therapy, what effect should **occlusal adjustment** have on the progression of clinical attachment and bone loss? A. None B. Mild C. Significant	**Answer: B** **Explanation:** Mild at best, if any. The primary factor in the progression of clinical attachment and bone loss is inflammation caused by the bacterial biofilm. Therefore therapy should focus on eliminating local factors and controlling biofilm formation; without local therapy, occlusal treatment is likely to have little effect on disease progression.
3. Trauma from occlusion may alter the course of bone destruction by redirecting the trajectory of the inflammatory process to the periodontal ligament space as opposed to supraperiosteally. A. True B. False	**Answer: A** **Explanation:** By widening the periodontal ligament space, large blood vessels travel toward the cancellous bone instead of running over the cortical plate. Because inflammation follows the course of larger blood vessels, it can contribute to the formation of vertical/angular defects.

CASE SCENARIO 22.3

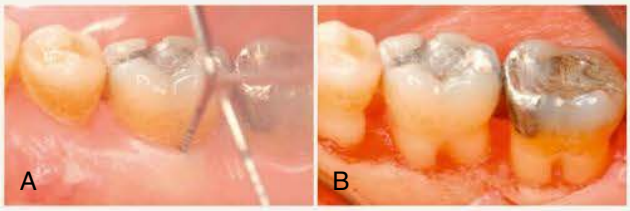
Patient: A 45-year-old female

Chief Complaint: "I don't have any complaints, but during a routine cleaning my new dentist noticed that I had pockets."

Background Information

The patient has been under the care of a family dentist for more than 10 years. She relocated and was referred to a new local dentist, whose dental hygienist delivered Phase I periodontal therapy but was not satisfied with the results and referred the patient to a periodontist.

Current Findings: The patient smokes 5 to 10 cigarettes per day and has adequate, although not great, oral hygiene. The gingival tissue is mostly fibrotic, with post-phase I pocket depths ranging from 3 to 6 mm. Bleeding on probing of the posterior teeth on the lower right sextant is 50%. Incipient furcation involvements were detected with the periodontal probe. The right photograph shows the bone profile during periodontal surgery.



CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. How can the bone loss observed on the lower right second bicuspid and molars be described? A. Horizontal B. Vertical C. Angular	**Answer: A** **Explanation:** The average distance between the cementoenamel junction is 2 mm, although substantial variation exists. The photograph on the right shows that distance to be around 4 to 5 mm, observed evenly around the teeth. This is a typical presentation of horizontal bone loss. No infrabony defect is present. Vertical or angular bone loss would imply the presence of areas where the base of the bony defect would be apical to the surrounding bony walls.
2. The furcation defects on the lingual aspect of the molars are of what degree? A. I B. II C. III	**Answer: A** **Explanation:** The photograph on the left shows a pocket depth of 5 mm in the lingual furcation of the first molar. Upon surgical exposure, the furcation areas of both molars show incipient bone loss, which is classified as grade I. Notice also that the incipient bone loss in the furcation areas is horizontal in nature, whereby no buccal wall of bone is present.
3. Furcation involvements are best diagnosed by which of the following? A. Radiographic images B. Exploration with a periodontal or Nabers probe C. Surgical exposure	**Answer: B** **Explanation:** The insertion of a periodontal or a Nabers probe into the furcation area is the correct way to diagnose a furcation involvement, which is graded by evaluating the destruction of the hard tissue and clinical attachment in the horizontal direction, using the entrance of the furcation as reference. Most of the time, furcation involvements of degree I will not show on radiographs; additionally, interproximal furcation involvements can be difficult to visualize on two-dimensional radiographs because of the superimposure of images. Surgical exposure is a treatment modality for furcation involvements, but it should not be used as a means to diagnose attachment and bone loss in furcation areas.

فصل بیست و سوم

CASE SCENARIO 23.1

Patient: 62-year-old male

Chief Complaint: "I have tenderness around dental implants that were placed 1 year ago, and I notice bleeding when I'm brushing them."

Background Information

The patient had a history of hypertension and hypothyroidism. He currently smokes 10–15 hand-rolled cigarettes per day, and he has smoked on and off for over 40 years. He managed to quit for a period around the time of implant placement, but he resumed smoking recently.

The patient sees his dentist regularly, has been edentulous for 10 years and struggled to wear a complete maxillary denture. He uses a powered toothbrush twice per day to brush around the implants.

Current Findings: (1 year after implant placement): Generalized probing depths of 5–6 mm around all the implants. Bleeding on probing score, 80%. Evidence of radiographic bone loss of 2–4 mm from baseline records. Generally poor oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Smokers who receive dental implants are at increased risk for which of the following? A. Failure of osseointegration B. Periimplantitis C. Wound healing complications D. All of the above	**Answer: D** **Explanation:** Smoking has myriad effects that will influence the prognosis of a dental implant in both the short and long term. Similar to the effects seen in periodontitis, smokers with implants will have adverse effects on their vasculature, immune and inflammatory responses, and microbiology.
2. If this patient was a current smoker at the time of dental implant placement, would he have been at increased risk of suffering from a dental implant failure? A. No increased risk B. 1.5 times the risk C. 2 times the risk D. 5 times the risk E. None of the above	**Answer: C** **Explanation:** There have been numerous systematic reviews on this topic. Overall, they find that smokers are at approximately double the risk of implant failure compared to nonsmokers. Patients should be made aware of this increased risk and every effort made to support them in their efforts to quit smoking.
3. If a patient successfully quits smoking, how long should you wait until placing dental implants? A. 1 week B. 2 months C. 2 years D. Not known	**Answer: D** **Explanation:** There is insufficient evidence to say with confidence at what time point a former smoker should receive a dental implant. Some early protocols suggested abstinence for 1 week before, and 8 weeks after dental implant placement, showing significantly improved early outcomes compared to those who continued to smoke.[7] More contemporary studies have suggested a 2-year cutoff is more useful, with those having dental implant placement earlier than 2 years from the time of cessation having a 2.7 times greater risk of implant failure compared to those who had been abstinent for longer than 2 years.[144] Further research is needed on this topic.
4. What should you advise e-cigarette users (former smokers) who are considering dental implant treatment? A. Stop e-cigarettes immediately. B. Consider cutting down. C. Use nicotine free e-liquids. D. Change the e-liquid flavor. E. Use an individualized approach.	**Answer: E** **Explanation:** E-cigarettes are a recent invention (see Box 23.6). Research studies have yet to explore these questions, and no official guidance exists. However, it is likely that e-cigarette aerosol (vapor) is likely to be significantly less harmful than tobacco smoke. Given this situation, it would be most suitable to provide individualized advice to the patient. For example, a patient who has recently given up a habit of smoking 20 cigarettes a day and is using an e-cigarette should not be pressured into immediately abstaining from the e-cigarette, for fear of relapse to cigarette smoking. Indeed, long-term e-cigarette use can be a protective factor against relapse back to smoking (relapse rates of 70% can be expected between 4 and 52 weeks). Because patients highly respect the opinions of health care professionals, it is important that we give the most up-to-date, evidence-based advice.

فصل بیست و چهارم

CASE SCENARIO 24.1

Patient: 42-year-old male

Chief Complaint: "I need dental cleaning and I have bad breath."

Background Information

Patient is a current smoker (smokes a pack of cigarettes a day), did not report any systemic conditions, is not on any medications, and has no known drug allergies. His last dental cleaning was done 10 years ago. Patient denies flossing but reports brushing once a day.

Current Findings: Probing depths were in the range of 2–4 mm; difficulty in probing the mandibular buccal areas due to extensive calculus buildups. Bleeding on probing was 55% with poor oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Does calculus *per se* cause gingival inflammation? A. Yes B. No	**Answer: B** **Explanation:** Calculus by itself does not cause gingival inflammation, but it acts as a retentive factor (nidus) for dental plaque (as shown in the above image), which in turn causes gingival inflammation.
2. Complete removal of subgingival calculus is feasible with thorough scaling and root planing in pockets deeper than 6 mm. A. True B. False	**Answer: B** **Explanation:** Even with thorough scaling and root planing, leaving some remnants of subgingival calculus on the root surface, especially in deeper pockets, is unavoidable.
3. Which of the following is NOT a tooth-associated retentive factor (like dental calculus) that can retain plaque and cause gingival inflammation? A. Open crown margins B. Overhanging restoration C. Occlusal caries D. Furcation involvement	**Answer: C** **Explanation:** Open cavitation (due to caries) in the occlusal surface of a tooth can accumulate food debris and plaque but is too far from gingiva to induce inflammation. With A, B, or D, the nearness of plaque (that is retained) to gingiva initiates inflammation.

Image courtesy Dr. Gustavo Avila-Ortiz, University of Iowa College of Dentistry, Iowa City, Iowa.

فصل بیست و پنجم

CASE SCENARIO 25.1

Patient: 38-year-old Caucasian male

Chief Complaint: "My gums are swollen and they bleed a lot."

Background Information

The patient noticed swelling of the gingiva 3 months after he started taking Dilantin 500 mg daily for seizures. He was initially diagnosed with epilepsy 16 years ago. He reports brushing once a day and does not floss.

Clinical Findings: Exam reveals generalized moderate bleeding on probing. There is moderate to heavy plaque and calculus. Probing pocket depths are generalized 3–6 mm with localized 7–9 mm around posterior teeth. Class 1–2 furcation involvement, Miller class 1–3 tooth mobility, and localized moderate gingival recession are present. There are localized areas with moderate to severe erythema, edema, and enlargement of the gingiva, especially in the mandibular anterior area.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Drug-induced gingival enlargement is more severe in: A. Edentulous areas B. Anterior region C. Premolar region D. Molar region	**Answer: B** **Explanation:** Gingival enlargement can be present throughout the mouth but tends to be more severe in the maxillary and mandibular anterior regions.

فصل بیست و ششم

CASE SCENARIO 26.1

Patient: A 38-year-old female

Chief Complaint: "I have swelling and pain in my gums."

Background Information

Patient is a nonsmoker with poorly controlled diabetes mellitus (HbA1c = 8.4). Patient is overweight. She indicates brushing one to two times per day but does not floss. She reports infrequent dental visits. Her last professional dental cleaning was at least 3 years ago.

Current Findings: Probing depths were generally in the range of 2 to 4 mm with localized 5 to 7 mm, BOP was 43%.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Does the patient's diabetes pose an increased risk for periodontitis? A. Yes B. No	**Answer: A** **Explanation:** There is increased prevalence of periodontitis in patients with diabetes mellitus, especially if poorly controlled.
2. This patient requires nonsurgical periodontal therapy. Could periodontal therapy improve glycemic control? A. Yes B. No	**Answer: A** **Explanation:** Although there are conflicting results from different studies, numerous systematic reviews and meta-analyses have consistently shown that periodontal therapy is associated with statistically significant and clinically relevant improvement in glycemic control in patients with diabetes and periodontitis.
3. Which of the following are complications of diabetes mellitus? A. Retinopathy B. Nephropathy C. Periodontal disease D. All of the above E. A and B	**Answer: D** **Explanation:** Complications of diabetes mellitus include **retinopathy**, **nephropathy**, neuropathy, macrovascular disease, altered wound healing, and periodontal disease.

CASE SCENARIO 26.2

Patient: A 49-year-old African-American female.

Chief Complaint: "I am feeling discomfort in my gums. They bleed a lot when I brush, and they are always sore."

Background Information

Patient is a smoker with controlled hypertension and uncontrolled type 2 diabetes mellitus with an HbA1c of 9.8. She is currently taking metoprolol and metformin to treat these inflammatory diseases. She reports brushing twice daily but often skips flossing or other dental aids because it hurts her gums.

Clinical Findings: Generalized probing depths ranging from 2 to 7 mm. **Bleeding on probing** was 52% and patient exhibits poor oral hygiene (biofilm control). Gingival tissues are erythematous, edematous, and tender.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Which of the following diseases have been linked to (adversely affected by) periodontal disease? A. Coronary heart disease B. Diabetes C. Myocardial infarction D. All of the above	**Answer: D** **Explanation:** Periodontal disease has been associated with each of these disease processes. However, causal studies still need to be performed. It is difficult because these disease processes share many of the same risk factors. Thus, the association may be among the risk factors rather than the diseases themselves.
2. Periodontal disease is one of the six complications of diabetes mellitus. A. True B. False	**Answer: A** **Explanation:** Yes, along with retinopathy, nephropathy, neuropathy, macrovascular disease, and altered wound healing, periodontal disease is officially recognized by the American Diabetes Association as a common complication among patients with poorly controlled diabetes mellitus.
3. Periodontal therapy has a beneficial effect on glycemic control. A. True B. False	**Answer: A** **Explanation:** This may be true for patients with poor glycemic control and more advanced periodontal destruction. Patients who improved periodontal health with treatment also experienced improvements in glycemic control.

فصل بیست و هشتم

CASE SCENARIO 28.1

Patient: 33-year-old white female

Chief Complaint: "I have painful gums that bleed easily."

Background Information

Patient reports brushing one or two times daily with an electric toothbrush and flossing at night. She denies tobacco use. Patient reports that she is 5 months pregnant. She started taking daytime naps due to fatigue. She does not brush her teeth before napping.

Clinical Findings: Generalized moderate gingival erythema and edema with localized moderate gingival overgrowth occur in the anterior interproximal sites. There is generalized, severe marginal bleeding. Generalized, slight plaque is localized to the distal part of the second maxillary molars.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Periodontal disease in the mother has adverse effects on the fetus, including an elevated risk for a preterm, low-birth-weight infant. A. True B. False	**Answer: A** **Explanation:** Pregnancy exacerbates periodontal disease. Research shows that periodontal disease can affect the patient's systemic health, including adverse effects on the unborn fetus.
2. What is the most likely diagnosis for this patient? A. Plaque-induced gingivitis B. Pregnancy gingivitis C. Generalized moderate chronic gingivitis D. Generalized mild chronic periodontitis	**Answer: B** **Explanation:** Pregnancy gingivitis occurs in 30%–100% of pregnant women. Kornman and Loesche found that during the second trimester, gingivitis and bleeding increased without an increase in plaque (biofilm) levels.[75]
3. This periodontal disease can manifest with the clinical finding of: A. Pregnancy tumor B. Gingival hyperplasia C. Pyogenic granuloma D. All of the above	**Answer: D** **Explanation:** All of these findings are associated with pregnancy gingivitis. Options A and C are the same.

فصل سی و یکم

CASE SCENARIO 31.1

Patient: A 63-year-old female

Chief Complaint: The patient complains of bleeding gums. Her husband complains about her foul mouth odor.

Background Information

The patient is allergic to penicillin. Medications: acetylsalicylic acid 80 mg/day and omeprazole 20 mg/day.

Current Findings: Generalized bleeding on probing and pockets > 5 mm. For organoleptic scoring, her nasal breath odor is scored 2, and the oral cavity odor and tongue coating are scored 5. The Halimeter gives a score of 250 ppb volatile sulfur compounds.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which is the most plausible cause of her bad breath? A. Tongue coating B. Periodontitis C. Stomach problems D. Tongue coating and periodontitis E. Stomach problems and periodontitis	**Answer: D** Tongue coating and periodontal disease are the most common causes of bad breath. In this patient, both are clearly present. Stomach problems are rarely a cause of bad breath. Although this patient uses omeprazole, it is prescribed for protection against gastric ulcers because she uses Asaflow, an acetylsalicylic acid formulation.
2. What do you do? A. Explanation of halitosis B. Oral hygiene instruction C. Periodontal treatment D. All of the above	**Answer: D** For every patient who complains about halitosis, it is important to explain the etiology and give oral hygiene instruction—because in most people, oral hygiene is suboptimal. Because the patient has tongue coating, this includes a tongue scraper. The patient has periodontitis, so this should also be treated.

CASE SCENARIO 31.2

Patient: A 25-year-old female

Chief Complaint: The patient complains of bad breath.

Background Information

The patient is systemically healthy. Her last dental checkup was 3 months ago, and she brushes twice a day using an electric toothbrush and interdental brushes.

Current Findings: The patient has good oral hygiene and healthy periodontium and teeth. When questioning the patient, it is clear that only she thinks she has bad breath. She mentions that her partner and siblings have never smelled anything. For organoleptic scoring, her nasal breath odor is scored 0, and the oral cavity odor and tongue coating are scored 1. The Halimeter gives a score of 36 ppb volatile sulfur compounds.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which is the most plausible cause of her bad breath? A. Tongue coating B. Periodontitis C. Stomach ulcer D. The patient does not have bad breath.	**Answer: D** Because all halitosis measurements, both organoleptic and with the Halimeter, are under the threshold limit, the patient does not have halitosis.
2. What is the diagnosis? A. Intraoral halitosis B. Extraoral halitosis C. Pseudohalitosis D. Halitophobia	**Answer: C** Because no obvious oral malodor could be perceived, pseudohalitosis is diagnosed.
3. What is the treatment? A. Explanation and oral hygiene instruction B. Explanation and oral hygiene instruction, explanation of examined data, education, and reassurance C. Explanation and oral hygiene instruction and prophylaxis D. Explanation and oral hygiene instruction and referral to psychology specialist	**Answer: B** In patients who think they have halitosis, this condition can be improved by carefully explaining the etiology of halitosis and the nature and results of all breath and oral cavity examinations. However, if the patient persists in believing that she has halitosis when no evidence exists, we call this halitophobia, and referral to a psychology specialist is required.

CASE SCENARIO 31.3

Patient: A 30-year-old female

Chief Complaint: The patient and people around her complain about intermittent halitosis. The patient says that the bad breath seems related to white stones that appear to come from her throat.

Background Information

The patient is in good health. She brushes once or twice a day and uses interdental cleaning aids daily.

Current Findings: The patient has good oral hygiene and healthy periodontium and teeth. Her tonsils seem inflamed, and tonsil stones can be seen. For organoleptic scoring, her nasal breath odor and tongue coating odor are scored 1 and the oral cavity odor is scored 3. The Halimeter gives a score of 133 ppb volatile sulfur compounds.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which is the most plausible cause of her bad breath? A. Tongue coating B. Periodontitis C. Tonsil stones D. Stomach problems	**Answer: C** Tonsil stones, or tonsilloliths, are formed when debris trapped in the crypts of the tonsils calcifies.
2. What do you do? A. Give explanation of halitosis B. Oral hygiene instruction C. Periodontal treatment D. Refer the patient to an ear, nose, and throat specialist.	**Answer: D**

فصل سی و سوم

CASE SCENARIO 33.1

Patient: 55-year-old female

Chief Complaint: "My upper front teeth have moved, increasing the spaces between teeth and changing my bite."

Background Information: The patient brought a photograph from 4 years before her appointment that shows the maxillary anterior teeth without increased spacing and fully coupled with the mandibular anterior teeth.

Current Findings: Clinical evaluation reveals minimal periodontal disease or loss of attachment, including the anterior teeth. The patient does not think she snores but is not sure. She has gained weight over the past 4 years and has noticed increasing dryness of her mouth, although no new medication was taken. Deep crenations of the tongue are observed, and the mandibular posterior teeth are lingually inclined and show wear, suggesting bruxism. (A) Image of maxillary right anterior sextant shows a space that the patient reports to have developed over last several years. (B) Patient asked to make "Ahhh" sound. Because she is showing only her palate and tongue, this observation may indicate limited airway dimension. (C) Patient asked to swallow. She protrudes her tongue and shows shallow crenations of her tongue in that region, indicating less than ideal room for her tongue. (D) Models were taken 4 years ago for a bleaching tray for this patient, showing very close proximity of the cuspid and lateral incisor at that time, which is consistent with this patient's observations.

CASE SCENARIO 33.1—cont'd

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What tentative diagnosis or explanation can you offer this patient? A. She may be experiencing separation of the teeth because of grinding them in her sleep and during the day. B. She may have developed an intolerance to the medications she has been taking for the past 10 years. C. Sleep-related breathing disorders may explain her symptoms, and the changes in her teeth may be a product of needing the tongue to move forward forcibly to open the airway to allow adequate oxygen intake.	**Answer:** C **Explanation:** The patient's history and clinical presentation show multiple signs of a sleep-related breathing disorder.
2. What are your recommendations if you assume the patient's condition is a product of sleep-disorder breathing? A. You explain to her that dentists are not qualified to make the final diagnosis of a sleep-related breathing disorder, (snoring may be a symptom) but there are many indications of the condition. Because there are serious medical complications related to an untreated sleep-related breathing disorder, you strongly recommend that she seek evaluation by a qualified physician. B. You suggest that the patient ask her spouse to determine whether she snores while sleeping, and if not, you tell her to mention the dental problems to her physician at the next regular or annual examination. C. If the spouse confirms that the patient snores while sleeping, you suggest making a snore appliance.	**Answer:** A **Explanation:** Discounting the importance of a complete and accurate diagnosis of the degree of a sleep-related breathing disorder puts the patient at risk for serious or life-threatening medical complications. Providing snoring relief without a complete diagnosis is similarly irresponsible. Emphasizing the need to immediately seek a medical diagnosis and intervention is the only responsible action.

فصل سی و چهارم

CASE SCENARIO 34.1

A patient calls the dental office the day after an extensive restorative procedure, which required several hours to complete, to report her condition. Though there is no history of temporomandibular joint (TMJ) disorders, no evidence on recent panoramic radiograph of change in condyle head shape or relationship to the articular fossa, and no history of occlusal disharmony, the patient states she has pain in the region of her right ear and is unable to get the posterior teeth on the right side to touch, despite having a complete dentition in both arches.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the source of the patient's discomfort and of the inability for the posterior teeth to contact? A. Anterior displacement of the articular disc of the right TMJ B. Dislocation of the left TMJ resulting in teeth on left side contacting first C. Ear infection affecting the comfortable function of her right condyle, resulting in her unconsciously avoiding tooth contact on the right side	**Answer: A** **Explanation:** The patient's articular disc of her right TMJ is displaced anteriorly due to sustained muscle effort during the dental appointment without adequate compensation by the dentist in the form of support or rest. The condyle head is held away from the articular fossa by the swelling of retrodiscal tissue, separating the right posterior teeth, and the rich innervation of the retrodiscal tissue and the state of inflammation account for her pain, especially when she attempts to achieve contact of posterior teeth on the right side.
2. What might a dentist do to help prevent this event from occurring? A. Inform the patient at the beginning of the long appointment that he or she should expect pain and jaw immobility for several days after that appointment. B. Request that the patient be aware of any discomfort or fatigue of jaw muscles during the appointment, offer a jaw support block or instrument whenever procedure permits, and allow the patient breaks and periods of rest during the appointment. C. Complete the procedures as quickly as possible, because slightly imperfect results are preferable to TMJ or masticatory muscle pain and dysfunction.	**Answer: B** **Explanation:** Extended dental treatment can lead to muscle spasm, TMJ disharmonies, and facial pain, even for patients with no reported history of difficulty. The dentist needs to collaborate with the patient to reduce potential complications of this type with support and rest consistent with the difficulty of the procedures being accomplished. Any history of masticatory system disorders of which the dentist has knowledge and documentation would require even more careful efforts to protect the patient from excessive muscle fatigue or protracted opening.

KEY APPLICATION

Clinical evaluation of each patient's TMJ condition and function, occlusal relationships, and any discomfort the patient may be experiencing is well within the scope of a dentist's training and abilities.

KEY FACT

The muscle mass of elevator muscles is significantly greater than that of juxtaposed depressor muscles, which include the inferior head of the lateral pterygoid muscles, anterior digastric muscles, and those muscles attached to the hyoid bone. This difference, along with the mechanical advantage, between closing and opening accounts for the intensity of bite force and the reaction of periodontal ligament mechanoreceptors.

KEY CLINICAL APPLICATION

Evaluation of the interaction of inclines of posterior teeth in contact during excursions is an essential component of accurate diagnosis for patients with a masticatory system disorder.

فصل سی و پنجم

CASE SCENARIO 35.1

Patient: A 42-year-old female

Chief Complaint: "My gums bleed and are tender whenever I try to floss my back teeth."

Background Information:
The patient had moderate, generalized periodontitis, which was primarily limited to the posterior teeth in all four quadrants.

Current Findings: Mobility of individual teeth is observed and charted. With a comprehensive diagnosis, nonsurgical therapies are prescribed. After intervention and the patient's collaborative home therapies produced clear evidence of an ideal response, there appeared to be no persistent inflammation, but mobility of several teeth remained measurable. The premolar shown in the radiograph had class 1 mobility, although the 6-mm pocket on its mesial aspect measured only 4 mm after initial therapy.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What does the radiographic image suggest to the dentist about the premolar? A. It is somewhat mobile. B. It is very stable. C. It is very mobile.	**Answer: B** **Explanation:** The size and shape of the root and minimal loss of support strongly suggest the premolar should be very stable because of the success of antiinflammatory therapies.
2. What criteria suggested in the radiograph can the dentist use to determine expected stability or mobility? A. Dimension and shape of the root form of the premolar B. Evidence of significant previous bone damage and loss of support C. Evidence of other contributing pathology	**Answer: A** **Explanation:** Because there is no evidence of other pathology and bone loss on the mesial aspect of the root of the premolar is minimal, assessment of the root form (i.e., not tapered) and size (i.e., significant root surface for attachment) should lead the dentist to conclude that another factor, occlusal trauma, is the likely source of persistent mobility.

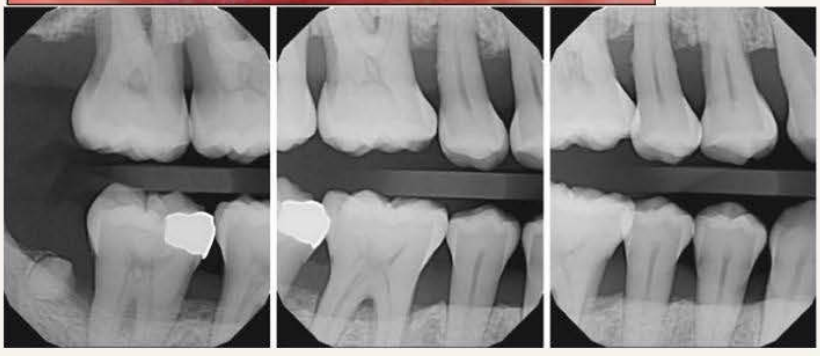
فصل سی و هشتم

CASE SCENARIO 38.1

Patient: A 62-year-old female presented for periodontal evaluation prior to orthodontic treatment

Health History: Patient stated that she is healthy. Last physical exam was 6 months ago.
No medications.
No known drug allergies.

Dental History: Patient did not go to the dentist for about 10 years due to a previous "bad dental experience." She did not return to the dentist until her teeth shifted.



CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. The distance from the cementoenamel junction (CEJ) to the alveolar crest on both mesial and distal of tooth #4, the maxillary second premolar, is 8 mm. What is the severity of bone loss on tooth #4? A. Mild B. Moderate C. Severe	**Answer: C** **Explanation:** In health, the distance between the cementoenamel junction and the alveolar crest is usually ≤2 mm. Bone loss on #4 is 6 mm (8 mm − 2 mm). Bone loss is scored as follows: mild = 1–2 mm, moderate = 3–4 mm, severe ≥5 mm.
2. Assume that the rest of the mouth has the same disease severity as the maxillary right quadrant and a total of two teeth lost due to periodontitis. % bone loss/age was 0.9. Based on radiographic bone loss and clinical presentation, what is the classification of periodontitis? A. Localized stage I grade B periodontitis. B. Generalized stage II grade B periodontitis. C. Generalized stage III grade B periodontitis.	**Answer: C** **Explanation:** Based on the severity, treatment complexity, tooth loss due to periodontitis, it is a stage III periodontitis case. Based on the rate of disease progression and risk factors, it is a grade B. And the disease extent (≥30%), it is generalized at the stage-defining level of severity.

فصل چهلم

CASE SCENARIO 40.1

Patient: 55-year-old male
Chief Complaint: "I have bad breath, and my gums bleed when I brush."
Background Information
Patient has type 2 diabetes (last HbA1c level was 8) and is a past smoker. Patient takes oral hypoglycemic medication for diabetes and denies any allergies. His last dental cleaning was done 4 years ago, and he denies flossing and reports brushing once a day.
Current Findings: Probing depths were in the range of 2–7 mm, bleeding on probing was 47%, and poor oral hygiene.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the major risk factor for periodontal disease in this clinical scenario? A. Extensive restorations B. Uncontrolled diabetes C. Medication usage D. Smoking history	**Answer: B** **Explanation:** Uncontrolled diabetes is a significant risk factor for periodontal disease.
2. What is the effect of controlling diabetes on periodontal treatment outcome? A. Improves the outcome B. Does not change the outcome C. Worsens the outcome	**Answer: A** **Explanation:** It is clear from several studies that patients with a controlled glycemic level (HbA1c ≤7) respond to periodontal therapy similar to nondiabetic patients.
3. In patients with diabetes (well controlled with medication), what common condition should the clinician anticipate and be prepared to manage chairside? A. Syncope B. Hypoglycemia C. Cardiovascular arrest D. All of the above	**Answer: B** **Explanation:** Hypoglycemia is common in patients with well-controlled diabetes. Proper history taking and questioning about meal intake are important before beginning a clinical procedure. Ready access to sugar supplements or fruit juice is critical in managing this condition.

فصل چهل و چهارم

CASE SCENARIO 44.1

CASE SYNOPSIS

Patient is a 67-year-old Caucasian female who presented with a chief complaint of "I would like to have dental **implant** in my upper left side." Patient is referred by her dentist for treatment of periodontal disease and implant therapy. Patient reported a history of depression, for which she was taking citalopram which is a selective serotonin reuptake inhibitor. Additionally, she reported an allergy to nickel. Otherwise, there were no other significant medical problems. She is a former smoker and quit smoking several years ago. Her blood pressure was 125/75 mm Hg with a heart rate of 75 beats per minute. Patient reported brushing twice a day and flossing once a day. Her last professional dental cleaning was done one year ago.

She has a high **caries** risk and had received significant number of dental procedures in the past such as crowns, composite restorations, and root canal therapy. Teeth # 2, 14, 15, 19 were extracted for reasons other than periodontal disease. Patient has amalgam restorations in teeth # 4 and 27 and composite restorations in teeth # 3, 5, 6, 11, 22, and 28. In addition, patient has crowns on teeth # 7, 8, 9, 10, 12, 13, 18, 20, 21, 29, 30, and 31, and root canal treatment was completed in teeth # 7, 8, 9, 13, 19, and 20.

Angle's molar class III on the right site was noted. Left side molars relationship was not possible to determine due to missing of #14. Moreover, canine relationship class III on the right side and canine class I on the left side were evident. Posterior crossbite on the right side was present, and normal overjet and overbite were noted. No occlusal interferences were observed. Clinical images of each sextant and intra oral radiographs are presented in eFigs. 44.1 and 44.2, respectively.

Key Periodontal Findings

- BOP%: 30%
- Probing depths range: 1–5 mm
- Interdental clinical attachment loss distribution:
  - 1–2 mm: 20.8%
  - 3–4 mm: 8.3%
  - 5 mm or more: None
- Gingival recession range: 1–2 mm
- Teeth missing due to periodontal disease: None
- Need for complex rehabilitation: No
- Inadequate keratinized gingiva: #20

Key Radiographic Findings

- Horizontal bone loss of around 15%–33% around teeth # 4, 20, 30, and 31
- Recurrent caries on teeth # 5, 6, and 11
- Periapical radiolucency on tooth #13
- % bone loss / age = 30/67= 0.45

Periodontal Diagnosis

Localized stage II, grade B periodontitis

In addition, the patient was diagnosed with the following conditions:

- Other conditions affecting the periodontium
- Mucogingival deformities and conditions.
- Gingival recession on teeth # 11, 20, and 28
- Lack of attached keratinized tissue: # 20
- Tooth and prosthesis-related factors: defective restorations

ETIOLOGY

- Microbial dysbiosis in a susceptible host

CONTRIBUTING FACTORS

- Poor oral hygiene
- Infrequent professional mechanical plaque removal
- History of smoking
- Defective restorations

TREATMENT PLAN

The following treatment plan was developed according to the S3 Level Clinical CPG for treatment of Stage I–III periodontitis:[13]

First Step in Therapy

- Oral hygiene instructions
- Supragingival dental biofilm control
- Professional mechanical plaque removal
  - Supragingival instrumentation
- Restorative consultation for treatment of recurrent caries and replacement of defective restorations
- Caries control including diet control and prescribing fluoride toothpaste
- Endodontic consultation for tooth # 13
- Reevaluation

Second Step in Therapy (Cause-Related Therapy)

- Subgingival instrumentation at sites with periodontal pockets of greater than 3 mm
- Periodontal re-evaluation 4–8 weeks after subgingival instrumentation. In this case, no sites with probing depths of greater than 4 mm were present at reevaluation visit.

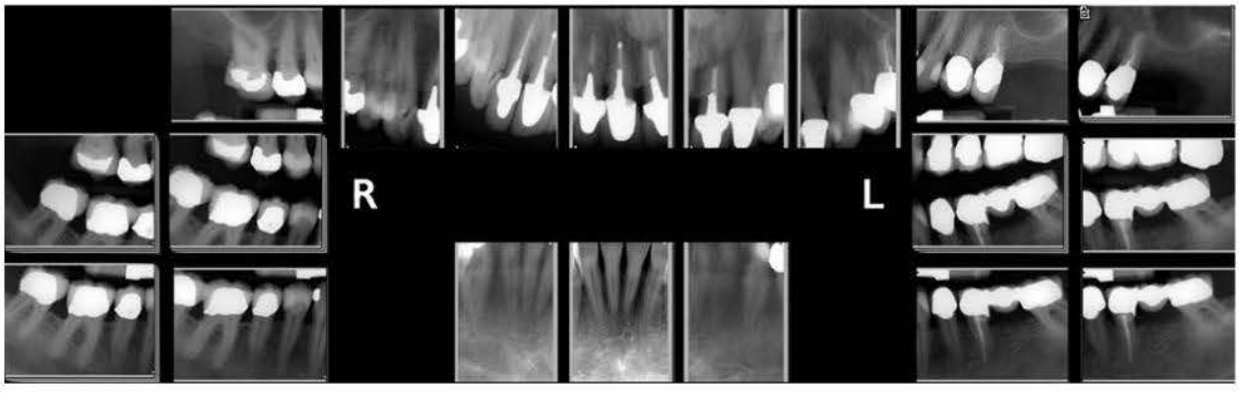
Third Step in Therapy

- Implant placement for sites # 14 and 15
- Connective tissue graft to increase attached keratinized tissue for tooth # 20
- Postsurgical reevaluation

Supportive Periodontal Care

- Periodic periodontal examination (every three months) including updating radiographs, oral hygiene instructions, supragingival dental biofilm control, subgingival instrumentation (as needed), evaluation of occlusion and tooth mobility, and examination for other pathologic changes.

eFig. 44.1 Buccal and palatal/lingual images of each sextant at initial presentation.



eFig. 44.2 A full mouth series of intraoral radiographs at initial presentation.

CASE SCENARIO 44.2

CASE SYNOPSIS

Patient is a 41-year-old African male who is referred to a periodontist by his general dentist with a chief complaint of "I was told that I have gum disease." Patient does not have any significant medical problems and is not taking any medication. He smokes five cigarettes a day. At initial visit, his blood pressure was 130/80 mm Hg with a heart rate of 75 beats per minute. Patient reports that he brushes and flosses twice a day. His last professional dental cleaning was done 18 months ago.

No significant findings were noted in extraoral and intraoral examinations. Patient has a history of undergoing root canal therapy and composite restoration in tooth #10. He does not have any other restorations. Hard tissue exam showed no missing teeth and no active caries. Non-carious cervical lesions were found on several teeth. Patient reports a history of bruxism. Occlusion analysis demonstrated Angle's molar and canine class I relationship with anterior open bite. No occlusal interferences were noted. eFig. 44.3 shows clinical images of each sextant and eFig. 44.4 presents a full mouth series of intraoral radiographs.

Key Periodontal Findings

- BOP%: 41%
- Probing depths range: 1–11 mm
- Interdental Clinical Attachment Loss Distribution:
  - 1–2 mm: 31.2%
  - 3–4 mm: 18.75%
  - 5 mm or more: 34.4%
- Gingival recession range: 1–5 mm
- Teeth # 16 and 17 showed mobility grade II
- Teeth missing due to periodontal disease: Teeth # 16 and 17 have a hopeless prognosis and are planned for extraction
- Need for complex rehabilitation: No
- Inadequate keratinized gingiva: No

Key Radiographic Findings

- Generalized moderate horizontal bone loss
- Severe horizontal bone loss of 50% around teeth # 9 and 10
- Vertical bone loss of around 90% on the mesial of # 17
- Vertical intrabony defect of 4 mm on the mesial of # 18
- No periapical radiolucency
- % bone loss/age = 50/41 = 1.22

Periodontal Diagnosis

Generalized Stage III Grade C Periodontitis

In addition, the patient was diagnosed with the following conditions:

- Other conditions affecting the periodontium
- Mucogingival deformities and conditions: Gingival recession on teeth # 2, 3, 4, 5, 8, 11–16, 18–31
- Tooth and prosthesis-related factors: Malpositioned teeth

Etiology

- Microbial dysbiosis in a susceptible host

Contributing Factors

- Poor oral hygiene
- Smoking
- Infrequent professional mechanical plaque removal

Treatment Plan

The following treatment plan was developed according to the S3 Level Clinical CPG for treatment of Stage I–III periodontitis[13]:

First Step in Therapy

- Oral hygiene instructions
- Supragingival dental biofilm control
- Professional mechanical plaque removal
  - Supragingival instrumentation
- Risk factor control
- Smoking cessation
- Orthodontic consultation
- Reevaluation

Second Step in Therapy (Cause-Related Therapy)

- Subgingival instrumentation at sites with periodontal pockets of greater than 3 mm
- Adjunctive use of chemotherapeutics (antiseptics)
- Periodontal reevaluation 4–8 weeks after subgingival instrumentation to assess whether the endpoints of therapy have been achieved. In this patient, periodontal pockets of greater than 5 mm were present around several teeth in the maxillary right, maxillary left, and mandibular left quadrants.

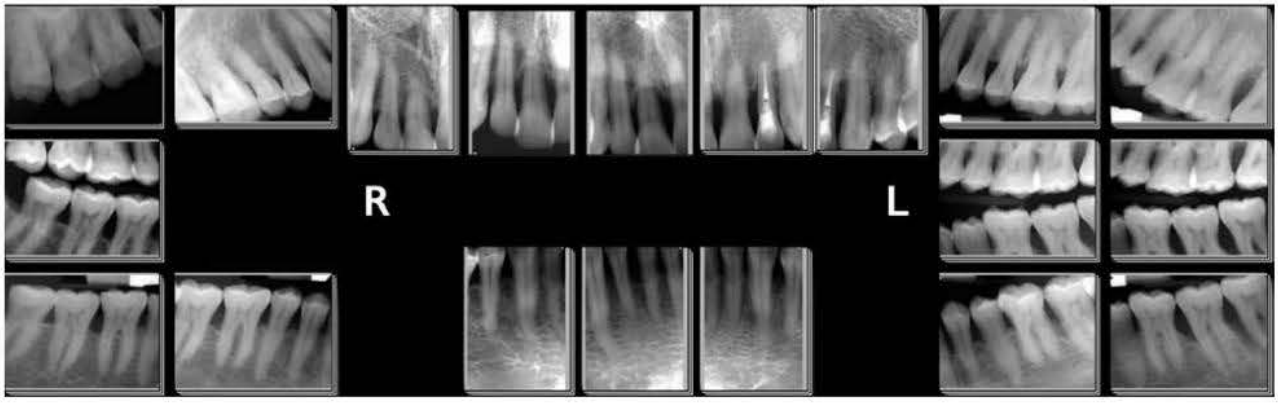
Third Step in Therapy

- Resective periodontal surgery for maxillary right quadrant
- Resective periodontal surgery for maxillary left quadrant with extraction of tooth # 16
- Regenerative periodontal surgery for mandibular left quadrant (if the intrabony defect on the mesial of # 18 is favorable for regenerative therapy) in conjunction with extraction of tooth # 17
- Postsurgical reevaluation

Supportive Periodontal Care

- Periodic periodontal examination (every three months) including updating radiographs, oral hygiene instructions, supragingival dental biofilm control and subgingival instrumentation (as needed), evaluation of occlusion and tooth mobility, and examination for other pathologic changes.

eFig. 44.3 Buccal and palatal/lingual images of each sextant at initial presentation.



eFig. 44.4 A full mouth series of intraoral radiographs at initial presentation.

CASE SCENARIO 44.3

CASE SYNOPSIS

Patient is a 38-year-old African-American male who presented with a chief complaint of "I am worried about losing my teeth." He was referred to a periodontist by his general dentist. Patient is not in pain or discomfort. Patient is allergic to penicillin with no other significant medical problems. Patient is not taking any medication. His blood pressure was 120/70 mm Hg with a heart rate of 72 beats per minute. Patient reported brushing twice a day and flossing once a day. His last professional dental cleaning was done 3 years ago.

Patient has amalgam restorations in teeth # 13, 14, and 15 and composite restorations in teeth # 2 and 31. The mandibular anterior teeth are splinted. Patient has a family history of diabetes (brother). Extraoral examination was within normal limits and intraoral examination, including cancer screen was within normal limits. Hard tissue exam revealed no active caries but presence of multiple amalgam and composite restorations. Amalgam overhang was observed on the mesial of tooth # 14. Angle's molar and canine class I relationship with no occlusal interferences was observed. Clinical images of each sextant are presented in eFig.44.5, and a full mouth series of intraoral radiographs is presented in eFig.44.6.

Key Periodontal Findings

- BOP%: 58%
- Probing depths range: 1–8 mm
- Interdental Clinical Attachment Loss Distribution:
  - 1–2 mm: 10.7 %
  - 3–4 mm: 35.7%
  - 5 mm or more: 17.9%
- Gingival recession range: 1–3 mm
- Teeth missing due to periodontal disease: None
- Need for complex rehabilitation: No
- Inadequate keratinized gingiva: No

Key Radiographic Findings

- Vertical intrabony defects on the mesial of teeth # 5 and 14
- A vertical intrabony defect on the mesial of tooth # 19
- Horizontal bone loss between teeth # 18 and 19 and around tooth # 31
- Severe horizontal bone loss of around 50% around mandibular anterior teeth
- No periapical radiolucency
- % bone loss/age = 50/38 = 1.32

Periodontal Diagnosis

- Localized Stage III Grade C Periodontitis
- Alternative Diagnosis: Molar-Incisor Pattern Stage III Grade C Periodontitis
- In addition, patient was diagnosed with the following conditions:
  - Other conditions affecting the periodontium
  - Mucogingival deformities and conditions: Gingival recession on teeth # 2, 3, 14, 18, 19, 20, 23, 24, 25, 29, 30, and 31
  - Tooth and prosthesis-related factors: Amalgam overhang on mesial of # 14
  - Occlusal trauma: Secondary occlusal trauma

Etiology

- Microbial dysbiosis in a susceptible host

Contributing Factors

- Poor oral hygiene
- Infrequent professional mechanical plaque removal
- Defective restoration: Amalgam overhang on mesial of # 14

Treatment Plan

The following treatment plan was developed according to the S3 Level CPG for treatment of Stage I–III periodontitis:[13]

First Step in Therapy

- Oral hygiene instructions
- Supragingival dental biofilm control
- Professional mechanical plaque removal
  - Supragingival instrumentation
  - Correction of overhang amalgam on mesial of tooth # 14
- Reevaluation

Second Step in Therapy (cause-related therapy)

- Subgingival instrumentation at sites with periodontal pockets of greater than 3 mm
- Adjunctive use of chemotherapeutics (antiseptics)
- Fabrication of occlusal guard
- Periodontal reevaluation 4–8 weeks following subgingival instrumentation to evaluate if the endpoints of therapy have been achieved. In this case, sites with probing depths greater than 5 mm were present in the maxillary left, mandibular left, and mandibular right quadrants.

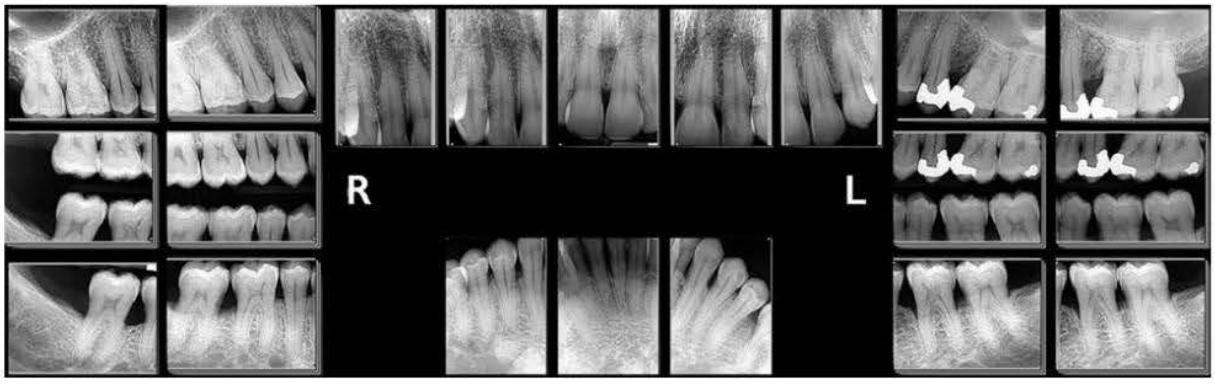
Third Step in Therapy

- Regenerative periodontal surgery for maxillary left quadrant based on the presence of intrabony defect on the mesial of # 14
- Resective periodontal surgery for mandibular right and left quadrant
- Postsurgical reevaluation

Supportive Periodontal Care

- Periodic periodontal examination (every three months) including updating radiographs, oral hygiene instructions, supragingival dental biofilm control and subgingival instrumentation (as needed), evaluation of occlusion and tooth mobility, and examination for other pathologic changes.

eFig. 44.5 Buccal and palatal/lingual images of each sextant at initial presentation.



eFig. 44.6 A full mouth series of intraoral radiographs at initial presentation.

CASE SCENARIO 44.4

CASE SYNOPSIS

Patient is a 44-year-old African-American femalewho is referred to a periodontist by her general dentist with a chief complaint of "I was told that I need gum surgery." She has hypertension and is taking losartan potassium, which is an angiotensin II **receptor** antagonist. She is also obese and her BMI is 37.1 kg/m^2. At initial visit, her blood pressure was 135/85 mm Hg with a heart rate of 80 beats per minute. Patient reports to be brushing twice a day and flossing once a day. Her last professional dental cleaning was done 2 months ago.

No significant findings were observed in extraoral and intraoral examinations except bilateral mandibular tori. Patient has amalgam restorations on teeth # 2, 4, 13, 14, 15, 18–21, and # 28–31. Patient had received root canal therapy and a porcelain fused to metal crown on tooth #3. Hard tissue exam showed missing of teeth # 1, 16, 17, and 32, and presence of active caries on teeth # 14, 20, and 29. Occlusal analysis demonstrated Angle's molar and canine relationships of class III on the right side and class I on the left side with anterior crossbite. No occlusal interferences were detected. Clinical images and intraoral radiographs are presented in eFigs. 44.7 and 44.8, respectively.

Key Periodontal Findings

- BOP%: 36%
- Probing depths range: 1–12 mm
- Interdental Clinical Attachment Loss Distribution:
  - 1–2 mm: 14.3%
  - 3–4 mm: 14.3%
  - 5 mm or more: 25%
- Gingival recession range: 1–3 mm
- Teeth # 18 and 31 displayed grade II mobility with probing depths of 10–12 mm.
- Teeth missing due to periodontal disease: Teeth # 18 and 31 have a hopeless prognosis
- Need for complex rehabilitation: No
- Inadequate keratinized gingiva: No

Key Radiographic Findings

- Generalized moderate horizontal bone loss on the posterior teeth
- Severe horizontal bone loss of greater than 33% around # 14
- Severe vertical bone loss of around 50% on the mesial of # 18 and around 70% on the distal of # 18
- Moderate vertical bone loss of around 30% on the mesial of # 19 and around 20% on the mesial of # 30
- Bone loss of around 100% on the distal and furcation area of # 31
- **Periapical radiolucency** on tooth # 3
- % bone loss/age = 50/44 = 1.14

Periodontal Diagnosis

Localized Stage III Grade C Periodontitis
In addition, the patient was diagnosed with the following conditions:

- Other conditions affecting the periodontium
- Mucogingival deformities and conditions: Gingival recession on teeth # 2, 3, 13, 14, 15, 18, and 30

Etiology

- Microbial dysbiosis in a susceptible host

Contributing Factors

- Poor oral hygiene
- Obesity

Treatment Plan

The following treatment plan was developed according to the S3 Level CPG for treatment of Stage I–III periodontitis:[13]

First Step in Therapy

- Oral hygiene instructions
- Supragingival dental biofilm control
- Professional mechanical plaque removal
  - Supragingival instrumentation
- Risk factor control
  - Dietary counseling and weight loss
- Restorative consultation for treatment of active caries
- Caries control including diet control and prescribing fluoride toothpaste
- Endodontic consultation for tooth # 3
- Reevaluation

Second Step in Therapy (Cause-Related Therapy)

- Subgingival instrumentation at sites with periodontal pockets of greater than 3 mm
- Adjunctive use of chemotherapeutics (antiseptics)
- Periodontal reevaluation 4–8 weeks after subgingival instrumentation to assess whether the endpoints of therapy have been achieved. In this case, periodontal pockets of greater than 5 mm with bleeding on probing were present around several posterior teeth in all four quadrants.

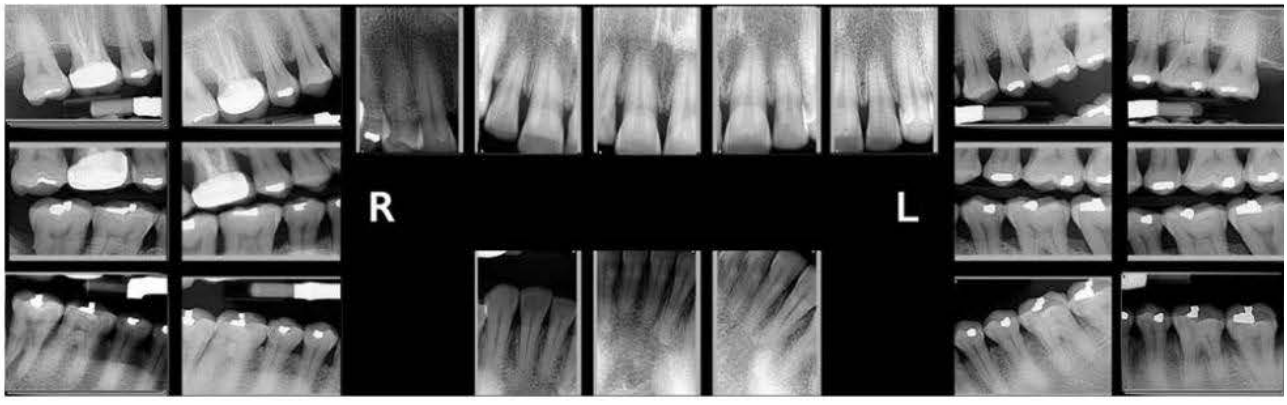
Third Step in Therapy

- Resective periodontal surgery for maxillary right and maxillary left quadrants
- Regenerative periodontal surgery for mandibular left quadrant, based on the presence of intrabony defect on the mesial of # 19, in conjunction with extraction of tooth # 18
- Resective periodontal surgery periodontal surgery for mandibular right quadrant in conjunction with extraction of tooth # 31
- Postsurgical reevaluation

Supportive Periodontal Care

- Periodic periodontal examination (every three months) including updating radiographs, oral hygiene instructions, supragingival dental biofilm control and subgingival instrumentation (as needed), evaluation of occlusion and tooth mobility and examination for other pathologic changes.

eFig. 44.7 Buccal and palatal/lingual images of each sextant at initial presentation.



eFig. 44.8 A full mouth series of intraoral radiographs at initial presentation.

فصل چهل و پنجم

CASE SCENARIO 45.1

Patient: A 41-year-old female

Chief Complaint: "My old crowns had a big open space between them by the gums."

Background Information

The patient is ASA 1, has a high smile, and a normal tissue biotype. Preexisting PFMs on central incisors had open gingival embrasure. Pocket depths are within normal limits, there is no bleeding on probing, and the patient practices good oral hygiene.

Current Findings: Preexisting PFM crowns on maxillary central incisors had poor shade match and open gingival embrasures. Patient brushes and flosses as directed and has hygiene visits twice per year. RCT/post on the maxillary right central incisor is intact.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. To predictably close the open gingival embrasure with the new crowns, the apical extent of the contact point should be _____ from the interdental bone crest. A. 4 mm B. 5 mm C. 6 mm D. 7 mm	**Answer: B** **Explanation:** According to Tarnow 1992, contact points 5 mm from the interdental crest of bone will be completely filled in 98% of patients.
2. What is the apparent height of the papilla between the centrals most dependent on? A. Tissue biotype B. Prep design C. Crestal bone height D. Deep margin placement	**Answer: C** **Explanation:** The height of the interdental bone is the largest variable in determining the apparent height of the papilla. Tissue biotype plays a role, though less significant.
3. What risk does the subgingival margins as seen here create? A. Cement-induced periodontal inflammation B. Increased plaque retention C. Esthetic concerns due to the darkened root of the right central incisor	**Answer: A** **Explanation:** Subgingival margins increase the risk for inflammation due to residual cement. This risk increases proportional to the subgingival depth of the margin. Healthy, robust gingiva mitigates this risk to some extent.

CASE SCENARIO 45.2

Patient: A 38-year-old male

Chief Complaint: "My old veneers are black by the gums."

Background Information

The patient is ASA 1, has a high smile, and a normal tissue biotype. Preexisting veneers on central incisors had black stains underneath the margins. Pocket depths are within normal limits, there is no bleeding on probing, and the patient practices good oral hygiene.

Current Findings: Existing veneers had black color stains under the margins, which appeared to be well sealed. Stains are likely secondary to the use of ferric-sulfate hemostatic agents during the previous preparations, impressions, or delivery. No caries was detected, margins were equigingival, and the gingiva is healthy.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Restorative margins in the esthetic zone should be placed as deep as possible to avoid esthetic issues with stained margins. A. True B. False	**Answer: B** **Explanation:** False. Modern all-porcelain materials allow margins to be placed equigingival or at most 0.5 mm subgingival. Deeper margins will increase the risk for recession and make it difficult to properly **isolate** the area from moisture during bonding.
2. What does the first cord rest on when it is placed into the bottom of the sulcus? A. Connective tissue attachment B. Junctional epithelium C. Sulcular epithelium	**Answer: B** **Explanation:** The junctional epithelium lies at the base of the sulcus. It is 1 mm thick on average. It must be treated with care to avoid damage during cord placement, cementation, and probing.
3. Soft-tissue recession can be caused by trauma resulting from, for example, surgery, aggressive probing, aggressive cord placement, and aggressive **root** instrumentation. Periodontal tissues with which of the following characteristics are most at risk for recession? A. Stippling of the gingiva B. Blunted papilla C. Thin biotype D. Pocket depths of less than 2 mm	**Answer: C** **Explanation:** Thin biotype. Thin biotypes are more susceptible to recession due to manipulation or trauma. Extreme care must be exercised.

فصل چهل و هشتم

CASE SCENARIO 48.2

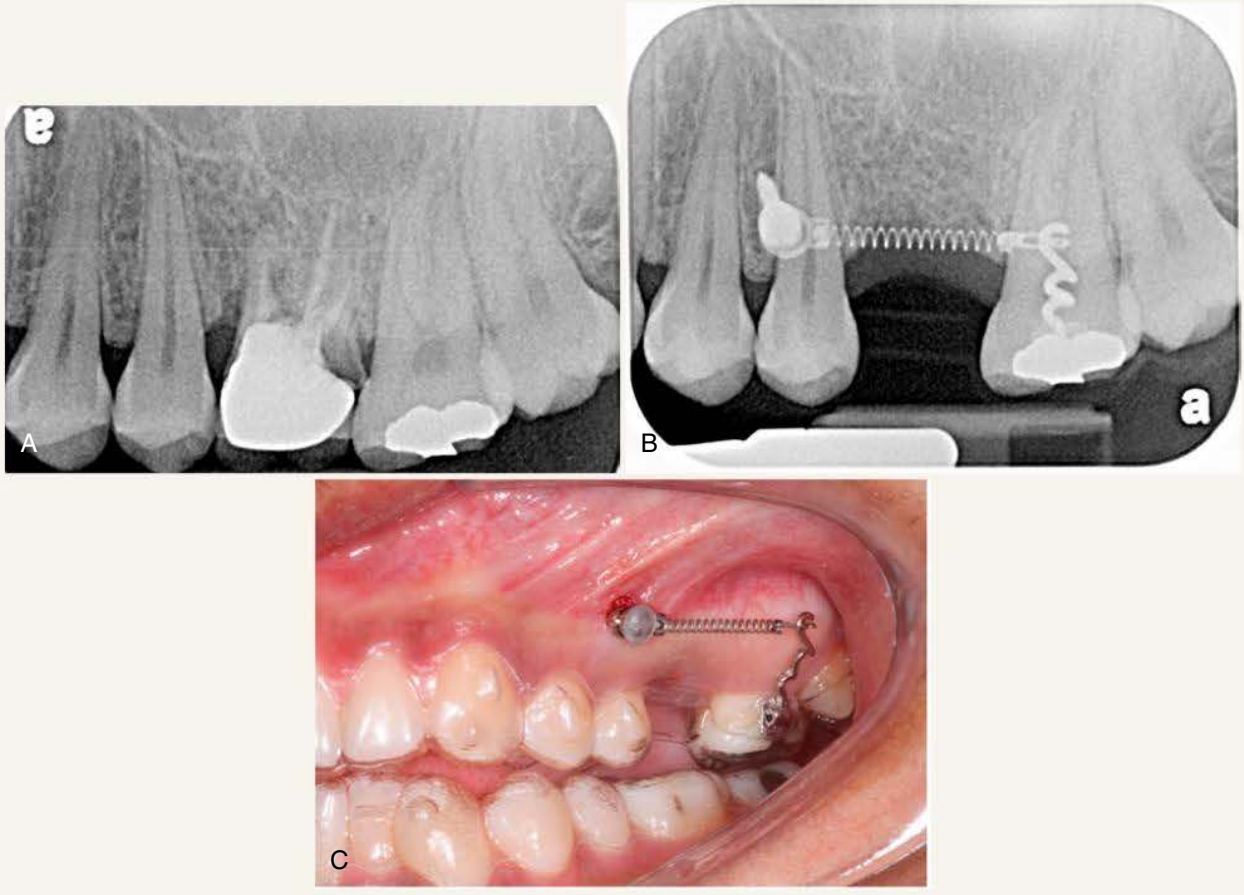
Patient: A 26-year-old healthy male

Chief Complaint: Nonrestorable upper left first molar

Background Information

Patient is seeking orthodontic treatment for class I crowded dentition and is requesting an aligner appliance. A significant finding is that the upper left first molar is nonrestorable due to decay. The intact upper left second and third molars are deemed useful for transpositional replacement.

Current Findings: The distoangular position of the upper left second and third molars is deemed favorable for their protraction into the first and second molar positions. Use of a TAD and power arm to apply force in conjunction with aligner sequencing will effect the movement.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. The appliance being utilized is an example of: A. Indirect implant-assisted anchorage B. Indirect TAD-assisted anchorage C. Direct implant-assisted anchorage D. Direct TAD-assisted anchorage	**Answer: D** **Explanation:** A miniscrew is placed buccally between the bicuspids and used solely for orthodontic facilitation; it will subsequently be explanted. Force is applied via a nickel-titanium coil spring directly applied to the head of the miniscrew.
2. The design of the appliance mechanotherapy is such that: A. The miniscrew and the spring provide the necessary force, and the aligners guide the movement. B. The aligners provide the necessary force, and the miniscrew and spring provide the guidance.	**Answer: A** **Explanation:** Force application is achieved by direct anchorage to the immovable miniscrew. A nickel-titanium coil spring between the screw and the power arm is secured by bonding to the buccal surface of the molar. A sequence of aligners is designed to guide the movement and contain the molars as they protract, preventing unwanted rotations.
3. Reciprocal movements are avoided because: A. The anchor system is independent of other teeth. B. The aligners embrace the entire dentition. C. Force is applied only to the teeth that are intended to move. D. All of the above.	**Answer: D** **Explanation:** Extradental anchorage by virtue of miniscrew application applies force only to the teeth that are attached to it. The need to plan for reciprocal movement is obviated, and anchor control is not pertinent. The aligners are also programmed to control all teeth in the arch.

CASE SCENARIO 48.3

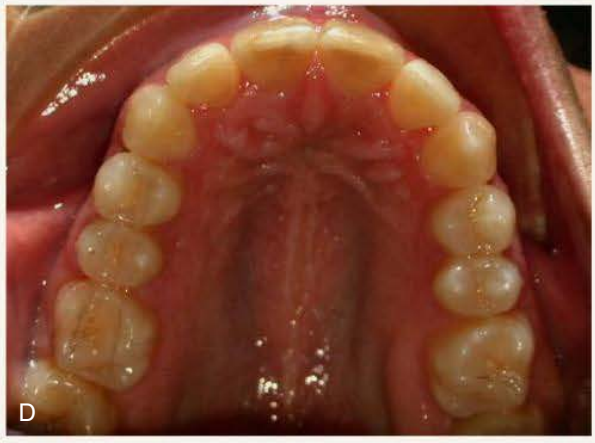
Patient: A 32-year-old healthy female

Chief Complaint: Crowded dentition and overlapped incisors

Background Information

Patient is seeking orthodontic treatment for cosmetic purposes and for long-term health of her dentition and periodontium. Patient reports difficulty in maintaining hygiene and is not happy with the appearance of her teeth.

Current Findings: The bimaxillary dentition is crowded with retroclined maxillary incisors and class II molar relation on the left side. Distal driving of the upper left posterior teeth will provide for a class I molar relation and make space for buccal movement of the palatally displaced second bicuspid. Distal movement avoids the need for a bicuspid extraction to alleviate crowding. A TAD is placed between the bicuspids and used to stabilize the archwire and bicuspids so that force application is directed to the molars.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. The appliance being utilized is an example of: A. Indirect implant-assisted anchorage B. Indirect TAD-assisted anchorage C. Direct implant-assisted anchorage D. Direct TAD-assisted anchorage	**Answer: B** **Explanation:** A miniscrew is placed between the upper left bicuspids and utilized to prevent unwanted mesial movement of the first bicuspid by connecting it to the archwire with an auxiliary T-bar. A coil spring distal to the bicuspid applies a distal force to the molar. The indirect attachment of the TAD to the bicuspid prevents reciprocal movement.
2. The design of the appliance mechanotherapy is such that: A. The miniscrew provides for indirect anchorage to the first bicuspid. B. The fixed appliance guides the movement. C. The open coil spring provides the force application. D. The TAD and T-bar prevent unwanted reciprocal movement. E. All of the above.	**Answer: E** **Explanation:** All of the above choices are true and describe the design of the mechanotherapy.
3. Distal driving of the posterior dentition in cases like this has which added feature(s)? A. It can restore a class I molar relation. B. It can prevent the need for an extraction. C. It can just as easily be achieved without TAD inclusion. D. A and B only	**Answer: D** **Explanation:** The use of indirect anchorage in this case allows the force application to drive the posterior dentition distally to restore a class I molar relation. This, in turn, increases arch length and provides the space necessary to incorporate the palatally displaced bicuspid into the arch. However, without the extradental source of indirect anchorage, unwanted reciprocal mesial movement would occur, increasing the anterior overjet.

CASE SCENARIO 48.4

Patient: A 56-year-old healthy male with congenitally missing maxillary lateral incisor

Chief Complaint: Unattractive upper dentition with spaces and missing teeth

Background Information

Patient was referred to orthodontics by his restorative dentist. Patient is seeking a more esthetic appearance for his upper dentition. Restoration of the missing lateral incisor requires space management, either for a fixed prosthesis to provide for a full-size lateral incisor or, if root alignment can be achieved, for implant replacement of the missing tooth.

Current Findings: The patient is missing the upper right lateral incisor, and the adjacent central incisor and cuspid teeth encroach on the root space necessary for implant placement. At the coronal level, there is insufficient space for a full-size lateral incisor. Orthodontic therapy was used for special site development to allow for implant placement and restoration. Total treatment time was 1.5 years and included orthodontic acceleration for expedition.

CASE-BASED QUESTION

1. This case is an example of:
   A. Implant-assisted direct orthodontic anchorage
   B. Implant-assisted indirect orthodontic anchorage
   C. Orthodontic special site development
   D. Orthodontic tissue augmentation

SOLUTION AND EXPLANATION

Answer: C

Explanation: Orthodontic therapy was employed to develop an implant site by proper root paralleling of the central incisor and cuspid teeth to allow for implant placement. Concomitantly, space for restoration at the coronal level was provided to allow a full-size lateral incisor to be restored. Implant placement occurred at the completion of orthodontic treatment and the implant was not used for anchorage at any time; its sole purpose was tooth replacement.

CASE SCENARIO 48.4 Cont'd	
CASE-BASED QUESTION	**SOLUTION AND EXPLANATION**
2. The orthodontic mechanotherapy: A. Is immaterial to the outcome. B. Must provide for proper root alignment. C. Should be monitored periodically by radiography. D. Can be easily monitored by measuring the developing intercoronal distance. E. B and C only	**Answer: E** **Explanation:** The design and execution of the orthodontic appliance are critical to a successful outcome. Root alignment and parallelism are essential to allow for the eventual placement of an implant between the adjacent teeth. Measuring the developing coronal space as the cuspid and central incisor are separated does not ensure that the roots are parallel; radiographic monitoring is necessary to ensure that interradicular site development is occurring.
3. Which of the following is the proper sequencing of this case type? A. Early implant placement to allow for implant anchorage B. Implant placement prior to orthodontic treatment to allow for integration C. Orthodontic site development after implant placement D. Orthodontic site development followed by implant placement	**Answer: D** **Explanation:** Orthodontic therapy must precede implant placement because of special deficiency in the proposed site. The eventual implant is used solely for tooth replacement and plays no role in anchor provision.

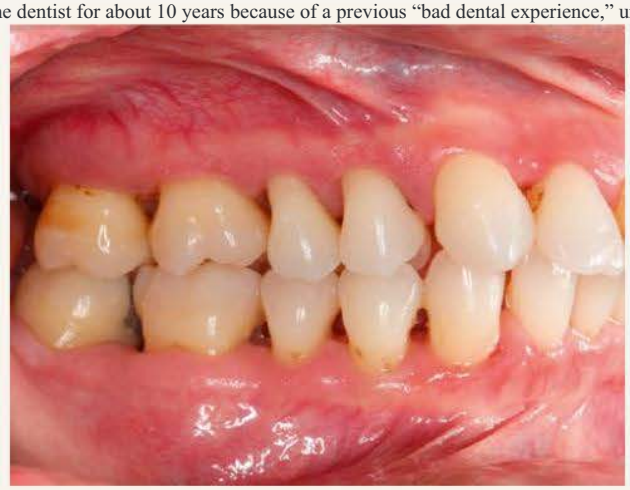
فصل پنجاه

CASE SCENARIO 50.1

Patient: A 49-year-old female patient presented for periodontal evaluation before orthodontic treatment.

Health History: Patient stated she is healthy. Last physical exam was 6 months ago. No medications. No known drug allergies.

Dental History: Patient did not go to the dentist for about 10 years because of a previous "bad dental experience," until her teeth shifted.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Based on the clinical photo of the right side, the best interdental cleaning aid is: A. Dental floss B. Interdental brush C. Water flosser D. Toothpick	**Answer: B** **Explanation:** Interdental cleaning with an interdental brush is a good first choice for interproximal biofilm removal when interdental spaces are present and the interdental brush fits into these spaces. However, patient preference and ability to use the brush are important considerations. If the patient is unable to be effective with the interdental brush, a water flosser is an excellent second choice. Toothpicks and dental floss have been shown to be the least effective in terms of plaque removal

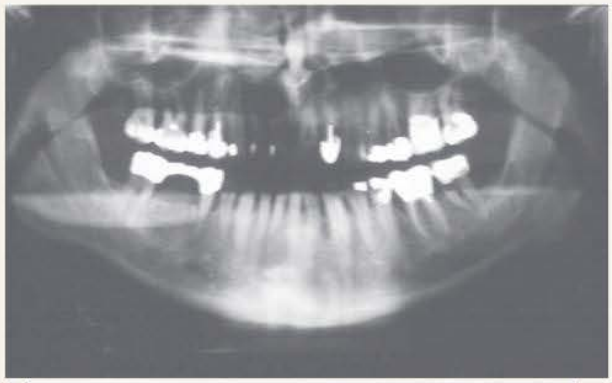
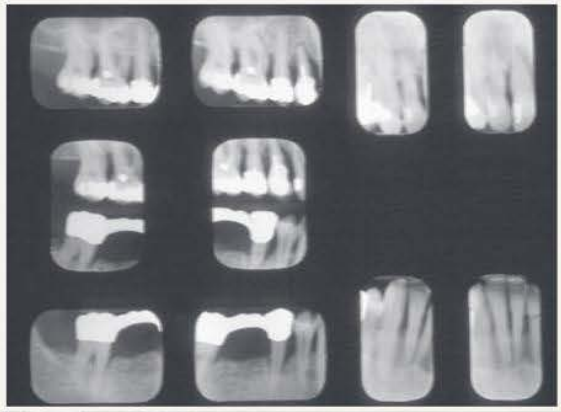
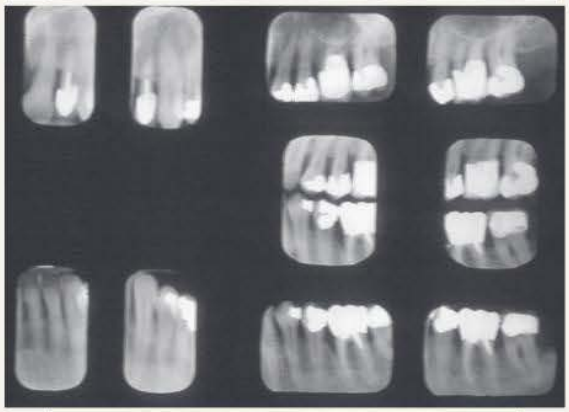
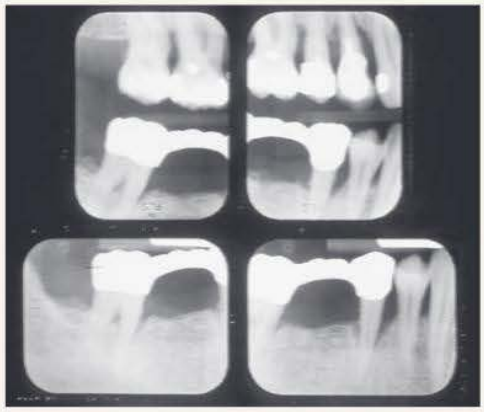
فصل پنجاه و یکم

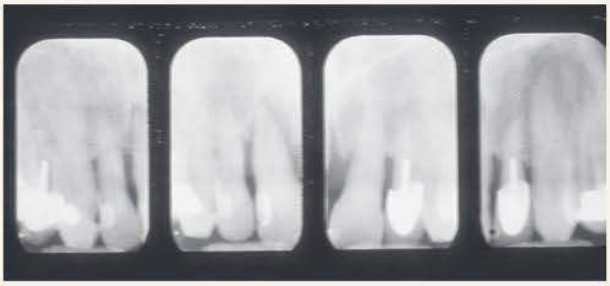
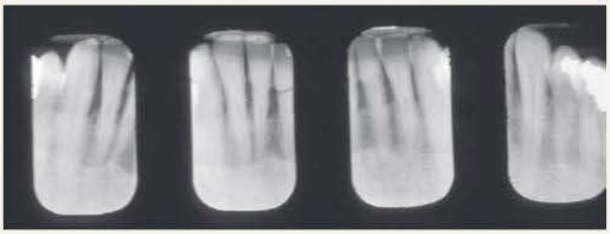
CASE SCENARIO 51.1

The patient is a 55-year-old mechanical engineer with diabetes who was diagnosed 5 years ago after his dentist noticed severe (stage III) periodontitis with multiple **abscesses**, which were treated at that time. He takes 20 units of insulin every morning and is also taking glyburide, atorvastatin (Lipitor), and losartan. He is overweight, has hypertension, and reports that his blood sugar is sometimes over 200 even with medication. His chief complaint today is pain in tooth #5 and discomfort in chewing with tooth #18. Several molars have furcation invasions with severe bone loss, **suppuration**, and bleeding on probing but no severe swelling on the buccal or lingual gingiva. He has not had any periodontal treatment since he underwent scaling 5 years ago and wants a "recall" scaling. You find that he has poor oral hygiene, generalized severe (stage III) periodontitis, probing depths of 4 to 9 mm, and moderate to heavy calculus throughout the mouth.

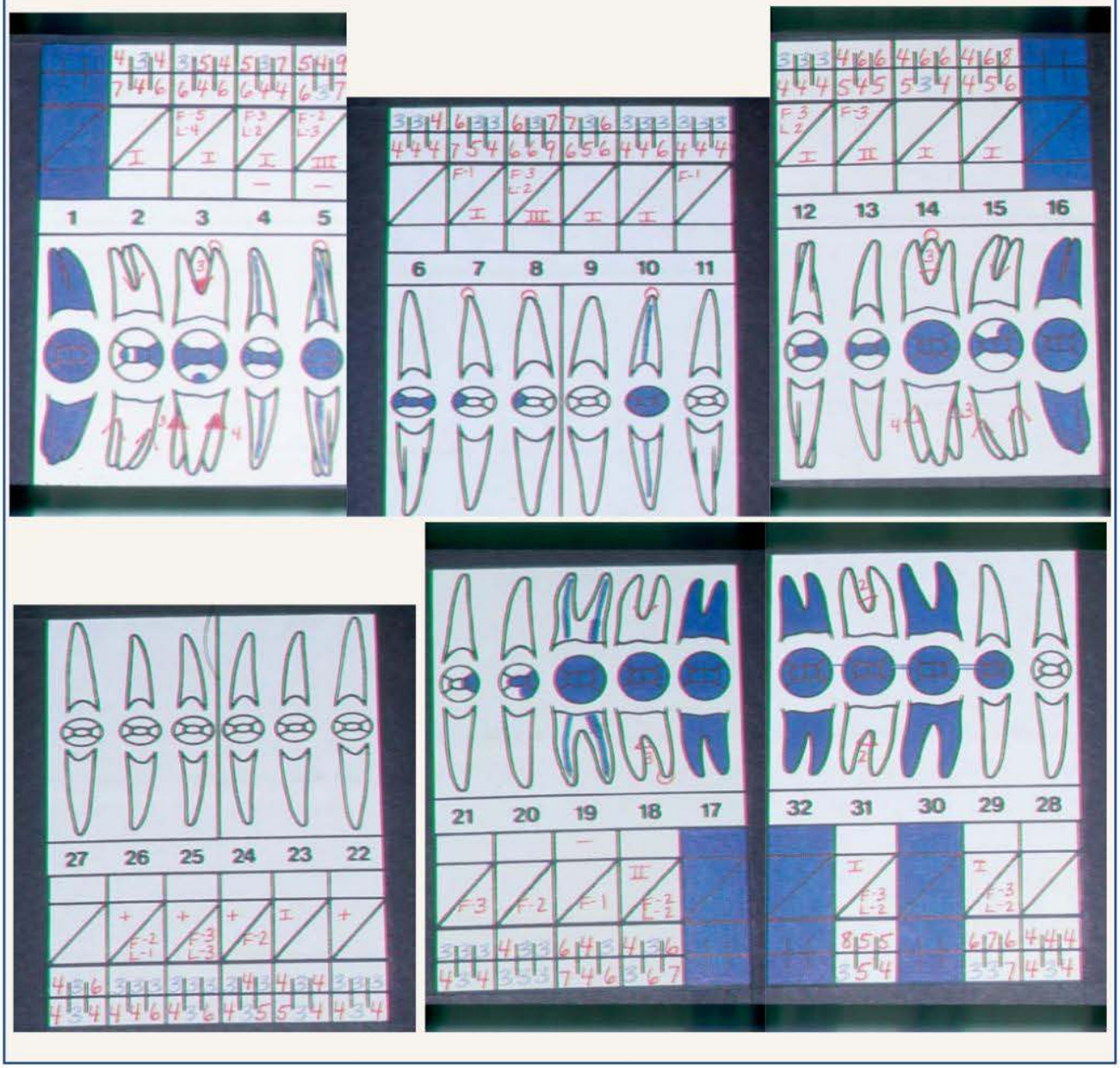
CASE SCENARIO 51.1—cont'd

CASE SCENARIO 51.1—cont'd

CASE SCENARIO 51.1—cont'd



CASE SCENARIO 51.1—cont'd

CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. The best instruments to adapt to the furcations and tight, deep pockets on this patient are: A. Rigid Gracey curettes B. Langer curettes C. Gracey Curvette Sub-0 curettes D. Mini-bladed or micro mini-bladed Gracey curettes	**Answer: D** **Explanation:** All furcations, whether Class I, II, III, or IV, are best scaled with mini- or micro-mini bladed Gracey curettes because they adapt to the contours of the roots better than any other hand instruments.
2. The Gracey Curvette Sub-0 was described as being the most effective instrument for deep pockets on which of the following? A. Maxillary or mandibular anterior teeth B. Maxillary molar furcations C. Molar line angles D. Maxillary premolars	**Answer: A** **Explanation:** The Gracey Curvette Sub-0 has a straight shank and a very short curved blade that is designed for the narrow root surfaces of the maxillary and mandibular anterior teeth.
3. On this patient, which of the following curettes would be the most effective for scaling a thin sheet of tenacious calculus in the 6-mm pocket on the palatal surface of the maxillary right central incisor (#8), which has very firm, tight tissue? A. Gracey #7-8, Gracey #13-14 B. Gracey #11-12, Gracey #5-6, Gracey #7-8 C. Gracey #13-14, Mini Five #13-14, Micro Mini #13-14 D. Gracey Curvette Sub-0, Mini Five #5-6, or Micro Mini #1-2	**Answer: D** **Explanation:** All three of the mini-bladed Gracey curette designs listed in Answer D are better choices for scaling tenacious calculus on a deep palatal root surface with tight tissue than the others. All the other choices include standard Gracey curettes, which would be too large for use on this palatal surface.
4. In which of the following areas would you select an extraoral fulcrum for use with Gracey curettes? A. Labial of maxillary anteriors with tight tissue B. Lingual of mandibular anteriors with heavy calculus C. Buccal of mandibular molars with furcations D. Mesial of maxillary molars with deep pockets	**Answer: D** **Explanation:** An extraoral fulcrum would work best for the mesial surfaces of the maxillary molars. Intraoral fulcrums would work best for the areas described in A, B, and C, and these areas should be scaled with mini-bladed Gracey curettes.
5. To remove a heavy ledge of interproximal calculus most effectively, it is best to begin by engaging the edge of the ledge with the: A. Upper one-third of the cutting edge B. Middle one-third of the cutting edge C. Lower one-third of the cutting edge D. Entire length of the cutting edge	**Answer: C** **Explanation:** Always engage the edge of any ledge of calculus with the lower one-third of the cutting edge to efficiently fracture the calculus away from the tooth. All other choices would most likely shave away at the calculus, resulting in incomplete removal or burnishing of the ledge.
6. The working stroke for removing a heavy ledge of interproximal calculus should be: A. Short, vertical with firm pressure B. Short, horizontal with moderate pressure C. Long, vertical with light pressure D. Long, oblique with firm pressure	**Answer: A** **Explanation:** Short and controlled vertical strokes that engage the interproximal calculus ledge with firm pressure are the most effective. Strokes should be 1 to 3 mm long and advance only 1 mm at a time in a series of overlapping strokes to remove the ledge completely.
7. Final root instrumentation (root planing) strokes to achieve a smooth surface should be: A. Short with light pressure B. Short with firm pressure C. Long with moderate to light pressure D. Long with firm pressure	**Answer: C** **Explanation:** Long strokes with moderate to light pressure are best for finishing root instrumentation (root planing) strokes. Short overlapping strokes are for calculus or biofilm removal. Long strokes with firm pressure can result in overinstrumentation of the root surface, removing too much cementum or dentin, or trauma to the soft tissue; they can also cause root hypersensitivity.
8. The maximum width of the active stroke of any hand instrument when it is properly adapted to the tooth or root surface is: A. 1 to 2 mm B. 2 to 4 mm C. 4 to 6 mm D. 6 to 8 mm	**Answer: A** **Explanation:** Only 1 to 2 mm of any hand instrument or ultrasonic tip will adapt to the tooth during any stroke because of the curvature of the tooth or root surface. This is true regardless of the design of the instrument or the length of the blade. It is the anatomy of the tooth that dictates the very narrow width of each stroke.
9. The maximum width of the active stroke of any ultrasonic tip when it is properly adapted to the tooth or root surface is: A. 1 to 2 mm B. 2 to 4 mm C. 4 to 6 mm D. 6 to 8 mm	**Answer: A** **Explanation:** Only 1 to 2 mm of any ultrasonic tip or hand instrument will adapt to the tooth during any stroke because of the curvature of the tooth or root surface. This is true regardless of the design or length of the ultrasonic tip. It is the anatomy of the tooth that dictates the very narrow width of each stroke.
10. When reevaluating the results of scaling and root instrumentation (root planing) after 4 weeks, the best indication of success is: A. Reduction of pocket depth B. Lack of bleeding on probing C. Root smoothness D. Absence of plaque	**Answer: B** **Explanation:** Lack of bleeding on probing is the most reliable indication of success after scaling and root instrumentation (root planing). Presence of bleeding on probing is almost always a sign that residual subgingival calculus remains on the root surface, especially in areas of pocket depth. Reduction of pocket depth, root smoothness, and absence of plaque can be positive outcomes, but they are not significant if bleeding on probing persists.

فصل پنجاه و دوم

CASE SCENARIO 2.1

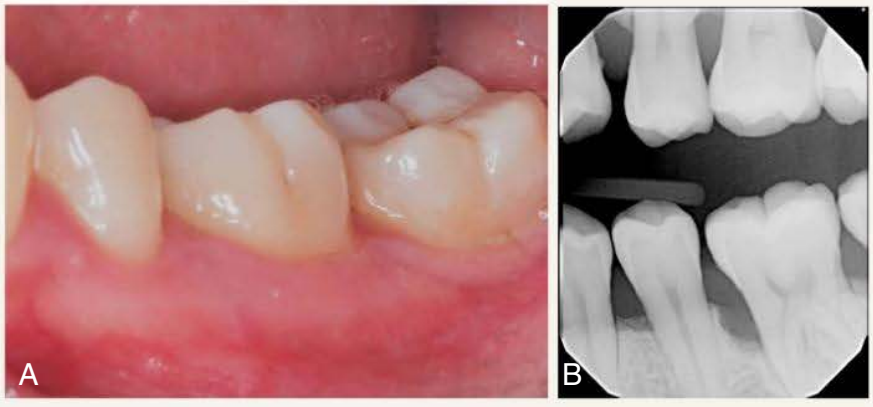
Patient: A 65-year-old female patient
Chief Complaint: Tenderness and bleeding around her implant, which replaced tooth #30.
Background and History: Tooth #30 was extracted 2 years ago due to a root fracture on a tooth with previous endodontic therapy. The patient is in overall good health. Her only medication is calcium for osteopenia. She underwent knee replacement due to osteoarthritis 9 months earlier. She reports that her recovery has gone well and she is back to normal activities. The patient also mentions that her hands are affected by osteoarthritis, and due to this, she is finding it increasingly difficult to use dental floss. She is concerned because she has always tried to take very good care of her smile.
Current Findings: The patient presents with mucositis around the implant restoring tooth #30. The rest of the mouth exhibits moderate gingivitis in more than 30% of sites. Light to moderate plaque and bleeding are present. Calculus buildup is light. Probing depths range from 2 to 4 mm, with the majority of the 4-mm readings occurring in posterior teeth. The patient was diagnosed with gingivitis and was treated with therapeutic scaling to bring the periodontium back to health. Because the patient struggles with floss, a water flosser was recommended for daily use.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATIONS
1. Due to the patient's history of joint replacement, at what setting should she use the water flosser? A. 30 psi B. 60 psi C. The use of a water flosser is contraindicated in a patient with joint replacement.	**Answer: B** **Explanation:** Studies have found the incidence of bacteria from a water flosser to range from 0% to 50%; this is comparable to string floss, which has been shown to have an incidence of bacteria at around 40%. Therefore, the most appropriate setting is the one that has been clinically demonstrated to be effective with implants—60 psi. Individuals who used the water flosser at 60 psi for a period of 30 days found that the water flosser was twice as effective as string floss at reducing bleeding.
2. As an alternative to string floss, the water flosser has been found to be: A. As effective at reducing bleeding and gingivitis B. Less effective at reducing bleeding and gingivitis C. More effective at reducing bleeding and gingivitis	**Answer: C** **Explanation:** Multiple studies have demonstrated that the water flosser is more effective at reducing bleeding and gingivitis than string floss. Many factors likely contribute to this outcome. For many people, the water flosser is easier to use than string floss. The water flosser has been shown to reduce bacteria up to 6 mm, and this may benefit patients with pockets or hard-to-access areas.
3. Because the patient has light calculus buildup, the use of ultrasonic instrumentation is not necessary. True False	**Answer: False** **Explanation:** New thinner tip designs are ideal for deplaquing and treating gingivitis. The most important consideration for this patient is the implant. Metal tips are generally contraindicated with implants. Because the tools for scaling implants are continually improving, it is best to check with both the manufacturer of the implant and the manufacturer of the ultrasonic device before using this device with implants.

فصل پنجاه و سوم

CASE SCENARIO 53.1

Patient: 27-year-old Caucasian female
Chief Complaint: "My gums bleed when I brush my teeth."
Background Information
The patient is a nonsmoker with no systemic medical conditions, but she is allergic to penicillin. She reports that her sister, who is 32 years old, has a similar gum condition. The patient says that she brushes twice a day and flosses three or four times in a week.
Current Findings: **Probing depths** are in the range of 1–8 mm. The deeper (>6 mm) probing depths are confined to maxillary incisors and first molars (Fig. A). Oral hygiene is optimal. Radiographically, a **vertical defect** is noted mesial to all first molars. A representative radiographic vertical defect mesial to #19 is shown in Fig. B.



Images courtesy Dr. Kelsey Tengan.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Based on the history and clinical presentation, what is the likely diagnosis? A. Generalized Stage 3 Grade B Periodontitis B. Necrotizing Periodontitis C. Localized Stage 3 Grade C Periodontitis (molar-incisor pattern)	**Answer: C** **Explanation:** Considering the patient's age, family history, clinical presentation (severe attachment loss confined to first molars and incisors in spite of good oral hygiene), and radiographic findings (vertical bone loss around first molars), a diagnosis of Localized Stage 3 Grade C Periodontitis with Molar-Incisor Pattern can be made.
2. Can you prescribe a combination of amoxicillin and metronidazole for this patient while performing scaling and root planing? A. Yes B. No	**Answer: B** **Explanation:** This patient is allergic to penicillin, and because amoxicillin is a derivative of penicillin, it should not be given to a penicillin-allergic patient. In such cases, metronidazole can be given alone or combined with other antibiotics, such as ciprofloxacin.
3. In North America, when compared with Caucasians, this molar-incisor pattern is more prevalent in patients of African descent. A. True B. False	**Answer: A** **Explanation:** Several epidemiologic studies point to a higher prevalence of molar-incisor pattern (previously diagnosed as localized aggressive periodontitis) (approximately 10 times more) in people of African descent when compared with Caucasians.

فصل پنجاه و چهارم

CASE SCENARIO 54.1

Patient: A 47-year-old male

Chief Complaint: "My gums on the lower right side still bleed when I floss."

Background Information

Patient is a current smoker (5 to 6 cigarettes/day). He has no systemic medical conditions and no known drug allergies. He underwent subgingival root instrumentation in the form of scaling and root planing (SRP) 6 months earlier and is now on a 4-month periodontal recall program. Today, he has a periodontal recall visit.

Current Findings: Probing depths were in the range of 1 to 6 mm. (A) The 6-mm probing depth is localized to distal side of #27, and it bled on probing. All other probing depths were in the range of 1 to 4 mm. His oral hygiene improved significantly after SRP. Radiographically, a vertical bony defect was seen between #27 and #28. (B) The clinician decided to perform localized SRP as part of the recall appointment and used minocycline microspheres as an adjunct.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. In this patient with a vertical defect between #27 and #28 that is amenable to periodontal regeneration, do the data suggest that adding a locally delivered, controlled-release antimicrobial as part of the surgical protocol would be beneficial? A. Yes B. No	**Answer: A** **Explanation:** Clinical studies have suggested additional clinical benefits by adding controlled-release antimicrobials to regenerative procedures, but the data need to be confirmed in further clinical trials.[150,161,195]
2. Minocycline acts by inhibiting which of the following? A. 50S ribosomes B. 30S ribosomes C. Cell wall synthesis D. DNA synthesis	**Answer: B** **Explanation:** Minocycline inhibits protein synthesis in microbes by binding to 30S ribosomes.
3. The following locally delivered, controlled-release antimicrobials are available in the United States *except*: A. Chlorhexidine-containing chip (PerioChip) B. Doxycycline gel (Atridox) C. Tetracycline fiber (Actisite) D. Minocycline microspheres (Arestin)	**Answer: C** **Explanation:** Tetracycline fiber was first introduced into the U.S. market in the early 1990s, and it was the prototypic system. The tetracycline fiber is no longer commercially available in the United States.

فصل پنجاه و هشتم

CASE SCENARIO 58.1

Patient: 45-year-old male

Chief Complaint: Dental phobia

Background Information

Patient had a bad experience with dental treatment. He is fearful and has avoided taking care of his oral health. He has periodontal disease that requires surgical treatment.

Current Findings: Before beginning treatment, the patient was given moderate sedation with an average dose of the sedative typically used. Although all vital signs (e.g., pulse oximeter, breathing, color, blood pressure) are normal, the patient has fallen asleep and is not responsive to verbal commands.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What do you do? A. Continue treatment as long as all the vital signs are normal. B. Immediately start positive-pressure oxygen delivery. C. Stop the procedure and facilitate the process to bring the patient to the moderate sedation level. D. Immediately give reversal agents.	**Answer: C** **Explanation:** The patient should be responsive to verbal or physical stimulus while undergoing moderate sedation. The sedation level is too deep. Attention must be focused on bringing the sedation back up to a moderate level with patient responsiveness.

CASE SCENARIO 58.2

Patient: 36-year-old female

Chief Complaint: "I would like to improve the appearance of my smile. I don't like the long appearance of my teeth. I am afraid of surgery and would like to be asleep."

Background Information

Patient has gingival recession with a high smile. The gingival recession is Miller class I, which can be corrected with a connective tissue graft.

Current Findings: The young healthy patient is administered moderate sedation with supplemental oxygen through a nasal cannula. She stops breathing.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. How long will it take for the pulse oximeter value to drop below 90% arterial oxyhemoglobin saturation? A. 1 minute B. 2 minutes C. 3 minutes D. 4 minutes or more	**Answer: D** **Explanation:** For a well-oxygenated healthy patient, it could take as long as 7 or 8 minutes for the pulse oximeter Value to drop below 90%. Capnography can detect breathing cessation in seconds.

فصل پنجاه و نهم

CASE SCENARIO 59.1

Patient: A 73-year-old female patient

Chief Complaint: "I want to replace my missing back teeth with implants."

Background Information

Patient is a nonsmoker. She denies any serious illnesses and takes no medications. She brushes two to three times per day and uses interproximal brushes. She maintains regular dental visits, including professional cleanings with the hygienist.

Current Findings: Examination reveals moderate to severe gingival recession around all remaining teeth. Tissues are pink, firm, well adapted, and healthy. **Probing depths** are generally in the range of 1 to 3 mm. No bleeding on probing is observed, and oral hygiene is excellent. All remaining teeth are stable.

CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. There are important anatomic structures to evaluate as part of the assessment for dental implants in the posterior mandible. A. Yes B. No	**Answer: A** **Explanation:** The mandibular canal and mental foramen need to be located to identify the position of the inferior alveolar nerve and mental nerve relative to potential implant positions.
2. The submandibular space is a concern when placing implants in the posterior mandible. A. Yes B. No	**Answer: A** **Explanation:** The submandibular space is found inferior and lateral to the mylohyoid and hyoglossus muscles. It forms an undercut space that could be violated by inadvertent drilling. Infections in this area can extend to sublingual and submental spaces.

CASE SCENARIO 59.2

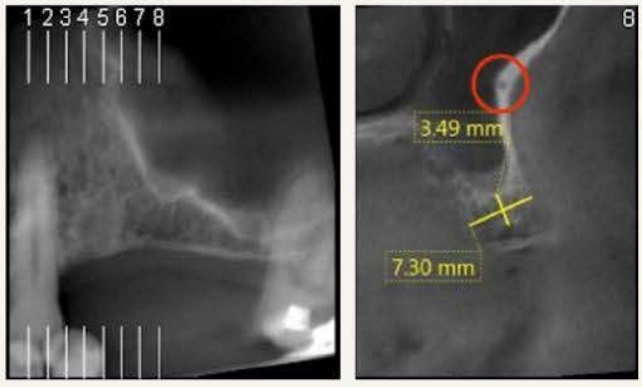
Patient: A 62-year-old Asian male patient

Chief Complaint: "I would like implants to replace my missing upper left back teeth."

Background Information

- No major systemic illnesses
- No known drug allergies
- Nonsmoker
- Patient is currently wearing maxillary treatment partial prostheses to replace missing upper left posterior teeth #12 to #14.

Clinical Findings: Clinical examination reveals missing teeth #12, #13, and #14. Tooth #15 is present. All remaining teeth appear to be stable. The edentulous ridge has good position and shape. Adequate **keratinized** attached tissue is present. Cone-beam computed tomography scan reveals a pneumatized maxillary sinus, with limited remaining alveolar bone. A lateral sinus bone augmentation procedure is indicated.



CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. What artery travels through the intraosseous structure (circled in red)? A. Descending palatine artery B. Posterior superior alveolar artery C. Maxillary artery D. Infraorbital artery E. Sphenopalatine artery	**Answer: B** **Explanation:** The posterior superior alveolar artery is often found on the lateral wall of the maxillary sinus.
2. What anatomic structure is the medial wall of the maxillary sinus? A. Alveolar process B. Lateral wall of the maxilla C. Lateral wall of the nasal cavity D. Floor of the orbit	**Answer: C** **Explanation:** The maxillary sinus is an air-filled cavity located in the posterior maxilla superior to the teeth. The lateral wall of the nasal cavity borders the medial wall of the maxillary sinus; it is bordered superiorly by the floor of the orbit and laterally by the lateral wall of the maxilla, the alveolar process, and the zygomatic arch.
3. Augmentin is an **antibiotic** with a good **spectrum** of antibacterial coverage (often prescribed) for sinus bone augmentation procedures. What is it? A. Penicillin B. Amoxicillin + clavulanic acid C. Clindamycin + clavulanic acid D. Amoxicillin + **metronidazole**	**Answer: B** **Explanation:** Augmentin is a combination antibiotic useful for a number of **bacterial** infections. It consists of amoxicillin, a beta-lactam antibiotic, and clavulanic acid, a **beta-lactamase** inhibitor.

فصل شصت

CASE SCENARIO 60.1

Patient: A 43-year-old White male

Chief Complaint: "I need gum surgery."

Background

Patient is healthy. He does not take any medications. He has smoked approximately one pack of cigarettes per day since he was 25 years old. He says that he was advised to see a periodontist about 5 years ago but did not follow the recommendation.

Current Findings: Generalized marginal erythema with **bleeding on probing**. Probing pocket depths range from 2 to 4 cm, with localized 5 to 8 mm at interproximal sites between molars.

CASE BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Which procedure should **not** be used to control hemorrhage before dismissing the patient when the surgery is completed? 1. Pressure 2. Application of cold pressure 3. Removal of granulation tissue 4. Microfibrillar collagen 5. Local anesthesia with epinephrine 6. None of the above	**Answer: 5** **Explanation:** The use of local anesthesia with epinephrine causes vasoconstriction. However, this effect has a short duration. The use of vasoconstriction should not be relied on for long-term hemostasis.

فصل شصت و پنجم

CASE SCENARIO 65.1

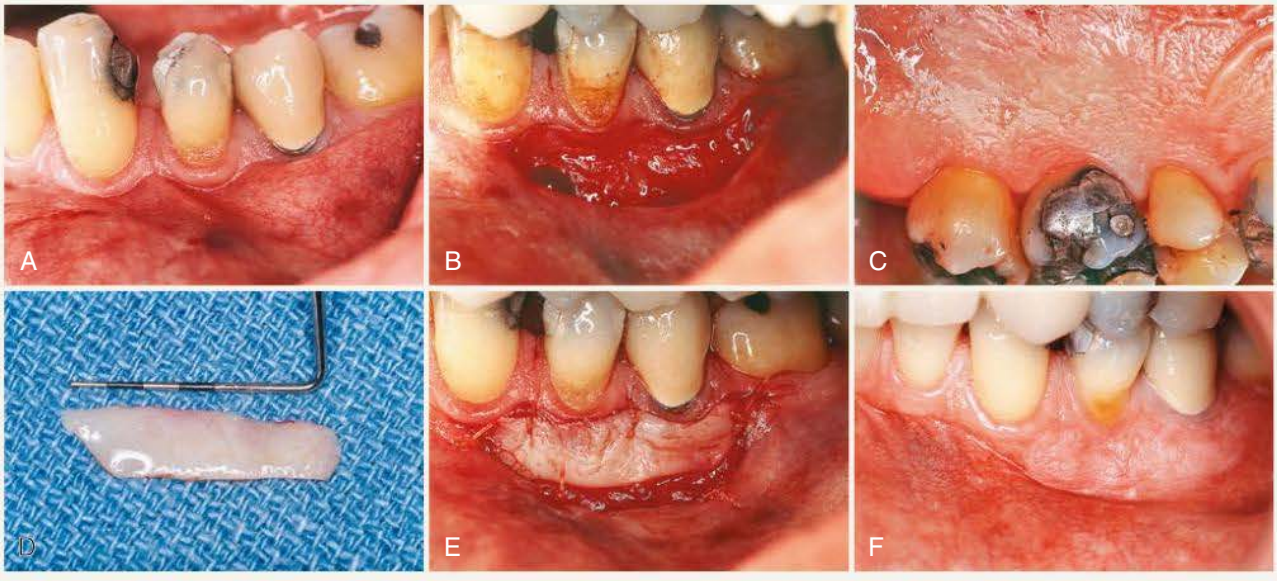
Patient: 35-year-old male

Chief Complaint: Gingival tissue facial to teeth 20, 21, and 22 is tender and sore during brushing due to a lack of keratinized attached gingiva.

Background Information

The mandibular left cuspid and first bicuspid have minimal keratinized tissue on the buccal gingival margin. The second bicuspid has a crown with no buccal keratinized gingiva.

Current Findings: A free gingival graft is placed apical to the mucogingival junction on the cuspid and first bicuspid and almost at the crown margin on the buccal gingiva of the second bicuspid.



CASE-BASED QUESTION

1. What is gained anatomically with this surgery, and which foramen and nerve are near this area?
   A. Unattached keratinized gingiva is gained. The lingual foramen and nerve are near the area.
   B. Unattached keratinized gingiva is gained. The mental foramen and nerve are near the area.
   C. Attached keratinized gingiva and vestibular depth are created. The mental foramen and nerve are near the area.
   D. Attached nonkeratinized gingiva is gained. The greater palatine foramen and nerve are near the area.

SOLUTION AND EXPLANATION

Answer: C

Explanation: All other answers are either unattached keratinized gingiva or attached nonkeratinized gingiva, with no mention of vestibular depth. Also, answers A and D have indicated nerve foramina that are incorrect.

فصل شصت و ششم

CASE SCENARIO 66.1

Patient: 31-year-old female

Background Information

The patient has a fractured crown on tooth #7. She is healthy and has no known drug allergies.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. To provide a full crown restoration in this case, a surgical crown lengthening should be performed. Why? A. To provide for retention, tooth preparation, and impressions B. To preserve supracrestal tissue attachment C. To maintain esthetic gingival levels D. All of the above	**Answer: D** **Explanation:** Teeth damaged by caries or fracture once certified as restorable can often be retained by performing a surgical crown-lengthening procedure. Teeth in the esthetic zone require special consideration. Care should be taken not to increase the crown length at the expense of esthetics. Efforts should be made to maintain a gingival level that is symmetric to the contiguous teeth and the contralateral side. If it appears that a crown-lengthening surgery will result in an unesthetic gingival level, an alternative treatment, such as orthodontic extrusion, should be considered.

CASE SCENARIO 66.2

Patient: 44-year-old female

Chief Complaint: My gums have receded and I am unhappy with my appearance.

Background Information

The patient is healthy and has no known drug allergies.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. This patient is preparing for orthodontics and restorative dentistry. Why should soft tissue grafting be considered? A. To prevent future gingival recession B. To protect the exposed root C. To reduce dentinal sensitivity D. To provide for an esthetic tooth length E. All of the above	**Answer: E** **Explanation:** Gingival recession is the result of a combination of an underlying bone dehiscence and gingival inflammation. The root exposure can result in dental sensitivity, root damage, and an unesthetic appearance. The treatment is soft tissue grafting.

CASE SCENARIO 66.3

Patient: 64-year-old male

Chief Complaint: "My gums are swollen."

Background Information

The patient has a history of infrequent dental care and developed asymptomatic gingival enlargement over several years. He also has hypertension and takes the antihypertensive medication amlodipine, a calcium channel blocker.

CASE-BASED QUESTION

1. What should this patient do to prepare for orthodontic treatment and restorative dentistry?
   A. Consult with his medical doctor before treatment to discuss a possible medication change, which may be in part responsible for the gingival overgrowth.
   B. Complete scaling, root planing, and oral hygiene education.
   C. Reevaluate after a suitable period for the resolution of gingival enlargement.
   D. Consider surgical treatment to reduce enlarged gingival tissues.
   E. Enter into a well-planned prevention program.
   F. All of the above

SOLUTION AND EXPLANATION

Answer: F

Explanation: It is important to complete periodontal treatment aimed at controlling an active disease before the commencement of orthodontics and restorative dentistry. This patient takes medication, which has led to drug-induced gingival overgrowth. This gingival enlargement is often related to a combination of plaque-associated inflammation and the effect of the calcium channel blocker, amlodipine. Resolution of the problem requires treating both the plaque-associated inflammation and the response to the medication. Once the medication has been discontinued, in conjunction with nonsurgical periodontal therapy, the result may be complete resolution of the hyperplasia. If not, surgical reduction may be indicated.

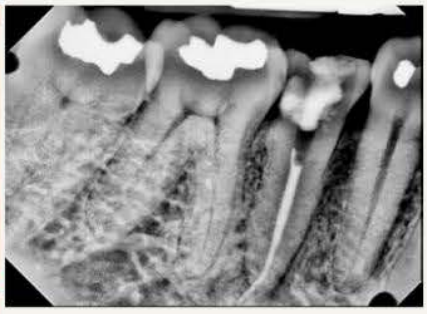
CASE SCENARIO 66.4

Patient: 55-year-old male

Chief Complaint: "I fractured my tooth, but I would really like to retain it."

Background Information

The patient recently fractured tooth #29, close to the bone crest. He has had previous endodontic treatment and is asymptomatic. The patient is healthy and has no known drug allergies.



CASE-BASED QUESTION

1. Based on the photographs presented, what treatment option is available to meet the patient's desire for tooth retention?
   A. Preparation of the tooth for a crown with the finish line approximating the bone crest.
   B. Surgical crown lengthening followed by a crown restoration
   C. The tooth cannot be restored; extraction and replacement is the only option.

SOLUTION AND EXPLANATION

Answer: B

Explanation: Tooth fracture is a common dental malady. Surgical crown lengthening provides the opportunity to retain structurally damaged teeth once they have been judged to be salvageable. It allows access for restorative procedures and retention form. Care must be taken to preserve space for supracrestal soft tissue growth to a physiologic dimension (biologic width). Failure to do so can result in chronic gingival inflammation and possible bone loss.

فصل شصت و هفتم

CASE SCENARIO 67.1

Patient: A 45-year-old female

Chief Complaint: "My upper right tooth is loose, and it has been hurting the last few days. My gum is also very swollen in that area. I rinsed with salt water, but it did not get better."

Background Information

Diabetes mellitus was diagnosed 4 years ago. The patient has been taking Metformin as prescribed by her primary care physician. The last glycated hemoglobin (HbA1c) value, taken 2 weeks ago, was 10.2%. She has no other systemic conditions, such as nonketotic diabetic acidosis. She does not smoke, drink, or use illicit substances. Patient never had scaling and root planing. She does not see a dentist regularly but had a cleaning done at a community dental clinic 10 days ago.

Current Findings: Generalized 3- to 6-mm **probing depths** were identified, with a localized 12-mm depth at #3M, 9 mm at #3B, 7 mm at #14D, and 4- to 7-mm probing depths around #19. Grade II **furcation involvement** at #19 was found. Generalized bleeding was elicited on probing. Gingival tissue appeared to be inflamed, erythematous, and edematous. There was an **abscess** on the buccal surface of #3, and there was generalized moderate biofilm and calculus **accumulation**. Radiographs revealed generalized mild to moderate **horizontal** bone loss with localized moderate to severe vertical bone loss at #3M and #14D. Patient had inadequate oral hygiene (i.e., biofilm control).

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Tooth #3 needs to be extracted to relieve pain. The fasting glucose level on the day of extraction was 120 mg/dL. What does this value mean? A. A fasting glucose level of 120 mg/dL indicates that diabetes is well controlled. B. The fasting glucose level determined on the day of extraction is more important than the HbA1c value because the latter test result is 2 weeks old. C. A fasting glucose level of 120 mg/dL on the day of extraction means that the patient is safe and stable for extraction. D. The HbA1c value is a more important indication of the patient's long-term glycemic control than the fasting glucose level.	**Answer: D** **Explanation:** HbA1c is a test that reflects glycemic control over the past 2 to 3 months. The fasting blood glucose level is a measure of glycemic control at that moment. The latter test fluctuates greatly. It does not indicate that the blood glucose level has been stable over weeks or months.
2. Although the patient has poor glycemic control, extraction of #3 is deemed necessary to relieve pain. Giving the patient prophylactic antibiotics as premedication should be considered. A. True B. False	**Answer: A** **Explanation:** Patients with poorly controlled diabetes are much more susceptible to infection and poor wound healing. Use of antibiotics is an appropriate preventive measure. Consultation with the patient's primary care physician is prudent. It is important to follow up after an invasive procedure to ensure proper healing and assess for signs of infection.
3. All of the following are important aspects to consider when any patient with diabetes undergoes a surgical procedure except: A. Limit the size of the surgical field so the patient is comfortable enough to resume a normal diet immediately and avoid hypoglycemia. B. Schedule the patient early in the morning. C. Routinely give prophylactic antibiotics. D. Life-threatening hypoglycemia is the most common dental complication in patients with diabetes.	**Answer: C** **Explanation:** Antibiotics are not routinely given to patients with diabetes as a prophylactic measure.

فصل فصل شصت و نهم

CASE SCENARIO 69.1

Patient: 35-year-old male

Background Information

A medically healthy patient presents with a diagnosis of generalized stage III periodontitis with periodontal pockets measuring 5 to 7 mm throughout his dentition.[38,43] All of his teeth are present except for his third molars. The remaining molar dentition manifests grade II furcation involvement. Heavy subgingival calculus is present throughout, and the gingival tissues are fibroedematous, partially due to his heavy smoking. The clinician recommends full mouth scaling at this first appointment and attempts nonsurgical therapy. The next day the patient returns with a fluctuant periodontal abscess around the buccal grade II furcation area of the mandibular first molar.

CASE-BASED QUESTION

This periodontal abscess is probably due to the following:

1. There was incomplete subgingival scaling, and residual calculus deep in the pockets was not removed. The coronal portion of the deep pocket was easily scaled, but the subgingival portion could not be reached due to the depth and fibroedematous nature of the gingival tissue, which is partially due to his smoking.
2. The gingival margin of this deep pocket was accessed and easily scaled, which caused the gingival margin tissue to shrink and tighten around the tooth. The exudate from the infection that remains in the subgingival area due to the calculus that could not be removed can no longer drain due to the closure of the coronally located gingival margin.
3. The degree II furcation area presents a unique access problem for both the patient's ability to remove biofilm and the clinician's ability to scale and root plane. Therefore, periodontal abscess occurs often in these furcation areas.
4. Attempting to scale and root plane the entire mouth on the patient's first visit is not possible, and the therapy will be incomplete. The result of incomplete therapy will often create an environment that favors the development of periodontal abscesses.
5. Smoking is a **risk factor** for periodontal abscesses.
6. All of the above.

• Solution: 6

فصل هفتاد

CASE SCENARIO 70.1

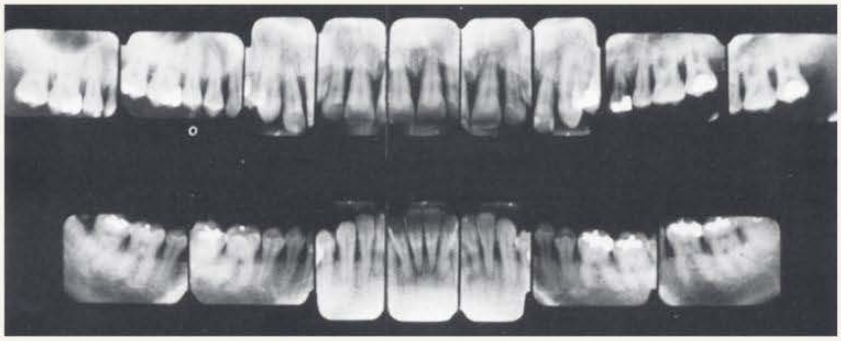
Patient: A 38-year-old female

Chief Complaint: "My gums have been bleeding, and my teeth are shifting."

Background Information

The patient's dental care has been irregular.

Current Findings: The patient has advanced generalized chronic periodontitis.



CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. Teeth #30 and #31 have similar pocket depths. Tooth #30 was found to have grade 1 bifurcation bone loss. How does the grade 1 bifurcation affect the prognosis of #30 versus #31, which does not have any bifurcation bone loss? A. Prognosis for tooth #31 is worse B. Prognosis for tooth #30 is worse C. Prognosis is the same for grade 1 and grade 0 D. Prognosis is the same for all grades of furcation involvement	**Answer: C** **Explanation:** See Reference 44.

CASE SCENARIO 70.2

Patient: A female age 62

Chief Complaint: Exam and x-ray to check implant at #29 one year after crown placement.

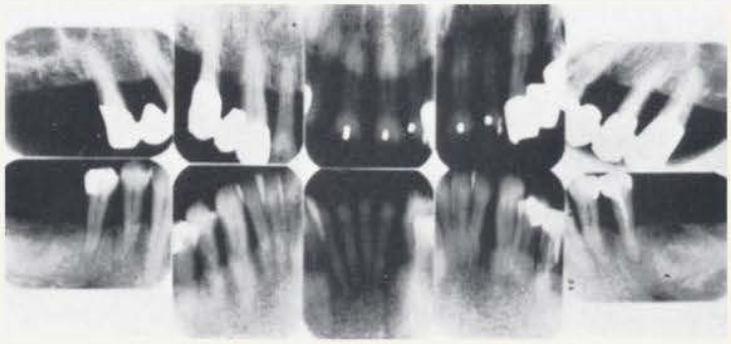
Patient History: Implant at tooth site #30 was restored 38 months ago, and the implant at tooth site #29 was restored 14 months ago. Patient is a heavy bruxer, has lost teeth due to fractures, and is not wearing her bite guard.

Clinical Findings: No. 30 has no pockets greater than 3 mm, and there is no **bleeding on probing**. When the occlusion was checked with blue **articulating** paper, the entire occlusal surface was blue.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the best diagnosis? A. Peri-implant bone loss B. Peri-implantitis C. Occlusal overload D. A and C	**Answer: D**
2. What is the best treatment for the implant in #30 position? A. Peri-implant surgery B. **Occlusal adjustment** and evaluate again in four months C. Antibiotics D. SPT only	**Answer: B**

فصل هفتاد و یکم

CASE SCENARIO 71.1



Patient: 60-year-old female
Chief Complaint: "I just moved to your area, and I'd like your help with my periodontal therapy."
Background Information
Patient is seeking supportive periodontal therapy because she moved to your area. She was treated in the Lindhe study for advanced periodontal disease with surgical treatment and has been maintained for 5 years.
Current Findings: Oral hygiene is good. Three pockets are 4 mm but have not changed in 5 years. There is no **bleeding on probing**. Mobility has not changed in 5 years, and the patient can chew comfortably.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the best periodontal diagnosis for this case? A. Advanced periodontitis B. Aggressive periodontitis C. Reduced but healthy periodontium D. Generalized periodontitis stage IV grade A	**Answer: D**

فصل هفتاد و سوم

CASE SCENARIO 73.1

Patient: 47-year-old male

Chief Complaint: "I'm here for a routine check of my teeth and implants."

Background Information

The patient reports that he recently moved to the area (job transfer) from another state. He has no complaints but wants to establish a new dentist for follow-up care. He denies any health conditions, does not take any medications except vitamins, and does not use tobacco. He does not have allergies to any medications. He reports that he has implants that replaced his maxillary central incisors. The implant crowns have been in place for about 6 to 7 years.

Current Findings: Examination reveals good periodontal and peri-implant health. Hygiene (**broth** control) is good. Tissues are pink without signs of swelling or **erythema**. Dentition is intact and appears to be stable. There is no obvious pathology and no need to repair/replace restorations. Routine periodontal/peri-implant maintenance is recommended. Radiographic evaluation of implants #8 and #9 show good bone support, with crestal levels maintained just slightly below the implant-abutment junction.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What mediates the attachment of cells to the implant surface? A. Lamina lucida B. Lamina densa C. Hemidesmosomes D. Desmosomes	**Answer: B** **Explanation:** There is no true connective tissue attachment on a dental implant. The lamina densa form scarlike tissue around the dental implant surface.
2. The peri-implant sulcular complex includes all of the following *except:* A. Bone B. Junctional epithelium C. Connective tissue attachment D. Sulcular epithelium	**Answer: A** **Explanation:** A sulcular complex around the dental implant is considered a soft tissue complex, which does not include hard tissue.
3. How can the connective tissue fibers around a dental implant be described? A. Circular B. Vertical alveolar-gingival C. Periosteal-gingival D. All of the above	**Answer: D** **Explanation:** Several animal and human studies have shown that the alignments of connective fibers around implants are circular and horizontal.
4. The apical extent of the junctional epithelium is _____ the implant/abutment interface. A. above B. equal to C. below	**Answer: A** **Explanation:** The peri-implant soft tissues consist of connective tissue covered by epithelium. Apical to the long junctional epithelial attachment is a zone of connective tissue above the supporting bone.
5. What typically surrounds the top of the dental implant? A. Bone and epithelium B. Connective tissue alone C. Bone and connective tissue D. Epithelium alone	**Answer: C** **Explanation:** In healthy patients, the most coronal aspect of the implant is surrounded by bone and connective tissue.

فصل هفتاد و چهارم

CASE SCENARIO 74.1

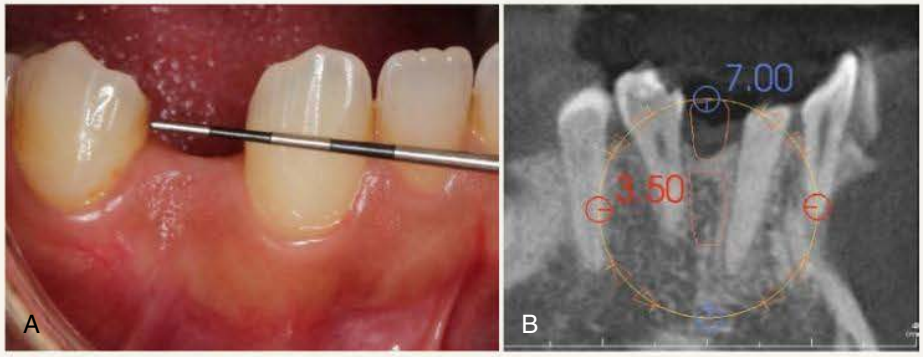
Patient: A 27-year-old female

Chief Complaint: "I want to replace my missing tooth with an implant."

Background Information

The patient was congenitally missing the mandibular right lateral incisor. She has worn a removable partial denture for as long as she can remember but now wants to replace the tooth in a more permanent fashion.

Current Findings: The mandibular right cuspid has drifted mesial to close the space for the missing lateral incisor. The open space is distal to the cuspid. The mesial-distal dimension of the edentulous space is 4.5 mm. A scan of the area reveals that the mesial-distal space between the roots of the cuspid and the premolar is about 4–4.5 mm.



CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What are the options for replacing this missing tooth? A. Single-tooth implant B. Fixed partial denture #27 and #28 C. Removable partial denture D. All of the above	**Answer: D** **Explanation:** Some options are better than others, but all of these are possible. The implant option is challenging due to limited space.
2. How much space is needed to replace a tooth in this position? A. 4 mm B. 5 mm C. 6 mm D. 7 mm	**Answer: C** **Explanation:** The minimum required mesial–distal space for a narrow (3.2–3.5 mm) diameter implant is 6 mm. It is desirable to maintain a minimum of 1–1.5 mm of bone around all surfaces, especially between the implant and the adjacent tooth.
3. What is the ideal amount of interocclusal space required for the implant crown, abutment, and screw? A. 4 mm B. 5 mm C. 6 mm D. 7 mm	**Answer: D** **Explanation:** The minimum amount of interocclusal space is probably about 4–5 mm, but the restorative unit would be very short. The ideal amount of interocclusal space required for an implant crown is 7 mm.

فصل هفتاد و پنجم

CASE SCENARIO 75.1

Patient: A 38-year-old male

Chief Complaint: "My upper right back tooth had recent sharp pain after I used my teeth to cut some copper wires at work."

Background Information: The patient is an electrician who presented to your office with an 11-mm narrow **probing** depth localized to the disto-buccal line angle of tooth #3. All clinical parameters suggest possible fracture. In an attempt to save this tooth, you have decided to use cone-beam computed tomography (CBCT) to perform a vertical root fracture survey in an attempt to locate any fractures.

Clinical Findings: A coronal section of a CBCT image for this tooth has identified a neurovascular bundle structure (circled in red) found on the lateral wall of the maxillary sinus.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. The neurovascular bundle structure (circled in red) is identified as the _____ artery. A. Descending palatine artery B. Infraorbital artery C. Maxillary artery D. Posterior superior alveolar artery E. Sphenopalatine artery	**Answer: D** **Explanation:** Intraosseous vessels are present throughout the jaws. It is important to identify the location, especially if planning a surgical procedure in the area. The posterior superior alveolar artery passes through the lateral wall of the sinus.
2. The neurovascular bundle structure (circled in red) consists of a nerve from which cranial nerve? A. Olfactory nerve (CN I) B. Optic nerve (CN II) C. Oculomotor nerve (CN III) D. Trigeminal nerve (CN V) E. Facial nerve (CN VII)	**Answer: D** **Explanation:** The trigeminal nerve (CN V) supplies the tissues on the lateral side of the face.
3. The above-identified nerve originates from the brain and exits the skull through which foramina? A. Foramen rotundum B. Foramen ovale C. Foramina of the cribriform plate D. Superior orbital fissure E. Stylomastoid foramen	**Answer: A** **Explanation:** See anatomy.

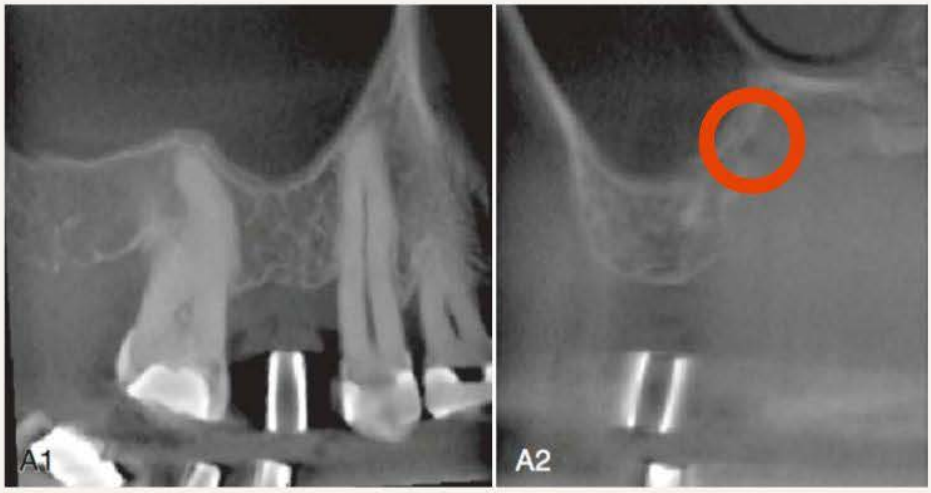
CASE SCENARIO 75.2

Patient: A 68-year-old female

Chief Complaint: "I had my upper right tooth extracted due to a huge cavity about 5 months ago. I would like to have it replaced as soon as possible because I can no longer smile confidently."

Background Information: Cone-beam computed tomography (CBCT) is an important tool for assessing bone quality, quantity, and volume; excluding pathology; and identifying important anatomic structures. CBCT data in DICOM format for the #4 edentulous site was obtained from the patient's restorative dentist.

Current Findings: Normal periapical demonstrates the extraction socket has healed completely. Sagittal and coronal sections of the potential implant site #4 are provided below.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Identify the structure circled in red. A. Abnormal anatomic structure B. Greater palatine artery C. Posterior superior alveolar artery D. Normal trabeculation bone pattern E. None of the above	**Answer: B** **Explanation:** See anatomy.

فصل هفتاد و ششم

CASE SCENARIO 76.1

Patient: A 29-year-old Caucasian female, ASA 1.

Chief Complaint: "I have pain and swelling around my implant."

Background Information: Patient reports having the mandibular left central incisor replaced with an implant about 1.5 years ago. She did not have symptoms until recently when the gum over the implant became tender and swollen.

Current Findings: Exam reveals that probing depths range from 2 to 3 mm. Dentition is intact except for the mandibular left lateral incisor, which is replaced with an implant. There is a 7- to 8-mm **pocket** on the labial area with moderate erythema and edema. The tissues easily retract away from the implant revealing excess cement. The implant crown is positioned facial to the adjacent teeth.

CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What is the diagnosis? A. Peri-implantitis B. Peri-implant mucositis C. Normal peri-implant health D. **Periodontal abscess**	**Answer: A** **Explanation:** There is attachment loss, bone loss, and peri-implant **inflammation** most likely precipitated by excess cement.
2. What are the etiologic factors? A. Smoking B. Poor oral hygiene C. Cementing an implant crown with margins that are more than 1 mm subgingival D. Unknown systemic disease	**Answer: C** **Explanation:** It has been well documented that excess cement cannot be detected or removed when >1 mm subgingival.
3. What prosthetic measures can be taken to avoid this problem? A. Use a screw-retained restoration B. Use a custom abutment that keeps the cement margins ≤ 1 mm from the gingival margin C. Both of the above D. This problem is unavoidable	**Answer: C** **Explanation:** Using a screw-retained restoration or using a custom abutment that creates crown margins within 1 mm of the gingival margin will avoid or minimize the likelihood of excess cement being extruded into the subgingival tissues.

فصل هفتاد و هفتم

CASE SCENARIO 77.1

Patient: A 70-year-old edentulous male

Chief Complaint: "My lower denture hurts so much in the back on my right side when I chew."

Background and/or Patient History

Complete edentulous for over 20 years. Experienced denture wearer.

Current Findings: Highly resorbed maxillary and mandibular ridges. Patient reported pain during palpation on the lower right quadrant. The support, stability, and retention of the existing complete dentures are adequate.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which of the following statements is correct? A. Either a mandibular implant fixed option or implant-supported overdenture should be considered to address patient's chief complaint. B. Remaking a new mandibular complete denture prosthesis will be an effective treatment solution for the stated chief complaint. C. Two implants and mandibular implant overdenture is recommended since it is the most bang for the buck implant treatment option for the edentulous mandible.	**Answer: A** **Explanation:** It would appear that the mental foramen is on the LR crest of the ridge due to the resorption and would likely be prone to discomfort from tissue-borne prosthetics.

فصل هفتاد و هشتم

CASE SCENARIO 78.1

Patient: 60-year-old Hispanic female
Chief Complaint:
"I'm ready for my implant."
Background Information
The patient has controlled hypertension. She is currently taking atenolol. She is a nonsmoker. Tooth #3 was extracted with socket preservation 1 year ago. A sinus lift and bone augmentation procedure was completed 4 months after extraction due to a limited (4-mm) vertical height of native bone. Now, 8 months later, the patient presents for implant placement.
Current Findings:
Generalized healthy gingiva with history of **periodontitis** (moderate **chronic periodontitis**). Edentulous site #3 has adequate ridge width, mesial-distal dimension, and interocclusal space. There is a good zone of keratinized, attached tissue. Cone-beam computed tomography (CBCT) scan reveals good healing and consolidation of bone grafted sinus. The native bone is type 3, with a loose trabecular pattern.

CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. You plan to place a 5- × 10-mm implant in site #3. How should the osteotomy be prepared? A. Overprepare the osteotomy site by using a 5-mm drill as the final drill. B. Complete the osteotomy site with a 4-mm drill, but perform bone tapping to facilitate implant insertion. C. Underprepare the osteotomy site by using a 3.75-mm drill as the final drill. D. Prepare the osteotomy site with reduced speeds (<800 rpm) to avoid overheating the bone.	**Answer: C** **Explanation:** The posterior maxilla has softer, loose trabecular bone, which reduces bone to implant contact. Overpreparing the osteotomy will remove an unnecessary amount of bone, making it more difficult to achieve primary implant stability. Bone tapping should only be performed in dense cortical bone. Additionally, osteotomy sites should be prepared at 800 to 1500 rpm with a pumping motion and copious water irrigation to prevent overheating the bone.
2. Which of the following promotes bone to implant contact? A. Machined surface implant B. Roughened surface implant C. Bone level implant D. Tissue level implant	**Answer: B** **Explanation:** Implants with roughened surface topography (e.g., sandblasted or acid-etched) increase the surface area of the implant to promote increased implant to bone contact and may result in shorter healing time.
3. If the patient did not have adequate keratinized tissue, when could soft tissue augmentation be performed? A. Prior to implant placement B. During the second stage of the procedure C. Following delivery of the final prosthesis D. All of the above	**Answer: D** **Explanation:** Soft tissue augmentation can be performed at any time. However, the need for bone augmentation prior to or during implant placement may dictate that a free gingival graft be performed first to provide adequate keratinized tissue for flap management and suturing.

فصل هفتاد و نهم

CASE SCENARIO 79.1

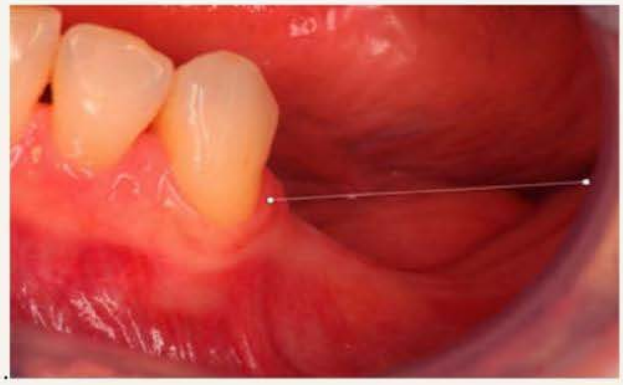
Patient: A 50-year-old male

Chief Complaint: "My lower left teeth have been missing for several years. I don't like my removal partial denture and I would like a fixed solution.

Background Information: Patient reports that he is healthy. He is not taking any medications. He denies any tobacco use. He has been missing the mandibular left posterior teeth for more than 10 years.

Current Findings

Exam reveals a severe vertical ridge deficiency in the posterior mandible. The CBCT scan shows that the distance between the inferior alveolar nerve and the alveolar crest in this area is 5 mm. Additionally, the alveolar ridge width is only 2 mm. The remaining dentition is intact. Oral hygiene is good.



CASE-BASED QUESTIONS	SOLUTION AND EXPLANATION
1. What treatment option will address the patient's chief complaint? A. New removable prosthesis B. Vertical and horizontal ridge augmentation followed by implant placement and restoration with an implant-supported prosthesis C. Nerve lateralization procedure with implant placement and restoration with an implant-supported prosthesis D. Fixed tooth-borne partial denture on the remaining teeth with several cantilevers replacing the premolars and at least one molar	**Answer: B** **Explanation:** A new removable prosthesis is an option, but it will not address the patient's chief complaint. Vertical and horizontal ridge augmentation will allow placement of implants to restore his posterior dentition with an implant-supported fixed prosthesis. The other options pose significant risk of morbidity or failure.
2. What complications are associated with supracrestal vertical bone augmentation procedures? A. Membrane exposure B. Postoperative infection C. Both of the above D. Neither of the above	**Answer: C** **Explanation** The rate of complications associated with vertical bone augmentation procedures are relatively high, ranging from 2.87 to 17%. The most common complications include membrane exposure and postoperative infections.

فصل هشتاد

CASE SCENARIO 80.1

Patient: A 57-year-old male **Chief Complaint:** "My upper back teeth have been missing for several years. I would like to get them replaced so I can chew better. I do not want anything removable." **Background Information** Patient reports that he is healthy. He has hypercholesterolemia and takes a statin medication (atorvastatin). He denies any tobacco use. He has been missing the maxillary posterior teeth for more than 10 years. **Current Findings:** An exam reveals a severe alveolar ridge deficiency in the posterior maxilla. The cone-beam computed tomography scan shows that the distance between the sinus floor and the alveolar crest in this area is 3 mm. The remaining dentition is intact. Oral hygiene is good.

CASE-BASED QUESTIONS

1. What treatment option will address the patient's chief complaint?
   A. A removable prosthesis
   B. Lateral window sinus bone augmentation followed by implant placement after healing and restoration with an implant-supported prosthesis
   C. Crestal sinus bone augmentation followed by implant placement after healing and restoration with an implant-supported prosthesis
   D. Crestal sinus bone augmentation with simultaneous implant placement and restoration with an implant-supported prosthesis

SOLUTION AND EXPLANATION

Answer: B

Explanation: A new removable prosthesis is an option, but it will not address the patient's chief complaint. Vertical and **horizontal** ridge augmentation will allow placement of implants to restore his posterior dentition with an implant-supported fixed prosthesis. The other options pose significant risk of morbidity or failure.

CASE-BASED QUESTIONS

2. What complications are associated with sinus elevation and bone augmentation?
   A. Membrane perforation
   B. Postoperative infection
   C. Membrane perforation and postoperative infection
   D. Membrane perforation, postoperative infection, and bleeding
   E. Intraoperative and postoperative bleeding.

فصل هشتاد و یک

CASE SCENARIO 81.1

Patient: A 52-year-old Hispanic female patient

Chief Complaint: "My front tooth is loose, and it hurts."

Background Information

Patient reports a history of periodontitis. Her front teeth were traumatized initially 3 years ago and then again 2 weeks ago. She has porcelain-fused-to-metal crowns on several anterior teeth. She was informed by her general dentist that tooth #8 has a **"hopeless" prognosis**. It was deemed non-restorable due to severe bone loss and horizontal root fracture sustained from the most recent traumatic injury. She was referred for evaluation and treatment to replace tooth #8 with an immediate implant. She is concerned about the esthetic appearance.

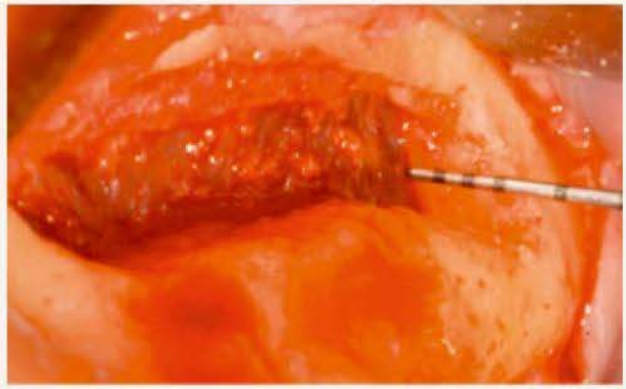
Clinical Findings: The patient has a high smile line. Periodontal examination revealed **pocket** depths in the range of 3–4 mm except in the upper anterior area, where the probing pocket depth is 6–9 mm on #8. Localized areas of gingival inflammation are noted on #8. Evaluation of the alveolar ridge in area #8 revealed severe facial bone resorption.

CASE-BASED QUESTIONS	SOLUTIONS AND EXPLANATIONS
1. What factors make this case esthetically demanding? A. Moderate to severe bone loss B. High smile C. Thin periodontal biotype D. Lack of labial bone E. All of the above	**Answer: E** **Explanation:** Several factors make this case esthetically challenging and difficult to manage, including but not limited to the factors listed in options A–D. In addition, the patient's expectations are demanding. This case requires both hard and soft tissue augmentation to address horizontal and vertical deficiencies.
2. What are treatment options for this patient? A. Single tooth implant #8 B. Fixed partial denture #7–#9 C. Fixed partial denture with multiple abutments D. Removable partial denture E. All of the above	**Answer: E** **Explanation:** Although more information is needed about the remaining bone support and attachment levels of adjacent teeth, all options are potentially viable. Because several teeth already have porcelain-fused-to-metal crowns, it would be reasonable to consider a fixed bridge with pontic to replace tooth #8. The edentulous site would be augmented to improve esthetics.

فصل هشتاد و سوم

CASE SCENARIO 83.1 PIEZOELECTRIC SINUS LIFT TECHNIQUE

Patient: Male patient, 64 years old
Background
Nonsmoker; edentulism of the upper left arch
Current Findings: Patient's edentulism can be treated by sinus lift and implant placement. The sinus lateral wall is 3–4 mm thick.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. What is the best piezoelectric technique to perform a sinus lift in a patient with a lateral wall thicker than 1 mm? A. Bony window osteotomy B. Lateral wall erosion C. A and B D. None of the above	**Answer: C** **Explanation:** When the lateral wall is thicker than 1 mm, performing the erosion technique before outlining the bony window speeds up the procedure and reduces the risk of membrane perforation.

CASE SCENARIO 83.2 NARROW CREST

Patient: Female patient, 57 years old
Background
Former smoker, partially **edentulous** for more than 20 years
Current Findings: Residual edentulous crest of average width <3 mm

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which technique is not advisable to treat this patient? A. Bone block harvesting B. Ridge split C. **Guided bone regeneration** D. All of the above	**Answer: B** **Explanation:** Ridge most likely consists of cortical bone. It is too narrow to split ridge predictably.

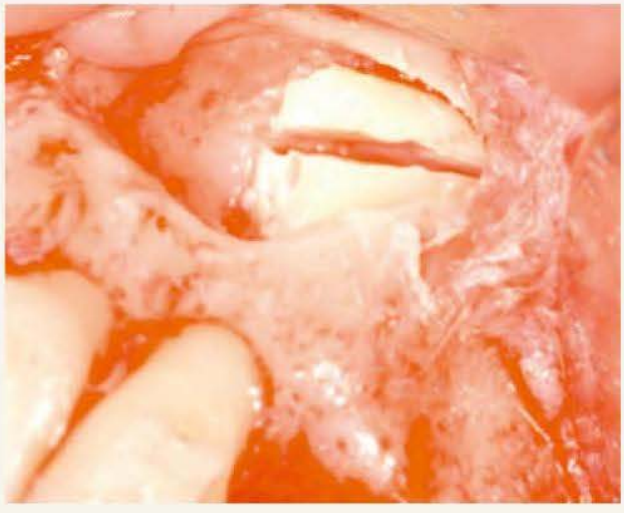
CASE SCENARIO 83.3 PIEZOELECTRIC EXTRACTION TECHNIQUE

Patient: Female patient, 38 years old

Background

Nonsmoker, permanent canine never erupted.

Current Findings: Ankylosed, impacted canine



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Which of the following piezoelectric extraction techniques is preferable when aesthetic results are important? A. Mesiodistal root sectioning B. Root consumption C. Buccolingual root sectioning D. All of the above	**Answer: A** **Explanation:** Mesiodistal root sectioning allows the removal of the root fragments while applying minimal pressure on the vestibular wall, thus reducing the risk of fracturing it during the procedure.

فصل هشتاد و ششم

CASE SCENARIO 86.1

Patient: A 53-year-old male

Chief Complaint: "I want implants to replace my teeth."

Background Information

The patient lost most of his posterior teeth more than 10 years ago due to periodontal disease. He has an upper partial denture but does not wear it. He has diabetes that is controlled with diet and oral medication (metformin) and hypertension controlled with medication (lisinopril). He has smoked 1–1.5 packs of cigarettes per day for the past 30 years.

Current Findings: The examination reveals generalized probing pocket depths of 2–4 mm with localized depths of 5–6 mm. There is generalized mild to moderate plaque (i.e., biofilm), minimal gingival recession, and slight marginal gingival erythema. He is missing all maxillary molars and the mandibular third molars. Radiographic examination reveals **pneumatized** sinuses and loose trabecular bone in the posterior maxilla.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Is this patient a candidate for implant replacement of his maxillary posterior dentition? A. Yes, he is an ideal candidate. B. Yes, but there are concerns. C. Maybe, maybe not. D. No, absolutely not.	**Answer: B** **Explanation:** This patient has several risk factors that may reduce the likelihood of implant survival and implant success. Smoking may be the most significant factor, especially for implants in the posterior maxilla.
2. Which of the following options is a surgical complication of the lateral window sinus bone augmentation procedure? A. Hemorrhage from inferior alveolar vessels. B. Neuropathic injury to the inferior alveolar nerve. C. Hemorrhage from the posterior-superior alveolar vessels. D. Neuropathic injury to the incisive nerve.	**Answer: C** **Explanation:** Several arteries supply the maxillary sinus, including the posterior-superior alveolar artery, which can be encountered during the lateral window approach to sinus elevation and bone augmentation procedure.

CASE SCENARIO 86.2

Patient: A 64-year-old White male

Chief Complaint: "My implant feels loose, and it hurts to brush the area."

Background Information

The patient reports having implant #4 placed and restored with a single crown 5 years ago.

Current Findings: Examination reveals that implant #4 is mobile (i.e., class 1). The implant moves with the crown. The buccal soft tissue consists primarily of unattached mucosa. The apical end of the implant is directed toward the palate. The implant crown is screw-retained, with the screw access from the buccal cusp. The natural dentition shows evidence of bruxism (i.e., severe wear facets).

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. The palatal position of the implant contributed to nonaxial occlusal loads, most likely causing what result? A. Fracture of the veneer. B. Loosening of the prosthesis. C. Screw loosening. D. Loss of osseointegration.	**Answer: D** **Explanation:** If any implant is mobile regardless of the cause, it has lost osseointegration, is no longer connected to the bone, and should be removed.
2. What prosthetic parameters are thought to reduce occlusal load on the implant? A. Narrow occlusal table. B. Increased buccal cantilever. C. Maximized working contacts. D. Maximized centric contacts.	**Answer: A** **Explanation:** A narrow occlusal table is favorable. A large cantilever would lead to unfavorable distribution of occlusal forces. It is preferable to have no balancing and minimal working and centric contacts.
3. What type of tissue surrounding the implant can decrease the risk of peri-mucositis or peri-implantitis? A. A minimum of 2 mm of keratinized gingiva. B. A minimum of 1 mm of keratinized gingiva. C. An entire border of detached mucosa. D. The tissue type or quality does not affect the risk of disease around the implant.	**Answer: A** **Explanation:** The quality (i.e., thickness and density) of tissue surrounding the coronal aspect of implants affects the established peri-implant seal and resistance to attachment and bone loss.

فصل هشتاد و هفتم

CASE SCENARIO 87.1

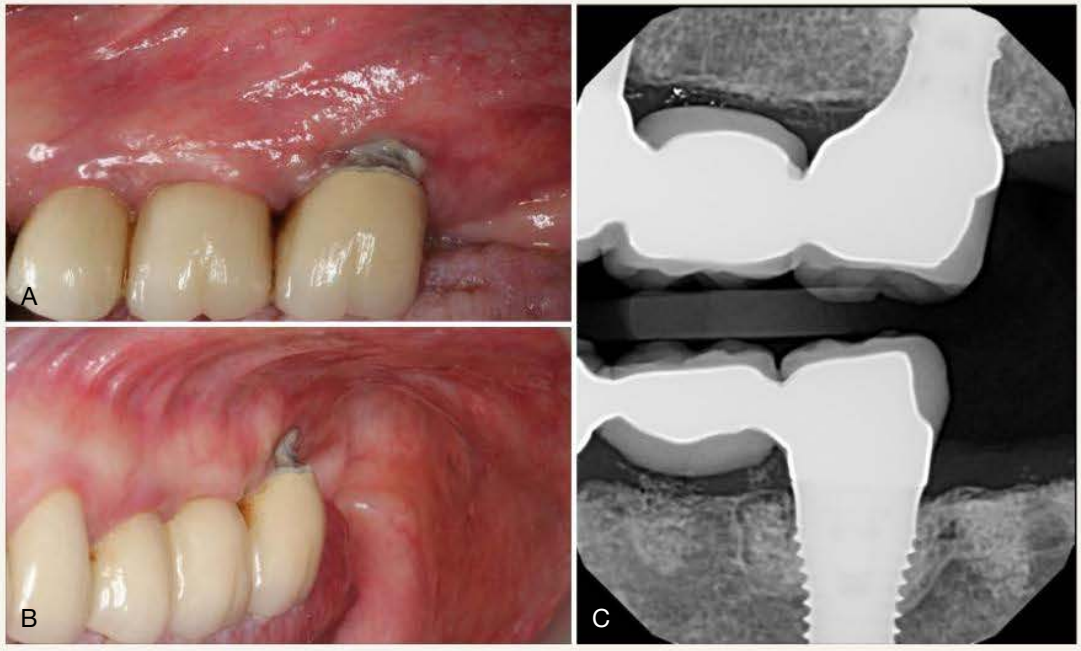
Patient: A 73-year-old woman

Chief Complaint: The patient reports pain and bleeding in the back upper left whenever she brushes.

Background Information

The patient has hypertension, hypothyroidism, depression, and anxiety. She has smoked half to three-quarters of a pack daily on and off since age 17. Medications include lisinopril, levothyroxine, and duloxetine. She had a 12-xx-14 fixed **dental prosthesis** restored ten years ago. She reports no pain or discomfort associated with implants.

Current Findings: The #14 implant is a Straumann tissue-level implant that is 4.8 mm in diameter. The patient has mild to moderate erythema and edema. There is no buccal keratinized tissue, and there is 3 mm of buccal recession. The buccal mucosa is loose and poorly adapted. Peri-implant probing depths are 4 to −5 mm. The first implant thread on the buccal aspect is detectable with the periodontal probe. There is heavy biofilm.



CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. The clinical and radiographic information is adequate for diagnosis and treatment. A. True B. False	**Answer: B** **Explanation:** Although a vertical bitewing is shown and the mesial and distal crestal bones on implant #14 are visible, an additional periapical radiograph is required to enable complete visualization of the implant before a diagnosis can be made.
2. Based on the information provided, what is the likely diagnosis? A. Peri-implant mucositis B. Peri-implantitis C. Health	**Answer: B** **Explanation:** Radiographically, it does not appear there is mesial or distal bone loss, but the presence of biofilm, inflammation, recession, and buccal bone loss, as detected by probing, supports the diagnosis of peri-implantitis.
3. Treatment must begin with which of the following? A. Patient education and oral hygiene instruction B. Implant debridement with implant scalers C. Soft tissue augmentation D. Bone augmentation	**Answer: A** **Explanation:** The cause of peri-implant mucositis and peri-implantitis is biofilm. For therapy to be successful, the patient must effectively control biofilm. After biofilm control is effective and inflammation is resolved, the implant can be assessed for the need for soft tissue augmentation.

فصل هشتاد و هشتم

CASE SCENARIO 86.1

Patient: 57-year-old male

Chief Complaint: "My front tooth is loose. It bothers me, and I want an implant."

Background Information: The patient reports a history of trauma to his front teeth as a young teenager. Both central incisors were fractured. Multiple restorations were done over the years. Tooth #9 had root canal treatment and a crown. Later, it became infected and required an apicoectomy. It is now loose and migrating.

Current Findings: Tooth #9 has severe localized gingival recession. Tooth mobility is class 2/3. It has drifted in a **coronal** and facial direction. There are no significant probing pocket depth measurements around tooth #9 or the remaining dentition. The patient is healthy and has no systemic illnesses.

CASE-BASED QUESTION	SOLUTION AND EXPLANATION
1. Is it possible to replace tooth #9 with an implant? A. Yes. Implants can successfully replace failing teeth. B. No. There is too much gingival recession. C. No. Implants are not successful in the anterior maxilla. D. Maybe. It depends on the patient's esthetic demands.	**Answer: A** **Explanation:** There will likely be a need for bone and soft tissue augmentation. Implant placement in the anterior maxilla has been a successful option for replacement of a single tooth.