
بسم الله الرحمن الرحیم

بیماری های قلبی عروقی و ملاحظات دندانپزشکی آن

HYPERTENSION

Hypertension is undiagnosed and not well controlled in many patients and often accompanied by comorbidities.

- BP should be routinely assessed in the dental office,should assess for signs, symptoms, and comorbidities.

- BP can be elevated due to dental anxiety and pain, but can be reduced with appropriate measures.

- Routine dental care can be provided when anxiety and pain are controlled, and local anesthetic with 1:100,000 epinephrine is limited to two carpules or fewer.

- Dental treatment should be deferred when BP is >180/ 110; these patients should be referred for medical care.
- Many antihypertensive drugs are associated with hyposalivation, xerostomia, dental caries, and fungal

TABLE 3.1 Classification of Blood Pressure (BP) in Adults and Recommendations for Follow-Up

BP Classification	Systolic BP (mm Hg)		Diastolic BP (mm Hg)	Recommended Follow-Up
Normal	<120	And	<80	Recheck in 2 years.
Elevated	120–129	Or	<80	Recheck in 1 year.
Hypertension				
Stage 1	130–139	Or	80–89	Confirm within 2 months.
Stage 2	≥140	Or	≥90	Evaluate or refer to source of care within 1 month. For those with higher BP (e.g., >180/110 mm Hg), evaluate and treat immediately or within 1 week, depending on the clinical situation and complications.

Drug	Oral Adverse Effects	Dental Considerations
Diuretics		
Thiazide Diuretics		
Chlorothiazide (Diuril), chlorthalidone (generic), hydrochlorothiazide (HCTZ) (HydroDIURIL, Microzide), polythiazide (Renese), indapamide (Lozol), metolazone (Mykrox), metolazone (Zaroxolyn)	Dry mouth, lichenoid reactions	Orthostatic hypotension; avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interactions: none. (*Applies to all diuretics*)
Loop Diuretics		
Bumetanide (Bumex), furosemide (Lasix), torsemide (Demadex)		
Potassium-Sparing Diuretics		
Amiloride (Midamor), triamterene (Dyrenium)		
Aldosterone Receptor Blockers		
Eplerenone (Inspra), spironolactone (Aldactone)		
Combination		
Aldactazide, Dyazide		
β-Blockers (BBSs)		
Nonselective		
Propranolol (Inderal), timolol (Blocadren), nadolol (Corgard), pindolol (Visken), penbutolol (Levatol), carteolol (Cartrol)	Taste changes, lichenoid reactions	Avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interactions: nonselective—potential increase in blood pressure (use maximum of 0.036 mg of epinephrine); avoid levonordefrin
Cardioselective		
Metoprolol (Lopressor), acebutolol (Sectral), atenolol (Tenormin), betaxolol (Kerlone), bisoprolol (Zebeta)		Vasoconstrictor interactions: none
α- and β-Blockers		
Carvedilol (Coreg), labetalol (Normodyne, Trandate)	Taste changes	Orthostatic hypotension; avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interaction: Blocking both β_1- and β_2-adrenergic receptor sites

		has potential for adverse interaction
Angiotensin-Converting Enzyme (ACE) Inhibitors		
Benazepril (Lotensin), captopril (Capoten), enalapril (Vasotec), fosinopril (Monopril), lisinopril (Prinivil; Zestril), moexipril (Univasc), perindopril (Aceon), quinapril (Accupril), ramipril (Altace), trandolapril (Mavik),	Angioedema of lips, face, tongue; taste changes; oral burning	Orthostatic hypotension; avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interaction: none
Angiotensin Receptor Blockers (ARBSs)		
Azilsartan (Edarbi), candesartan (Atacand), eprosartan (Teveten), irbesartan (Avapro), losartan (Cozaar), olmesartan (Benicar), telmisartan (Micardis), valsartan (Diovan)	Angioedema of the lips, face, tongue	Orthostatic hypotension. Vasoconstrictor interaction: none
Calcium Channel Blockers (CCBSs)		
Amlodipine (Norvasc), Bepridil (Vascor), diltiazem (Cardizem, Cartia XT, Dilt-XR, Diltia XT, Taztia XT, Tiazac), felodipine (Plendil), isradipine (DynaCirc), nicardipine/SR (Cardene), nifedipine/PA/XL (Adalat, Nifediac, Procardia), nisoldipine (Sular), nitrendipine verapamil/SR (Calan, Isoptin, Verelan, Covera)	Gingival overgrowth, dry mouth, lichenoid eruptions (rare)	Avoid prescribing macrolide antibiotics that can raise plasma levels of CCBs resulting in hypotension and kidney damage. Vasoconstrictor interaction: none
α_1-Adrenergic Blockers		
Doxazosin (Catapres), prazosin (Minipress), terazosin (Hytrin)	Dry mouth, taste changes	Orthostatic hypotension; avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interaction: none

TABLE 3.3 Drugs Used in the Management of Hypertension—cont'd

Drug	Oral Adverse Effects	Dental Considerations
Central α_2-Adrenergic Agonists and Other Centrally Acting Drugs		
Clonidine (Catapres), methyldopa (Aldomet), reserpine (generic), guanfacine (Tenex)	Dry mouth, taste changes	Orthostatic hypotension. Vasoconstrictor interaction: none
Direct Vasodilators		
Hydralazine (Apresoline), minoxidil (Loniten)	Lupus-like oral and skin lesions, lymphadenopathy	Orthostatic hypotension; avoid prolonged use of NSAIDs—may reduce antihypertensive effects. Vasoconstrictor interaction: none

DENTAL MANAGEMENT OF PATIENTS WITH HYPERTENSION

PREOPERATIVE RISK ASSESSMENT

- Review medical history, determine whether hypertension exists, and discuss relevant issues with the patient.
- Identify all medications and drugs being taken or supposed to be taken by the patient.
- Examine the patient for signs and symptoms of disease and obtain vital signs (i.e., take BP correctly).
- Review recent laboratory test results or images required to assess risk.
- Confirm patient has a primary care provider and has taken antihypertensive medication today.
- Obtain a medical consultation (i.e., refer to physician) if the patient is poorly controlled or is undiagnosed.
- If BP and vital signs are well controlled, routine dental procedures can be performed without special precautions.

A	
Antibiotics	Avoid the use of erythromycin and clarithromycin (not azithromycin) with CCBs because the combination can enhance hypotension.
Anesthesia	Ensure profound local anesthesia. Modest doses of local anesthetic with 1 : 100,000 or 1 : 200,000 epinephrine (e.g., one or two carpules) at a given time are of little clinical consequence in patients with BP $<$ 180/110 mm Hg. Greater quantities may be tolerated reasonably well but with increased risk. Levonordefrin should be avoided. In patients with uncontrolled hypertension (BP $\geq$ 180/110 mm Hg), the use of epinephrine should be limited.
Anxiety	Patients with hypertension who are anxious or fearful are candidates for preoperative oral or intraoperative inhalation sedation (or both). Apply good stress management protocols.

	B
Bleeding	Excessive bleeding caused by hypertension is possible, but unlikely.
Breathing	No issues.
BP	Monitor BP. Patients with a BP < 180/110 mm Hg may receive any necessary dental treatment. For patients with a pressure reading >180/110 mm Hg, dental

treatment should be deferred until BP is brought under control. If urgent or emergency dental treatment is required, it should be done in as limited and conservative a manner as possible.

C	
Capacity to tolerate care	Patients who have hypertension <180/110 mm Hg and are asymptomatic can receive routine dental care. A BP > 180/120 mm Hg is a hypertensive emergency, which dictates provision of immediate medical care.
Chair position	Avoid rapid position changes owing to possibility of antihypertensive drug-associated orthostatic hypotension.

D	
Drugs	Avoid excessive amounts of epinephrine in patients who take nonselective β-adrenergic blockers, which can potentially cause a spike in BP and appears to be dose dependent; avoid the use of epinephrine-impregnated retraction cord. Several antihypertensive drugs have reported oral manifestations.
Devices	For patients with stage 2 hypertension (BP > 140/90 mm Hg), periodic monitoring of BP during treatment may be advisable.

E

Equipment	No issues.
Emergencies	Patients with hypertension are at increased risk for cardiovascular disease; although unlikely, angina, stroke, arrhythmia, and MI should be anticipated as possible occurrences.

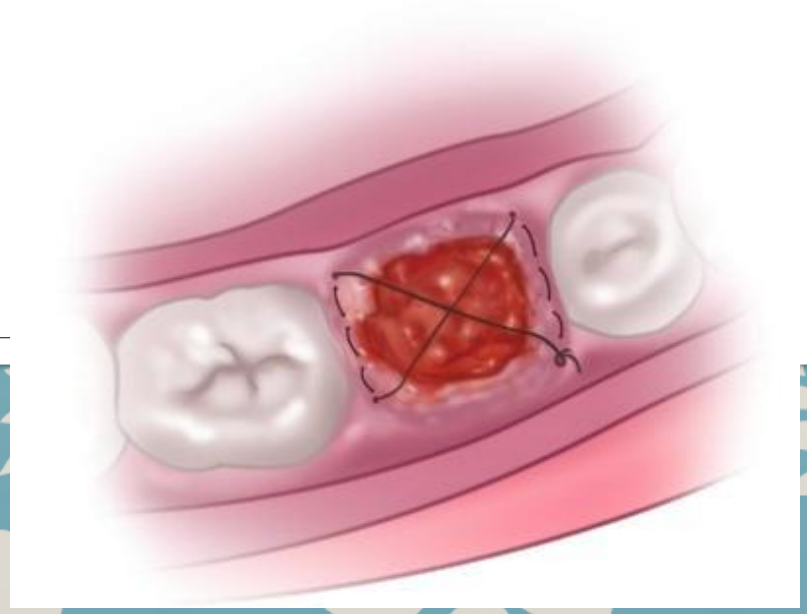
F	
Follow-up	• After the procedure, allow patient to sit in upright position for several minutes before dismissing to avoid dizziness. • Avoid long-term (>2 weeks) use of NSAIDs because these agents may interfere with effectiveness of some antihypertensive medications. • Ensure patient is receiving regular follow-up evaluation by physician; especially for patients with stage 2 hypertension (BP ≥ 140/90 mm Hg) and those with symptoms or comorbid

ORAL MANIFESTATIONS

have not been associated with hypertension itself.

facial palsy with malignant hypertension.

Excessive bleeding after surgical procedures or trauma has been reported in patients with severe hypertension(uncommon).



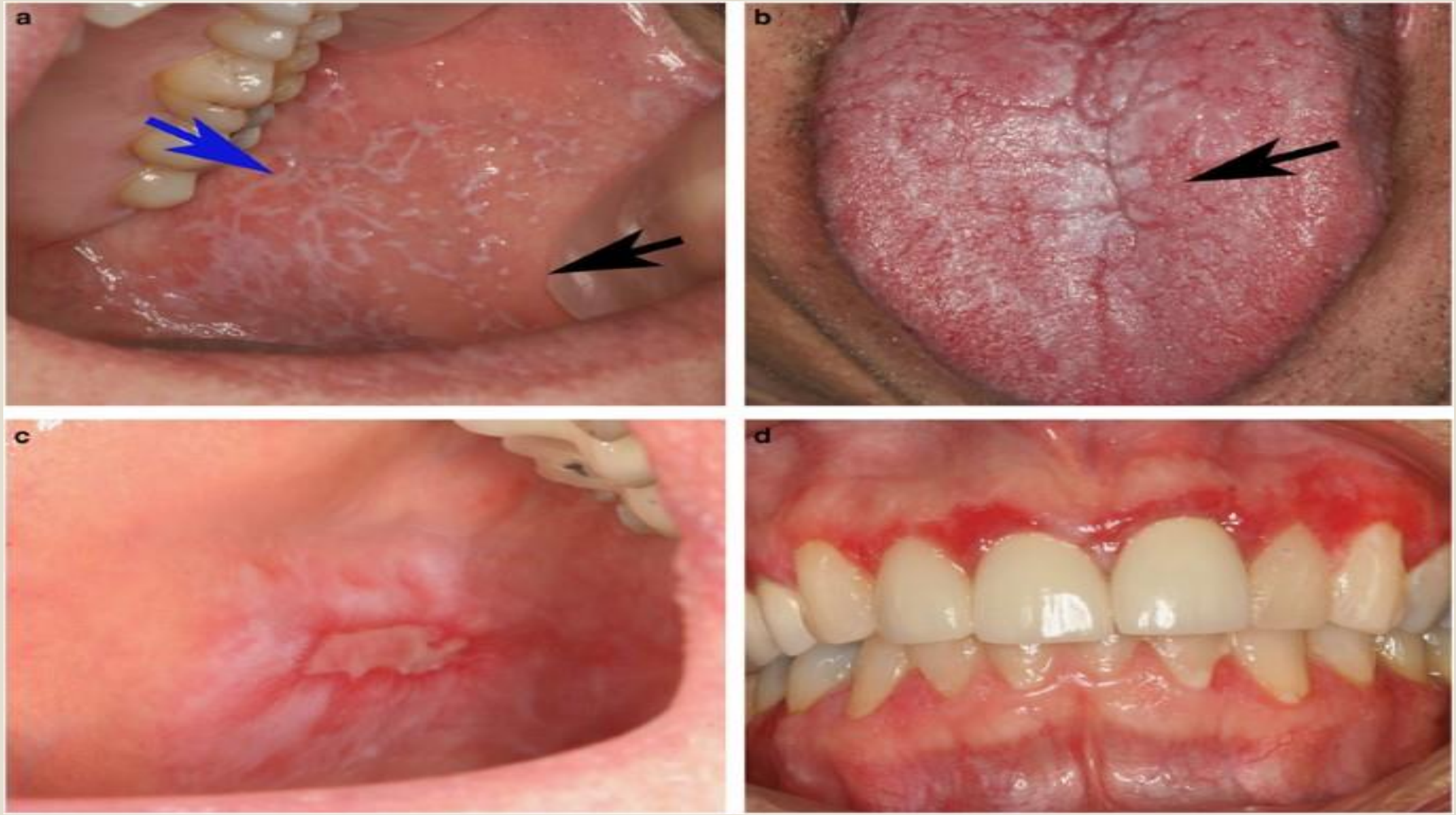
ACE inhibitors may cause neutropenia, resulting in delayed healing or gingival bleeding. Angioedema, a persistent cough, and oral burning sensations are associated with ACE inhibitor use.

CCBs can cause gingival overgrowth, with highest prevalence occurring with nifedipine

diuretics, may experience hyposalivation and complain of dry mouth.

Mercurial diuretics may cause oral lesions with an allergic or toxic basis.

Lichenoid reactions have been reported with thiazides, methyldopa, propranolol, and labetalol.


a
b
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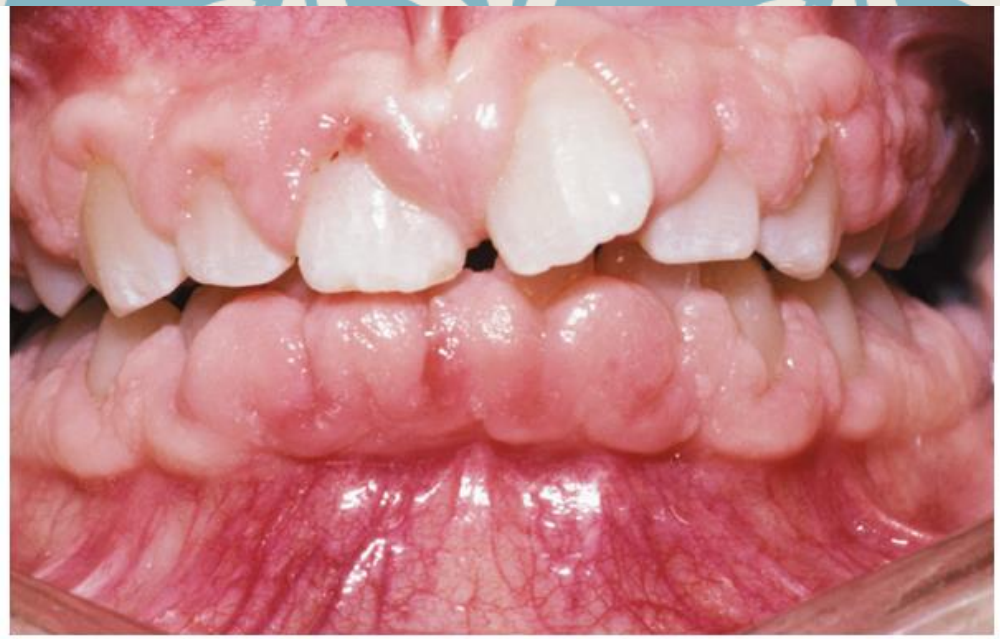
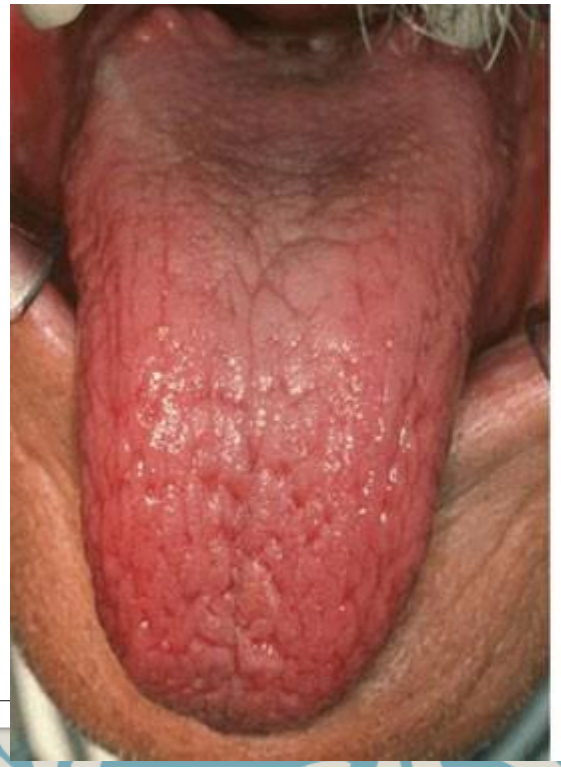


FIG. 3.4 Gingival overgrowth in a patient taking a calcium channel blocker. (Courtesy of Dr. Terry Wright.)



ISCHEMIC HEART DISEASE

Atherosclerosis and ischemic heart disease may be asymptomatic or symptomatic, and features suggestive of this disease may appear in the panoramic image.

- Patients affected by atherosclerosis may be at risk for angina, myocardial infarction, stroke, and peripheral arterial disease , before, during, or after dental treatment.

- Managing blood pressure, anxiety, pain, and limiting the amount of local anesthetic with epinephrine help to reduce adverse outcomes when treating patients with ischemic heart disease.

Routine dental care can be provided to most patients who have ischemic heart disease when anxiety and pain are controlled, and local anesthetic with 1:100,000 epinephrine is limited to two carpules or fewer.

- Routine dental care should be deferred for patients who have had a myocardial infarction within 30 days and for those who are unstable and have symptoms of ischemic heart disease.

- avoid drugs that may cause adverse interactions.

- Dental providers should ensure that patients who have ischemic heart disease are evaluated on a regular basis by their physician to ensure that their cardiac condition is well controlled

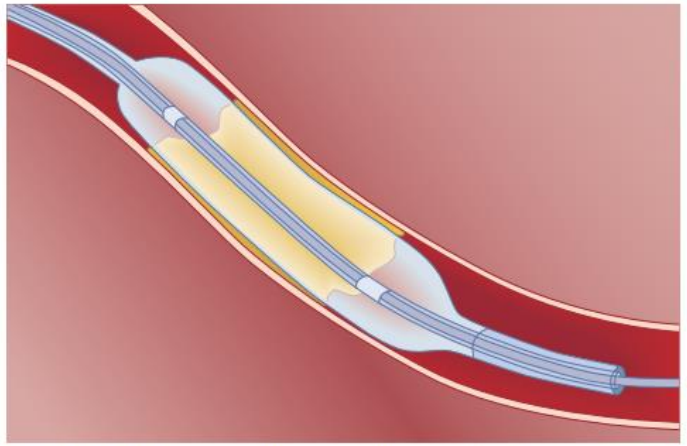


FIG. 4.6 Balloon angioplasty catheter. (From Teirstein PS. Percutaneous coronary interventions. In: Goldman L, Ausiello D, eds. *Cecil Textbook of Medicine*. 23rd ed. Philadelphia: Saunders; 2008.)

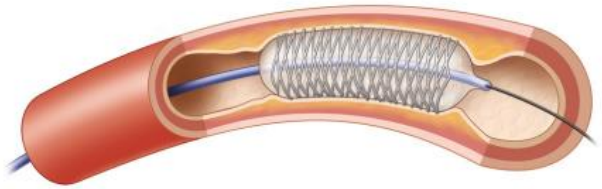
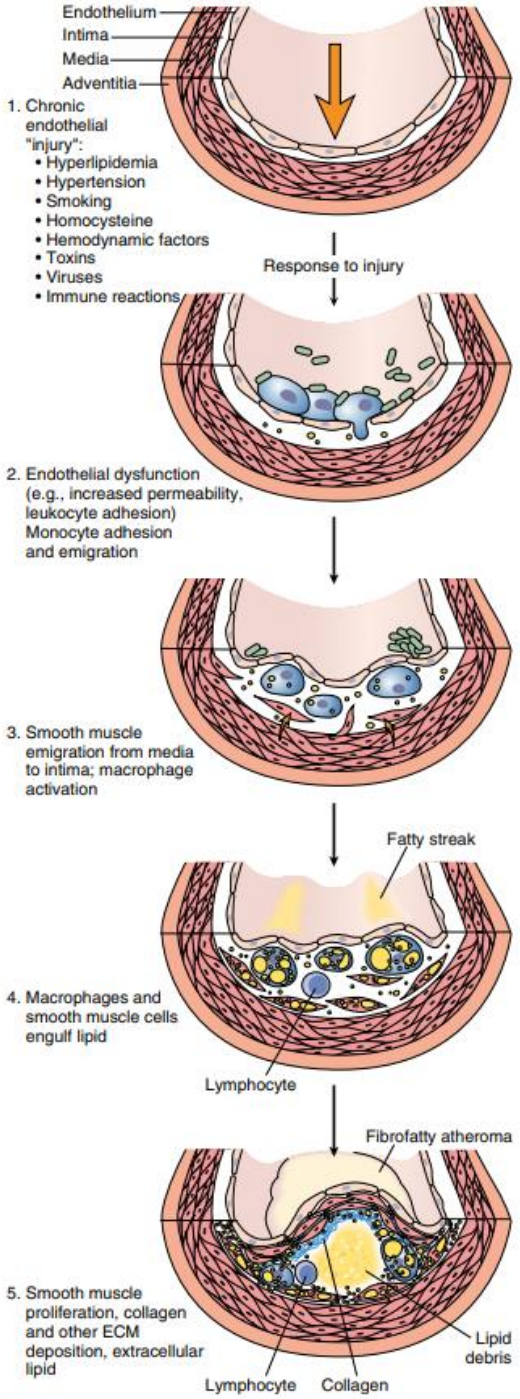


FIG. 4.7 Expandable metallic stent. The stent is left in place after deflation and withdrawal of the balloon catheter.



DENTAL MANAGEMENT OF PATIENTS WITH STABLE (MILD) ANGINA OR PAST HISTORY OF MYOCARDIAL INFARCTION MORE THAN 30 DAYS, WITHOUT ISCHEMIC SYMPTOMSA

PREOPERATIVE RISK ASSESSMENT

- Review medical history, determine whether (i) patient has active cardiac conditions or clinical risk factors, (ii) functional capacity, (iii) risk level of surgery, and discuss relevant issues with the patient.
- Identify all medications and drugs being taken or supposed to be taken by the patient.
- Examine the patient for signs and symptoms of disease and obtain vital signs.
- Review recent laboratory test results or images required to assess risk.
- Confirm patient has a primary care provider and has taken cardiac medication(s) today.
- Obtain a medical consultation (i.e., refer to physician) if the patient is poorly controlled or is undiagnosed.
- If vital signs indicate well control, routine dental procedures can be performed without special precautions.

A	
Antibiotics	No issues. Patients with ischemic heart disease, coronary artery stents, or CABG surgery do *not* require antibiotic prophylaxis.
Analgesics	See F—Follow-up.
Anesthesia	Ensure profound local anesthesia. Avoid use of excessive amounts of epinephrine; limit to 2 carpules of 1 : 100,000 epinephrine at a time (within 30—45 min); greater quantities may be tolerated well but increase risk.
Anxiety	Use stress reduction protocol (see Chapter 1). Consider the use of preoperative oral sedation (short-acting benzodiazepine) 1 h before procedure, as well as using N_2O—O_2 inhalational sedation intraoperatively.

B	
Bleeding	If the patient is taking aspirin or other antiplatelet medication, anticipate some increased bleeding, but modification of drug regimen is not required.
Breathing	No issues.
Blood pressure	Monitor BP during procedure. Use a pulse oximeter if oral sedation is used or if the patient becomes symptomatic.

C

Capacity to tolerate care	Patients who have stable angina that is relieved by nitrates can receive routine dental care. Have nitroglycerin available.
Chair position	Ensure a comfortable chair position and avoid rapid position changes.

D	
Drugs	Use of excessive amounts of epinephrine with nonselective beta-blockers can potentially cause a spike in blood pressure and appears to be dose dependent; avoid the use of epinephrine-impregnated retraction cord.
Devices	Patients who have coronary artery stents do not require antibiotic prophylaxis.

E	
Equipment	Consider taking preoperative vital signs and the use of a pulse oximeter if oral sedation is used or if the patient becomes symptomatic.
Emergencies	Precipitation of an angina attack, MI, arrhythmia, or cardiac arrest is possible. Have nitroglycerin readily available as well as oxygen. Be prepared to perform basic life support (activate EMS, provide CPR, use AED, if needed).

	F
Follow-up	• Ensure adequate postoperative pain control to reduce risk of cardiac event. • Contact patients who have had invasive procedures between 24 and 72 h to ensure that the postoperative course proceeds without complications. • Ensure that patient is maintaining regular follow-up visits with his or her physicians.

DENTAL MANAGEMENT OF PATIENTS WITH UNSTABLE ANGINA OR HISTORY OF RECENT MYOCARDIAL INFARCTION (WITHIN PAST 30 DAYS)

PREOPERATIVE RISK ASSESSMENT

- Be aware that there is higher risk for cardiac arrest in these patients; appropriate precautions are advised.
- Special precautions:
  - Avoid elective dental care.
- If care becomes necessary,
  - follow thorough risk assessment as listed in Box 4.6.
  - consult with a physician to develop a treatment plan.
  - best treated in a hospital dental clinic or special care facility.

A	
Antibiotics	No issues. Patients with coronary artery stents or CABG surgery do not require antibiotic prophylaxis.
Analgesics	Ensure adequate postoperative pain control. Avoid NSAIDs.
Anesthesia	Avoid use of vasoconstrictor if possible. If vasoconstrictor is needed, limit to 2 carpules of 1:100,000 epinephrine at a time (within 30—45 min); greater quantities may be tolerated but increase risk. May need to discuss use with physician.
Anxiety	Use stress reduction protocol (see Chapter 1). Consider use of preoperative oral sedation (short-acting benzodiazepine) 1 h before procedure, as well as using N_2O—O_2 inhalational sedation intraoperatively.
B	
Bleeding	If patient is taking aspirin or other antiplatelet medication, anticipate some excessive bleeding, but modification of drug regimen is not required.
Breathing	No issues.
Blood pressure	Continuous monitoring of blood pressure, pulse and oxygen saturation is recommended.

C	
Capacity to tolerate care	Defer care if patient has unstable angina; refer to physician. Defer care of patient who has a history of MI that occurred <1 month or if the patient has chest pain—related symptoms.
Chair position	If urgent care is required, ensure a comfortable chair position and avoid rapid position changes.
D	
Drugs	Consider administering prophylactic nitroglycerin just before procedure. Provide continuous oxygen by nasal cannula or nasal mask. Use of excessive amounts of epinephrine with nonselective beta-blockers can potentially cause a spike in blood pressure and appears to be dose-dependent; avoid the use of epinephrine-impregnated retraction cord.
Devices	Patients who have coronary artery stents do not require antibiotic prophylaxis.

E	
Equipment	Recommended management includes placement of IV line, continuous ECG monitoring, ongoing monitoring of vital signs, and use of a pulse oximeter.
Emergencies	Precipitation of an angina attack, MI, arrhythmia, or cardiac arrest is possible. Have nitroglycerin readily available as well as oxygen. Be prepared to perform basic life support (activate EMS, provide CPR, use AED, if needed).

F	
Follow-up	As delineated in Box 4.6

ORAL MANIFESTATIONS

Coronary atherosclerotic heart disease does not directly induce oral lesions or oral complications.

However, carotid calcifications can be detected on panoramic images in about one-third of patients who have atherosclerosis .

Also, an association between ischemic heart disease and periodontal disease, poor oral health (e.g., chronic apical periodontitis), and tooth loss has been documented.

Drugs used in the treatment of ischemic heart disease may produce oral changes such as dry mouth, taste aberrations, lichenoid eruptions, and oral ulcerations.

CCBs can induce gingival overgrowth when plaque control is less than optimal and is more prominent at anterior interproximal sites.

In rare cases, patients with angina may experience pain referred to the neck, shoulder, lower jaw, or teeth. The pattern of onset of pain with physical activity and its disappearance with rest usually serves as a diagnostic clue as to its cardiac origin.

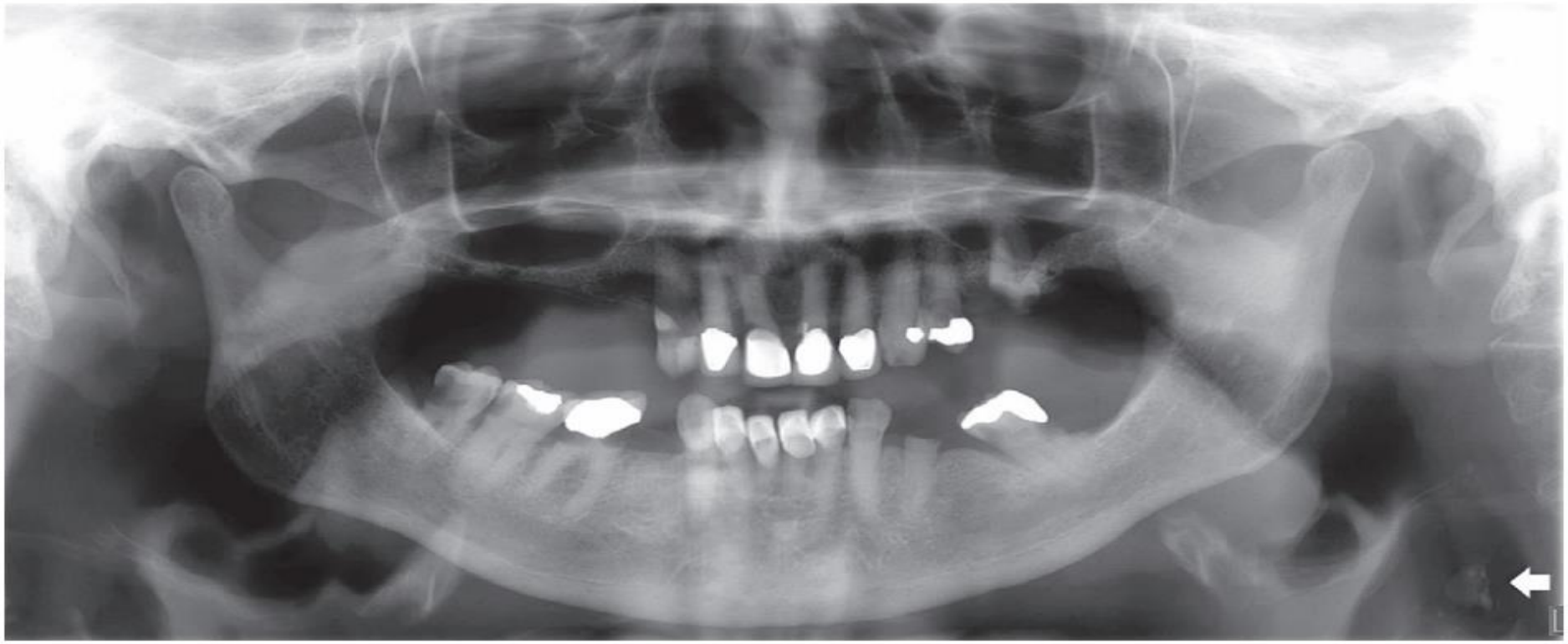


FIG. 4.10 Calcification of the left carotid artery as indicated by the *arrow*.


THANK
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