Dental Management of Patients *With* Systemic Diseases

Prof. Maged Lotfy

PYRAMIDS AWARD ORG.

The Arabic wards in the middle of the logo is part of Sourat Al– Alaque (96) in Quran. The following is part of it:

"READ IN THE name of your Lord who created, (1) Created man from an embryo; (2) Read, for your Lord is most beneficent, (3) ***Who taught by the pen****, (4) Taught man what he did not know. (5)"*

Preface

The world's population is estimated to be 7 billion. Within this mass of humanity is a substantial number of people that are elderly; the graying of the world's population is predicted to produce millions of individuals with systemic medical conditions that can affect oral health and dental treatment. The dental management of these medically compromised patients can be problematic in terms of oral complications, dental therapy, and emergency care.

This booklet focuses on a number of medical problems that dentists might encounter in daily practice that necessitate extra knowledge and care to prevent potential complications causing otherwise unnecessary morbidity and mortality. These include diabetes, cardiac abnormalities, and infectious disease and others.

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Content

Chapter 1
Cardiovascular Diseases

Ischemic Heart Disease

The heart, constantly beating throughout life, never rests as some other organs do, for example the stomach. The metabolic requirements of the heart is only exceeded by those of the brain. An abundant supply of oxygenated blood is necessary to the heart to be able to carry on its duties. It has been mentioned that the capillary network of the myocardium is so profuse that almost every muscle fiber is paralleled by a capillary. The coronary arteries (Fig.1) are two in number and are responsible for supplying the heart with its requirements of oxygenated blood. Disease of the coronary arteries are due to narrowing of one or two of the main branches. This leads to imbalance between the blood supply to the myocardium and its metabolic requirements.

The condition starts by formation of a mass of fatty tissue, usually cholesterol, that becomes fixed to the wall of the coronary artery. This mass of fatty tissue is called "atheroma" [V]. As a result of narrowing of the vessels, the blood flow slow down. This in turn leads to thrombus formation, i.e. formation of blood clot. The condition is called coronary artery thrombosis, i.e. formation of blood clot in the coronary artery [V]. The resultant imbalance between the blood supply to the myocardium and its work requirements of oxygen leads to myocardial ischemia. If this ischemia of the myocardium is mild and of short duration "Angina Pectoris" results, while if sever and of long duration "Myocardial Infarction" results.

Angina Pectoris

The condition is caused by transient inability of the heart to receive sufficient oxygen to carry on its work. The condition is the earliest and the mildest clinical form of coronary atherosclerosis.

Clinically, the condition is characterized by substernal squeezing, crushing pain radiating to the left shoulder and arm, that lasts for less than 5 minutes. The attack can be precipitated by pain, stress and emotional upset. Treatment of angina is symptomatic by the administration of Nitroglycerin, Isordil

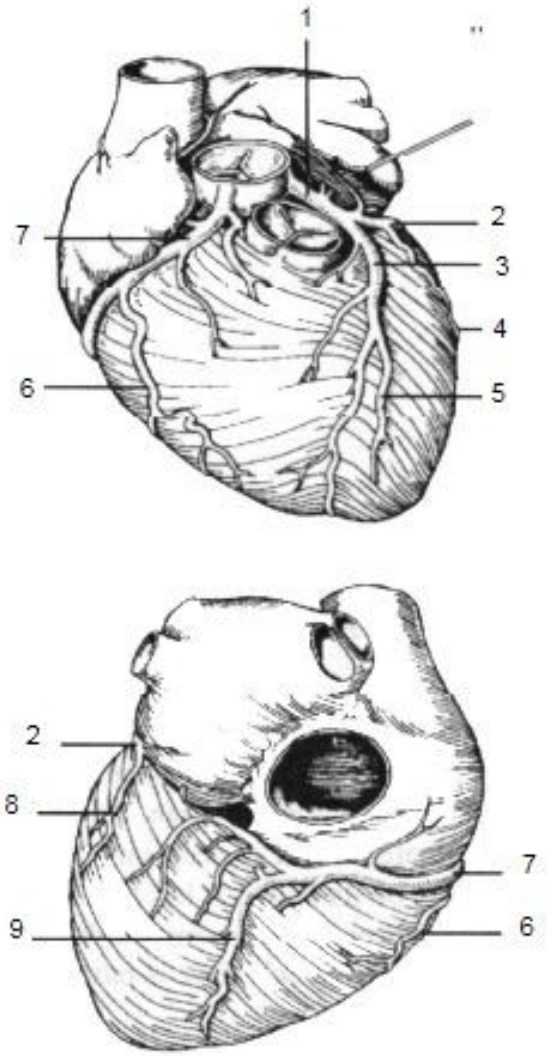


Fig. 1. The coronary arteries. Anterior view (Upper) and posterior view (Lower).

1. left coronary artery. 2. Circumflux branch 3. Anterior inter-ventricular branch, 4. Left marginal branch, 5. lateral branch, 6. Right marginal branch, 7. Right coronary artery, 8. Posterior left ventricular branch, 9. Posterior inter-ventricular branch

or Amylniterate. The first two drugs are given by sublingual route while the later is given by inhalation route.

Dental Implication Before starting dental treatment ask the patient about the date of his last attack. If it is within the last 6 months you should be more concern about this patient (Table 1-1). Drugs used in the treatment of angina, namely Nitroglycerin and Amylniterate, relive pain by reducing the work load of the heart. This is achieved by producing generalized vasodilatation so that the heart pump the blood against less resistance.

This may cause "postural hypotension" due to lack of reflex vasoconstriction. The condition is due to sudden drop in the blood pressure when the patient changes his position suddenly, especially from recumbent to setting or standing positions. The condition is due to pooling of the blood from the head to the dilated vessels of the trunk and limbs. So the patient should change his position slowly especially if he had taken a prophylactic dose of Nitroglycerin or Amylniterate.

Myocardial Infarction

Infarction of the myocardium is the result of occlusion, by a thrombus, of one of the coronary arteries. If the degree of the resultant ischemia to the myocardium is significant and of long duration, the part of the myocardium supplied by this branch undergoes necrosis and is replaced

Table 1. Dental management of patients with Angina Pectoris

Medical Consultation
- Especially if the last attack was within the last 6 month

Appointment
- In the morning to avoid loading the heart by food digestion after meals.
- Short to avoid patients fatigue.
- If the patient becomes fatigued or developed changes in pulse rate or rhythm terminate the appointment at once.

Reduction of Stress and Anxiety
- Allow the patient to express his fear.
- Premedication with Diazepam (Valium) 5-10 mg 1/2 hour before the start of treatment.
- Nitroglyceriner tablet sublingually, as a prophylactic dose - better from patient own medication.

Local Anesthesia
- Vasoconstrictor concentration 1/100,000 and not more.
- One carpule per visit and not more.
- Aspirate and inject slowly.

General Anesthesia
- Agents that cause cardiac hypoxia are contraindicated

Treatment Procedures
- Painless and atraumatic as possible as pain may precipitate the attack.
- Avoid use of vasopressors for controlling of local bleeding.
- Avoid vasopressors in gingival packing materials.

Drugs Used In Treatment
- Postural hypotension may occur, slowly change the chair position and support the patient while getting out of the chair. (see text for explanation)

If The Attack Developed
- Stop dental treatment
- Give the patient Nitroglycerine tablet, better from the patient own medication.
- If pain relived within 5 minutes you can continue the treatment, but better to terminate the visit.
- If pain was not relieved within 5 minutes, give another Nitroglycerine tablet up to 3 tablets within 15 minutes.
- If pain was not relieved transfer the patient immediately to the nearest hospital.

by scar tissues. Often myocardial infarction follow long history of angina. The condition is medical emergency carrying the potentiality of death. Clinically the symptoms are sever persisting squeezing pain localized in the chest and radiates, as in angina, to the left shoulder and arm. Pain may lasts for 30 minutes or more. The attack may be precipitated at any overwork or at rest or even during sleep. During the attack the patient may have dyspena , vomiting, cold moist skin, lowered blood pressure and rapid weak pulse. The attack may be immediately fatal.

Treatment of myocardial infarction is by giving Morphine sulfate to relief pain during the attack together with absolute rest and oxygen administration. Between the attacks the patients is on anticoagulant therapy to prevent blood clotting and enable the heart to work against less resistance.

Table 2. Dental management of patients with myocardial infarction.

Consultation
- Is a must and no routine dental care until at least 6 months after the infarction.

Appointment
- In the morning for the same reason as in angina [see Table 1].
- Short to avoid patient fatigue.

Reduction of Stress and Anxiety
- Place the patient in general relaxing atmosphere.
- Premedication with Diazepam [Valium] 5-10 mg 1/2 hour before the start of the treatment.

Local Anesthesia
- Epinephrine and other vasoconstrictors should be at a concentration of 1/100,000 or less.
- Give only one carpule per visit.
- Aspirate and inject slowly.

Treatment Procedures
- As with angina pectoris [Table 1].

Drugs Used in Treatment, See table -3

Management of Complications if Developed

If the patient developed chest pain or changes in pulse rate or rhythm during the dental appointment:
- Stop dental treatment.
- Place the patient in shock position .
- Give oxygen.
- Give morphine sulfate to relieve pain.
- Transfer the patient to the nearest hospital, better by an ambulance

Dental Implication

No routine dental care until at least 6 months after the infarction because of the increased risk of the occurrence of the attack. Dental management of patients with myocardial infarction are listed in table 2. Anticoagulant drugs are used in the management of coronary artery diseases to prevent blood coagulation. The use of this drugs carry the risk of excessive bleeding, either spontaneous or after minor injuries, if the drug dose is high. So before performing any dental surgical procedures the anticoagulant level must be regulated. The anticoagulant drugs in common use are Heparin, Dendivan and Morevan. Oral anticoagulants in common use are Coumarine derivatives as Dicomarol and Coumaline. The sudden withdrawal of the anticoagulant drug before surgery, in an attempt to avoid profuse bleeding during the operation, may lead to serious or even fatal complications. Sudden drug with-

drawal result in over swing toward thrombosis. This is called *"anticoagulant rebound thrombosis"*. It should be known that regulating the anticoagulant drug level is a medical problem that should not be done by the dentist.

During management of the infarction the physician usually attempt to have a prothrombin time that is 11/2 to 3 times longer than the normal. Prothrombin time double the normal is suitable for soft tissues surgery as scaling, while a time 11/2 the normal is the maximum for bony surgery, including single tooth extraction. Table 3 shows dental management of patient receiving anticoagulant therapy.

Table 3. Dental management of patients receiving anticoagulant therapy

Medical Consultation
- Is a must.

Check Prothrombin Time
- Ask the physician to adjust prothrombin time to be 11/2 to 2 times that of the normal.

Local Anesthesia
- Avoid deep injection, as inferior dental nerve block and superior maxillary injection, as massive hematoma may be formed.

Surgical Procedure
- As atraumatic as possible.

After Surgery Or Extraction
- Local measures to stop bleeding [pressure packs and suturing] but no vasopressors.
- Advise the patient not to eat on this side for 3 days.

Congestive Heart Failure

Congestive heart failure is the end stage of an imbalance between the hemodynamic load of the heart and the capacity of the heart to handle this load. This imbalance may occur due to chronic increase in the load and/or damage to the myocardium. Failure of the heart usually begins with left ventricular failure due to increase in the heart load or myocardial disease. The increase in the work load may result from aortic valve disease or arterial hypertension, while the myocardial affection is either due to infection or infarction. This result in an inability of the left ventricle to pump the blood efficiently into the arterial circulation. The ventricle do not become empty from blood during diastole. Accordingly the blood will retain in the lungs leading to pulmonary hypertension and oedema. The right ventricle now has to pump the blood against increased resistance in the lungs. This result in right ventricular failure. Right side heart failure result in systemic venous congestion and peripheral oedema.

Clinically the most outstanding signs and symptoms in cases of left side heart failure are dyspnea and shortness of breath, as the lungs are filled with blood and there is very little room for air. On the other hand, in cases of right side heart failure there are systemic venous congestion and peripheral oedema, e.g. clubbing of fingers.

Fig. 2. Clubbing of fingers. There is thickening of tissues at the bases of the fingers and toe nails so that the normal angle between the nail and the digit is filled in. The nail becomes convex in all directions and in extreme cases the digit becomes bibulous like drumstick. The condition is seen in cases of pulmonary tuberculosis, infective endocarditis, congestive heart failure and other heart conditions and in cases of lung cancer. *[V. Clubbed fingers - schamroth's sign]*

Table 4. Classification of patients with congestive heart failure

Class I. Activities are within normal range

Class II. Ordinary exercises causes dyspnea

- In patients of these two classes there is no unusual risk during the dental treatment other than those due to the underlying preexisting condition that caused the heart failure

Class III Dyspnea occur at less than ordinary activities

Class IV Dyspnea occurs at rest

- For patients of these two classes, being potential risk of death, dental treatment should be kept at minimum.

Table 5. Dental management of patients with congestive heart failure.

Medical Consultation

- Is mandatory, no dental treatment until good medical management.

Determine the Underlying Causative Pathological Condition

- To be concerned in the treatment planning, e.g. hypertension, rheumatic heart disease, ischemic heart disease..etc.

Preoperative Antibiotic

- To prevent postoperative infection and guard against infective endocarditis .

Appointment

- Short and in the morning.
- Patient better treated in upright position [see text for explanation].

Reduction of Stress and Anxiety

- General relaxing atmosphere.
- Premedication with Diazepam [Valium] 5-10 mg 30 minutes before treatment.

Drugs Used in Treatment

- Digitalis make the patient more prone to nausea and vomiting so avoid stimulating gagging during treatment.

Management Of Complications If Developed

- Excessive bleeding may occur if polycythemia (increase in the number of red blood cell) is present, so local haemostatic measures are performed but avoid vasopressors application.
- If the patient develop dyspnea and fatigue stop treatment and transfer the patient to the nearest hospital.

Management of congestive heart failure include the administration of digitalis and diuretic agents. Digitalis increase the force of contraction of cardiac muscle fibers, thus help to overcome the effect of myocardial failure.

Dental Implication

Patients with congestive heart failure are classified into four classes (Table 4). This classification based on the degree of activity at which dyspnea occurs. It should be mentioned here that patients with heart failure are better to be treated in nearly upright position and avoid supine position. This is recommended so as not to add to pulmonary congestion and edema which predispose to dyspnea. Also patients taking digitalis are more prone to develop nausea and vomiting during dental treatment. So procedures that may cause gagging should be done with extra care if not possible to avoid. Table 5 shows the dental management of patients with congestive heart failure. [V. How dental health may be linked to cardiovascular disease]

Patients at the Risk of Infective Endocarditis

Infective endocarditis is a disease caused by microbial infection to the heart valves or endocardium most often in proximity to congenital or acquired cardiac defect. The disease was 100% fatal before the antibiotic era. Even with the best medical treatment the condition has a mortality rate of 17-65%. The disease is more easily prevented than treated. Prevention can be easily performed by adequate antibiotic therapy for the susceptible patients. Infective endocarditis may occur in patients who do not have cardiac defects. It has been reported that about 37-76% of cases occur in patients with rheumatic heart diseases and 6-24% occur in patients with congenital heart diseases. Table 6 shows the degree of risk of infective endocarditis in different heart conditions and suggested antibiotic regimen for prophylaxis. [Antibiotic Prophylactic Regimens for Endocarditis]

Table 6. Degree of risk of infective endocarditis in various cardiac conditions and suggested antibiotic regimen (for regimen A and B see tables 11-7 and 8).

High Degree Risk [Regimen B}

- Prosthetic valves.
- Recent surgical repair of cardio vascular defects.
- Previous infective endocarditis.
- Rheumatic heart disease.

High To Moderate Degree Risk [Regimen A Or B]

- Congenital or acquired heart defects.
- Aortic valve diseases.

Moderate Degree Risk {Regimen A]

- Valvular disease.
- Pure mitral stenosis. •
- Surgically corrected cardiovascular lesions with implant.

Low Degree Risk [Regimen A Or Non]

- Coronary sclerosis.
- Small atrial septal defect.
- Syphilitic aortitis.
- Surgically corrected cardiovascular defects with no prosthetic implants.

Rheumatic Fever

This is an acute inflammatory condition that develop in some persons as a complication following group A streptococcal infection. It is said to be due to an autoimmune reaction between the normal host tissues, that has been altered by the bacterial products, and antibodies produced by the host in response to this altered tissues.

Rheumatic fever is essentially a childhood disease. About 75% of cases occur before the age of 20 years. The disease and its sequel accounts for about 95% of cases of heart diseases in children. The cardiac damage which result from acute rheumatic fever attack is called *"Rheumatic Heart Disease"*. This usually involves damage to the mitral valve and aortic valve. The affected valves undergo scaring and calcification, this may result in stenosis or regurgitation of blood. The basic lesions in rheumatic heart disease consists of valvular, myocardial and pericardial changes. The most common valvular defects is mitral stenosis.

Table 7. Prophylactic antibiotic coverage for prevention of infective endocarditis in adult dental patient (regimen A)

Patient Not Allergic to Penicillin

- 1000,000 U. Aq. Crystalline Penicillin G intramuscular injection 1/2 hour before dental treatment followed by 500'000 IU penicillin V orally every 6 hours for 8 doses.....**OR**
- 2 m. IU penicillin V orally 1/2 hour before treatment followed by 500 mg penicillin V orally every 6 hours for 8 doses.

Patients Allergic to Penicillin

- One gm Erythromycin orally 1/2 hour before treatment followed by 500 mg erythromycin orally every 6 hours for 8 doses.

This regimen is also used for patients receiving low doses of penicillin to prevent attacks of rheumatic fever, as the development of resistance strains to penicillin should be suspected.

N.B. New regimen are suggested by the AHA (American Heart Association) every few months

Dental Implication

The main problem that confront the dentist when dealing with patients with history of rheumatic heart disease, or other heart diseases that predispose to infective endocarditis, is to prevent the occurrence of endocarditis. This is achieved by giving the patient the suitable antibiotic regimen (Table 7 and 8). Another problem is that to decide whether or not the rheumatic heart disease is present, to decide whether or not to give antibiotic prophylaxis. Based on the findings of the medical history and to some extent the physical examination of the patient, four

Table 8. Prophylactic antibiotic coverage for prevention of infective endocarditis in high risk adult dental patient (Regimen B).

Patients Not Allergic to Penicillin

- 1000.000 U Aq. Crystalline penicillin G mixed with 600.000 U procaine penicillin G intera- muscular injection 1/2 hour before treatment.... ....**OR**
- 1 gm streptomycin intramuscular injection followed by 500'000 IU penicillin V orally every 6 hours for 8 doses.

Patients Allergic to Penicillin

- One gm Vancomycin intramuscular injection 1/2 hour before treatment followed by 500 mg Erythromycin orally every 6 hours for 8 doses.

Table 9. Dental management of patients with history of rheumatic fever (RHD).

Group I. Patients with unconfirmed history of illness that could be RHD

- *20 years since:* if no evidence of RHD, no coverage is needed.
- *Less than 20 years since:* if no evidence of RHD, refer for medical evaluation if RHD is found give coverage.
- *Current signs and symptoms of RHD:* give coverage.

Group II. Patients with history of heart murmur

- Medical consultation to confirm the presence and the nature of murmur.
- For all patients having murmur give coverage.

Group III. Patients with known history of RHD

- If no medical follow up, refer the patient and give coverage.
- Medical follow up and reported to have the disease give coverage.

Group IV. Patients who have been treated for symptoms of RHD

- Congestive heart failure caused by RHD, give coverage.
- RHD with history of infective endocarditis, give coverage.
- Open heart surgery and valve replacement, consultation and give coverage.

separate groups of patients can be identified, who had or may have had rheumatic heart disease (Table 9).

Hypertensive Disease

The term hypertension or high blood pressure is used to describe the patients who have blood pressure greater than 140/90 mm. Hg. Patients who have blood pressure between 140/90 and 160/95 mm. Hg. are described as being border line hypertensive. Definite hypertension is diagnosed when the blood pres-sure is above 160/95 mm. Hg. Most authors define the severity of blood pressure based on the level of diastolic pressure. Blood pressure is said to be mild if the diastolic pressure is between 95-105 mm. Hg, moderate when it is between 105-115 mm. Hg. and sever if it is above 115 mm. Hg.

Table 10. Potential problems that may arise during dental treatment of uncontrolled hypertensive patients.

Stress and Anxiety / Excessive Use of Vasopressors

- May cause increase in blood pressure that may be dangerous as it may cause myocardial infarction or cerebral accident.

Excessive Bleeding

- May occur following surgery or even scaling if the blood pressure is significantly elevated.

Patients Receiving Antihypertensive Drugs

- May develop nausea and vomiting.
- Liable to develop postural hypotension.
- Sedatives when used with Antihypertensive drugs may result in hypotensive episodes.
- Certain antihypertensive drugs potentiate the action of barbiturates (see table 14).

Dental Implication

The first task of the dentist is to identify, by history and blood pressure measurement, those patients who may have significant hypertension. Two blood pressure recordings should be taken for all patient in the first dental visit, and the result are averaged. These records serve as a base line from which to decide that the patient suffers a systemic reaction later during dental treatment. Also the results are used to screen the patients to identify those who may have hypertension. It is important to identify patients with sever undiagnosed hypertension before starting dental treatment. The stress and anxiety associated with the dental appointment may raise the blood pressure to a serious or even dangerous level. Potential problems that may arise during the treatment of uncontrolled hypertensive patients are listed in table 10.

Based on the information taken from the patient and the measurement of blood pressure in the first appointment, five groups of patients can be identified regarding the type of dental treatment that can be given safely to them and the need for any treatment modifications. These groups are:

Table 11. Dental management of group II hypertensive patients.

Diastolic Pressure 115 mm. Hg. or More

- Refer for medical care, do only the emergency treatment

Repeat Blood Pressure Recording the Next Visit

- If the BP is 140/90 mm. Hg. or less continue treatment
- If the BP is more than 140/90 mm. Hg. referral for medical evaluation and control of the BP then manage as patient of group III

Table 12. Dental Management of group III hypertensive patients.

Patient under Good Medical Control

Consult the patient physician to:

- Confirm the medical status
- Confirm medication taken
- Explain dental management plan and ask for suggestions

After Consultation

- Finalize dental management plan, see table 13.

Table 13. Dental management of patients with hypertensive disease.

Appointment

- Short to avoid patient fatigue.
- In the morning to avoid patient being stressed by day duties.
- If the patient becomes fatigued terminate the visit.

Reduction of Stress and Anxiety

- General relaxing atmosphere.
- Premedication with sedatives and tranquillizers.

Local Anesthesia

- Vasopressors concentration 1/100000 and not more.
- Three carpules / visit and not more.
- Aspirate and inject slowly.

General Anesthesia

- Avoid its use as sever hypotension may occur in patients receiving antihypertensive drugs.

Treatment Procedures

- Surgery should be atraumatic and kept at minimum.
- Local haemostatic measure is taken after surgery.
- Avoid vasopressors in local control of bleeding.

Group I: Patients who have no history or symptoms of hypertension and their blood pressure is within normal. For these patients all types of dental treatment can be given safely.

Group II: Patients who have no history or symptoms of hypertension but their blood pressure is more than 140/90 mm. Hg. In these patients if the diastolic pressure is 115 mm. Hg or more the patient should be referred to the physician for medical treatment before any dental treatment is performed. Table 11 shows the dental management of group II patients.

Group III: Patients who have hypertension that is under good medical control. For these patients medical consultation with the patient physician is obligatory. Table 12 shows the dental management of group III patients.

Group IV: Patients who have uncontrolled hypertension. No dental treatment should be given to those patient except palliative treatment. The patient is referred to the physician for good medical control of his disease, then he is managed the same as the patients of group III (Table 13).

Table 14. Management of potential problems associated with drugs used in treatment of hypertension (Antihypertensive drugs)

Reduce Doses of Barbiturates and other Sedatives

- Because there action may be potentiated by many antihypertensive drugs

Avoid Stimulating Gagging

- As many antihypertensive drugs cause nausea and vomiting

Guard Against Postural Hypotension

- By changing the chair position slowly and supporting the patient while getting out of the dental chair as many antihypertensive drugs cause postural hypotension

Avoid the Use of Central Nervous System Depressants

- This is because sedatives, hypnotics and narcotics when used with patient receiving monoamine oxidize inhibitors there action will be prolonged and potentiate

Adrenaline

- Should not be used in patients receiving antihypertensive agents as its action will be greatly potentiated

Group V: Patients who have overt signs and symptoms of hypertension and are not under medical control. These patients, as those of group IV, should not be treated except after having their disease controlled then they are treated as patients of group III (Table 13).

In general no dental treatment, other than emergency one, i.e. analgesic for pain and antibiotic for infection, should be performed for patients with marked elevation of blood pressure. Table 13 summarizes the dental management of hypertensive patients while table 14 shows a list for the management of potential problems associated with the use of antihypertensive drugs. ■

Chapter 2

Hepatic Diseases

Liver is the largest organ in the human body. It plays very important and vital role in metabolic and biochemical functions. Liver functions are shown in table 15.

Jaundice

Jaundice is not a disease by itself but rather a sign for some underlying pathological condition, usually in the liver or bile duct. It may be due to either pathology in the liver or obstruction of the bile duct. Types of jaundice are hemolytic, as in sickle cell anemia, obstructive as in bile duct stone and hepatocellular as in infectious hepatitis (Table 16). Clinicopathologically jaundice is characterized by accumulation of bile pigments in the blood. This produces a yellow color in the sclera of the eye, skin and mucous membranes. The dark pigments then appears in the urine giving it dark-brown color.

Table 16 . Types of jaundice and some conditions in which jaundice is present.

Hemolytic Jaundice

- Sickle cell anemia Hepatocellular Jaundice
- Infective hepatitis
- Liver cirrhosis

Obstructive Jaundice

- Bile duct stone

Table 15. Functions of the liver.

1. During embryo life it serves in blood formation.
2. Stores vitamin B12 that prevents anemia.
3. Stores iron and copper.
4. Converts glucose into glycogen & store it.
5. Produces heparin, which is anticoagulant that works essentially on small vessels to prevent blood coagulation.
6. Produces prothrombin and fibrinogen which are essential blood coagulation factors.
7. Produces enzyme that is responsible for urea production.
8. Involved in formation of vitamin A*.
9. Aids in regulation of blood volume by production and construction of some of its constituents.
10. Together with spleen, liver is responsible for destruction of red blood corpuscles.
11. Detoxifies certain metabolic products.
12. Aids in protein metabolism.
13. Converts excessive amounts of carbohydrates into fats to be stored in the fat deposits in the body.
14. Aids in heat production as liver, because of its size and amount of work performed, produces large amount of heat ..
15. Bile formation occurs in the liver. The bile aids in emulsification and absorption of fats and fat-soluble vitamins in small intestine.

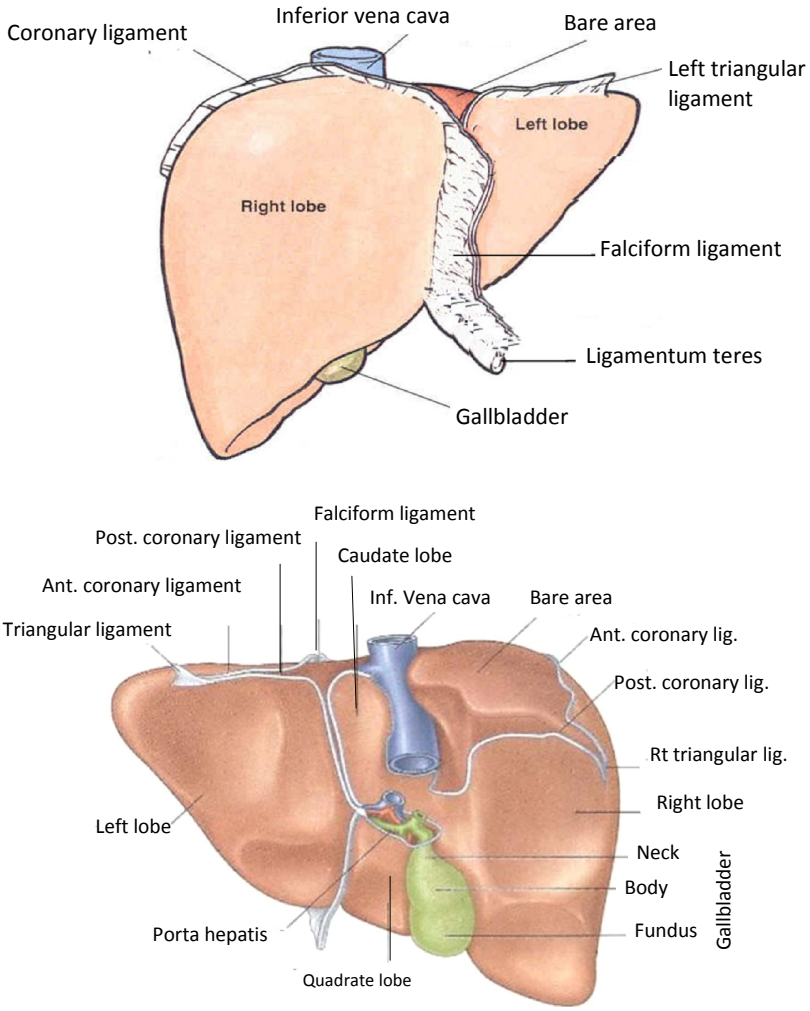


Fig. 3. The liver, anterior (diaphragmatic) surface (upper) and visceral surface (lower). [V. Gross anatomy of the liver]

Table 17. Signs and symptoms of advanced liver disease.

- Spider angioma of skin.
- Jaundice.
- Ankle edema.
- Ascites.
- Ecchymosis and petechia in skin and mucous membranes.
- Parotid enlargement.
- Increased tendency of gingival bleeding.

Table 18. Potential complication during dental management of patients with advanced liver disease.

Bleeding Tendency
- Due to deficiency in coagulation factors produced by the liver.

Drug Toxicity
- Due to decreased ability of the liver to detoxify and metabolize drugs.

Infection Transmission
- This is true in cases of hepatitis.

Liver Cirrhosis

This is a chronic liver disease in which there is an increased amount of fibrotic connective tissue replacing the destroyed liver cells. There are many causes for this liver condition, the most common are alcohol intake and viral hepatitis. Liver cirrhosis result in progressive deterioration of the metabolic and secretary functions of the liver and finally hepatic failure. Clinically liver cirrhosis , particularly the alcoholic type, may remain asymptomatic for many years, except for liver enlargement until there is sufficient destruction of liver cells to produce clinical manifestation of liver failure. So it is important that the dentist be aware of the signs and symptoms suggestive of advanced liver diseases (Table 17). Table 18 shows a list for the potential complication associated with the treatment of patient with advanced liver diseases.

Viral Hepatitis

The term “Hepatitis” is defined non-specifically as “inflammation of the liver”. Hepatitis may occur as a primary disease or secondary to other diseases. Primary hepatitis are viral hepatitis, drug induced hepatitis (alcohol) and toxic hepatitis (halothane). On the other-hand, diseases in which hepatitis occur as a secondary complication include infectious mononucleosis, secondary syphilis and tuberculosis.

Viral hepatitis is caused by at least three distinct viruses. These are type A virus, type B virus and non-A and non-B virus (NANB). Each of the three types has its distinct antigenic properties, but there clinical manifestations are very similar.

Previously, viral hepatitis that was not caused by the type A or type B virus was called “non-A, non-B hepatitis.” Recently three more viruses have been identified that cause some of these non-A, non-B infections. These new viruses are hepatitis C, D, or delta, and E. The hepatitis C virus (HCV) is

Fig 4. Ascites (Hydropertoneum) is accumulation of fluid in the peritoneal cavity, causing abdominal swelling (upper). Causes of ascites include infections as tuberculosis, heart failure and liver cirrhosis. A case of ascites due to tuberculous infection (lower). Note the everted umplicus and glandular enlargement of the left groin

Table 19. Dental management of patients with advanced liver diseases.

Patient Detection Through
- History taking.
- Clinical examination.

Medical Consultation To Verify
- History of the disease. • Current status.
- Medication taken. • Suggestion for dental management.

Laboratory Screening
- Complete blood count with differential white cell count.
- Serum glutamic oxaloacetic transminase (SGOT).
- Bleeding time.
- Thromboplastin time.
- Prothrombin time.

Avoid The Use Of Drugs Metabolised In liver

Avoid Surgery
- If the screening test is abnormal.
- Refer for medical evaluation and control.

Table 20. Dental management of patients with history of hipatitis.

Patients With Active Hepatitis
- Medical consultation.
- Do emergency treatment only.

Patient With Past History Of Hepatitis
- Medical consultation.
- If in doubt order RIA for HBsAg.

Patients In High Risk Category
- Order RIA for HBsAg.

Carriers (HBsAg Positive)
- Medical consultation. • Strict aseptic technique.
- Use gloves, masks and gowns.
- Sterilize all equipment after use.
- Minimize the use of drugs metabolized in the liver.

Patients With Signs And Symptoms Of Hepatitis
- Refer for medical consultation.
- Postpone dental treatment when possible.
- If treatment is essential do emergency treatment.

Table 21. Emergency dental management for patients with hepatitis.

- Medical consultation.
- Minimize the use of drugs. metabolised in liver (see table 3-6).
- Before surgery prothrombin time and bleeding time is essential.
- Strict aseptic technique is a must.
- Use rubber gloves, masks and gown.
- Minimize the use of high speed aerators.
- Sterilize all instruments and handpieces after use.
- Do only the necessary work.

thought to cause 95% of non-A, non-B hepatitis infections in people who have had blood transfusions. In addition, hepatitis C probably causes 50% of cases of sporadic non-A, non -B hepatitis.

With viral infection, the liver becomes inflamed and usually becomes tender and swollen. Patches of liver tissue may be destroyed. Hepatitis C virus (HCV) is almost always chronic and spreads only by blood. Hepatitis A and B can be prevented by vaccination, but not hepatitis C.

It is frequently impossible to differentiate between hepatitis A and B on clinical basis. This is essentially true at the early phase of the disease. There are classically three phases of acute viral hepatitis which are preicteric, icteric (jaundice) and posticteric phases. As the cases with most viral diseases there is no specific treatment for acute viral hepatitis. Treatment is essentially palliative and supportive. Absolute bed rest and high caloric diet are advisable. Drugs metabolised by the liver are to be avoided. However, prophylaxis against viral hepatitis is the best line of treatment.

Dental Implication

From the dentist standpoint of view there are three major consideration to observe when dealing with patients who have advanced liver diseases. These are bleeding tendency, decreased liver ability to detoxify and metabolize drugs and the possibility of infection transmission in cases of viral hepatitis. The bleeding tendency is partially due to deficiency in the coagulation factors, especially the prothrombin factors (factors II, VII, IX and X). In addition thrombocytopenia may be caused by hypersplenism secondary to portal hypertension as well as accelerated level of fibrinolysis. Before dental treatment medical consultation is obligatory to verify the current status of the patient, check medication the patient is taken and finally to obtain suggestion for the dental management plane. Table 19 shows dental management of patients with advanced liver diseases while table 20 shows dental management of patients with history of infective hepatitis. Table 21 shows emergency dental care for patients with infectious hepatitis. ■

Chapter 3

Endocrine Diseases

Islets Of Langerhans - Diabetes Mellitus

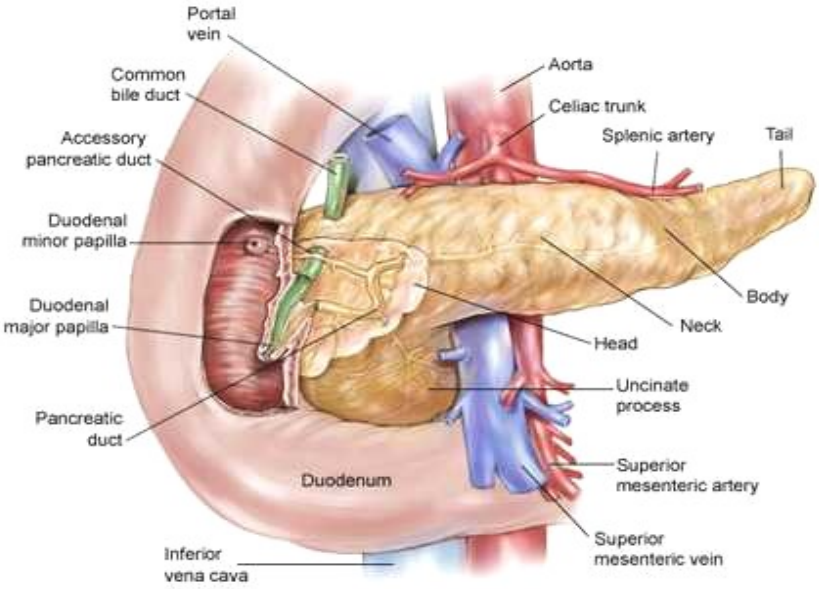
Diabetes Mellitus is a disease complex with metabolic and vascular components. The *metabolic component* involves elevation of the blood glucose level associated with alteration in the lipid metabolism resulting from relative or absolute lack of insulin. Insulin is secreted by the beta cells in islets of Langerhans that are scattered throughout the pancreas.

The *vascular component* of the diabetes, on the other hand, include accelerated onset of nonspecific atherosclerosis and a more specific microangiopathy that particularly affects the eyes and the kidneys.

Diabetes is of great importance to the dentist as he is in a position that enables him to discover undetected cases of diabetes. Also the dentist should be able to perform dental care and necessary dental treatment for patients already treated for diabetes without endanger their life.

Incidence of diabetes is said to be 2% of population. One half of the patients are unaware that they are diabetic. Four of every five diabetic patients are over the age of 45 years. It is expected that the number of cases of diabetes will increase in the near future. This is because the population is increasing, life expectancy is increasing and the number of obese persons is increasing. In addition patients with diabetes are living longer because of the better medical management. These individuals will have more children who will pass on the disease.

Classical signs and symptoms of diabetes are polyuria, polydepsia and polyphagia together with general weakness and loss of weight. Numbness and tingling of extremities as well as peripheral neuritis (pain in the limbs). There is also frequent occurrence of boils and carbuncles. Oral manifestations of diabetes range from simple, in well controlled cases, to sever in uncontrolled patients. These may include gingivitis, frequent ulceration of oral mucosa, periodontal disturbances and the presence of acetone smell, fruit-like smell, in the breath of sever uncontrolled cases. Table 22 shows a list for the oral manifestations that may be seen in patients with diabetes mellitus.



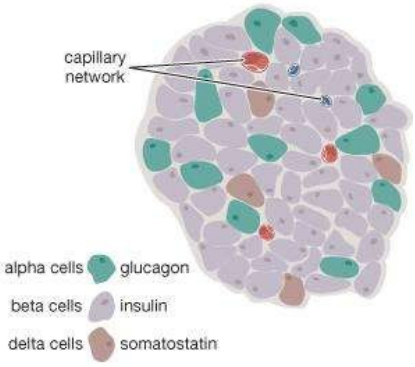


Fig. 5. Anatomical relations of the pancreas. ***Islets of Langerhans****, also called* ***islands of Langerhans****, irregularly shaped patches of endocrine tissue located within the pancreas of most vertebrates. The normal human pancreas contains about 1,000,000 islets. The islets consist of four distinct cell types, of which three (alpha, beta, and delta cells) produce important hormones; the fourth component (C cells) has no known function.*

The most common islet cell, the beta cell, produces insulin, the major hormone in the regulation of carbohydrate, fat, and protein metabolism. Insulin is crucial in several metabolic processes: it promotes the uptake and metabolism of glucose by the body's cells; it prevents release of glucose by the liver; it causes muscle cells to take up amino acids, the basic components of protein; and it inhibits the breakdown and release of fats. The release of insulin from beta cells can be triggered by growth hormone (somatotropin) or by glucagon, but the most important stimulator of insulin release is glucose; when the blood glucose level increases—as it does after a meal—insulin is released to counter it. The inability of the islet cells to make insulin or the failure to produce amounts sufficient to control blood glucose level are the causes of diabetes mellitus. [V. Pancreas, insulin and glycogen]

Complications of diabetes are associated with vascular system and peripheral nervous system. Vascular changes may lead to retinal hemorrhage and renal failure. Nervous complications are usually in the form of neuropathosis which result in pain in the extremities and sometimes pain and burning sensation in the tongue. Diagnosis of diabetes is established by clinical symptoms complex and is confirmed by laboratory tests.

Table 22. Oral manifestations of diabetes mellitus.

- Gingivitis and easily bleeding gingiva.
- Alveolar bone resorption, periodontal lesions and looseness of teeth.
- Xerostomia (dryness of the mouth).
- Oral mucosal ulceration.
- Pulpits in non-carious teeth, thought to be due to arthritis of the pulpal arteries.
- Delayed healing, due to poor circulation as a result of arterial sclerosis.
- Neuritis and burning sensation in the tongue.
- Presence of acetone (fruit-like) smell in the breath of sever uncontrolled patients.

Treatment of diabetes may be by control of diet and physical activity, administration of oral hypoglycemic agents (agents that decrease the blood glucose level) and/or insulin injection. If regulation of diet and physical activities fail to control the blood glucose level hypoglycemic agents are used. Patients with type I diabetes (IDDM) will require insulin administration to control their blood glucose level.

Diabetes may be classified according to the type of treatment the patient is receiving into mild, moderate and sever. Mild diabetes is that which is controlled by diet and physical activity, moderate diabetes is that controlled by hypoglycemic agents while sever diabetes is that controlled by insulin injection. Insulin should be administrated only by injection route as if it is taken orally it will be destroyed by the stomach and intestinal flora. [V. Diapetes and the oral cavity (Part 1) (Part 2) (Part 3)]

Dental Implication

The diabetic patient who is receiving good medical management and has no serious complications, as renal failure, hypertension or coronary atherosclerosis, can receive any indicated dental treatment safely. On the other-hand, mild and moderate diabetic patients can withstand minor surgical procedures without any modification in their treatment plane. However, patients controlling blood sugar level by insulin administration require some modifications in their treatment before subjecting to dental procedures. Accordingly evaluation of diabetic patients is essential before performing any dental treatment to determine if any modifications are required. (Fig. 7)

When local anesthesia is to be used it is advisable not to use adrenaline as a vasoconstrictor as it may elevate the blood sugar level. However, if adrena-

Fig. 6. Multiple periodontal abscesses in case of uncontrolled diabetes.

Fig. 7. The signs and symptoms of of diabetic foot are due to ischemia and neuropathy. The clinical picture is therefore the result of complications stemming from a combination of both. Peripheral neuropathy is the leading cause of most diabetic foot lesions. A majority of patients who enter the hospital because of diabetic foot lesions do so because of ulceration secondary to painless trauma. If the condition was not properly managed gangrene may occur and amputation become a must.

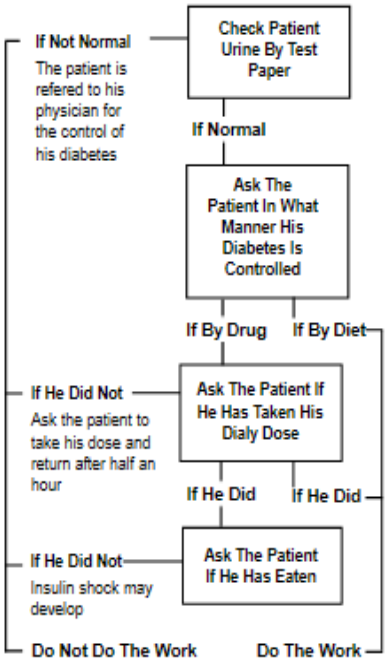


Fig. 8. Diagram for the preoperative evaluation of diabetic patients.

Table 23. Signs and symptoms of insulin shock

Mild

Hunger / Tachycardia / Pallor / Sweating / Weakness / Paraesthesia

Moderate

Uncooperativeness / Lack of judgment / Poor orientation

Sever

Unconsciousness / Tonic or colonic movement / Hypotension / Hypothermia / Rapid weak pulse

line is to be used the concentration should not exceed 1/100,000 and the amount should be limited to what is present in one carpule. It should be known that the use of vasoconstrictor is indicated to decrease the operative and postoperative bleeding. Also the vasoconstrictor help to decrease the postsurgical bacteremia (the presence of bacteria and its toxins in the blood) which is important because the diabetic patient is more susceptible to infection. The best vasoconstrictor to be used is Corbasil or Octaperssin.

It is of prime importance to be sure that the patient has taken his insulin dose as well as his usual meal. This is because the most common office complication to occur with diabetic patients is “Insulin shock or Hypoglycemic coma”. Treatment of this complication is by giving considerable amount of sugar either by mouth, if the patient is conscious, or as intravenous glucose drip, if the patient is unconscious. Fortunately, patients who are about to go into insulin shock will usually tell you and it is easier to manage them during this stage (Table 23). Other potential problems with diabetic patients related to dental treatment are listed in table 24. [D. Insulin shock: Warning signs & Treatment option]

Table 25 shows the dental management of patients with diabetes. Postoperative care of diabetic patients is as important as the preoperative assessment. All measures to guard against the possibility of postoperative bleeding should be performed to insure that the patient is able to eat soon after surgery to avoid hypoglycemia.

Table 24. Potential problems of diabetic patients related to dental treatment.

Uncontrolled patients
- Increased susceptibility to infection
- Poor wound healing (Both are due to arteriosclerosis)

Insulin treated patients
- Insulin shock

Antibiotic therapy pre and post-operatively may be indicated depending on the extent of surgery and the presence of infection. This is because diabetic patients have a lowered body resistance to infection.

Thyroid Gland Diseases

The thyroid gland is located in the anterior portion of the neck just below and lateral to the cricoids cartilage. It consists of two lateral lobes connected together by an isthmus. The thyroid gland develop from the thyroglossal duct. Thyroid tissues may be present any where along the pass of the thyroglossal duct from its origin in the midline in the posterior part of the tongue to the location of the thyroid gland in the neck. (Fig. 5) [D. Thyroid gland]

Table 25. Dental management of patients with diabetes mellitus.

Appointment
- Short and at day time.
- Better to be 1 1/2 to 3 hours after meal.

Patient Assessment See figure 4**.**

Premedication
- Important to prevent excess secretion of endogenous adrenaline.
- Stress free atmosphere.
- Diazepam (Valium) 5-10 mg.

Local Anesthesia
- Vasoconstrictor is a must.
- Adrenaline is better to be avoided, if used concentration is 1/100,000 and amount is only what is present in one carpule.
- Octapressin or Corbasil vasoconstrictor are better to be used.

Treatment Procedures
- Pre- and postoperative antibiotic is a must.
- Local haemostatic measures after surgery.

Drugs used in treatment (Insulin)
- Ask the patient to eat normal meal before appointment.
- Ask the patient to inform you if any symptom of insulin shock occurred.
- Keep sugar in any form at hand to give it to the patient in case insulin shock developed.
- Patients with sever oral infection may require increase of the insulin dose, consult the physician, in addition to aggressive local and systemic management of the infection.

The thyroid gland secretes three hormones which are thyroxin (T4), tri-iodothyronin (T3) and calcetonin. T4 and T3 are hormones that affect the metabolic process throughout the body and are involved with tissue oxygen use. Secretion of these two hormones is controlled by the hypothalamus and the pituitary gland through a negative feedback mechanism. Calcetonin, on the other-hand, is involved together with the parathyroid hormone and vitamin D, in regulating the calcium and phosphorus levels in the blood as well as skeletal remodeling.

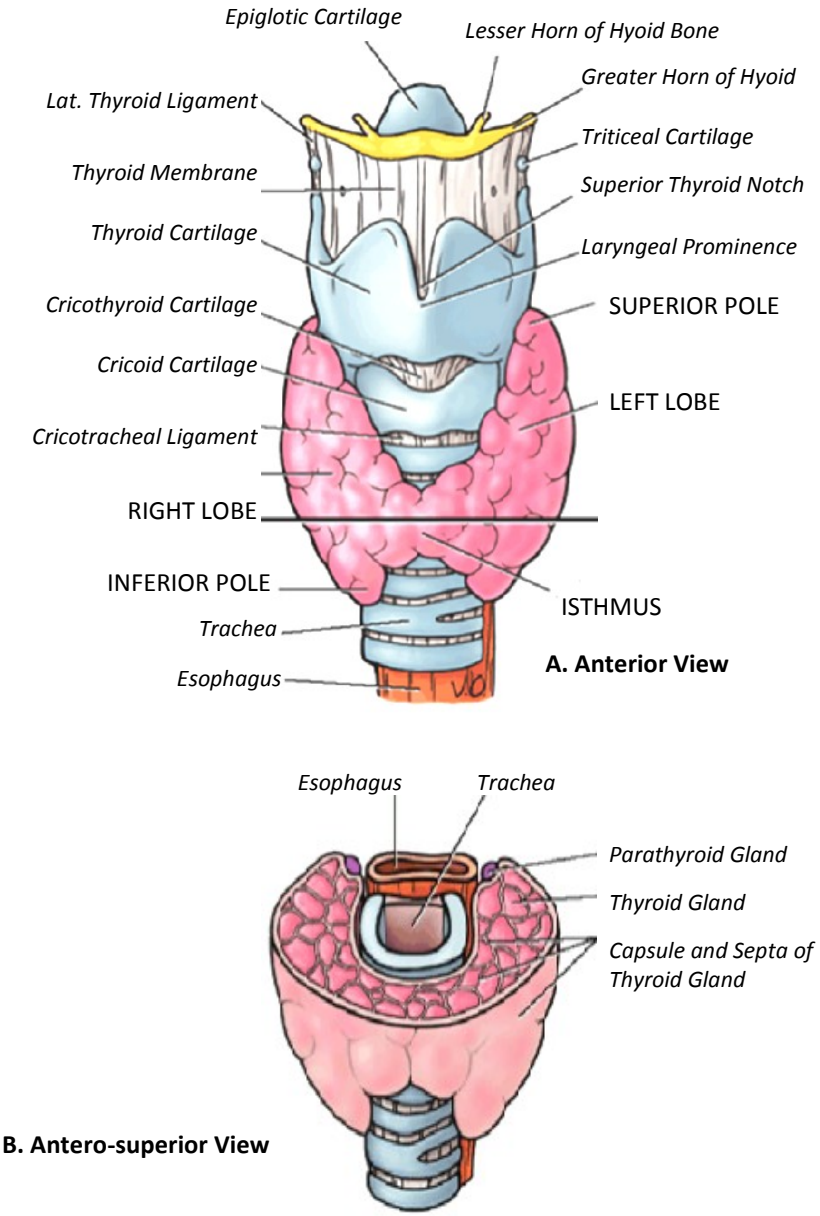


Fig. 9. Thyroid Gland and its anatomical relations.

Hyperthyroidism

Fig. 10. Patient with hyperthyroidism (thyrotoxicosis). Note the tension in the face, the sweatiness of the skin, the exophthalmos and lid retraction of the both eyes. Lid retraction and proptosis of the eye can be noticed.

The term hyperthyroidism or thyrotoxicosis refer to the excess secretion of T4 and T3 in the blood. This may be caused by ectopic thyroid tissues, multi-nodular goiter, thyroid adenoma, pituitary diseases or, much more common, due to Grave's disease or toxic goiter. Grave's disease or toxic goiter is due to the presence of immunoglobulin G, called long acting thyroid stimulator (LATS), in the blood. The presence of LATS in the blood leads to excessive secretion of T4 and T3. The disease was reported to have some familiar tendency for transmission and is much more common in females than males, ratio is 7/1. The disease may manifest it self at puberty, pregnancy or menopause. Generally the thyrotoxic patient is nervous, emotionally unstable, lose his temper easily and cry often. The patient can not set still and is always moving. Medical treatment involves the use of antithyroid agents, that block hormones synthesis, or subtotal thyrodectomy. If exophthalmos is present it is usually irreversible.

Dental Implication

Patients with thyrotoxicosis whom are not properly managed during the dental treatment or who have their disease not under good medical control may develop thyroid crisis in the dental office. Thyroid crisis is a serious condition that needs immediate and vigorous treatment. Stressful conditions, sever infection and adrenaline administration are among the factors which may precipitate the thyroid crisis. Signs and symptoms of thyroid crisis are listed in table 26. Immediate treatment of

Table 26. Thyroid crisis, precipitating factors, signs and symptoms and management.

Precipitating Factors

- Stressful situations.
- Sever trauma.
- Sever infection.
- Adrenaline and other vasopressors.
- Atropine administration.

Signs And Symptoms

- Extreme restlessness.
- Nausea and vomiting.
- Abdominal pain.
- Fever.
- Profuse sweating.
- Tachycardia.
- Coma.
- Sever hypotension.
- Finally death.

Management

- Large doses of antithyroid drugs.
- Hydrocortisone.
- Intravenous glucose.
- Oxygen administration.
- Cooling to decrease temperature.

thyroid crisis include large doses of anti-thyroid drugs, hydrocortisone and intravenous glucose solution (Table 26).The dentist should consider the clinical examination of the thyroid gland as part of the head and neck examination performed for every patient. This will enable the dentist to detect any undiagnosed and poorly controlled cases of thyrotoxicosis. Dental management of patients with thyrotoxicosis are listed in table 27.

Hypothyroidism

Generally hypothyroidism is a rare condition. Myxoedema or Myxedema, which is the adult form of the disease is five times more common in females, most often between 30-40 years of age. Cretinism, on the other-hand, is hypothyroidism which occur in childhood.

Table 27. Dental management of patients with thyrotoxicosis.

Uncontrolled or poorly controlled patients

- No treatment except palliative for pain control and antibiotic to prevent sever infection.
- Refer for medical treatment and control.

Patients with controlled thyrotoxicosis

Medical Consultation

- To evaluate the current stage of the patient.

Appointment

- Short to avoid fatigue.
- **Premedication**
- Sedative and tranquilizers are essential to:
  - Ally fear and apprehension.
  - void over secretion of endogenous adrenaline.

Local Anesthesia

- Avoid adrenaline and similar vasopressors sympathommetic drugs.

General Anesthesia

- Better when possible as it decrease the psychic trauma.

Drugs Used In Treatment

- Antithyroid drugs may produce leucopenia and aplastic anemia so white cell count is essential before surgery.

Surgical Procedure

- Should be as atraumatic as possible.

Thyroid Crisis, If Developed

- Cool the patient using wet packs, ice, fan .
- Give oxygen.
- Transfer the patient to hospital immediately, better by an ambulance.

Hypothyroidism may be congenital or acquired. The acquired form may follow the thyroid gland or pituitary gland disorders, such as thyroid radiation or surgery and excessive antithyroid drug therapy. Some cases occur without any detectable causes. Tables 28 shows the most common signs and symptoms of cretinism and myxedema.

Table 28. Signs and symptoms of hypothyroidism.

Cretinism

- Dwarfism and overweight.
- Broad flat nose and eyes set apart.
- Thick lips and large tongue.
- Delayed eruption of teeth and malocclusion.
- Delayed bone age.
- Hoarseness of voice.
- Umbilical hernia.
- Mental retardation.

Myxedema

- Dull facial expression.
- Puffy eyelids.
- Alopecia.
- Dry rough skin.
- Enlarged tongue.
- Hoarseness of voice.
- Slowing of physical and mental activity.
- Increased sensitivity to cold.
- Increased capillary fragility.
- Muscular weakness.
- Deafness

Fig. 11. Hypothyroidism in adult, Myxedema. Note the dry puffy facial appearance and the coarse hair. Note also the thinning of the lateral eyebrows. Typically women with hypothyroidism had a slow hoarse deep voice and lassitude (state of feeling tired in mind or body).

Fig. 12. untreated congenital hypothyroidism, Cretinism. Note the presence of macroglossia, large frontanelles, and course facial features.

Hypothyroid coma may be precipitated by stress, trauma, operations, central nervous system depressant and sever infection. It is more liable to occur in old age patients and is more common during winter, i.e. cold weather, and has a high mortality rate. Signs and symptoms of hypothyroid coma are hypothermia, bradycardia, sever hypotension and convulsions. Medical management of patients with hypothyroidism involve the administration of synthetic thyroid hormone or thyroprotein derived from animals thyroid gland.

Dental Implication

Patients with mild hypothyroidism who are receiving no medical care generally presents no risk during dental treatment. On the other-hand, those with sever hypothyroidism and are not medically controlled may present serious or even fatal complications during dental treatment. This is particularly true in case of old age patients. Remember that Myxoedema or hypothyroid coma may be immediately fatal. Accordingly, the dentist should be able to detect patients with undiagnosed Myxoedema and refer them for medical management before any dental treatment is performed.

Table 29. Dental management of hypothyroid patients.

Uncontrolled Patients Emergency management only

- Analgesics for pain control but no narcotics.
- Antibiotics for control of infection.
- Immediate referral to physician for medical control.

Uncontrolled Cases

- Avoid oral infection.
- Avoid central nervous system depressants.

Detection And Management of Early Stages of Myxoedema Coma

- Hydrocortisone.
- Artificial respiration.
- Transfer the patient to hospital. **Controlled Cases** • Avoid oral infection.
- Routine dental care can be done.

On the other-hand, cases of Cretinism are very important to be detected early in life as early medical management can prevent the mental retardation ,which occur in these cases, as well as delayed eruption of teeth, tongue enlargement and skeletal growth retardation. In cases of hypothyroidism under good medical control no specific problems are presented during dental treatment. Table 29 shows the dental management of hypothyroid patients.

As a general rule cases with uncontrolled or poorly controlled thyroid diseases, hypo- or hyper-, only emergency dental treatment is to be performed. These are antibiotics for control of infection and analgesics for pain control in addition to the important strategy of doing only the necessary work.

Hyperparathyroidism

Increased activity of parathyroid gland is usually due to tumor in the parathyroid gland. Increase secretion of parathyroid hormone result in a syndrome named von Recklenghausen's disease of bone. There well be:

- Loss of minerals from bones which become softer, fragile and more liable for fracture.
- Elevated blood level of calcium and phosphate
- Increased tendency of renal stone formation.
- Formation of brown nodes of hyperparathyroidism which when occur in bone predispose to fracture. Bone lesions is termed “Osteitis Fibrosa Cystica”.
- The loss of bone result in the radiopaque teeth standing out in contrast to the relatively radiolucent jaw.
- The loss of distinct lamina dura and the granular texture of the bone is characteristic especially in periapical films. (Fig. 13)

Fig. 13. In advanced cases of hyperparathyroidism large regions of bone are replaced by connective tissues containing giant cells. This is termed “Ostetis Fibrosa Cystica” (upper). Radiographic picture is characterized by loss of lamina dura around the roots of the teeth.

Hypoparathyroidism

Hypoparathyroidism is the combination of symptoms due to inadequate parathyroid hormone production. This is a very rare condition, and most commonly occurs because of damage to or removal of parathyroid glands at the time of parathyroid or thyroid surgery.

Hypoparathyroidism is the state of decreased secretion or activity of parathyroid hormone (PTH). This leads to decreased blood levels of calcium (hypocalcemia) and increased levels of blood phosphorus (hyperphosphatemia).

Hypoparathyroidism can cause hypocalcemia with consequent paresthesias, tetany and seizures. Disorders of ectodermal tissues are also common in these patients. These disorders include alopecia, scaling of the skin, deformities of the nails and dental abnormalities such as enamel. hypoplasia in horizontal lines, poorly calcified dentin, widened pulp chambers, dental pulp calcifications, shortened roots , hypodontia and mandibular tori as PTH af-

fects rate of eruption, formation of the matrix and calcification. A delay or cessation of dental growth and development, chronic candidiasis of the oral mucosa and nail, paresthesia of the tongue or lips and alteration of the facial muscles can occur. (Table 29.)

Table 30. Oral manifestations of patients with parathyroid gland disorders.

HYPERPARATHYROIDISM	HYPOPARATHYROIDISM
Dental abnormalities: • Widened pulp chambers • Development defects • Alterations in dental eruption • Weak teeth • Maloclussions **Brown tumor** **Loss of bone density** **Soft tissue calcifications**	**Dental abnormalities:** • Enamel hypoplasia • Poorly calcified dentin • Widened pulp chambers • Dental pulp calcifications • Shortened roots - • Hypodontia • Delay of dental development **Mandibular tori** **Chronic candidiasis** **Paresthesia of the tongue or lips** **Alteration in facial muscles**

These patients have more susceptibility to caries because of dental anomalies. Dental management will be the prevention of caries with periodic reviews, advice regarding diet and oral hygiene instructions. Before performing dental treatment, serum calcium levels should be determined. They must be above 8mg/100ml to prevent cardiac arrhythmias, seizures, laryngospasms or bronchospasms.

Supra-Renal Gland “Adrenal Insufficiency”

The adrenal or suprarenal glands are bilaterally located at the superior lobe of each kidney. Each gland is formed of two parts an inner part called medulla and an outer part called cortex. The adrenal cortex secretes large number of hormones collectively called “Steroids”, while the adrenal medulla secretes “Adrenaline”. Of the steroids the most important ones are “Cortisone” and “Hydrocortisone”. Normal production of these two hormones is 10-30 mg/day, but the amount increases significantly in stressful situations as fear, trauma, surgery and infection. (Fig. 12) [D. Adrenal glands]

There are two forms of adrenal insufficiency, primary and secondary. The primary type is not common and is due to disorders of the adrenal or the pituitary glands. This form of the diseases is called “Addison's Disease” and is characterized by progressive atrophy or destruction of the adrenal glands, usually due to chronic granulomatous disease as tuberculosis for example. Also there is an idiopathic form of adrenal destruction, which is suggested to have an autoimmune background. [V. Addison’s disease]

Secondary adrenal insufficiency, on the other hand, is far more common. The most common cause is chronic administration of corticosteroids which

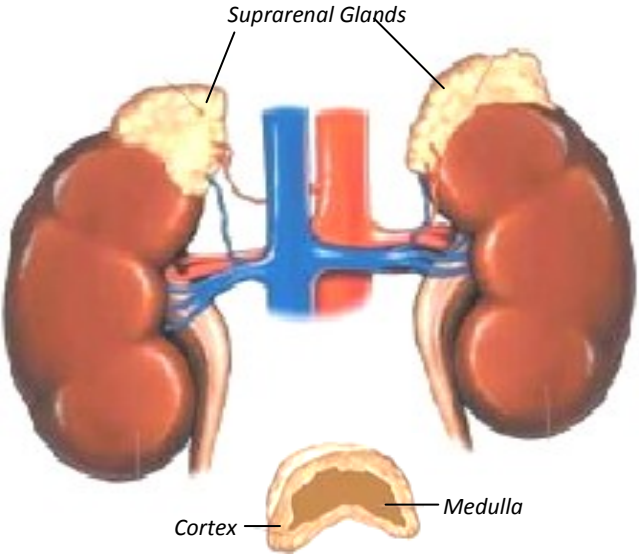


Fig. 14. the supra-Renal Glands. Cross Section of the gland (lower)
[V. Adrenal gland explained clearly-1] [V. Adrenal gland explained clearly 2]

results in suppression of normal corticosteroids production. Corticosteroids are used in the treatment of many diseases as rheumatoid arthritis, asthma and many autoimmune and dermatological diseases. Although corticosteroids are not curative yet there palliative effect is extremely useful and serve as a good adjunct in management of diseases not emendable to curative treatment.

Clinically the signs and symptoms of primary adrenal insufficiency are weakness, skin and mucosal pigmentation, hypotension, anorexia and loss of weight. More important is that if the patient is subjected to any stressful situation as surgery or infection adrenal or Addison crisis may be precipitated. Signs and symptoms of adrenal crisis are listed in table 29. Secondary adrenal insufficiency, resulting from prolonged use of corticosteroids, usually present no symptoms at early stage of the disease. However, if the patient is subjected to stressful situation and does not have adequate corticosteroids in his blood, adrenal crisis will develop. Treatment of Addison's disease is by giving the deficient hormones. Patients with adrenal crisis requires vig-

Table 31. Signs and symptoms of adrenal crisis.

- Sever hypotension.
- Dehydration.
- Hyperpyrexia.
- Nausea and vomiting.
- Weakness.
- Headache.

Fig 15. Cushing syndrome, moon-face with erythrema and acne. Compare with the left photo for the same girl taken six months earlier before the onset of the disease. The condition was due to carcinoma in the adrenal gland

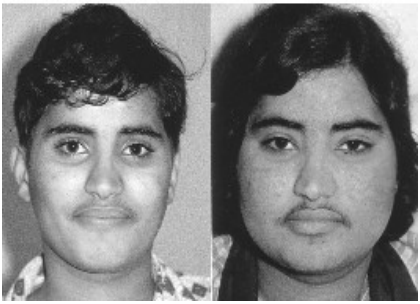


Fig 16. The mooning of the face can be minor. This is especially true following administration of corticosteroids. This patient was under cortisone treatment for Behect's syndrome. Mooning of the face was minor in the beginning (left) then become obvious six months later.

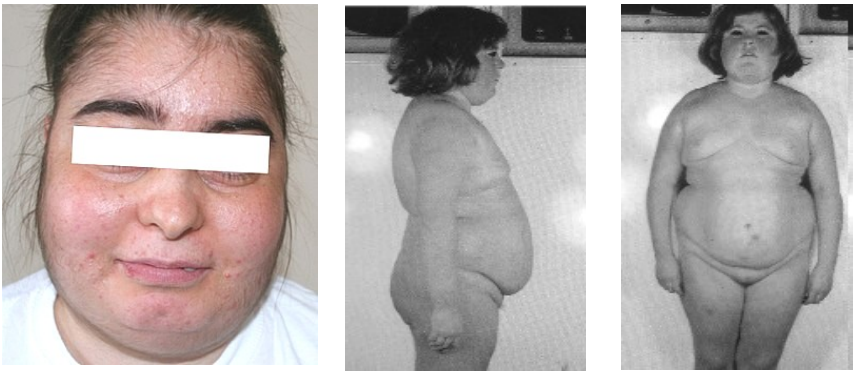


Fig 17. Cushing's syndrome secondary to steroid therapy. Note the round moon face, malar flushing, streia over the abdomen and the back and relative slimness of the legs and buttocks and deposition of fat over the shoulder, upper back and abdomen

orous immediate treatment. Management include fluid and electrolyte replacement, administration of glycol-corticoids and, most important, relief of the underlying stressful condition that precipitated the attack.

Cushing's syndrome and Disease

Cushing's syndrome is a rare condition that occurs when there is excess cortisol in the body. Cortisol is a hormone normally made by the adrenal glands and is necessary for life. It allows us to respond to stressful situations such as illness or injury, and has effects on almost all body tissues. It is produced in

Table 32. Dental management of patients with history of corticosteroid administration.

Patients Taking Corticosteroids
(Duration of drug taking is at least one month)

Up to 20 mg / day
- Most probably such patients do not have suppression, but medical consultation is essential before treating them as normal patients.

Between 20 - 40 mg / day
- Double the normal dose the day of the appointment.
- Major procedures require hospitalization and medical consultation.

More than 40 mg / day
- No additional medication is needed.
- Major procedures require hospitalization and medical consultation.

Patients using topical corticosteroids
- Consult the physician.

Patients With History Of Corticosteroid Administration
- If no corticosteroid had been taken in the last year, treat normally.
- If corticosteroids had been taken in the last year, consult the physician.

Table 33. Emergency dental care for patients with adrenal suppression.

- 100-200 mg hydrocortisone, I.M. one hour before surgery.
- Double the daily dose the day after the operation.

This regimen is used with patients taking less than 40 mg / day and their condition can not wait until regulation of the dose.

varying amounts over the course of the day, most in the early morning, with very little at night.

Cushing's syndrome refers to the condition caused by excess cortisol in the body, regardless of the cause. When Cushing's syndrome is caused by a pituitary tumor, it is called Cushing's disease. Cushing's syndrome is more often found in women than in men and often occurs between the ages of 20 and 40. [V. Cushing's syndrome]

Dental implication

Patients with secondary adrenal suppression do not tolerate stress properly and acute adrenal crisis may develop. The main concern of the dentist, when dealing with such patients, is to prevent the development of the attack. Table shows dental management of patients with history of corticosteroid therapy. Table 30 shows emergency treatment for those patients. ■

Chapter 4

Hematological Diseases

Patients with blood diseases presents challenge to the dentist. Many procedures performed in dentistry may cause bleeding. With normal patients this bleeding is rapidly ceased with normal clotting phenomenon. However, those patients whose ability to control bleeding has been altered may be in great danger if bleeding occurred. On the other-hand, patients with blood dyscrasis may show, in addition to the bleeding tendency, delayed wound healing, increased susceptibility to infection and mucosal ulceration (Table 34). Identifying such patients before performing any dental treatment should be the prim aim of the dentist so as to be able to take precautions that greatly reduces the risk associated with dental treatment.

Table 34. Potential problems associated with dental management of patients with blood diseases.

- Abnormal bleeding.
- Increased susceptibility to infection.
- Delayed healing.

Bleeding And Clotting Phenomenon "Hemostasis"

It is very important for the dentist to be familiar with the normal bleeding and clotting phenomenon or hemostasis. By definition hemostasis is the spontaneous or induced cessation of blood from a rupture in the integrity of the vascular tree. Many factors affects the process of normal hemostasis. These factors are vascular, intravascular and extravascular.

Vascular factors: In normal hemostasis vascular contraction is important to reduce the diameter of the severed vessel thus help in the consolidation of the homeostatic plug formed by the platelets. Disorders of vessels may produce a group of blood diseases called "Purpuras".

Extravascular factors: This factors depends on the integrity and health of all the tissues which surrounds and support the blood vessels. Atrophy of subcutaneous tissues, as in senile purpura, or fragility of the skin, as in Cushing's syndrome, may produce purpuras but the symptoms are not so sever as with intravascular and vascular factors.

Intravascular factors: These are platelets aggregation and blood coagulation. The platelets with there function of adhesion and aggregation form a homeostatic plug, which is sufficient in small vessels to produce hemostasis. In large vessels another function of platelets, clot retraction, takes place to help in closing the rupture vessel. Blood coagulation, on the other-hand, takes place by the action of 13 coagulation factors (Table 35). They are designated in Roman numerals which represents the order of their identification not the order in which each play a role in the coagulation process. Coagulation of blood occurs in three stages. In the first stage activation of thromboplastine takes place, while in the second stage conversion of the inactive enzyme prothrombin (Factor II) into thrombin, by means of thromboplastin occurs. In the third stage the soluble fibrinogen (Factor I) is converted into insoluble fibrin by the action of thrombin formed in stage two.

Table 35. Blood coagulation factors.

I.	Fibrinogen.
II.	Prothrombin.
III.	Thromboplastin.
Iç.	Calcium.
ç.	Proacclerin (Accelerator globulin).
çI.	Factor
çII.	Serum proththrombin.
çIII.	Antihemophilic factor.
IΞ.	Plasma thromboplastin component (Charisma's factor).
Ξ.	Stueart - Prower factor.
ΞI.	Plasma thromboplastin antecedent.
ΞII.	Hegman factor.
ΞIII.	Fibrin stabilizing factor.

Table 36. Normal values for coagulation tests.

- Prothrombin time **(11-14 sec.)**
- Partial prothrombin time**(30-35 sec.)**
- Bleeding time **(1-3 minutes)**
- Clotting time **(5-11 minutes)**
- Platelets count **(140,000-440,000/mm^3)**

Screening Patients For Bleeding Disorders: Clinical laboratory tests used of screening patients with bleeding disorders are clotting time, bleeding time, clot retraction time, prothrombin time, partial prothrombin time and platelets count. Table 36 shows normal values of the most commonly used tests. [V. Overview of hemostasis] [V. Hemostasis - Helpful blood clotting]

Bleeding Disorders

This category of disorders are characterized by increased tendency for bleeding after trivial injuries or surgical procedures. In many of these disorders the resultant bleeding may threaten the life of the patient. Table 37 shows a simple classification for the most common bleeding disorders.

Hemophilia

Hemophilia and Christmas's disease are the most common inherited coagulation disorders. They are inherited as sex-linked recessive character. The

Table 37. Classification of the bleeding disorders according to the underlying etiology.

A. Defect In Coagulation
- Hemophilia.
- Hypoprothrombinemia.

B. Defect In Platelets
- Idiopathic thrombocytopenic purpura.
- Anaphylactoid purpura.
- Ehlars-Danlos syndrome.
- Pesudohemophilia.
- Hereditary Hemorrhagic Telangectasia.

C. Acute Fibrinolytic Activity

D. Hemorrhagic Lesions
- Hemangiomas.
- Arteriovenous aneurysm.

E. Acquired Bleeding Disorders
- Liver diseases (see chapter III).
- Renal failure (see chapter VI).
- Anticoagulant therapy.

Table 38. Signs and symptoms of hemophilia.

- History of sever prolonged bleeding following trivial injury.
- Episodes of hematuria and hematamesis.
- Hemarthrosis (Bleeding in the joint cavity) result in limitation of movement most com-monly occur in large joints as knee joint).
- Screening for hemophilia will show:
- Clotting time prolonged.
- AHG level diminished.

Table 39. Substances used to raise the antihemophilic globulin level

Substance	Raise %	Suitability
Fresh or Frozen blood or plasma	20	• Minor injuries • Single extraction
Human AHG	40	• Moderate injuries • Multiple extractions
Animal AHG	100	• Sever injuries • Moderate surgeries

disease appears only in males and transmitted only by clinically normal females. Hemophilia is caused by deficiency of factor VIII, the anti-hemophilic globulin factor. There are several types of hemophilia which are hemophilia A, B and C. They differ from each other in the underlying deficient blood factor. Clinically the principal symptoms of hemophilia is persistent bleeding on trivial injuries. Table 38 shows signs and symptoms of hemophilia. A study of the patient history will show that the bleeding episodes tends to be grouped and are separated by periods of relative normality. Accordingly, using clotting time test for screening the anti-hemophilic globulin (AHG) level in blood, these periods of relative normality can be detected. Any necessary dental treatment should be performed in one of these periods Treatment of hemophilia is essentially by replacing the detected missing blood factor. However, it is possible to render the patient relatively normal, if surgery is to be performed, by raising the AHG level in the blood. This can be achieved only temporary by administration of a variety of substances. Unfortunately all these substances have very short duration. For example the half-life of the human AHG is about 12 hours, 24 hours after administration its level will drop to 1/4 the initial level. Table 39 shows the substances which are used to raise the AHG level..

Table 40. Dental management of patients with hemophilia.

Hospitalization
- Preoperatively and until 5 days have elapsed free from bleeding postoperatively.

Anesthesia
- General anesthesia may cause throat bleeding during intubation.
- Mandibular injection is contraindicated as it may cause sever bleeding into the pterygomandibular and/or the parapharyngeal spaces.
- Infiltration anesthesia may cause bleeding at each needle puncture.
- Interperiodental anesthesia is the best to be used.

Surgery
- Every effort to avoid surgery should be done and when performed it should be as traumatic as possible.

Local Homeostatic Measures
- See table 4-8

Postoperative Analgesics
- Aspirin and similar drugs should be avoided as it impairs the platelets function.

Postoperative Instructions
- Absolute rest.
- Soft diet.
- No hot food or drinks.
- No smoking.
- Avoid excessive talking.
- Avoid eating on the side of surgery.

Table 41. Local haemostatic measures for hemophilic patients.

Splints
- Preoperatively constructed to protect the blood clot from any disturbances postoperaively.

Sutures
- Contraindicated no suture should be taken, squeezing of the socket is enough as bleeding may occur from the needle puncture.

Pressure Packs
- Small gauze is placed over the socket and gentle pressure is applied and maintained until coagulation occur.

Increasing Clot Stability
- Booster dose of AHG, given daily until the patient is free from bleeding for 5 days.
- Application of Epselon aminocarporic acid.
- Application of Tranexamid acid, reduces the activity of any formed plasmin.

Dental Implication

Generally every effort should be performed to avoid surgical procedures in hemophilic patients. Root canal therapy should always be considered instead of extraction. When surgery is mandatory, hospitalization of the patient preoperatively and for five days, free from bleeding, postoperatively is a must. Table 40 and 41 show the dental management of hemophilic patients.

Acute Fibrinolytic Status

The fibrinolytic enzyme system (Plasminogen) normally present in plasma, is in a state of equilibrium with the coagulation system. The coagulation system form the fibrin plug to seal any rupture in the vascular tree, the fibrinolytic system, on the other-hand, remove this plug after the endothelial repair of the cut vessel is completed. Any increase in the fibrinolytic activity leads to excessive bleeding. Antiplasmin or plasmin inhibitor is another protein present in the plasma and is responsible to destroy any formed amount of plas-

Table 42. Signs and symptoms suggestive for central hemorrhagic lesion.

- History of hemorrhage from the gingival crevice around the teeth.
- Teeth mobility.
- Palpable thrill over the lesion.
- Pain and parathesia may be present.
- Change in the color and contour of the overlying tissue.
- On aspiration pure blood comes out in endless amount.
- Radiographic signs:
  - Multiple radiolucencies.
  - Erosion of the roots of the teeth.

Table 43. Management of accidental extraction of a tooth with roots in central hemangioma.

- Immediately replace the tooth into the socket to serve as a stopper.
- Transfer the patient to the nearest hospital.

min, but only if in small amount. Antiplasmin can not destroy large amounts of plasmin. Treatment of this condition is by giving Episelon Aminocarporic Acid, and antifibrinolytic substance, together with repeated blood transfusion.

Hemorrhagic Lesions

There are two entities that constitute absolute contraindication for exodontia and surgery. These are arteriovenous aneurysm and central and peripheral hemangioma. Removal of teeth or performing surgery within the territories of these two lesions carry the risk of sever hemorrhage that may be fatal. Death in this case is usually due to hypovolamic shock. For these reasons every effort should be performed to detect such lesions preoperatively. Table 42 is a list of some signs and symptoms suggestive for the presence of central hemangioma. On the other-hand, aspiration should be done for every central radiolucency, when in doubt, before performing any invasive surgical procedure. If the cortical plate is thick and the needle cannot go through it, it can be thinned by a round bur to allow the passage of the needle. Table 43 shows management of accidental extraction of a tooth whose roots are in a central hemangioma.

Blood Dyscrasis

The hemolytic disorders discussed here are grouped according to the cell type involved. Obviously not all blood diseases are included. However, the most common blood dyscrasis that have oral manifestations and important dental implication are included (Table 44).

Anemia

By definition anemia is abnormal reduction of the red blood cells, the quantity of hemoglobin and the volume of packed blood cells in the blood. Anemia may be classified according to the etiologic factors (Table 45) or according to the morphology of the red cells. Morphological classification express the characteristic changes in size and hemoglobin content of the red cells.

Table 44. Classification of blood dyscrasias.

Diseases Of Red Cells

A. Anemia

- Pernicious anemia.
- Aplastic anemia.
- Erythroblastic anemia.
- Sickle cell anemia.

B. Polycythemia

Diseases Of White Cells

A. Leukopenia

- Agranulocytosis.

B. Leukocytosis

- Infectious mononucleosis.
- Leukemia.

Diseases Of Platelets

A. Purpura

- Nonthrombcytopenic.
- Thrombpocytopenic.

B. Thrmbocythemia

Table 45. Etiological classification of anemia.

Blood Loss

- Post-hemorrhagic anemia.

Excessive Destruction of red cells Impaired Production Of Red Cells

- Sickle cell anemia.
- Pernicious anemia.
- Iron deficiency anemia.

Inadequate Production Of Mature Red Cells

- Aplastic anemia.

Table 46. Oral manifestations of prenicious anemia.

Glossitis

- Painful and burning tongue.
- Tongue is beefy red in color.
- Aphthus like ulcers in the tongue.
- Smooth tongue due to atrophy of papillae.
- Loss or distortion of taste.

Stomatitis

- Inflammation and burning sensation of oral mucosa.

A. **Pernicious Anemia:** It is relatively common chronic disease. The exact cause of the disease is not known. Absence of the intrinsic factor from the gastric juice due to atrophy of the gastric mucosa has been suggested as an etiological factor. The intrinsic factor is a substance normally present in the gastric juice and is responsible for intestinal absorption of vitamin B12 which is essential for normal erythropeotic function. Clinically the condition occurs mostly above 30 years of age and affects males more than females. The disease characterized by the presence of a triad of symptoms which are general weakness, sore painful tongue and numbness and tingling of the extremities. In some cases the painful sore tongue may be the first symptom of the disease. Oral manifestation of pernicious anemia are shown in table 46. Treatment of the condition is by administration of vitamin B12 and folic acid.

B. **Aplastic Anemia:** In this type of anemia there is general lack of bone marrow activity which may affect, not only the red cells, but also the white cells and the platelets resulting in pancytopenia. The disease may be primary or secondary. The primary form occurs usually in young adults and has an unknown etiology and is usually fatal. Secondary aplastic anemia on the other-hand is due to exposure of the patient to certain

drugs, chemicals or radioactive isotopes.

Clinically there are sever weakness, dyspnea, pale skin, numbness of extremities, petechia (due to decreased platelets count) and increased susceptibility to infection due to neutropenia (decreased in number of neutrophilis). Oral manifestations are shown in table 47. It should be remembered that in aplastic anemia all the blood elements are diminished. Treatment of primary aplastic anemia is non-specific. The rapid fatal course of the disease may be attenuated by administration of antibiotics and repeated blood transfusions. In secondary aplastic anemia the removal of the underlying causative agent in addition to supportive therapy is the line of treatment.

Table 47. Clinical manifestation of aplastic anemia

Oral Manifestations

- Petechia
- Purpuric spots
- Hematomas
- Gingival bleeding

....These are due to platelets deficiency...

- Multiple ulcerative lesions
- Decreased resistance to infection .

...These are due to neutropenia .....

General Manifestations

- Sever weakness
- Dyspnea
- Pallor of skin

.....These are due to red cell deficiency....

C. **Erythroplastic Anemia:** It is a hereditary disease, also called Cooley's disease or Thalassemia. It affects most commonly persons from Italian, Greek, Syrian and Armenian races. The disease is characterized by the presence of abnormality in the protein part of the hemoglobin molecule. Accordingly, the red cell can not function normally. Other symptoms include spleenomegaly and hepatomegaly, generalized weakness and yellowish polar of the skin and mucous membrane. However oral manifestations are very little and nonspecific. Children inheriting the disease from both parents are severely affected, "Thalassimia Major", and those inheriting the disease from only one parent are usually symptom free. Radiographic skeletal changes of thalassimia are very characteristic. Treatment of the disease is nonspecific and consists of repeated blood transfusions.

D. **Sickle Cell Anemia:** It is a hereditary disease affects Negroes and whites of Mediterranean origin. The disease is characterized by the production of an abnormal type of hemoglobin, called sickle cell hemoglobin (Hbs), in the red cells. The abnormal Hbs becomes insoluble when the blood becomes deprived from oxygen and precipitate forming elongated crystals within the red cells. Precipitation of these crystals within the red cells result in their distortion to the characteristic sickle or crescent like

shape. Sickle cells are rapidly removed from the circulation leading to anemia. The disease is more common in females and usually manifested before the age of 30 years. Clinical features of the disease are general weakness, fatigue and pain in the extremities. Oral manifestations are nonspecific and are mainly radiographic similar to those of thalassimia. Treatment of the disease is also nonspecific and consists mainly of repeated blood transfusions. [D. Skill cell disease]

E. **Iron Deficiency Anemia:** This type of anemia occurs mainly in females. Generally the deficiency of iron may be due to chronic blood loss (as in profuse menstruation), inadequate dietary intake, faulty iron absorption and increased requirements of iron as in cases of pregnancy. Clinically, Plummer-Vinson syndrome is one manifestation of iron deficiency anemia. Presenting symptoms of anemia and the syndrome are shown in table 48. It has been reported that the disease result in atrophy of mucous membrane of upper elementary tract which predispose to carcinoma in this tissues. Treatment of this type of anemia is by administration of iron therapy and giving high protein diet.

Table 48. Clinical manifestations of iron defficiency anemia and Plummer-Venson Syndrome

- Cracks or fissures at the corner of the mouth
- Paler of skin and mucous membranes
- Smooth painful tongue with atrophy of filliform papillae
- Dysphagia

Polycythemia

Polycythemia is an abnormal increase in the number or red blood cells. Three forms of the disease has been recognized which are relative polycythemia, primary polycythemia and secondary polycythemia.

Relative polycythemia is an apparent increase in the number of red blood cells that is only relative and the total blood volume is not increased, so it is not a true polycythemia. In primary polycythemia on the other-hand, there is actual increase in the number of circulating red blood cells. Etiology of primary polycythemia is not known. Secondary polycythemia, or polycythemia vera, is similar to the primary form but the cause is known. Generally the cause

Table 49. Clinical features of polycythemia.

General Features

- Headache, dizziness and tinnitus.
- Fatigue and visual disturbances.
- Mental confusion.
- Splenomegaly.
- Skin is flushed and reddened.

Oral Features

- Mucosa is deep purplish red in color.
- Gingiva bleeds easily.
- Petechia, ecchymosis and hematomas.

of the secondary polycythemia is either bone marrow anoxia or over production of erythropoetic stimulator factor. Clinical features of polycythemia vera are shown in table 49.

Table 50. Drugs that may cause agranulocytosis and oral manifestation of agranulocytosis.

Drugs That May Cause Agranulocytosis

- Barbiturates.
- Chloramphenicol
- Sulfonamides.

..Most persons can be exposed to these drugs with no adverse reaction, in fact the hematological reaction is uncommon.

Oral Manifestations

- Narcotizing ulceration of the oral mucosa.
- Ulcers are covered with gray membrane.
- Gingival bleeding.
- Excessive salivation.

Leukopenia - Agranulocytosis

Leukopenia or agranulocytosis is abnormal reduction in the number of white blood cells in the peripheral blood. The disease affects often the granulocytes (Polymorphnuclear leukocytes - PNLs) yet any type of white cell may be affected. The white cell count may reach as a 2000/mm^3 (normally it is 2.6-9.6 millions/mm^3) with an almost complete absence of PNLs. The red cells and platelets counts are normal, however, occasionally anemia may be present. Agranulocytosis may be primary or secondary depending on whether the cause is known or not. The most common cause of secondary type is drug administration (Table 50). Clinically the disease affects most commonly adult females. Also the disease frequently affects workers in health professions as physicians, dentists, nurses and pharmacists most often due to the injudicious use of drugs which they can achieve easily. The most common and characteristic feature of the disease is the presence of infection especially in the oral cavity. Description of the oral lesions is shown in table 50. Due to the increased susceptibility to infection any surgical procedures, including single tooth extraction, is not recommended. Administration of antibiotics should be considered when surgery is essential.

Leukocytosis

Leukocytosis is an abnormal increase in the number of white blood cells. It is considered to be manifestation of the reaction of the body to a pathological situation. Table 51 shows some of the common condition that result in an increase in the number of white blood cells, i.e. leukocytosis.

Table 51. Common causes of lekocytosis.

- Acute infection.
- Uremia.
- Leukemia.
- Spleenectomy.
- Allergic disorders as asthma.

A. **Infectious Mononucleosis:** This disease occurs chiefly in children and young adults. The dis-

ease is caused by Epestien-Bar virus, a herpes like virus, which is the same virus suggested to be the etiological factor of Burkitt's lymphoma and lymphoplastic leukemia. The mechanism of transmission of the disease is not well known. One important mean of transmission, however, is thought to be through deep kissing or intimate oral exchange of saliva. hence the name "Kissing disease".

Clinically there are fever, sore throat, headache, chills, cough, nausea or, sometimes vomiting and lymphadenopathy. The cervical lymph nodes are usually the first to enlarge followed by the axillary and the groin nodes. Oral manifestations consists chiefly of acute gingivitis and stomatitis. Table 52 shows pharyngeal and oral manifestations of the disease. Treatment of mononucleosis is nonspecific. The disease usually runs its course for about 2-4 weeks and complications are very rare.

Table 52. Pharyngeal and oral manifestation of infectious mononucleosis.

- Sore throat and pharyngitis.
- Tonsillitis.
- Acute stomatitis and gingivitis.
- Palatal petechia.
- Mucosal ulcerations.

B. **Leukemia:** Leukemia is characterized by over production of white blood cells which appear in the peripheral blood in an immature form. The white blood cell proliferation is so uncoordinated and independent that the condition is considered a malignant neoplasm. The disease has high mortality rate. Depending on the type of white blood cell involved the disease may be classified into myeloid, lymphoid and monocytic leukemia. Another classification based on the clinical course of the disease is acute, subacute and chronic leukemia. The etiology of the disease is not known, however, many factors has been suggested. These include viral infection (Epstien-Bar virus) and chromosomal abnormality. Clinical features of leukemia is almost the same in all morphological types. In acute leukemia the onset is sudden and there is lymph node enlargement, splenomegaly and hepatomegaly, as well as, enlargement of the salivary glands and

Table 53. Leukemia, classification and oral manifestation.

Classification

- Myeloid leukemia, cell involved is granulocyte.
- Lymphoid leukemia, cell involved is lymphocyte.
- Monocytic leukemia, cell involved is monocytes.

Oral Manifestations

- Gingivitis and gingival hyperplasia.
- Easily bleeding gingiva.
- Purpuric lesions on the oral mucosa.
- Sever oral ulcerations.
- Rapid loosening of teeth due to necrosis of the periodontal ligament.

the tonsils. Enlargement of spleen, liver, lymph nodes and salivary glands is due to infiltration with leukemic tissues. Destructive lesions of bone may be seen in some cases. Acute leukemia is more common in children while chronic leukemia most often seen in adults of middle age and old. Oral manifestation are more common in acute leukemia and consists mainly of gingivitis and gingival hyperplasia. Table 53 is a list for oral manifestations seen in cases of acute leukemia.

Purpura

Purpura is a purplish discoloration of skin and mucous membranes due to spontaneous extravasation of blood. It is not a disease by itself but rather a symptom for some disease process. Purpura may be due to deficient or defective blood platelets or increased capillary permeability (Table 54).

Thrombocytopenic Purpura: In this disease there is abnormal decrease in the number of circulating platelets. Two basic forms of the disease are recognized, primary and secondary. The primary type is of unknown etiology while the secondary type is due to wide variety of factors. These include meningeococcal infection, scarlet fever, leukemia and drug sensitivity. The disease usually occurs before the age of 30 years and the clinical picture of both primary and secondary types are almost identical.

The clinical features of the disease are mainly due to spontaneous hemorrhage in different areas and organs of the body. This leads to petechia, ecchymosis and even hematoma formation on skin and mucous membranes, epistaxis, hematuria and hematemesis. Oral manifestations of the disease are shown in table 54. Tendency for excessive bleeding contraindicates any surgical procedures, including a single tooth extraction. This is because although the coagulation time is normal the bleeding time is greatly prolonged.

Table 54. Purpura, classification and oral manifestations.

Classification

- Nonthrombocytopenic Purpura *(Due to vascular abnormalities*)
- Thrmbocytopenic Purpura *(Due to platelets deficiency*) AND
- Primary purpura (Cause is unknown).
- Secondary Purpura (Cause is known).

Oral Manifestation Of Thrombocytopenic Type

- Spontaneous sever profuse gingival bleeding.
- Petechia and ecchymosis of the oral mucosa.

Dental Implication Of Blood Diseases

The prime aim of the dentist should be the detection of the patient who might have a blood disorder. The dentist should be alert for the signs and symptoms that are suggestive for blood disorders. Also the dentist should be able to screen the patient

Table 55. Dental management of patients with blood dyscrasias.

Detection Of Undiagnosed Cases
- History and clinical examination.
- Screening laboratory tests.

Medical Consultation
- To reveal the current status of the patient.
- Discuss the dental treatment plane.

Routine Dental Care
- Should not be done in patients with acute symptoms or uncontrolled diseases.

Surgical Procedures (Including Scaling)
- Test for bleeding time and clotting time the day of surgery.
- If normal do the surgical work, but give antibiotic to prevent postoperative infection.
- If not normal do emergency treatment and refer to physician.

Emergency Dental Care
- Symptomatic treatments for oral ulcers.
- Antibiotics for infection. • Mouth washes.
- Strong analgesics for pain.

using the appropriate laboratory test. Screening tests should include a complete blood picture that shows red cell count, white cell count, hemoglobin percentage, hematocrite value and platelets count. If any value is found to be abnormal medical consultation is a must. Generally potential problems that may arise during the dental management of patients with blood diseases are the possibility to infection and slow delayed healing of wounds. Also patients with sickle cell anemia may develop serious crisis if subjected to reduced level of oxygen in their blood (see sickle cell anemia). Therefore, general anesthesia in the dental clinic for those patients is contraindicated. Table 55 shows dental management of patients with blood dyscrasis. ■.

Chapter 5
Renal Diseases "Renal Failure"

End stage renal condition, renal failure, is not a disease by itself, but rather a result of some underlying pathological condition. In renal failure there is bilateral progressive and chronic deterioration of nephrones, that result in uremia and finally leads to death. The severity of the condition and the rate of destruction of the nephrones depends on the underlying causative factor. However the cause remains unknown. The most common causes of renal failure are nephrosclerosis, diabetic nephropathy, drug induced nephropathy, obstructive uropathy and hypertension. Figure 16 shows a longitudinal section through the left kidney.

Table 56. Signs and symptoms of uremia.

- Psychosis.
- Muscular hyperactivity.
- Anorexia, vomiting and diarrhea.
- Stomatitis.
- Parotitis.
- Amonia-like odor in the breath.
- Hemorrhagic episodes of gastrointestinal tract.
- Echymosis and petechia in skin and mucous membrane.
- Cardiovascular manifestation.
  Hypertension / Pericarditis / Congestive heart failure

Early stages of renal failure is usually asymptomatic except for some laboratory abnormalities. At this stage the condition is called "Renal Insufficiency". As the disease progress their is impaired excretory, endocrine and metabolic functions of the kidneys beyond the compensatory mechanism level. The condition is now frank renal failure. Renal failure result in a syndrome called "Uremia". Clinical manifestation of uremia appear in many organs and systems. The following are the most common manifestations:

- Polyuria (excess amount of diluted urine).
- Azotemia (increase urea level in blood)
- Sodium depletion.
- Acidosis.
- Hyperkalemia (increase potassium concentration in blood).
- Anemia.
- Hemorrhagic tendency.
- Osteodystrophy.

Anemia is one of the most common symptoms of renal failure. It is due to

decreased production of erythropoetin by the kidneys and inhibition of red cell production by the uremic serum which leads also to red cell hemolysis. There is also some changes in production and function of white cells which leads to deterioration of the patient ability to resist infection. Hemorrhagic tendency, on the other-hand, is attributed to defect platelets aggregation and decrease in platelets factor III. Renal osteodestrophy, on the other-hand, refer to the variety of bone changes and disorders that are seen in chronic renal failure. Figure 17 shows the most common signs and symptoms of uremic patients. Medical management of renal failure start with conservative methods that include dietary modification, protein restriction and monitoring of sodium and potassium level in the blood. Also avoidance of nephrotoxic drugs and drugs metabolized mainly in the kidneys is very important. As the condition progress and more nephrones becomes destroyed conservative management is no longer adequate. Artificial filtration of blood in the form of peritoneal dialysis or hemodialysis becomes essential. Peritoneal dialysis is less expensive and less effective than hemodialysis. Kidney transplant is an alternative to hemodialysis. Kidney may be transplanted from either a living donor or cadaver. The most important advantage of kidney transplant is that all the complica-

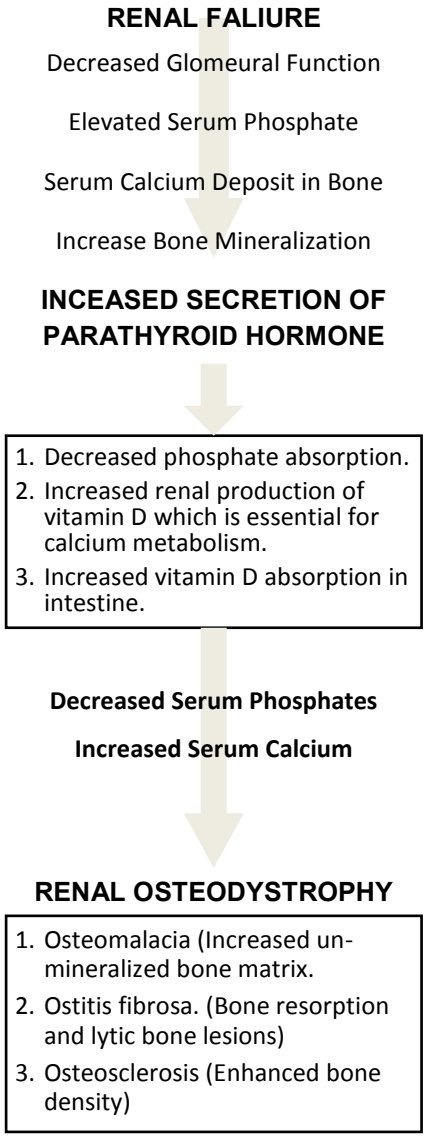


Fig. 17. Sequence of events that result in renal osteodystrophy

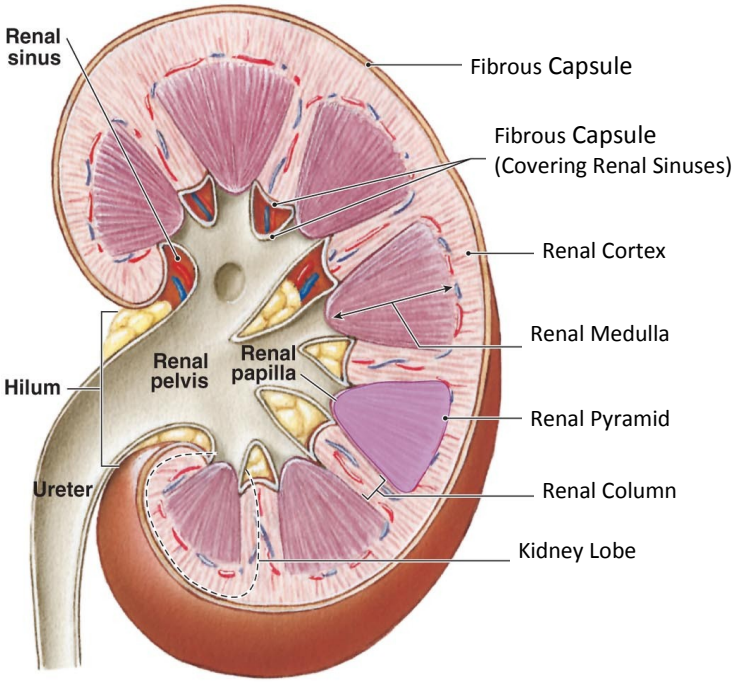


Fig. 18. Diagrammatic view of a longitudinal sectioned kidney

tions of renal failure tends to be reversed.

Dental Implication

From the dental stand point it is much more easier to manage the medically treated patients than those who are receiving hemodialysis or have had kidney transplant. Generally, patients with well controlled renal condition can be safely treated on an outpatient basis. On

Table 57. Potential problems related to dental treatment of patients with renal failure.

- Bleeding tendency.
- Increased susceptibility to infection.
- Adrenal suppression in patients with kidney transplant.
- In hemodialysis patients.
- Endocarditis.
- Hepatitis B infection.
- Problems of anticoagulant therapy.

Table 58 .Dental management of patients with renal failure.

Conservative treatment

- Medical consultation.
- Presurgical evaluation of bleed- ing tendency.
- As atraumatic surgical procedure as possible.
- Avoid nephrotoxic drugs.
- Avoid drugs metabolized in kidney.
- Sever orofacial infection should be hospitalized and aggressively managed.

Hemodialysis

In addition to previous measures

- Antibiotic prophylaxis to guard against bacterial endocarditis.
- No dental treatment at the day of hemodialysis.
- Screening for hepatitis B and treat the patient as potential carrier.

Kidney Transplant

In addition to previous measures

- Consideration of adrenal suppression (Table 4-17).
- Prophylactic antibiotic in surgical patients.

Table 59. Emergency dental treatment for patients with uncontrolled renal failure.

- Medical consultation.
- Only the essential treatment is performed.
- Hospitalization is essential in sever infection and large surgery as multiple extraction.

the other-hand, those with advanced renal failure are better to be treated in a hospital. Table 57 is a list for the potential problems that may arise during the dental management of patients with renal failure. Dental management of patients with renal failure who are conservatively treated, receiving hemodialysis or had kidney transplant are shown in table 58. Emergency dental treatment for patients with uncontrolled renal failure is listed in table 59. ■

Chapter 6

Neurogenic Diseases

EPILEPSY

Epilepsy is the most common neurogenic disorder the dentist may face in his clinic. There are many forms of epileptic seizures, see table 60. The most common and the most important to the dentist are the idiopathic grand-mal seizures.

Table 60. Classification of epileptic seizures.

Partial seizures (Focal and Local)

- Simple partial seizures.
- Complex partial seizures.
- Partial seizures evolving to generalized tonic-colonic spasm.

Generalized Seizures (Convulsive or Non-convulsive)

- Absent seizure (Petit-mal).
- Myoclonic seizure.
- Colonic seizures.
- Tonic-clonic seizures (Grand-mal).
- Tonic seizures.
- Atonic seizures.
- Unclassified seizures.

The pathophysiological disorders that cause the epileptic seizures are an excessive focal neuronal discharge that spread to the thalamic and brainstem nuclei. The cause of this abnormal electrical activity is not known. No specific type of brain lesions is absolutely correlated to the epileptic seizures. The same lesion in the same location may be epileptogenic in some patients and nonepileptogenic in others. Actually, in many cases no pathological lesions could be detected. However, although the underlying cause of epileptic seizures is not known, the attack can be precipitated in some patients by a specific stimulus. The patient may report that his attack usually follows his exposure to certain circumstances, such as flickering light, monotone sound, music or loud noise.

Clinically the seizure is usually initiated by sudden cry which is caused by spasm of the diaphragmatic muscles. This is followed by loss of consciousness and falling to the ground. The tonic phase of the attack consist of generalized muscle rigidity. This is followed by the colonic phase that consists of uncoordinated movements of limbs and head. Within few seconds all convulsive movements stop. The patient then become comatose and then fall in sleep. Within minutes the patient starts to gain consciousness with stopper, head-ache and disorientation. It has to be mentioned that once the attack

started the jaws are clamped tightly and can-not be opened. At termination of the seizure relaxation of the muscles occur and the jaws can be opened. The most serious acute complication of epilepsy is the occurrence of repeated attacks within a short period of time. This condition is called "Status Epilepticus" and it is a medical emergency that may result in permanent brain damage or death.

Medical management of epileptic seizures is essentially by drug therapy, which is actually very successful. The most common anticonvulsant drug used in the treatment of epilepsy is Dilantin (Phenytoin). Table 61 shows a list for the drugs commonly used for the control of grand mal seizures. Frequently it is necessary to use combination of more than one drug for adequate control of the frequency of the attack.

Dental Implication

Through medical history and discussion with the patient, and/or his family, the dentist should be able to reveal many important information about the status of the patient. This includes type of seizures, its frequency and medication taken. Table 62 is a list for dental management of patients with grand-mal seizures.

Table 61. Drugs commonly used for control of grand-mal seizures.

- Dilantin.
- Tegratol.
- Depakene (Valporic Acid).

Table 62. Dental management of patients with epileptic seizures.

Identification of the epileptic case to reveal:

- Type and frequency of the seizures.
- Age of onset.
- Precipitating factors, if known.
- Medication taken.
- Date of last seizure.

II. Patients with controlled seizures:

- Treat nearly as normal patients except for the problem of drug taking (See table 6-4).
- Be always ready to manage a grand-mal seizures if it developed in the dental clinic (See table 6-5).

III. Patients with uncontrolled grand-mal seizures:

- Medical consultation.
- No dental treatment except emergency measures.

Table 63. Common complications associated with anticonvulsant drugs.

Dilantin

- Gingival hyperplasia.

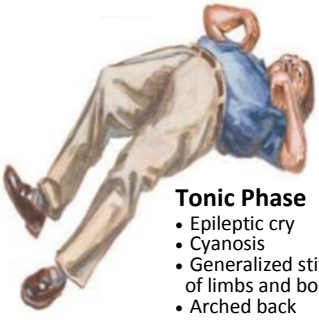
Depakene (Valporic Acid)

- Bleeding tendency.

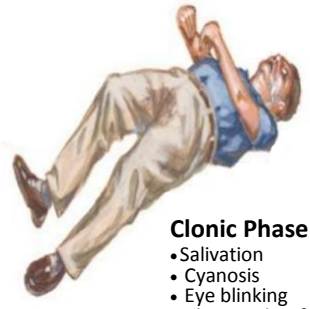
Any drug, adverse reaction consists of:

- Drowsiness and dizziness.
- Slow mentition.
- Ataxia.
- Gastrointestinal upset.
- Allergic signs as rashes and erythema.

Most epileptic patients receive anticonvulsant drugs for control of their seizures. Unfortunately some patients suffer from the toxic effect or side effect of these drugs. These include drowsiness, slow mentation, dizziness, gastrointestinal upset and allergic manifestation. Table 63 shows a list for the most



Tonic Phase
- Epileptic cry
- Cyanosis
- Generalized stiffening of limbs and body
- Arched back



Clonic Phase
- Salivation
- Cyanosis
- Eye blinking
- Clonic jerks of body, limbs and head

Post- Ictal
Confusional fatigue
- Limbs and body limp

Fig. 19. Generalized tonic-clonic seizure of grand mal.

Fig. 19. Recovery position for patient with seizure.

[V. Recovery position: Step by step]

common complications associated with the anticonvulsant drugs.

The most significant oral manifestation that commonly seen in epileptic patient is gingival hyperplasia. The condition is associated with the administration of Dilantin. It occurs most commonly in young age patients and often in the anterior region of both upper and lower jaws. Monitoring good oral hygiene will de-crease the severity of the gingival hyperplasia. On the other-hand the Valporic acid (Depaken), a recent anticonvulsant drug, is usually associated with bleeding tendency. This is due to the effect of the drug on platelets aggregation. There may be spontaneous hemorrhage with multiple petechiae on the skin and mucous membranes. Checking the bleeding time for these patients before any surgical procedure, including deep scaling, is essential. If bleeding time is longer than normal medical consultation is necessary .

Table 64. Management of grand-mal seizures in the dental office.

- If the attack develops while the patient on the dental chair, do not remove the patient.
- If the attack developed elsewhere, place the patient in a suitable place.
- In either cases try to put the patient on his side, preferably the right, to avoid aspiration of saliva into the lungs.
- Protect the patient from injuring himself during the convulsion phase.
- If the attack lasts for more than 10 minutes ask for medical support.

Table 65. Emergency dental care for patients with grand-mal seizures.

- Analgesic for pain control.
- Antibiotics for infection.
- Any obligatory surgical work, as incision of an abscess, must be performed in hospital.

In spite of all preventive measures taken by the dentist, the physician and by the patient to avoid the occurrence of the attack there is still the possibility that an epileptic seizure may develop in the dental office. If the attack occurred while the patient is on the dental chair, the chair is placed on the supine position and the patient is turned on his right side if possible, to avoid aspiration of saliva into the lungs. Table 64 shows management of epileptic seizures if developed in the dental clinic, while emergency care is shown in table 65. ■

Chapter 7
Sexually Transmitted Diseases

Although there are many sexually transmitted diseases (STDs) the most commons are gonorrhea, syphilis and genital herpes. These diseases are communicable and are of interest to the dentist because of the following:

- The dentist is at risk to contract a STD from an infected patient.
- The STDs occasionally manifest themselves in and around the oral cavity. The dentist should be alert to these manifestations.
- The dentist may be the first one to detect the undiagnosed cases of STDs.

Gonorrhea

Occurrence of gonorrhea is world wide and the human being is the only known natural host for the disease. Transmission of gonorrhea is almost exclusively via sexual contact. The primary sites of infection are the genitalia, anal canal and pharynx. The disease can occur at any age but is most common between 15-24 years of age. Males are more commonly affected than females, ratio is 3/1. However, this sex difference may be only apparent than real as many females are unaware that they have the disease (see signs and symptoms for explanation).

The disease is caused by "Nesseria Gonorrhea" that is an aerobic organism that requires high humidity and specific temperature and pH for optimal growth. The organism is fragile and easily killed by drying. It develops resistance to antibiotic readily and many strains develop resistance to penicillin.

Signs and symptoms of gonorrhea usually occur after an incubation period of about one week. The most common symptom is urethral discharge (Table 66). In females many cases may be asymptotic or show minimal symptoms.

Table 66. Signs and symptoms of gonorrhea

- Urethral discharge.
- Pain on urination.
- Urinary urgency.
- Gonorrheal pharyngitis or stomatitis (20%).

Oral manifestations of gonorrhea are most commonly in the pharynx and it occurs in 20% of cases and it is

probably due to orogenital contact or inoculation from infected hands. Oral gonorrhea, on the other-hand, is uncommon but does exist (Table 67). A prominent feature of the oral lesions is the presence of pseudo-membrane that is not adherent and leaves bleeding surface on removal. The lesion may be solitary or widely disseminated. Generally there is close similarity between the gonorrheal lesions and lesions of erythema multiforme, lichen planus and herpetic gingivostomatitis.

Table 67. Oral manifestation of gonorrhea.

- Acute ulceration.
- Diffuse erythrema.
- Necrosis of interdental papilla.
- Lingual edema.
- Vesiculisation.
- Burning and itching sensation.
- Dryness of the mouth.
- Bad taste and smell.
- Submandibular lymphadenitis.

Medical treatment of gonorrhea includes the use of oral Tetracycline or parenteral Amoxicillin or Ampicillin with oral Probencide. Follow up culture is recommended 4-7 days after completion of the treatment. Fortunately the infectiousness of the disease rapidly diminishes following the initiation of treatment.

Syphilis

Syphilis is one of the most infectious diseases all over the world. As with gonorrhea human is the only known natural host for syphilis. Transmission of syphilis is mainly sexual but can occur through nonsexual means as kissing or blood transfusion. The causative organism of syphilis is "Treponema Pallidum". The organism is easily killed by heat, drying, oxygen and even soap and water. Clinically syphilis is divided into three stages which are the primary, secondary and tertiary stage (Table 68). The disease may be also classified into acquired and congenital. However, the congenital syphilis is also acquired as the infection is transmitted to the fetus from his mother.

Table 68. Signs and symptoms of primary and secondary syphilis.

Primary Syphilis

- Occurs three weeks after the infection.
- 95% of cases occur in the genitalia.
- Intraoral lesions occur in tongue, lips, palate and tonsils.
- Appears as an elevated ulcerated indurated nodule (Chancre).
- When in the lip it may have brownish crusted appearance.
- Intraoral lesions appears as ulcerated lesions covered by grayish white membrane.

Secondary Syphilis

- Occurs 6-8 weeks after the chancre.
- Skin lesions appears as macules or papules.
- Intraoral lesions are called "Mucous Patches", occurs in the tongue, gingiva, palate and buccal mucosa.
- Appears as oval or irregular grayish plaques overlying an ulcerated surface and surrounded by erythromatous zone.
- Secondary lesions are highly infectious.

In the ***primary syphilis*** the lesion usually develops after incubation period of about 3 weeks. The primary lesion is called "Chancre". The most common site of chancre is the genitalia but it may occur in o ther areas. Of particular interest to the dentist are the lesions that occur in the lips, tongue, palate, gingiva and tonsils. The lesion starts as a small papule that enlarges in size to form a chancre with surface erosion or ulceration. Chancre is highly infectious and most commonly is asymptomatic. Associated with the primary lesion is enlarged painless regional lymph nodes. The lesion disappears within 2-3 weeks leaving scar tissues (Table 68).

The ***secondary syphilis*** occurs 6-8 weeks after the primary lesion. It is characterized by diffuse eruption on the skin and mucous membranes. The oral lesion is called "mucous patches" and they are highly infectious as they contain a large number of the microorganisms. Secondary lesions of syphilis may undergo remission within few weeks but exacerbation may continue to occur for several months or years (Table 68).

Latent or tertiary syphilis is the third clinical stage of the disease. It is completely asymptomatic and may lasts for many years. About 66% of patients with untreated secondary syphilis will remain in this latent stage for the rest of their life. The remaining 33% of patients will show manifestation of tertiary syphilis. Surprisingly, this stage of syphilis is not infectious.

The chief localized tertiary stage is called "Gamma" and it may occur in many tissues as skin, mucous membranes, bone and viscera. It is basically an inflammatory granulomatous lesion with central necrosis. All other manifestations of tertiary syphilis are essentially vascular in nature and they result from obliterating endarteritis. Intraoral gamma is not common and when it occurs it is usually seen on the tongue or the palate (Table 69).

Congenital syphilis ,on the other hand, shows manifestations which vary greatly depending on the stage of intrauterine development at which the fetus conducted the infection from his mother. Sequelae of early intrauterine infection of the

Table 69. Signs and symptoms of tertiary syphilis.

Localized Lesion "Gumma"

- Occurs in skin, mucous membrane, bone and viscera.
- Intraorally it occurs in tongue and palate.
- It appears as local granulomatous inflammatory process with central necrosis and variable size.
- Intraoral lesion appears as a firm nodular mass which may ulcerate.

Generalized Lesion

- Cardiovascular lesions.
- Aneurysm of ascending aorta.
- Neurosyphilis.
- Meningitis like syndrome.
- General paresis.
- Tabes dorsalis.

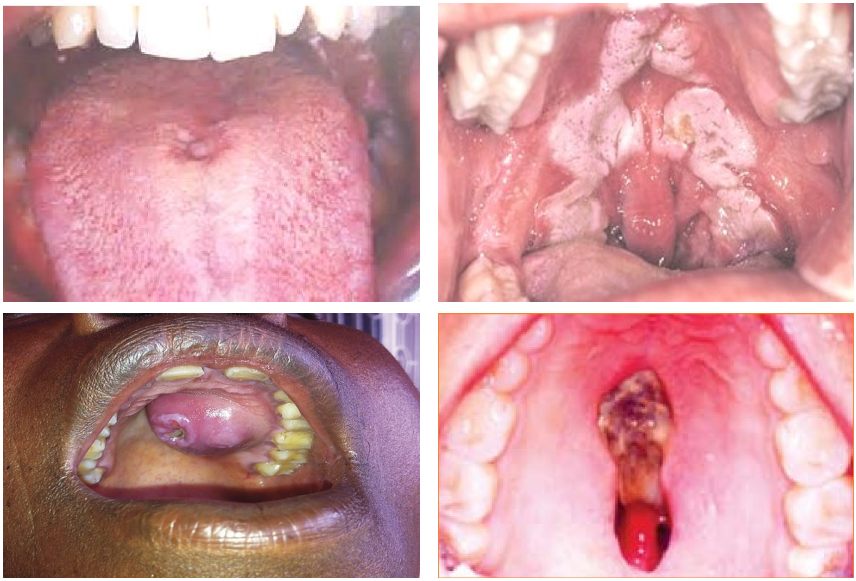


Fig. 20. Chancre on the dorsum of the tongue (upper left). White mucous patches on the palate of 26 years old man, secondary syphilis (upper right). Tertiary syphilis, gumma on the palate (lower left) and palatal perforation (lower right).

fetus include periostitis, osteochondritis and ectodermal changes. Oral manifestations of congenital syphilis are listed in table 70.

Table 70. Signs and symptoms of congenital syphilis

- Frontal possae.
- Short maxilla.
- High palatal arch.
- Saddle nose.
- Mulberry molar.
- Relatively protruded mandible.
- Rhagades.
- Hutchinson's incisor.

Medical treatment of syphilis is usually by long acting Penicillin injection or, in patients allergic to Penicillin, Tetracycline and Streptomycin are given. The patient should be re-tested serologically to confirm cure which usually occur within one year of treatment in most cases.

Genital Herpes

Genital herpes (herpes simplex type-2) is an important highly infectious sexual disease. Herpes simplex is one of the most common viral diseases affecting man. The herpes simplex virus (HSV) affects only the ectodermal tissues. There are two immunologically different types of HSV which are:

Fig. 21. Oral herpes: Clusters of blisters erupt on the lips, tongue, and inside the mouth. Most people have been infected by at least one herpes subtype before adulthood. Note the blisters in a group (arrow)

- HSV-Type 1: Usually affects face, lips, oral cavity and upper body skin.
- HSV-Type 2: Usually affects genitalia and lower body skin.

Genital herpes is relatively common disease that affects uterine cervix, vagina, vulva and penis. HSV-2 is clinically more virulent than HSV-1. However, the pathological process caused by both viruses are essentially the same and so are the occurring lesions. Signs and symptoms of HSV infection appear after an incubation period of about 2-7 days. The primary lesion appears as a papule formation which progress to fluid filled vesicle. The vesicle then rupture leaving an ulcerated or crusted surface. Regional lymphadenopathy and viraemia (the presence of virus particles in blood) are also present in most cases. Within 10-14 days spontaneous healing occur for the ulcer with no scar formation.

At the end of the course of the disease the virus enters the ends of the peripheral neurons and migrate up the axonal sheath to the regional ganglion where they remain inert. The HSV-1 migrates to the trigeminal ganglion and HSV-2 migrates to the sacral ganglion. Upon any adequate stimulation as trauma, sunlight, menses, upper respiratory tract infection and others, the virus is reactivated and migrate down the axonal sheath to produce a recurrent infection. However, the recurrent herpes infection has less sever nature than the primary one.

In females both internal and external genitalia may be involved as well as the perennial region and the skin of the thighs and buttocks. In males the external genitalia and skin may be affected. In both , characteristically, the ulcerative lesion is very painful.

Table 71. Dental management of patients with sexually transmitted diseases.

Patients receiving treatment of STDs

Gonorrhea And Syphilis

- Consultation before treatment.
- Provide emergency care only.
- Wear disposable masks and gloves.

Oral Lesions:

- Gonorrheal lesions may resemble many other lesions and primary and secondary syphilitic lesions are highly infectious so be very careful.

Genital Herpes

- Medical consultation.
- Do necessary care only.
- Strict aseptic conditions.

Patients with symptoms suggestive of STDs

Gonorrhea And Syphilis

- Postpone treatment and refer to physician.
- When necessary do emergency treatment only. ***Genital Herpes***
- No elective dental care.
- Refer to physician.

Patients with history of STDs

- Approach with caution, obtain good history of the disease its treatment and follow up. Follow up test for gonorrhea is by culture of the urethral discharge and of syphilis is by STS test.
- For gonorrhea and syphilis if no follow up consult the physician.
- If proved free from the disease so treat as normal patient.

Medical treatment of primary and recurrent herpes infection is symptomatic and palliative. No curative treatment has yet been found. However the drugs used for medical care need no modifications in the dental treatment plane.

Table 72. Emergency dental care for patients with STDs

- Consult the physician.
- Use strict aseptic conditions.
- Do only the necessary treatment.

Dental Implication of STDs

Patients with STDs can be classified into three groups for proper dental management. These are:

- Patients receiving treatment for STDs.
- Patients with history of STDs.
- Patients with signs and symptoms suggestive for STDs.

Dental management of each group are shown in tables 71 and 72. ■

Chapter 8

Respiratory Diseases

Bronchial Asthma

The bronchial asthma is a syndrome consisting of dyspnea, cough and wheezing, that are caused by bronchospasm. Bronchospasm occur due to hyperirritability of the trachea-bronchial tree. It is primarily a disease of children and young adults with males affected more than females.

Bronchial asthma is a multi-factorial disease for which the exact cause is not well known. There are two types of asthma, allergic or extrinsic asthma and idiosyncratic or intrinsic asthma. The allergic or extrinsic asthma is more common and usually seen in children and young adults. Familial history of allergic diseases is usually found in addition to positive skin test for different allergens. There is elevated serum level of immunoglobulin E. This type of asthma is often seasonal and may be associated with different grains or pollen. However, fortunately 50% of asthmatic children become asymptomatic by adulthood.

Intrinsic or idiosyncratic asthma, on the other-hand, is usually not associated with familial history of allergy. Also there is no elevation of immunoglobulin E in the blood together with negative skin tests for different allergens. The disease affects middle age adults and its onset is usually associated with upper respiratory tract infection.

Considerable large number of substances and events may precipitate the asthmatic attack. The most common include air borne substances as pollen and dust as well as environmental pollutants as smoke and chemicals. Drugs as aspirin and anti-inflammatory agents may also precipitate the attack in some persons. Respiratory infection especially with virus, exercises especially in cold dry weather and emotional upsets can also precipitate the asthmatic attack.

Dental Implication

Management of the asthmatic dental patient should aim to avoid the development of the acute asthmatic attack. Through good history, taken from the patient, the dentist should be able to identify the type of asthma, age of

onset, precipitating factors, the frequency and the severity of the attack in addition to the usual management of the attack. The history should also reveal the medication the patient is taken and whether or not the corticosteroids have ever been taken. If so adrenal suppression should be suspected. However, other than corticosteroids, drugs used in the management of asthma has no particular management problems. The patient should be asked to bring his aerosol inhaler with him each visit. The dentist should assure a stress free environment for the patient as emotional upsets may precipitate the attack. Tranquillizers may be used as a premedication. Good pain control is also essential during treatment as pain may precipitate the attack. Antihistaminic and narcotics are better to avoid as they may cause respiratory depression. On the other-hand, aspirin, nonsteroidal anti-inflammatory drugs and penicillin should be avoided due to there well known potential allergic property. Table 73 summarizes the dental management of asthmatic patients.

Table 73. Dental management of patients with bronchial asthma.

Medical Consultation To Verify

- Type of Asthma and precipitating factors.
- Severity and frequency of the attacks.
- How the attack is usually managed.
- Medication taken. Appointment
- Premedication with Diazepam (Valium) 5-10 mg is used.
- Avoid antihistamines, narcotics and aspirin as they may cause respiratory depression
- If the patient use metered dose inhaler he is instructed to bring it with him during the dental visit.

Local Anesthesia

- Good pain control is essential as pain may precipitate the attack.

Drugs Used In Treatment

- Other than the effect of prolonged use of corticosteroids drugs used in the treatment of asthma has no particular management problems. For the prolonged use of corticosteroids.

Drugs Given To The Patient

- Avoid the use of antihistamines, narcotics, aspirin and penicillin due to their depressant action on respiratory system and / or their potential allergenic properties.

Tuberculosis

Tuberculosis is a diseases which can affect any organ in the body, however, the lungs are by far the most common organ to be affected. The disease is highly infectious and is caused by mycobacterium tuberculosis. The typical mode of bacterial transmission is by airborne droplets of mucus or saliva that have been forcibly expelled from the lungs, most commonly by coughing but also by sneezing and talking. A secondary mode of transmission of the disease is by digestion. This is quite uncommon except with patients with active lung lesions. Such patients may cough-up infected sputum and then swallow it. By this mechanism the oral lesion may be initiated with the dorsum of the tongue being the most common site.

Fig. 22. Patient with cervical lymph node tuberculosis.

Fig ??. Tuberculosis ulcer in the tongue.

Signs and symptoms occur late in the course of the diseases after the lesion becomes extensive. The symptoms are generally non-specific and could be associated with any infectious disease. The symptoms include malaise, anorexia, loss of weight, productive cough, night sweat and low grade fever. For these reasons definite diagnosis of tuberculosis must be based on culture and identification of mycobacterium tuberculosis or acid fast bacilli in the body fluids and tissues, usually the sputum.

For treatment of tuberculosis several anti-tuberculoses drugs are in use today. It is advisable to give combination of two or three drugs rather than a single drug to decrease the chance for development of resistant strains.

Facial and oral manifestation

Tuberculous infection may involve the submandibular and cervical lymph nodes leading to tuberculous lymphadenitis. The condition may progress to the formation of actual abscess. The involved lymph node is tender and painful, the overlying skin is inflamed and when abscess is present a sinus discharging pus will be found.

Mucosal lesions may occur at any site of the oral cavity. The tongue is the most common site followed by the palate, lips, buccal mucosa and gingiva. The oral lesions appear as irregular superficial or deep painful ulcer which tends to increase slowly in size. “Tuberculous gingivitis” is an uncommon oral manifestation that appears as diffuse, hyperemic, nodular or papillary proliferation of the gingival tissues. Bone lesions may occur in the mandible and maxilla and in advanced cases tuberculous osteomyelitis may develop.

Table 74. Dental management of patients with history of tuberculosis.

Patients With Active Tuberculosis

- Medical consultation is a must.
- Patients above 6 years, do only the emergency treatment.
- Patients below 6 years, treat them as if normal, usually not infective.
- When patients produce constantly negative sputum treat them as if normal as they are noninfectious.

Patients With Past History Of Tuberculosis

- Medical consultation is a must.
- If the patient is free from the active disease treat him as if normal but approach with caution.

Patients With Positive Tuberculin Test*

- Medical consultation to role out the presence of active disease.
- Patient may receive Isoniazid up to one year as a prophylaxis.
- If free from active disease treat as normal.

Patients with Signs and Symptoms Suggestive of Tuberculosis

- Postpone treatment and refer to physician.
- Give only emergency treatment when necessary.

Table 75. Emergency dental treatment for patients with active tuberclosis.

Medical Consultation

- To verify the current status of the patient
- To discuss the dental management plan

Strict Aseptic Conditions

- Isolation of dental operatory when possible
- Gloves, masks and gowns for all personnel
- Use rubber dam when possible
- Minimize aerosol production by using slow speed handpieces when possible

Do Only The Necessary Work

Dental Implication

Tuberculosis, being highly infectious disease, the dentist may transmit the disease from patient to patient or most commonly a patient with an active form of the disease transmits it to the dentist. Tuberculous patients can be placed into four categories regarding their dental management. Table 74 shows the dental management of patients of each category.

Patients with active tuberculosis should not be treated on outpatients basis. They are better to be treated in hospital emergency room and all the precautions to guard against the transmission of infection are to be taken. Only emergency treatment is to be performed (Table 75). Children below 6 years can be treated as normal patients due to their inability to cough-up sputum effectively. Regarding the antitubercoulus drugs, such as Isoniazed, Rifamin, Streptomycin and Ethambutal, there are no apparent interaction with these drugs commonly used in dentistry and there is no specific precautions to be taken. Generally it is better to postpone dental treatment in patients with active tuberculosis. However, emergency treatment can be performed . ■

Chapter 9

Acute Immunodeficiency Syndrome "AIDS"

The acquired immunodeficiency syndrome (AIDS) is a disease characterized by loss of the cell mediated immune response due to decreased numbers of T-lymphocytes. The resulting deficiency in the immune system render the patient at risk for many opportunistic infections and for development of malignant tumors. The disease is caused by human immune deficiency virus (HIV). Routes of virus transmission are shown in table 76 while table 77 shows persons at high risk for infection of HIV.

It is equally important to know how the HIV is not transmitted. It is not transmitted by social contact, for example within families, nor by food and water, nor by insect bites, nor by contact with telephones, toilet seats, or used clothes, nor by contact at work, except in few rare instances in health care workers.

Signs and symptoms of AIDS resemble those of flu or even common cold. Symptoms usually appears after an incubation period that varies from few weeks to few years. Table 78 shows a list of the signs and symptoms of AIDS.

Table 76. Routes of HIV transmission.

- Penetrative sexual intercourse with an infected person.
- Inculcation of infected blood.
- An infected mother will pass the infection to the unborn fetus, to the baby during delivery or during breast-feeding.

Table 77. Persons at high risk of contracting AIDS

- Homo- and bisexual men.
- Intravenous drug users.
- Hemophilic patients.
- To lesser degree the sexual partner of any of the above.

Table 78. Signs and symptoms of AIDS

- Persistent low grade fever.
- Unexplained rapid weight loss.
- Enlarged lymph nodes in the neck, axilla and groin.
- Night sweats.
- Chronic unexplained diarrhea.
- Fatigue and loss of appetite.
- Delayed healing
- Hematologic abnormalities:
  - Leukopenia.
  - Thrombocytopenia.
  - Anemia.
  - Decreased number of T-lymphocytes.
  - Elevated serum globulin level.

As the symptoms of AIDS are non-specific and are common to various diseases diagnosis of AIDS is very difficult. The only test available, commonly called "ELESA test" can test for the presence of HIV antibodies which indicates the exposure of the person to the HIV but do not indicate the presence of the virus

Table 79. Opportunistic infections and malignancies associated with HIV infection..

- Pneumonia*.
- Candidiasis.
- Hepatitis.
- Herpes virus infection.
- Cytomegalovirus* infection.
- Kaposi's sarcoma.
- Lymphoma.

Table 80. Oral manifestations of HIV infection.

Candidiasis, Either pseudomembraneous or erythematous type.

Angular Chelitis: Fissures or linear ulcers at the corner of the mouth.

Gingivitis: Erythematous marginal gingival band that can extend into the adjacent attached and alveolar mucosa. The lesion do not respond to local measures of oral hygiene.

Periodontitis: Sever destructive lesions characterized by soft tissue ulceration and necrosis.

Necrotizing Stomatitis: Localized acute painful ulceronecrotic lesion of the oral mucosa that expose the underlying bone.

Herpes Simplex: Intraoral and / or perioral form may be present.

Cytomegalovirus: Oral ulcers from which cytomegalovirus can be identified.

Varicella zoster virus: Unilateral vesiculoerosive eruption of skin and mucosa along the distribution of one or more of the branches of the trigeminal nerve.

Aphthus ulcerations: Minor, major or herpetiform aphthus ulcers may be present.

Hairy Leukoplakia: Usually on the lateral and ventral tongue margin.

Salivary gland disease: Enlargement of the major salivary glands and / or xerostomia.

Oral Kaposi's Sarcoma: Has a predilection for hard palate and attached gingiva but can appear on any site.

Oral warts and papilloma.

itself. However, according to the center of disease control (CDC), the presence of two clinical findings and two hematologic abnormalities are enough to establish a diagnosis of AIDS-related complex (ARC). The presence of op-

Table 81. Dental management of patients with HIV infection.

Medical consultation

- To verify the general condition of the patient and his suitability for treatment.

Strict adherence to the barrier technique

(for all personnel in the dental team)

- Use gloves and gowns.
- Use masks and eye glasses.
- Be very careful when using sharp instruments.

Proper sterilization technique

(before and after treatment)

- Use disposable gloves, gowns and masks.
- Handpieces, air-water syringes, Cavetron tips should all be sterilized before and after use.
- Thorough removal of blood and saliva from all surfaces.
- Difficult areas to disinfect should be warped with impervious covering as plastics or aluminum foil, which are discarded after use.

Local Anesthesia

- Avoid deep injection techniques as inferior dental nerve block as hematoma may be formed.

Surgery

- Should be avoided when ever possible due to the delayed healing response and the possible bleeding during and after surgery.

portunistic infection or Kaposi's sarcoma or lymphoma, in addition, is required for establishing a definite diagnosis of AIDS. Table 79 shows a list of the most common opportunistic infection that occur with HIV infection.

HIV infected patients commonly show lesions in the head and neck. More than 95% of AIDS patients have head and neck lesions and 55% have oral lesions. A wide range of oral lesions may be seen, some of which may be the earliest manifestation of the disease. Table 80 shows the common oral manifestations of HIV infection. [Oral manifestation on HIV]

Although there is no known cure from AIDS yet there are many drugs that are in various stages of clinical trials. These include zidovudine (AZT) and alpha-interferon. The later is used successfully in the treatment of AIDS generated cancer. AZT on the other-hand, successfully delay the onset of the active symptoms of the disease.

Dental Implication

When treating patients with HIV infection dentist should take every possible effort to prevent the transmission of the virus from the patient to the dentist himself or from the patient to other patients. Also the delayed healing and possible hematologic abnormalities should be considered on treatment planning. Table 81 shows management of patients with HIV infection. ■

Chapter 10

Pregnancy and Breast Feeding

Although pregnant women can not be considered systemically diseased, yet they present a set of unique management problems to the dentist. Although routine dental treatment can be performed safely for most pregnant women, but still there are some potential problems related to dental care.

It is important for the dentist to be familiar with the normal stages of pregnancy and fetal development so as to be able to handle the pregnant dental patient without causing any harm to the mother or the fetus. Normal pregnancy lasts for about 40 weeks. During the first trimester formation of the systems and organs of the fetus occur. In the second and third trimesters growth and maturation of the fetus systems takes place. For these reasons the chance for malformation is greatly decreased after the first trimester. However, an exception is the dental staining which may occur due to administration of tetracycline during pregnancy as development of permanent tooth germs takes place at a later time of intrauterine life.

The pregnant women are subjected to great changes in their basic body physiology, habits and psychology. Common neurological findings in the first trimester include fatigue, hyper-emesis, tendency for syncope and postural hypotension. During the second trimester the pregnant women may have relatively few symptoms, while in the third trimester increasing fatigue may occur.

Endocrine changes are the most significant basic changes that occur with pregnancy and result in most systemic changes seen in pregnant women. There is increased production of maternal hormones, and

Table 82. Basic physiologic changes which occur during pregnancy.

Neurologic Changes
- Fatigue.
- Hyperemesis (Morning sickness).

Endocrine Changes
- Progesterone secretion increase.
- Placental hormone start to be secreted.

Cardiovascular Changes
- Slight decrease in blood pressure.
- Increase blood volume.
- Increase cardiac output.
- Tachycardia.
- Functional heart murmur.
- Dyspnea at rest, aggravated by supine position.
- Vena cava syndrome, in late pregnancy.

Hematological Changes
- Increase hematocrite value.
- Iron deficiency anemia.

placental hormone also start to be produced. Cardiovascular changes include slight increase in blood pressure, increase in blood volume and increase in the cardiac output. Hematological changes, on the other-hand, include decreased hematocrite value and anemia, usually iron deficiency anemia, due to the increased needs for iron due to the increased blood volume (Table 82).

"Supine hypotensive syndrome" or "Vena cava syndrome" is a phenomenon which may occur in late pregnancy. In this syndrome there is sudden drop in blood pressure and loss of consciousness when the pregnant women is in supine position due to compression of the inferior vena cava by the gravid uterus which leads to decrease of venous return to the heart. This in turn will lead to decrease in blood pressure, decreased cardiac output * and finally loss of consciousness. The treatment of this condition is simply by rolling the patient to her side to lift the uterus off the vena cava. Usually the patient rapidly regain consciousness.

Complications during dental treatment of pregnant women are to be expected in two distinct periods of pregnancy, the first and the third trimesters. In the first trimester the fetus is most susceptible to teratogenic effect of drugs, radiation, infections and other environmental factors (Tables 83 and 84). In the third trimester vena cava syndrome is more likely to occur than on the first trimester. On the other hand , spontaneous abortion and premature delivery are more likely to occur in the first and third trimesters. Another possible complication is during breast-feeding, drug administrated during this period may find its way to the breast milk of mother and transfer to the infant, in whom exposure may have adverse reaction

Table 83. Possible complications during dental management of pregnant patient.

- Spontaneous Abortion: In the first and third trimester
- Fetus Malformation: Mostly in the first trimester
- Vena Cava Syndrome, in late pregnancy

Table 84. Dental drugs administration during pregnancy.

Local Anesthesia
- Lidocaine, Yes.
- Mepivacaine, Yes.

Vasoconstrictors
- Adrenaline, Yes, but better avoided.
- Corbasile, Yes.

Analgesics
- Codeine, Yes.
- Phenacetin*, No.
- Aspirin, Yes, but not in the third trimester as it cause acidity and has some anticoagulant effect.

Antibiotics
- Penicillin, Yes.
- Erythromycin, Yes.
- Tetracycline, No, teratogenic.
- Streptomycin* , No.

Sedatives
- Diazepam, No.
- Barbiturates, No.

Fig. 23. Pregnancy tumor.

(Table 85). Table 86 shows oral changes in pregnancy. [V. Vena cava syndrome]

Dental Implication

Pregnancy usually leads to some changes or complications in the oral cavity (Table 87). The most common complication is the so called "Pregnancy Gingivitis" which represents an exaggerated inflammatory response of gingival tissue to local irritants as a result of hormonal influence. "Pregnancy Tumor" on the other-hand represents exaggerated local inflammatory hyperplasia of the gingival tissue to irritant. Also, it should be mentioned that pregnancy do not cause any periodontal diseases but modifies and worsen any disease present. Gingival changes usually appear at the second month of pregnancy and remain so until the eighth month after which all gingival changes rapidly return to normal in most cases.

As regarding the dental caries no relationship could be established between it and pregnancy. However, the reported increase in caries activity during pregnancy could be

Table 85. Dental drugs administration during breast feeding.

Local Anesthesia
- Lidocaine, Yes.
- Mepivacaine, Yes.

Analgesics
- Aspirin, Yes, but in occasional doses.
- Codeine, Yes.

Antibiotics
- Tetracycline, No, may cause dental discoloration.
- Streptomycin, No, may cause deafness.
- Cephalosporines , Yes, but consider sensitivity.
- Penicillin, Yes, but development of allergy to the infant should be considered.

Sedatives
- Diazepam, Yes, in small doses.
- Barbiturates, Yes.

Table 86. Oral changes in pregnancy

- Pregnancy gingivitis.
- Pregnancy tumor.
- Increased caries activity.
- Teeth mobility, first degree.
- Any present periodontal disease becomes worsen.

Table 87. Treatment timing during pregnancy

First trimester
- Oral hygiene procedures.
- Emergency treatment.

Second trimester
- Oral hygiene procedures.
- Routine dental care as dental filling and single tooth extraction.

Third trimester
- As in first trimester.

Generally, reconstructive and elective surgical procedure are better to be delayed until after termination of pregnancy.

attributed to poor oral hygiene as a result of the presence of gingival inflammations. First degree teeth mobility may also be seen during pregnancy. This is due to gingival inflammation, disturbances in the attachment apparatus and some mineral changes in the lamina propria. Fortunately the condition is reversed after delivery.

References,
Further Readings and Useful Links

Cardiovascular diseases in dental practice. Practical considerations

Cardiovascular Disease and the Dental Office

Dental Management of the Cardiovascular Compromised Patient: A Clinical Approach

Dental management of patients with endocrine disorders

Management of patients with thyroid disease Oral health considerations

Dental management of patients with inherited bleeding disorders: a multidisciplinary approach

Bleeding Disorders of Importance in Dental Care and Related Patient Management

Dental considerations in patients with liver disease

Liver disease: Current perspectives on medical and dental management

Dental considerations for the patient with renal disease

The Dental Health Status of Dialysis Patients

Management of the Dental Patient With Neurological Disease

Oral Manifestations of Sexually Transmitted Infections

Principles of Oral Health Management for the HIV/AIDS Patient

Dental considerations in patients with respiratory problems

Breastfeeding and Oral health: Information for Dental Practitioners