

Pedodontics

Fifth stage

Lec. 2

Preliminary medical and dental history

م. م. رحاب تحسين

When a patient's medical and dental history is recorded, the presence of current illnesses or history of relevant disorders signals the need for special attention. In addition to consulting the child's physician, the dentist may decide to record additional data concerning the child's current physical condition, such as blood pressure, body temperature, heart sounds, height and weight, pulse, and respiration. Before treatment is initiated, certain laboratory tests may be indicated, and special precautions may be necessary.

The dentist and the staff must also be alert to identify potentially communicable infectious conditions that threaten the health of the patient and others. Knowledge of the current recommended childhood immunization schedule is helpful. It is advisable to postpone nonemergency dental care for a patient exhibiting signs or symptoms of acute infectious disease until the patient recovers.

Clinical Examination

Most facts needed for a comprehensive oral diagnosis in the young patient are obtained by thorough clinical and radiographic examination. In addition to examining the oral cavity structures, the dentist may in some cases wish to note the patient's size, stature, gait, or involuntary movements. The first clue to malnutrition may come from observing a patient's abnormal size or stature. Similarly, the severity of a child's

illness, even if oral in origin, may be recognized by observing a weak, unsteady gait of lethargy and malaise as the patient walks into the office.

General examination include the examination of the followings:

- 1) Head, hair, face, neck and hands
- 2) Temporomandibular joint
- 3) Lymph nodes
- 4) Lips, Chin and tongue

1) Head, hair, face, neck and hands: The dentist can gather useful information while getting acquainted with a new patient. After the patient seated in the dental chair, attention to the patient's hair, head, face, neck, and hands should be among the first observations made by the dentist, because abnormalities in size, shape, symmetry, function of head and neck indicate various syndromes that may be associated with oral abnormalities. Inspection and palpation of the patient's head and neck are indicated. Unusual characteristics of the hair or skin should be noted. The dentist may observe signs of problems such as head lice, ringworm, or impetigo during the examination. Proper referral is indicated immediately, because these conditions are contagious. If a contagious condition is identified but the child also has a dental emergency, the dentist and the staff must take appropriate precautions to prevent spread of the disease to others while the emergency is alleviated. Further treatment should be postponed until the contagious condition is controlled.

The patient's hands may reveal information pertinent to a comprehensive diagnosis. The dentist may first detect an elevated temperature by holding the patient's hand. Cold, clammy hands or bitten fingernails may be the first indication of abnormal anxiety in the child. A callused or unusually clean digit suggests a persistent sucking habit. Clubbing of the fingers or a bluish color in the nail beds suggests congenital heart disease, which may require special precautions during dental treatment.

2) Temporomandibular joint evaluation: The dentist should evaluate temporomandibular joint (TMJ) function and the associated musculature by palpating the head of each mandibular condyle and by observing the patient while the mouth is closed (teeth clenched), at rest, and in various open positions. Movements of the condyles or jaw that do not flow smoothly or that deviate from the expected norm should be noted. Similarly, any crepitus (that may be heard or identified by palpation) as well as any other abnormal sounds or clicking should be noted. Sore masticatory muscles (that may be detected by pain, deviation and restricted mouth opening) may also signal TMJ dysfunction. Such deviations from normal TMJ function may require further evaluation and treatment. There is a consensus that temporomandibular disorders in children can be managed effectively by the following conservative and reversible therapies: patient education, mild physical therapy, behavioral therapy, medications, and occlusal splints.

3) Lymph nodes: The extra oral examination continues with palpation of the patient's neck and submandibular area and any deviations from normal, such as unusual tenderness or enlargement, should be noted and follow up tests performed or referrals made as indicated.

4) Lips, Chin and tongue: If the child is old enough to talk, speech should be evaluated. The positions of the tongue, lips, and perioral musculature during speech, while swallowing, and at rest may provide useful diagnostic information.

The intraoral examination of a pediatric patient should be comprehensive. There is a temptation to look first for obvious carious lesions. Although controlling carious lesions is important, the dentist should first evaluate the condition of the oral soft tissues and the status of the developing occlusion. If the soft tissues and the occlusion are not observed early in the examination, the dentist may become so engrossed in charting carious lesions and in planning for their restoration that other important anomalies in the mouth are overlooked. In addition, any unusual breath odors and abnormal quantity or consistency of saliva should also be noted.

Soft tissue examination

An underlying systemic disease or nutritional deficiency can be indicated through the abnormal appearance of the oral mucosa. It is, therefore, very important to examine carefully the lips, palate and oropharynx, tongue, floor of the mouth, buccal mucosa. It includes examination of the oral mucosa and examination of periodontal tissues. Complete inspection and palpation of all the oral soft tissues is important to evaluate the condition of the oral soft tissues and the status of developing occlusion. In addition, unusual breath odors or abnormal quantity or consistency of saliva should be noted. During examination of intraoral soft tissues,

Gingiva should be examined:

High maxillary labial frenum attachment may be responsible for abnormal spacing between the central incisors. Redness and swelling of gingiva may be seen associated with gingivitis. Draining fistula on the attached gingiva accompanied by a tooth that is tender, painful and mobile are usually diagnostic of abscessed teeth. Assessment of the oral hygiene and the presence of plaque and calculus should be done. The presence of profound gingival inflammation in the absence of gross plaque deposits, prematurely exfoliating teeth, or mobile permanent teeth may indicate a serious underlying disease.

Tongue should be examined:

The size, shape, color and movement of the tongue should be noted.

Dryness of tongue—indicates dehydration.

Abnormal lingual frenum can result in ‘tongue tie’ or ankyloglossia

Hard tissue examination

During the clinical examination for carious lesions, each tooth should be dried individually and inspected under a good light. A definite routine for the examination should be established. For example, a dentist may always start in the upper right quadrant, work around the maxillary arch, move down to the lower left quadrant, and end the examination in the lower

right quadrant. Morphologic defects and incomplete coalescence of enamel at the bases of pits and fissures in molar teeth can often be detected readily by visual and explorer examination after the teeth have been cleaned and dried. The decision whether to place a sealant or to restore a defect depends on the patient's history of dental caries, the parents' or patient's acceptance of a comprehensive preventive dentistry program (including dietary and oral hygiene control), and the patient's dependability in returning for recare appointments.

A) Careful evaluation and inspection of individual teeth should be done for:

Teeth number---any missing/extra teeth(supernumerary)

Evidence of carious lesions---The teeth should be cleaned thoroughly before attempting to check for decay. Refer for diagnosis of caries (active lesion/ arrested), restorations---(intact/ deficient).

Hereditary or acquired anomalies: Visual examination with explorer can detect any morphological defects and incomplete coalescence of enamel at the base of pits and fissure in molar teeth. Tooth structure—record any localized or generalized defect, e.g. fluorosis.

Discoloration

Difference should be made regarding discoloration, which may be due to extrinsic, or an intrinsic reason. Food stains or tobacco stains cause discoloration on the surface of the tooth. The cause for discoloration in a non-vital tooth is due to intrinsic reasons. Other reasons that cause intrinsic change in the color are enamel hypoplasia, fluorosis, etc.

B) Examination of occlusion

Inspect occlusion and note any dental or skeletal irregularities. Dental or skeletal abnormalities may undergo considerable changing during childhood and early adolescence. This dynamic developmental process occur in all three planes of space and with periodic evaluation, the dentist

can intercept and favorably influence undesirable changes. Early recognition of malocclusion will help to formulate a treatment plan in a very young age.

Monitoring of patient facial profile and symmetry, molar, canine, and anterior segment relationship, dental midlines, overjet and overbite, physiological spacing, presence of crowding/spacing; severe skeletal abnormalities, arch length to tooth mass comparison should be routinely included, diagnostic casts, cephalometric analysis indicated early in mixed dentition and sometime in the primary dentition.

Radiological examination

Radiograph should be taken before comprehensive oral health care plan can be developed and subsequent radiographs are required periodically to detect incipient caries or other developing anomalies. A child should be exposed to dental ionizing radiation **only** after the dentist has determined that radiography is necessary to make an adequate diagnosis for the patient at the time of the appointment. Sometimes, obtaining isolated occlusal, periapical or bitewing radiograph is indicated in very young children (even infants) because of trauma, toothache, suspected developmental disturbances, or proximal caries. Carious lesions appear smaller on radiographs than they actually are. If the pediatric patient can be motivated to adopt a routine of good oral hygiene supported by competent supervision, many of these initial lesions can be arrested.

Radiographic Techniques

Multiple radiographic techniques must be used to manage the wide range of pediatric and special-needs dental patients. The patient's size and ability to cooperate must be considered when a radiographic technique is selected.

Intraoral Radiography

Intraoral tube heads should generate between 60 and 70 kVp to produce adequate diagnostic images. The timer must be accurate to allow for short exposure times. Radiation-sensitive (rapid) image receptors should be used at all times. Collimation of the radiation beam is advised to reduce the irradiated surface area to the size of the image receptor. There are several types of intraoral radiographs, each of which has specific indications and limitations.

A-Periapical Radiography

Periapical radiographs should show the crown of the tooth and at least 3 mm beyond the apex of the tooth. To achieve this coverage, one can use either the paralleling technique or the bisecting angle technique. The paralleling technique is preferred because of its accuracy.

Paralleling Technique. This is the most accurate technique for taking intraoral radiographs. The image receptor should be positioned parallel to the long axis of the teeth, while the x-ray beam is directed perpendicular to the image receptor.

Bisecting Angle Technique. In the bisecting angle technique, the image receptor is placed as close to the teeth as possible, and the central x-ray is directed perpendicular to a line that bisects the angle created by the tooth and image receptor. This technique is obviously more prone to geometric errors and should not be regarded as the preferred technique. Elongation or foreshortening (vertical angulation errors) of the image or interproximal overlap (horizontal angulation errors) of the image is often the result of inaccurate aiming.

B-Bitewing Radiography

Bitewing radiographs are intended to assess interproximal caries and interproximal bone height. Bitewing geometry is based on the paralleling technique, where the image receptor is placed parallel to the teeth and the

x-ray beam is aimed perpendicular to the receptor. Overlap of proximal surfaces is minimal with the proper image receptor holders, which assist in directing the x-ray beam through the proximal contacts.

C- Occlusal radiography

Anterior Maxillary Occlusal Technique. In the anterior maxillary occlusal technique, the patient's occlusal plane should be parallel to the floor, and the sagittal plane should be perpendicular to the floor. A size 2 image receptor is placed in the patient's mouth so that the long axis of the film runs from left to right, rather than anteroposteriorly, and the midsagittal plane bisects the film. The patient is instructed to bite lightly to hold the receptor; a tongue blade can be attached to PSP or film receptors, and rigid receptors should be wrapped in gauze to protect the sensor when the patient bites on it. The anterior edge of the receptor should extend approximately 2 mm in front of the incisal edge of the central incisors. The central x-ray is directed to the apices of the central incisors and a centimeter (half-inch) above the tip of the nose and through the midline. The vertical angle is $+60^\circ$. This receptor is exposed at the usual setting for maxillary incisor periapical films.

Posterior Maxillary Occlusal Technique. In the posterior maxillary occlusal technique, the patient's occlusal plane should be parallel to the floor, and the sagittal plane should be perpendicular to the floor. A size 2 image receptor is placed in the patient's mouth so that the long axis of the film is parallel to the floor. The anterior edge of the receptor should extend just mesial to the canine. The outer buccal edge of the receptor should extend approximately 2 mm beyond the primary molar crowns. The patient is instructed to bite lightly to hold the receptor. The central x-ray is directed toward the apices of the primary molars as well as interproximally. The vertical angle is $+50^\circ$. The receptor is exposed at the usual setting for maxillary premolar periapical projection.

Anterior Mandibular Occlusal Technique. The film placement for the anterior mandibular occlusal technique is identical to that for the anterior maxillary occlusal technique, except that the receptor must be placed so

that the tube side faces the x-ray source . In addition, when the patient bites on the receptor, the anterior edge of the receptor is 2 mm beyond the incisal edge of the lower incisors. The patient's head is positioned so that the occlusal plane is at a 45° angle. The cone is then aligned at a -15° vertical angle, and the central x-ray is directed through the symphysis.

D-Oblique Occlusal Radiography

Oblique occlusal radiography is also based on the bisecting angle technique; it is a good alternative for patients with a severe gag reflex or who cannot tolerate the positioning of the image receptor holder device. It is advisable to tape two wooden tongue depressors around the image receptor to position it in the patient's mouth . Make sure that the long edge of the film or phosphor plate is visible 1 to 2 mm buccal to the teeth. Position the patient so that the occlusal plane is parallel to the floor. Aim the x-ray beam perpendicular to the bisecting line between the long axis of the tooth and the axis of the occlusal plane. For maxillary images, the patient faces forward. For mandibular images, the patient should turn the head to the opposite side to position the x-ray machine pointing upward, 45° to the mandibular teeth. If the patient faces forward, the tube head will be blocked by the patient's shoulders. The result of these projections should provide a periapical view of the posterior teeth . It is obvious that errors in the vertical or horizontal plane can easily be made, and that foreshortening or elongation and/or overlapping of proximal surfaces can easily occur.

Localization Techniques

One method of localizing embedded or unerupted teeth involves the buccal object rule (also referred to as the parallax technique or the “same lingual opposite buccal” [SLOB] rule), which states that the image of any buccally oriented object appears to move in the opposite direction from a moving x-ray source. Conversely, the image of any lingually oriented object appears to move in the same direction as a moving x-ray source . Using this principle for localization, the practitioner makes two

radiographs of the unerupted tooth. The technique consists of positioning the patient's head so that the sagittal plane is perpendicular to the floor and the ala-tragus line is parallel to the floor. An intraoral periapical film is placed in the mouth and then exposed by the paralleling technique. Subsequently, a second film is placed in the mouth in the same position as the first film, with the patient's head position remaining the same, but with the horizontal angle shifted either anteriorly or posteriorly depending on the site. The object in the projection that moved in the direction opposite that in which the xray machine was moved is located more buccally, relative to the object(s) that moved in the same direction as the x-ray machine.

Extraoral Radiography

Panoramic Imaging

The panoramic image is obtained through tomography. This means that only the structures located in the focal trough are captured in focus. Objects or structures outside the focal trough should be interpreted with care. Because of the projection geometry, panoramic images are magnified (by a factor of around 1.3), so measurements taken from a panoramic image will also be magnified. Most current panoramic machines enable one to take bitewing look-alike images. These images should be interpreted with caution since a standard bitewing projection requires that the image receptor be placed parallel to the teeth, with the x-ray beam directed perpendicular to the receptor. The panoramic bitewing is re-created from the existing panoramic image; nevertheless, it is a very useful alternative when a patient cannot tolerate the intraoral image receptor. However, it should not be used as a standard bitewing projection. Panoramic machines are available with solid-state sensors or with a cassette system.

Cephalometric Imaging

This technique is usually used in orthodontics and orthognathic surgery. Some machines will use a single exposure, which minimizes motion errors. In the scanning machines, the exposure takes longer; hence there is a higher risk for motion artifacts in these images. Positioning of the patient in the cephalostat is very important. Remember that digital imaging does not correct or compensate for improper patient positioning.

Oblique Lateral Radiography

This technique offers an excellent alternative to bitewing radiographs, periapical radiographs, or panoramic images, when patients are unable to tolerate these techniques. The technique requires a cassette system (analog film or phosphor storage plate), held parallel to the midsagittal plane of the patient, while the x-ray beam is directed perpendicular to the cassette from behind or below the mandibular body. This technique should not be regarded as a standard of care for every patient. Special-needs patients and small children can definitely benefit from this technique if a radiographic image is required.

Cone Beam Computed Tomography (CBCT)

This technology has become very popular in the past decade and has found its way into many private practices. This modality is ideal for imaging hard tissues. Artifacts due to beam hardening and motion artifacts are to be avoided. The radiation dose from CBCT is considerably higher than that from a periapical radiograph. It is also very hard to determine the radiation dose in general from CBCT since it depends on exposure settings (kVp, mA, and exposure time), field of view (the size of the volume, which is determined by the size of the coneshaped x-ray beam), and the resolution of the image (the details). Justification to expose pediatric patients to CBCT should not be taken lightly.

Medical Computed Tomography

Medical CT is responsible for the highest radiation doses a patient can receive from diagnostic imaging. The fanshaped beam rotates around the patient's body (part) in a helical motion. The space between two rotations

of the beam (pitch) determines the resolution of the image and hence the radiation dose. Medical CT, also called multislice CT, is useful for the imaging of hard and soft tissues and provides the clinician with the ability to detect very small differences in density in the image (contrast resolution). The technique is usually used to identify malignancies, tumors, and other symptoms of pathology, with or without the use of contrast medium.

Ultrasound Imaging

Most people associate ultrasound imaging with pregnancy, but this technique also is excellent for investigation of soft tissues, such as the floor of the mouth, salivary glands, and lymph nodes in the head and neck region. Since the technique does not involve ionizing radiation, it can be repeated as many times as necessary, without exposing the patient to any risks. In addition, this technique is appropriate when fine-needle aspirations are required.

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) evaluates the hydrogen content of tissues and uses a magnetic field to differentiate among different tissue types. Since there are more hydrogen atoms in soft tissues than in cortical bone, this technique is especially useful with soft tissue. Contraindications for MRI include claustrophobia and the presence of metallic clips or metallic foreign bodies. The most common dental indication for the use of MRI is for imaging the soft tissues of the temporomandibular joint.

Treatment priorities :Planning the treatment can be made based on different phases:

- 1) Emergency phase
- 2) Medical/referral phase
- 3) Systemic phase
- 4) Preventive phase
- 5) Corrective phase
- 6) Maintenance and recall

Emergency phase

All the problems that require immediate actions, such as relieving the child from pain, infection, attending due to a trauma, etc. should be done in this stage. Conservative treatment approach at an emergency visit is advantageous because the child is often under stress and of low tolerance level. If possible, delay extraction or extensive pulpal therapy, if the pain can be relieved by some other means.

Medical/referral phase

In this phase, patients with positive medical history should be referred to a pediatrician for evaluation and consent. It may also be required to modify the dosage or change a particular drug as per the requirement of the treatment. Sometimes, modification to the type of the treatment is needed according to the underlying systemic condition.

Systemic phase

Any medication given to modify dental treatment is included in this phase, such as premedication for behavior management or antibiotic prophylaxis to a child with congenital cardiac defect.

Preventive phase

This phase is the first phase of treatment. It is aimed at providing preventive therapy to prevent or minimize dental disease. A plaque control program should be done that includes plaque identification and removal, diet counseling, topical fluoride application and child- parent education on home care oral hygiene practice. This phase includes:

- 1) Oral prophylaxis and fluoride treatment
- 2) Pit and fissure sealant application
- 3) Oral hygiene counseling
- 4) Diet counseling
- 5) Orthodontic consultation

Corrective phase It includes providing treatment or management of the disease process. It includes:

- 1) Extractions
- 2) Restorations
- 3) Minor surgical procedures
- 4) Space maintainers
- 5) Minor orthodontic corrections
- 6) Prosthetic rehabilitation

** Orthodontic and prosthodontic care following the completion of the restorative phase of treatment that may be rendered if needed. Although minor oral surgical procedures are accomplished during the restorative phase of treatment using the quadrant approach, complex surgical procedure should be delayed until this phase.

Maintenance and recall

Patients are recalled at regular intervals following the completion of the required treatment for evaluation and necessary follow up. This is done as a preventive measure for early detection of disease and for biannual topical fluoride application. Patients at high risk are maintained at 2-3 months recall and low risk at 6 months recall.

The dentist should inform the parents for:

1. The dental need of their child
2. The restorative procedures that required
3. The amount of time required to perform the projected procedures
4. The total cost of the services
5. Preventive measures that are necessary to maintain the completed treatment