Patient management

Not all dental radiographic techniques can be successfully performed on all patients ; sometimes these techniques must be modified to accommodate patients with special needs such as gag reflex.

The main difficulties & challenges encountered in dental clinic during taking radiographic image are:

1. mandibular third molar

2. endodontic

3. gagging reflex

4. Neuromuscular problems

5. Physical disability

6. Developmental disabilities

7. child patient.

8. Edentulous patient .

1. Mandibular third molar

It is difficult to place the film sufficiently posterior to record the entire mandibular third molar. The solution is by using a surgical needle holder to hold the film in the mouth

1. the needle holder is secured onto the top edge of the film packet. With the mouth is opened, the film is positioned gently in the lingual sulcus as far posteriorly as possible.

2. the patient is asked to close the mouth onto the handle of the holder (which relaxed the tissue of the floor of the mouth) and at the same time the film is eased further into the mouth until its front edge is opposite the mesial side of the mandibular first molar , then the patient is asked to support the handle of the holder in position.

3. x ray tube is positioned over the third molar at right angle to the film. Sometimes it is difficult to get the film far enough back to cover the third molar region due to gagging or anatomy, and all the third molar will not be seen on the film when taking the image with proper technique and angulation , so we rotate the tubehead so that the beam is directed more anteriorly (distal shift technique) ; in this way the third molar is projected onto the film entirely but with some overlapping.

2. Endodontic treatment:

The main difficulties with endodontic treatment are:

1. Film placement and stabilization when endodontic instrument , rubber dam & rubber dam clamps are in position , solved by using film holder

2. Separation & Identification of root canals . solved by (buccul object rule)

3. gagging reflex:

Gagging : refer to a strong **involuntary** effort to vomit.

Gag reflex (pharyngeal reflex) elicited by stimulation of **the sensitive tissue of the soft palate and the lateral posterior third of the tongue**. It is considered as a protective mechanism of the body to clear the airway from obstruction.

In dental radiology ; gag reflex is a very common problem.

Prior to gag reflex, two reactions occur:

1. cessation of respiration.

2. contraction of the muscle of the throat and abdomen

The precipitating factors that are responsible for initiating the gag reflex include (psychogenic stimuli) and (tactile stimuli).

Patient management:

a. Operator attitude:

most gagging can be controlled through the creation of the patent confidence or by diverting the patient's concentration away from gagging reflex like asking the patient to breathe deeply through the nose or moving his arm or leg.

b. Patient and equipment preparations:

every effort should be made to reduce the time that the film remain in the mouth; the longer the time a film stay in the mouth , the more likely the patient to gag

c. Exposure sequence:

in patient who need multiple exposure , the dentist should always start with anterior exposure. In posterior area we should expose the premolar before molars.

d. Use extraoral radiograph:

In patients where the intraoral radiograph is impossible , dental radiographer can use extraoral films such as panoramic radiographs or lateral jaw radiographs.

e. Using topical anesthetic agent:

when the cause of gag reflex is tactile, we can use topical anesthesia on the palate or posterior area of the tongue. Salt application on the palate is said to be useful.

4. Neuromuscular proplems:

Refers to patient inability to remain immobile.

A. Speed is essential in radiographic procedure. That mean in such patients we should minimize the exposure interval through:

* The use of fast film. (E or F)

* Using high kilovoltage or high milli amperage .

B. Using film holder that can be stabilize by another person but not by dental office staff.

C. Extraoral film may be useful

D. sedation may be useful.

E. Radiograph may be performed under anesthesia.

5. Physical disability:

That is mean patient with impairment that limits one or more of an individual's life activities.

a. Vision impairment: if a patient is blind or visually impaired, the dentist must communicate using clear verbal explanation. He must keep the patient informed of what is being done and explain each procedure before performing it.

b. Hearing impairment: if a person is deaf or hearing impaired, the dentist may ask the caretaker to act as interpreter, or use written instructions. When the patient can read lips, we must face the patient and speak clearly and slowly.

c. Mobility impairment: if a person is in a wheelchair and cannot use the lower limb, the dental radiographer may offer to assist the patient in transferring to the dental chair. If a transfer is not possible, we may attempt to perform the procedure with the patient seated in the wheelchair.

If the patient doesn't use the upper limbs ; the dentist may ask the caretaker to assist with film holding, the caretaker must wear a lead apron and thyroid collar.

6. Developmental disabilities:

Is a substantial impairment of mental functions that occurs before the age of 22 and is of indefinite durations. (such as autism, cerebral palsy, epilepsy , mental retardation & other neuropathy).

A person with a developmental disability may have problems with coordination or comprehension of instruction. As a result the dental radiographer may experience difficulties in obtaining intraoral film. If coordination is a problem as in autism , **mild sedation** may be useful. If comprehension is a problem and the patient cannot held the film , the caretaker may be asked to assist in film holding.

7. Child patient

The radiographic examination usually the first procedure performed on a young patient. If this examination is comfortable to the child; subsequent dental procedures usually are accepted with little or no apprehension.

* Use conveniently small intraoral film.

* Lead apron , the growing organ of the child are particulary susceptible to the effect of ionizing radiation and must be protected , so lead apron & thyroid collar must be used with child patient

* Describe the x ray machine as a camera used to take picture of teeth.

*The child can become more comfortable with the film and the x ray machine by touching them before examination.

* Show him a radiograph of another child's teeth and let him see the radiographic procedure on another member of the family.

*Exposure factors (Ma, kVp, time) must be reduced.

* radiographic procedure should not be hurried nor should the child be apprised of any negative possibilities like you might hurt a bit or you may gag a little.

* A mirror enabling the child to observe the procedure may be helpful.

8. Edentulous patient:

Edentulous patient may require dental radiograph for the following reasons:

1. Detect the presence of root tips, impacted teeth and lesions.

2. To establish the position of normal anatomical landmarks relative to the crest of alveolar ridge.

3. To observe the quantity and quality of bone that is present.

**The radiographic examination of edentulous patient may include:

1. Panoramic radiograph: is the most common way, it is quick, easy and cover a large area. If the panoramic technique reveals any root tips, impacted teeth, foreign bodies or lesions in the jaw; a periapical film of that specific area must be used.

2. Periapical radiograph: it provides more definitions of the examined area. When using parallel technique, cotton roles must be placed on both sides of biting block of the receptor holding instrument (paralleling instrument) to take a place of missing teeth. Bisecting angle technique can also be used if the alveolar ridge is severely resorbed.

3. Occlusal examination. Is used to examine the tooth bearing area and detection of bone lesion .

LOCALIZATION

The radiograph presents as a two dimensional image of a three dimensional object. There is often a need for determining special relationship.

The localization technique is used to locate the position of a tooth or object in the jaw.

Localization technique is used to locate the followings:

1- foreign bodies. 2. Impacted & unerupted teeth 3. Retained root

4. salivary stones 5. Root position 6. Intraosseous lesion

7. broken needle & instrument

The following techniques are used for localization of objects:

1. right angle technique.

2. tube shift technique.

3. using a radiopaque media.

4. Stereo radiography (it is not widely used because it is time consuming and need a special viewing device)

Right angle procedure

It involves the use of at least 2 films taken at right angles to each other. For example:

Lateral skull projection demonstrates the anteroposterior area and **posteroanterior projection** (**PA skull**) demonstrate the mediolateral area so an object can be located.

Also we can localize an object intraorally by using a **periapical film** (show superior-inferior &mesiodistal relation) and **occlusal film** at right angle to the first periapical film (to show mesiodistal &buccolingual relations).

***** مهم Periapical film cannot demonstrate the buccolingual diamension

Tube shift technique: technique (also named buccal object rule or Clark's rule)

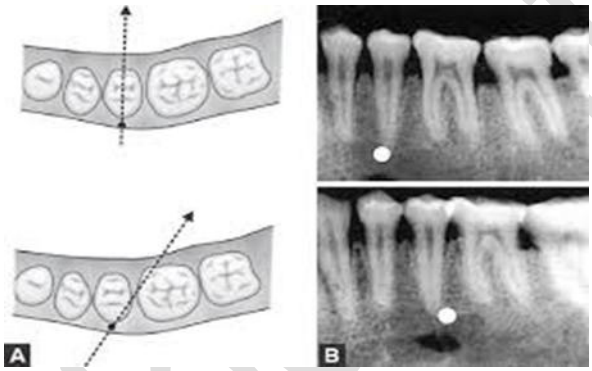
In this technique we use a standard periapical technique to determine the relative buccolingual relationship between two structures that appear radiographically superimposed, a second radiograph is taken with a different horizontal angulation.

All factors remain the same for the second exposure, except that the tube is shifted about 20 degrees either mesially or distally. Then the two radiographs are compared.

If the object in the second radiograph is moved in the same direction as the tube , it means it located lingually or palatally; if it is moved in opposite direction that means it located buccally or labially

*note: to remember the tube shift technique. Keep in your mind the word

(SLOB) Same = Lingual , Opposite = Buccal



Use of radiopaque media:

Barium sulfate, lipiodol and dionosil can be used to demonstrate cavernous areas. After the injection of the radio-opaque media (mostly lipiodol) in cyst for example, film exposed, processed and viewed to see the extension of the cyst. Radio-opaque media also used in sialogram to demonstrate the salivary glands and their duct.

* sometimes dentist may use **definition evaluation** technique for localization; it stats that structures that are closer to the receptor have better definition than those that are farther from the receptor. Because an intraoral receptor is positioned lingually in the mouth, the structure that is more sharply defined is positioned lingually . in general this technique is the least reliable and not recommended.

RADIOGRAPHIC SURVEY

An examination of a part or an area designed to determine whether any abnormal changes exist within that part or area. It is either **routine scanning procedure, or specific purpose survey** for example cephalometric films designed to study growth pattern A new complete survey is not necessary for a period **of at least 5 years**, but new bite-wing films are often necessary every 6 months. Any single film in the complete mouth survey should have the following **criteria of excellence**:.

1.Should show no film fog. (للاطلاع فقط من ١- ١٠)

2.Should have no stain or discoloration resulting from inadequate darkroom procedure.

3. excessively dark or light films are unacceptable.

4.The position of the identifying dot must be toward the occlusal plane, such positioning will avoid superimposing important structures on the dot.

5.The film should be placed so that the incisal edges or cups of the teeth are approximately 1/8 inch (2mm) from film margin.

6.Each single film should show a suitable reproduction of the area being examined.

7.Each tooth's image should be neither elongated nor foreshortened.

8.Inter proximal surfaces of teeth should not overlapped.

9.Each film should show the inter proximal bone crest without superimposition of the adjacent teeth. It is necessary that approximately 1/8 of an inch of alveolar be observable beyond the apex of the tooth (for periapical view).

10.In the excessively long tooth we use 2 films to cover the whole area.

** Criteria of excellence for extraoral films are largely similar to those for intra oral films.

Radiographic survey methods:

Routine: for children, adult and edentulous **14-17 periapical films with 2-4 posterior bite-wing films** are necessary for adequate interpretation of oral conditions.

Alternate: lateral jaw projections, anterior periapical mandibular and maxillary views with bitewing for posterior teeth. For edentulous patients topographic occlusal films could be used instead of periapical films as alternative survey method .