

Preparation for Endodontic Treatment

(Endodontic Radiography, Pain Control in Endodontics, Rubber Dam Application)

❖ **Endodontic Radiography**

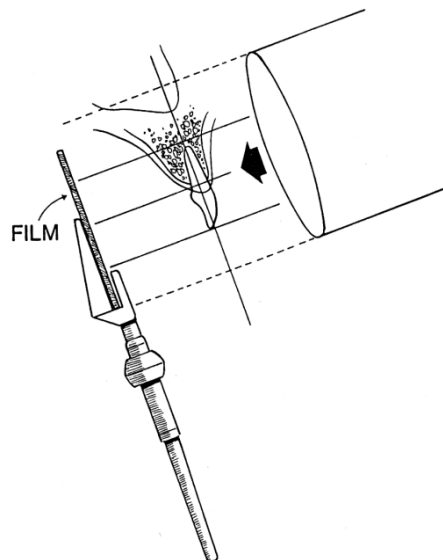
The dental radiograph allows indirect vision to the dentition and supporting structures, and provides standardization of intracanal procedures. As a result, radiographs are a very important aid for endodontic diagnosis and treatment.

▪ **Information gained from the radiograph**

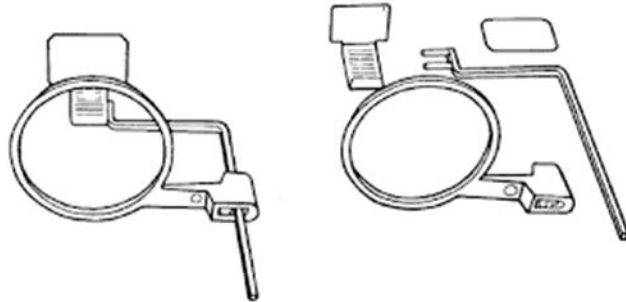
- 1- The crown and pulp anatomy
- 2- Hard tissue alterations in the tooth (sclerosis or resorption)
- 3- Number, size, location and direction of the roots
- 4- Estimation of the working length
- 5- Related anatomical structures as mental foramen, maxillary sinus etc...
- 6- Confirm position of master cone
- 7- Evaluation of success of obturation
- 8- Instrument separations or perforations

▪ **Suggestions for good endodontic radiography**

- 1- For periapical exposures the edge of the film is positioned parallel to and near the incisal or occlusal surface of the teeth so that the tooth apices are near the center of the film.



2- The plastic film holder facilitates standardization of a radiographic technique by aiding in film positioning and preventing movement of the film during exposure.

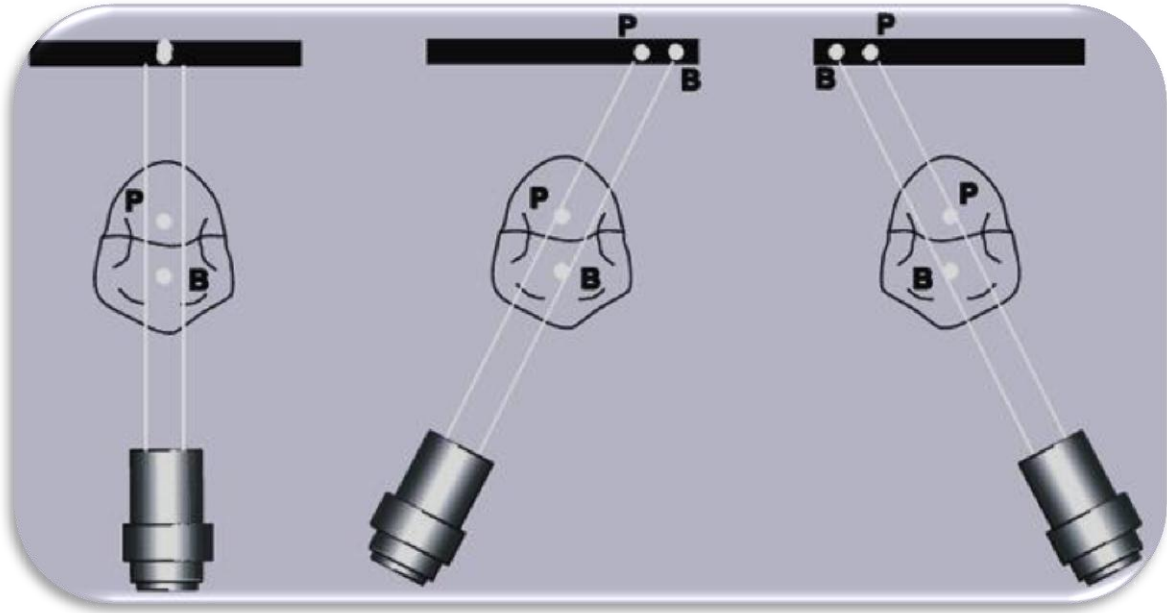


3- Because of the angle of the hard palate the films that are held by the finger usually show maxillary molars with short buccal roots and very long palatal root.



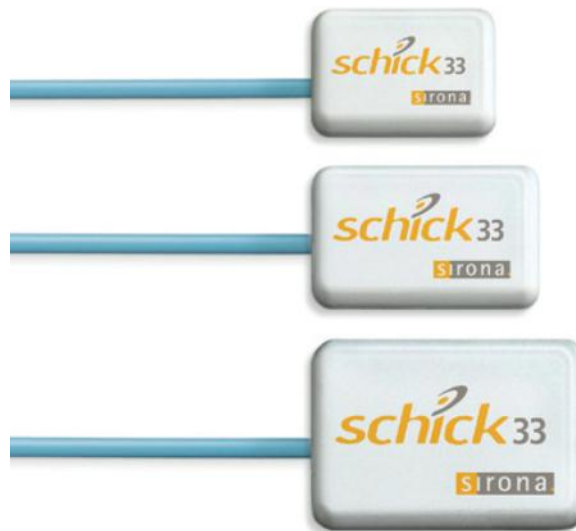
- **Buccal object rule**

When treating premolars and molars, it is often difficult to recognize radiographically which canal is nearer to buccal side. When the exposure is done to a multicanaled tooth, the canals may be superimposed and difficult to differentiate them. If the x-ray cone is deviated mesially or distally with a given angle the roots will separate in the film. Therefore, when the cone is moved distally the buccal canal appears mesial to the lingual or palatal canal and when the cone is moved mesially the buccal canal appears distal to the lingual or palatal canal.



❖ Digital radiography:

Digital radiography uses no x-ray film and requires no chemical processing. Instead, a sensor is used to capture the image created by the radiation source. This sensor is either directly or wirelessly attached to a local computer, which interprets this signal and, using specialized software, translates the signal into a two-dimensional digital image that can be displayed, enhanced, and analyzed.



3 different sensor sizes.

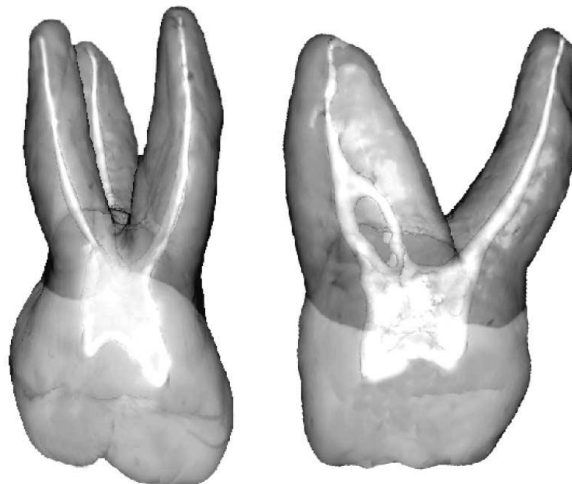
Advantages of digital radiographs over conventional radiographs:

- Lower radiation doses,
- instant viewing,
- convenient manipulation,
- efficient transmission of an image via the Internet,
- simple duplication;
- Easy archiving.
- the image can even be colorized, a useful tool for patient education

❖ Cone-Beam Computerized Tomography (CBCT):

The radiation source of CBCT is different from that of conventional two-dimensional dental imaging in that the radiation beam created is conical in shape. Also, conventional digital dental radiography is captured and interpreted as pixels, a series of dots that collectively produces an image of the scanned structure. For CBCT, the image is instead captured as a series of three-dimensional pixels, known as voxels. Combining these voxels gives a three-dimensional image that can be “sliced” into various planes, allowing for specific evaluations never before possible without a necropsy.

Compared with two-dimensional radiographs, CBCT can clearly visualize the interior of the cancellous bone without the superimposition of the cortical bone. Studies show that CBCT is much more predictable and efficient in demonstrating anatomic landmarks, bone density, bone loss, periapical lesions, root fractures, root perforations and root resorptions.



❖ RUBBER DAM APPLICATION

Rubber dam isolation is essential for the success of numerous dental procedures by eliminating the risks of contamination from saliva and bacteria found in the oral cavity.

The importance and purposes of the dam are:

1. It provides a dry, clean, and disinfected field.
2. It protects the patient from the possible aspiration or swallowing of tooth and filling debris, bacteria, necrotic pulp remnants, and instruments or operating materials.
3. It protects the patient from rotary and hand instruments, drugs, irrigating solutions, and the trauma of repeated manual manipulation of the oral soft tissues.
4. It is faster, more convenient, and less frustrating than the repeated changing of cotton rolls and/or saliva ejectors.

Components of rubber dam :

- 1. Rubber dam sheet**
- 2. Rubber dam frame**
- 3. Rubber dam punch**
- 4. Rubber dam clamp**
- 5. Rubber dam clamp forceps**

1. Rubber dam sheet

Sheet is used to isolate tooth from the oral cavity.

Surfaces: shiny toward tissue and the dull toward the occlusal.

2. Rubber dam frame

Rubber dam frame (either stainless steel or plastic).

Frame maintain the borders of the dam in position away from the patient's nose.

Holding the edges of the sheet, retract soft tissue and improve access.

3. Rubber dam punch

A punch is used to make the necessary number of holes in the rubber dam, corresponding to the number of teeth to be isolated. In the case of endodontic treatment, usually single tooth isolation is used.

The smaller holes in the punch are used for incisors, canines, and premolars, the larger holes are used for molars.

4. Rubber dam clamp

Clamp is used for supporting the flexible sheet around a tooth during the operation.

There are two types of clamp Winged and Wingless Clamps. Winged clamps have an extension to the buccal and lingual of the clamp jaws to hold the dam further away from the clamped tooth, this is great for endodontic procedures, but often these projections interfere with the placement of matrix systems when interproximal lesions are to be restored.



5. Rubber dam clamp forceps

Rubber dam clamp forceps are used to stretch the jaws of the clamp to open in controlled manner during placement and removal.

Methods of Rubber Dam Placement:

Method I: Clamp placed before rubber dam :

- Select an appropriate clamp according to the tooth size.
- Tie a floss to clamp bow(bracket) and place clamp onto the tooth.
- Larger holes are required in this technique as rubber dam has to be stretched over the clamp. Usually two or three overlapping holes are made.
- Stretching of the rubber dam over the clamps can be done in the following sequence:
 - Stretch the rubber dam sheet over the clamp
 - Then stretch the sheet over the buccal jaw of the clamp and allow to settle into place beneath that jaw
 - Finally, the sheet is carried to palatal/lingual side and released.

This method is mainly used in posterior teeth in both adults and children except third molar.

Method II: Placement of rubber dam and clamp together:

- Select an appropriate clamp according to tooth anatomy.
- Tie a floss around the clamp and check the stability.
- Punch the hole in rubber dam sheet.
- Clamp is held with clamp forceps and its wings are inserted into punched hole.
- Both clamp and rubber dam are carried to the oral cavity and clamp is tensed to stretch the hole.

- Both clamp and rubber dam is advanced over the crown. First, jaw of clamp is tilted to the lingual side to lie on the gingival margin of lingual side.
- After this, jaw of the clamp is positioned on buccal side.
- After seating the clamp, again check stability of clamp.
- Remove the forceps from the clamp.
- Now, release the rubber sheet from wings to lie around the cervical margin of the tooth.

Method III: Split dam technique:

In this method rubber dam is placed to isolate the tooth without the use of rubber dam clamp. In this technique, two overlapping holes are punched in the dam. The dam is stretched over the tooth to be treated and over the adjacent tooth on each side. Edge of rubber dam is carefully teased through the contacts of distal side of adjacent teeth.

Split dam technique is indicated to isolate anterior teeth when there is insufficient crown structure or when isolation of teeth with porcelain crown is required. In such cases placement of rubber dam clamp over the crown margins can damage the cervical porcelain.

