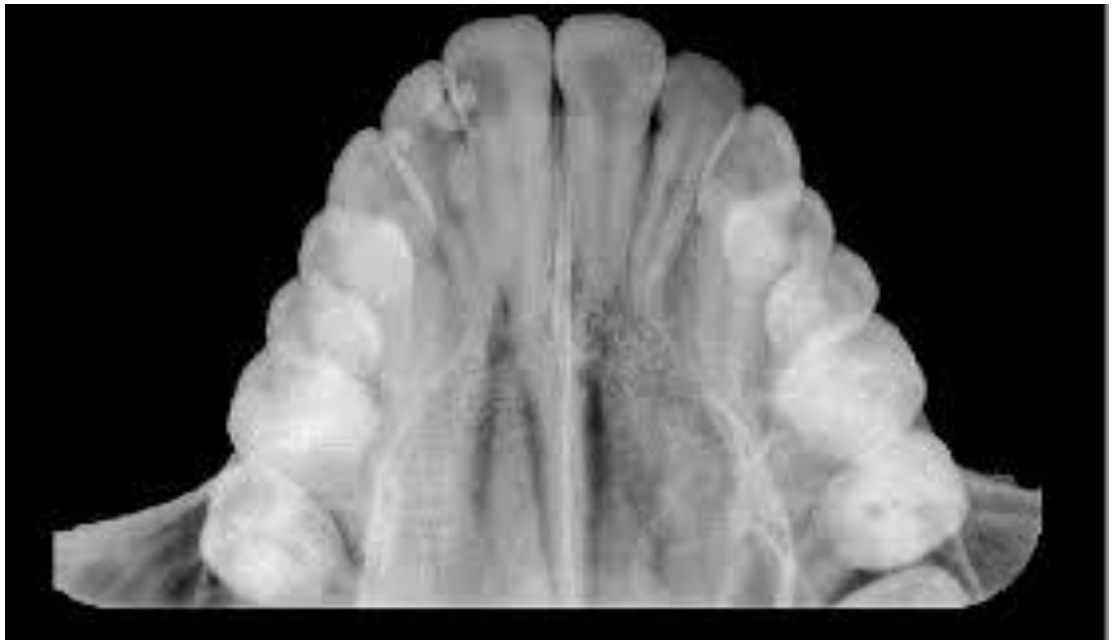
Occlusal and Localization Technique
Chapter 21

-Ketul Dave

Occlusal Radiographs



Objectives

Upon completion of the lecture, the student should be able to:

1. Define the key terms associated with occlusal and localization techniques.
2. Describe the purpose of the occlusal examination.
3. List the uses of occlusal examination and discuss the basic principles involved.
4. Describe the patient's equipment and equipment preparations that are necessary before using the occlusal technique.
5. State the recommended vertical angulations for the following maxillary occlusal projections: topographic, lateral (right or left) and pediatric.
6. State the recommended vertical angulations for the following mandibular occlusal projections: topographic, cross-sectional, and pediatric.
7. State the purpose of localization techniques and list their uses.
8. Describe the buccal object rule.
9. Describe the right-angle technique.

Terminology

Occlusal surfaces: Chewing surfaces of posterior teeth

Occlusal examination: A type of intraoral radiographic examination to inspect large areas of the maxilla or the mandible on one image

Occlusal technique: Method used to expose a receptor in occlusal examination

Occlusal receptor: It is named because the patient “occludes” or bites on the entire receptor.

- Size 4 receptor are the largest size, measuring 3x2.25 inches which is used in adult whereas size 2 receptor is used in child with primary dentition.

Purpose of Occlusal Technique

To locate retained roots of extracted teeth

To locate supernumerary, unerupted or impacted teeth

To locate foreign bodies in the maxilla or the mandible

To locate salivary stones in the duct of submandibular gland

To locate and evaluate the extent of lesions (eg: cysts, tumors, malignancies) in the maxilla or the mandible

Purpose of Occlusal Technique

To evaluate the boundaries of the maxillary sinus

To evaluate fractures of the maxilla or mandible

To aid in the examination of patients who cannot open their mouth more than a few millimeters

To examine area of cleft palate

To measure changes in the size and shape of the maxilla or mandible

Uses of Occlusal Technique

1. Used in conjunction with periapical or bite-wing images

2. Used when the large areas of the maxilla or mandible must be visualized.

3. Used when the area of interest is larger than a periapical receptor may cover or when the placement of intraoral receptors is too difficult for the patients

Basic Principes of the Occlusal Technique

- The receptor is placed with the tube side facing the arch that is being exposed.
- When using the film, it is pointed with the white side facing the arch that is being exposed.
- When using a digital sensor, the flat non-wired or non-battery side of the sensor must face the arch that is being exposed
- Receptor is placed in the mouth between the occlusal surface of maxillary and mandibular teeth.
- Lastly, inform patient to “Gently” bite on the receptor to avoid seeing permanent bite marks on the film

Patient and Equipment Preparations

- Follow the infection control protocol
- Explain the procedure to the patient
- Adjust the chair so that patient is positioned upright and at a comfortable working height
- For maxillary occlusal exposure, the pt's head must be positioned with the maxillary arch parallel to the floor and the midsagittal (midline) plane perpendicular to the floor
- For mandibular occlusal exposure, the pt's head must be reclined and positioned with the occlusal plane perpendicular to the floor.
- Lead apron with thyroid collar
- Set the exposure control factors (kilovoltage, milliamperage, time)
- Either a short (8-inch) or a long (16-inch) PID may be used

Occlusal Projections

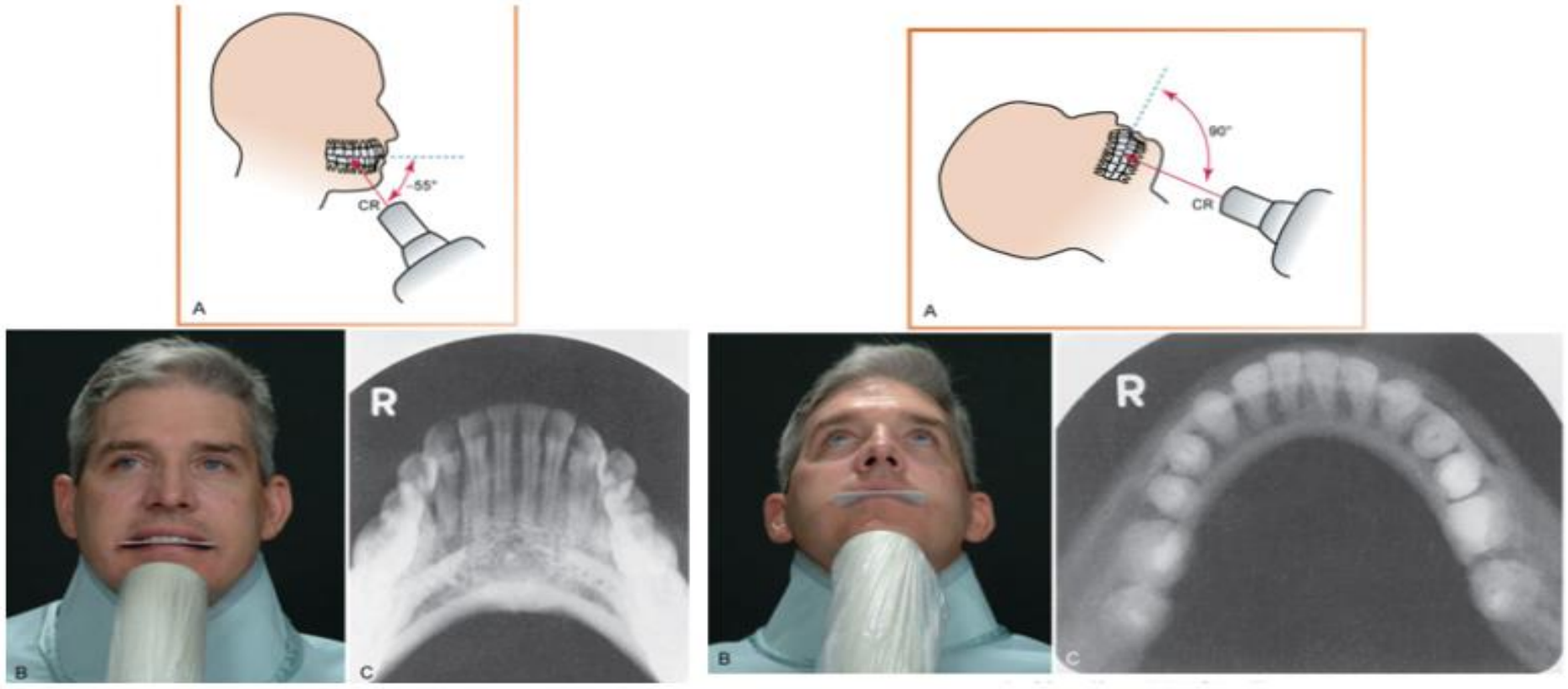
Maxillary

- **Topographic Projection:** Used to examine the palate and the anterior teeth of the maxilla
- **Lateral (right or left) Projection**: Used examine the palatal roots of molar teeth. Also used to locate foreign bodies or lesions in the posterior maxillary
- **Pediatric Projection:** To examine the anterior teeth of the maxilla and is recommended for use in children 5 years or younger

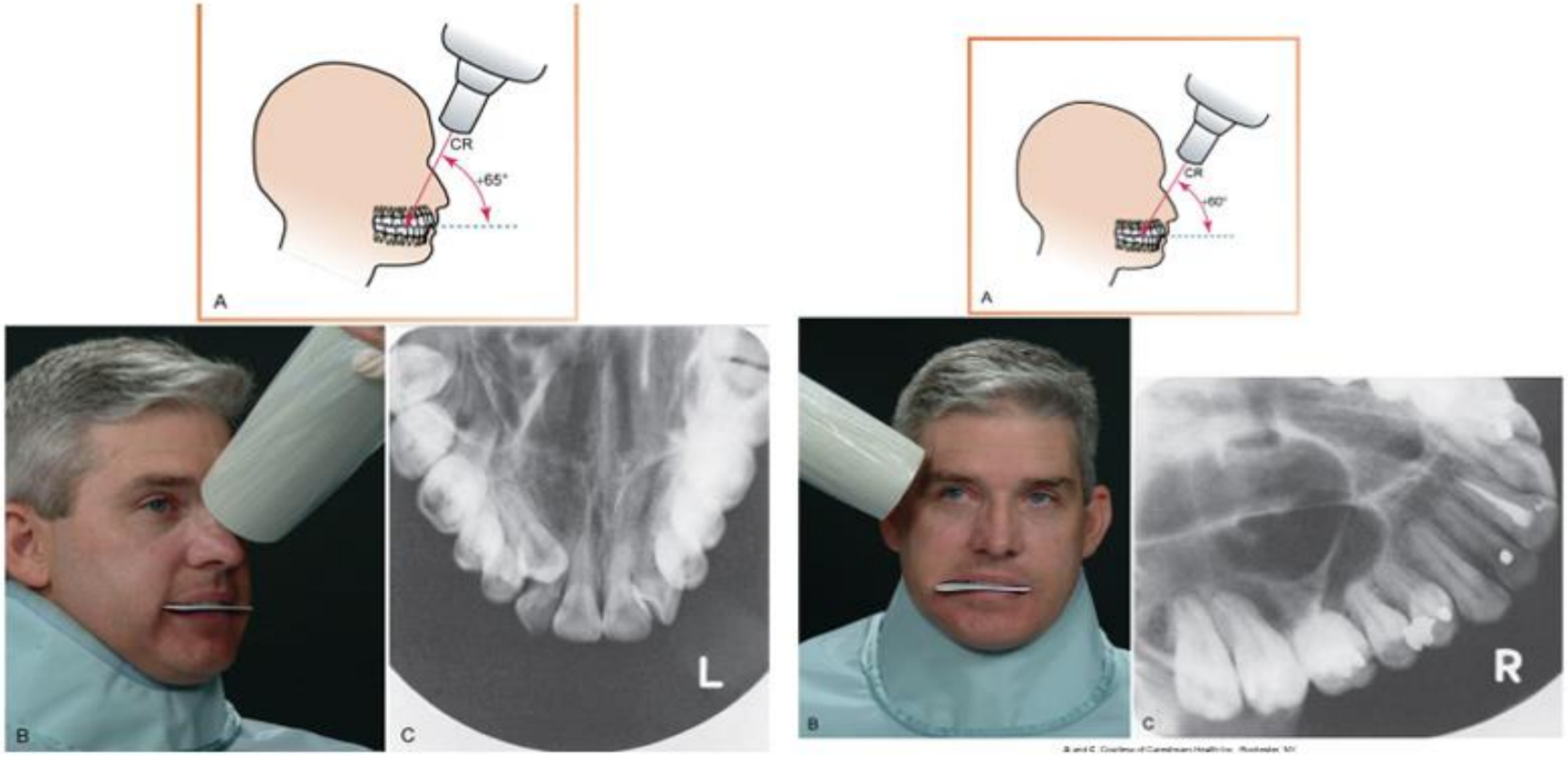
Mandibular

- **Topographic Projection:** Used to examine the anterior teeth of the mandible
- **Cross-sectional Projection:** Used to examine the buccal and lingual aspects of the mandible. Also used to locate foreign bodies or salivary stones in the region of the floor of the mouth
- **Pediatric projection:** To examine the anterior teeth of the mandible and is recommended for use in children 5 years or younger

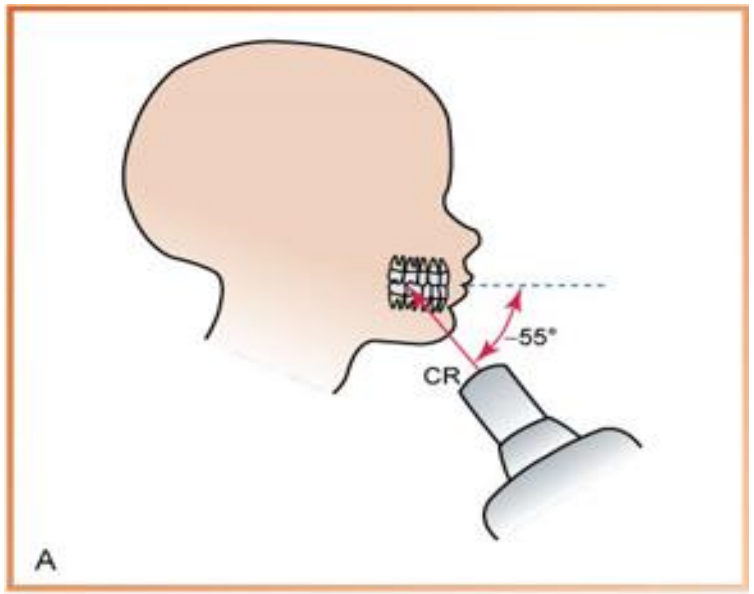
Identify the projections



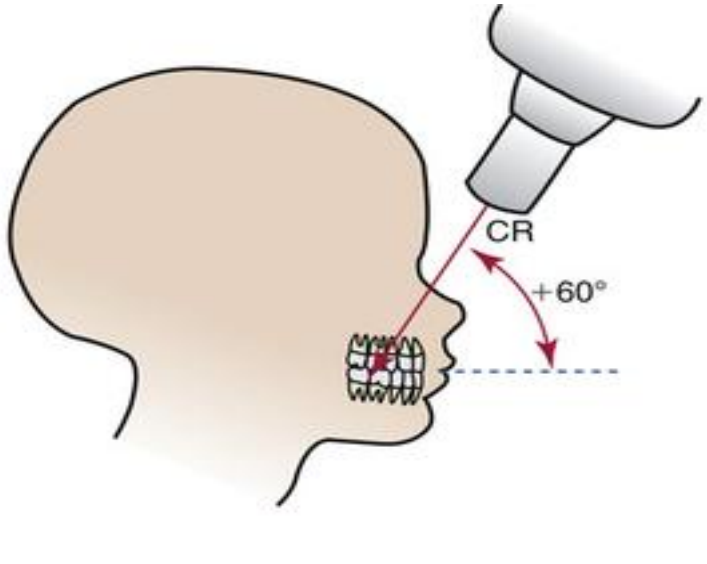
Identify the projections



Identify the projections



Copyright © 2012, 2006, 2000, 1996 by Saunders, an imprint of Elsevier Inc.



Projections and vertical angulations

Maxillary Topographic:	+65
Maxillary Lateral:	+60
Maxillary Pediatric:	+60
Mandibular Topographic:	-55
Mandibular Cross-sectional:	90
Mandibular Pediatric:	-55

Localization technique

- To obtain three-dimensional information
- Used to locate
    1. Foreign bodies
    2. Broken needles and instruments
    3. Dental restorative material
    4. Root positions
    5. Salivary stones
    6. Jaw fractures
    7. Impacted teeth
    8. Unerupted teeth
    9. Retained roots

Types of localization techniques

Buccal object rule

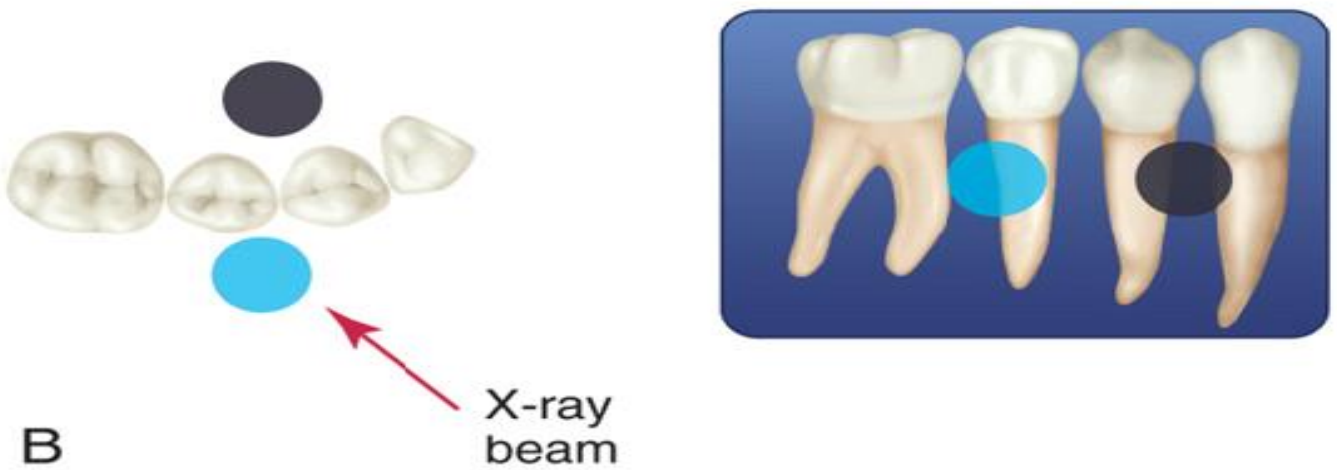
Right angle technique

Buccal Object Rule

- 2 radiographs at different angulations
- 1 with proper angulation/technique
- A 2nd with different angulation/change in a direction of x-ray beam
- If the object seen in 2nd image moves in the same direction as shift of PID, object is positioned lingual
- If the object seen in 2nd image move in opposite direction as shift of PID, object in question positioned buccal
  - S-L-O-B rule
  - Same=Lingual
  - Opposite=Buccal

SLOB

Redrawn from Haring JI, Lind LJ: *Radiographic interpretation for the dental hygienist*, Philadelphia, 1993, Saunders.

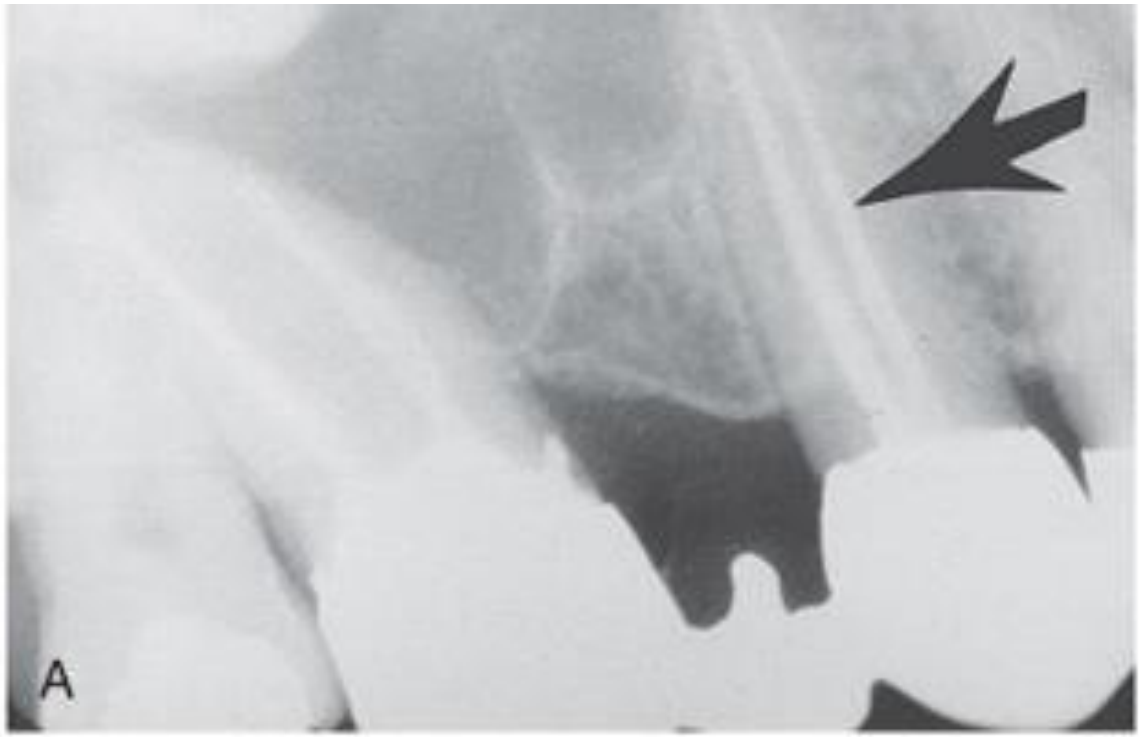


SLOB

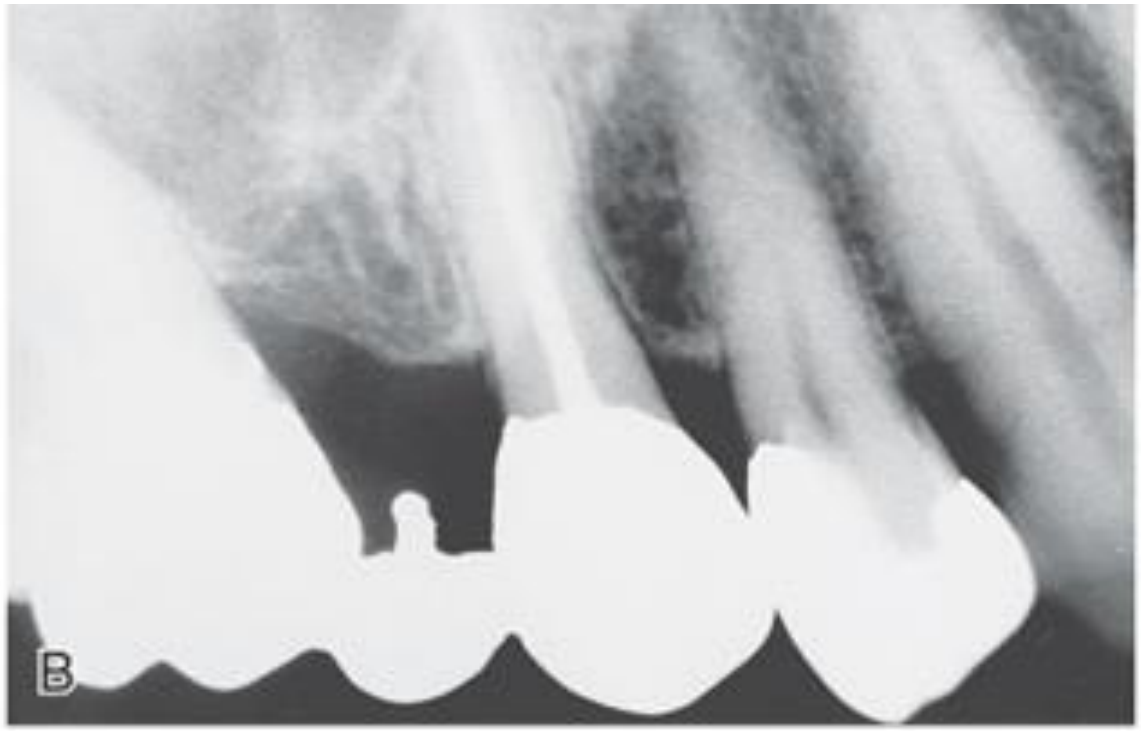
Redrawn from Haring JI, Lind LJ: *Radiographic interpretation for the dental hygienist*, Philadelphia, 1993, Saunders.

Redrawn from Haring JI, Lind LJ: *Radiographic interpretation for the dental hygienist*, Philadelphia, 1993, Saunders.

Buccal Object Rule

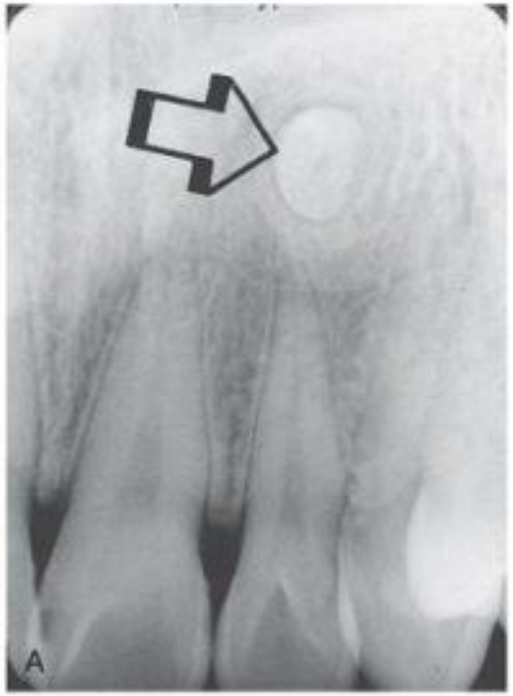


Images courtesy of Dr. Robert Jaynes, Columbus, OH. From Haring JI, Lind LJ: *Radiographic interpretation for the dental hygienist*. Philadelphia, 1993, Saunders.

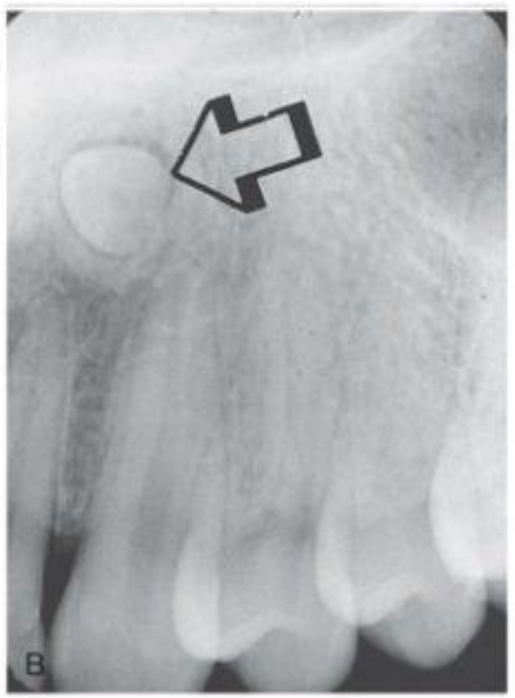


Images courtesy of Dr. Robert Jaynes, Columbus, OH. From Haring JI, Lind LJ: *Radiographic interpretation for the dental hygienist*. Philadelphia, 1993, Saunders.

Buccal Object Rule



Images courtesy of Dr. Robert Jaynes, Columbus, OH



Images courtesy of Dr. Robert Jaynes, Columbus, OH

Right-Angle Technique

- One periapical receptor is exposed using the proper technique/ angulation(90 degrees)
  - This show the position of the object in the superior-inferior and anterior-posterior relationships.
  - Occlusal receptor is used
  - Images are compared to find objects in 3-D
  - Primarily used to locate objects in mandible

Right Angle Technique

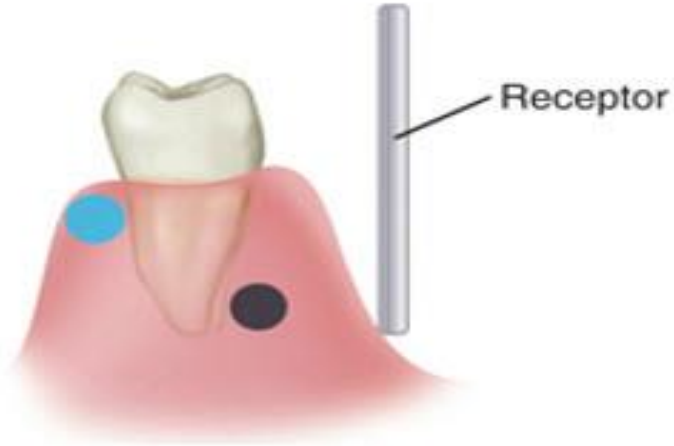
A

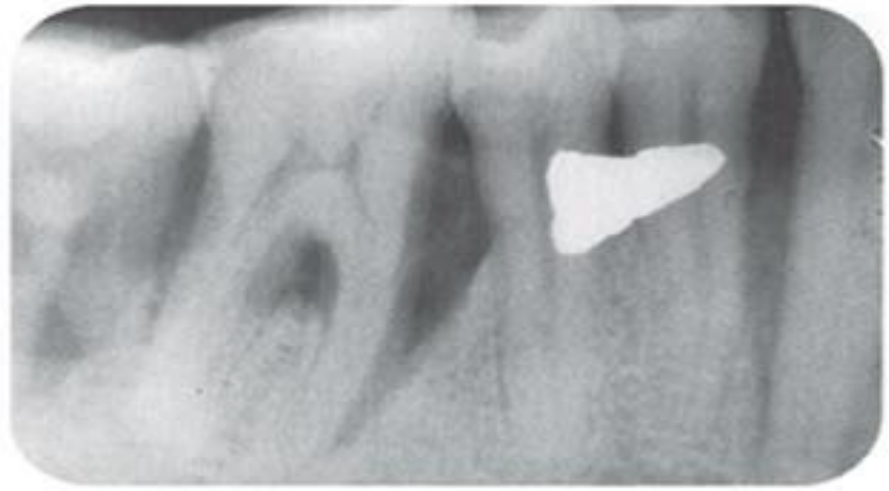
Copyright © 2017, Elsevier Inc. All Rights Reserved.

B

Copyright © 2017, Elsevier Inc. All Rights Reserved.

A

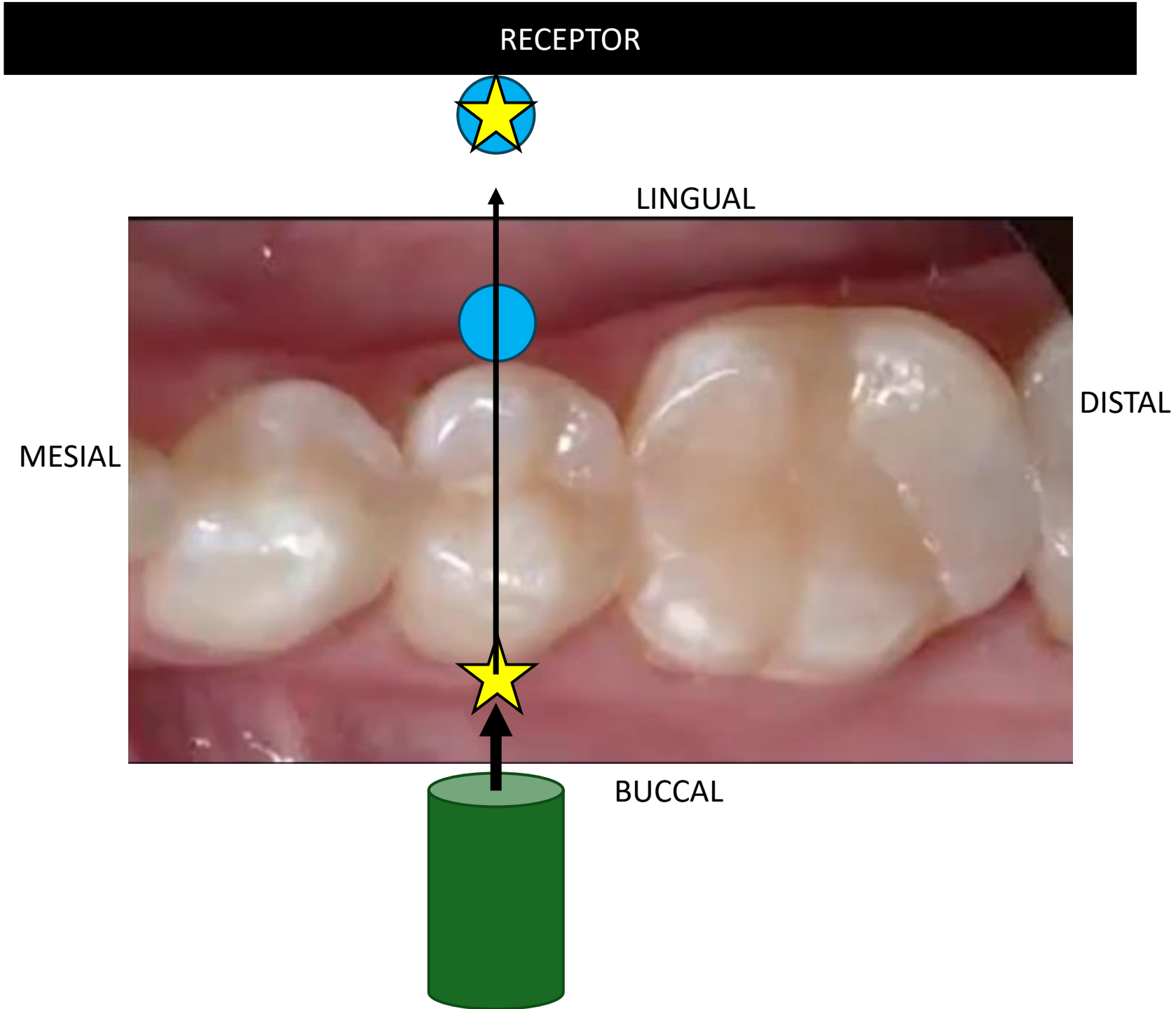


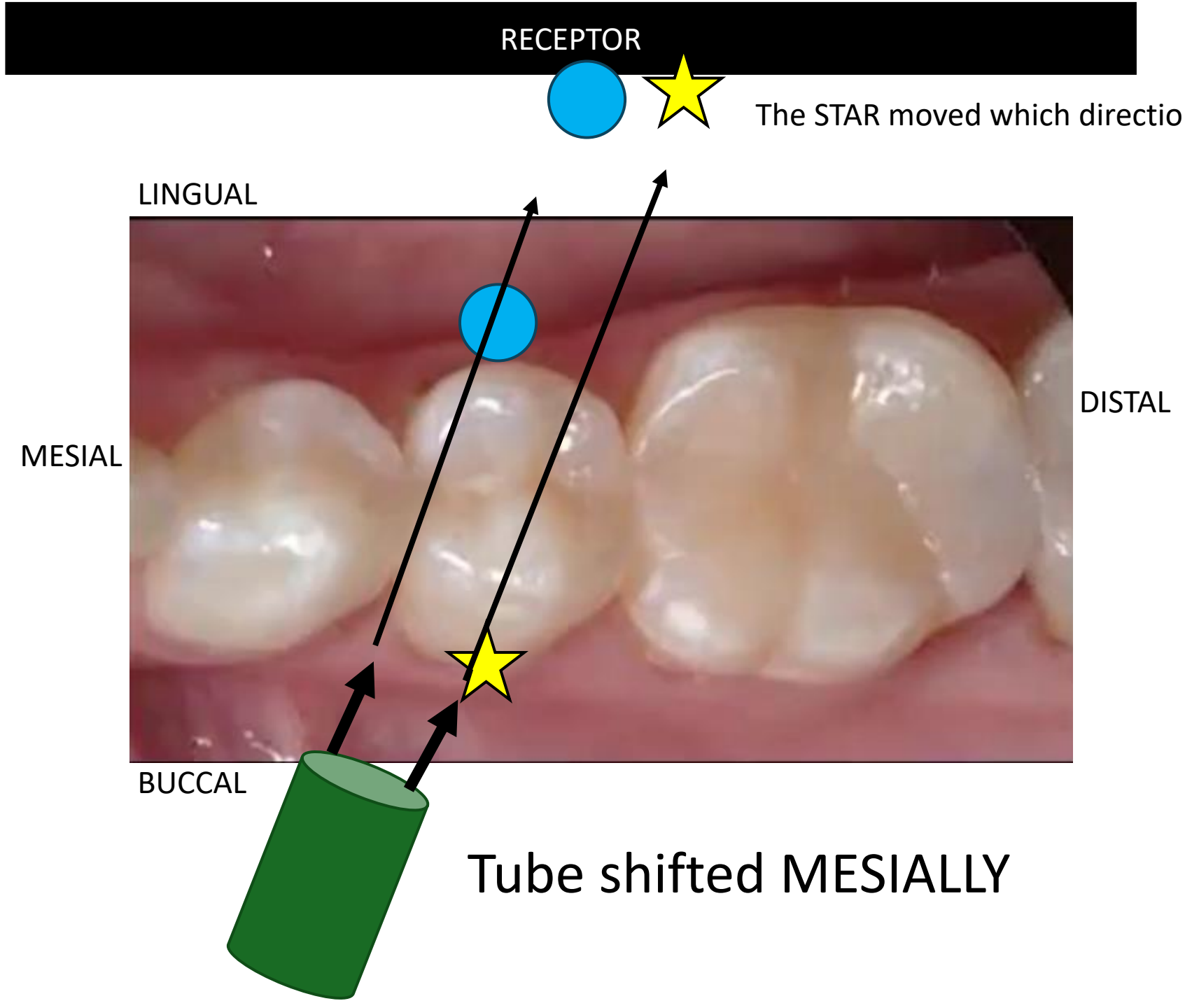


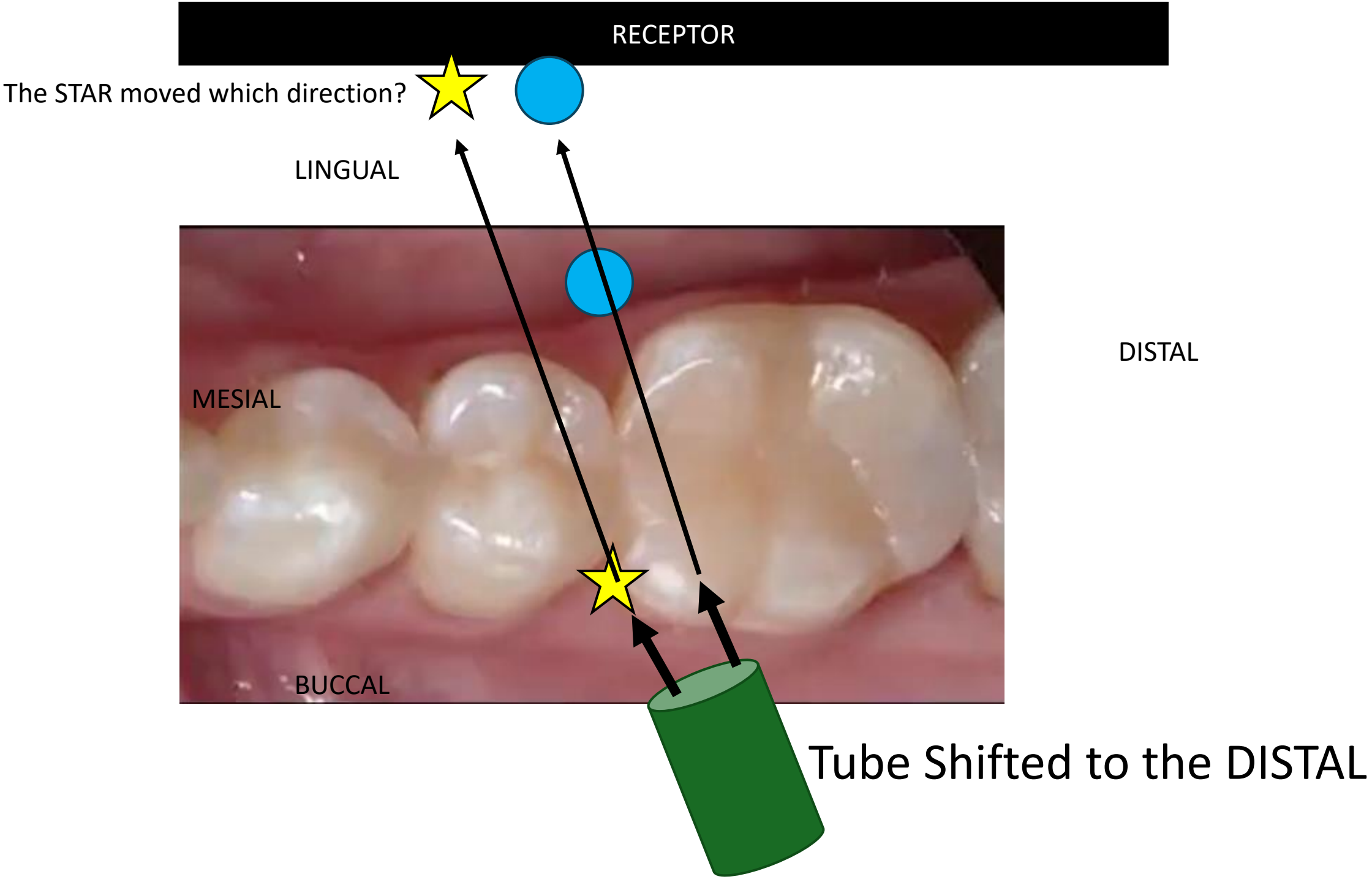
Redrawn from Olson SS: *Dental radiography laboratory manual*, Philadelphia, 1995, Saunders.

B

Redrawn from Olson SS: *Dental radiography laboratory manual*, Philadelphia, 1995, Saunders.


RECEPTOR
LINGUAL
MESIAL
DISTAL
BUCCAL


RECEPTOR
The STAR moved which direction?
LINGUAL
MESIAL
DISTAL
BUCCAL
Tube shifted MESIALLY

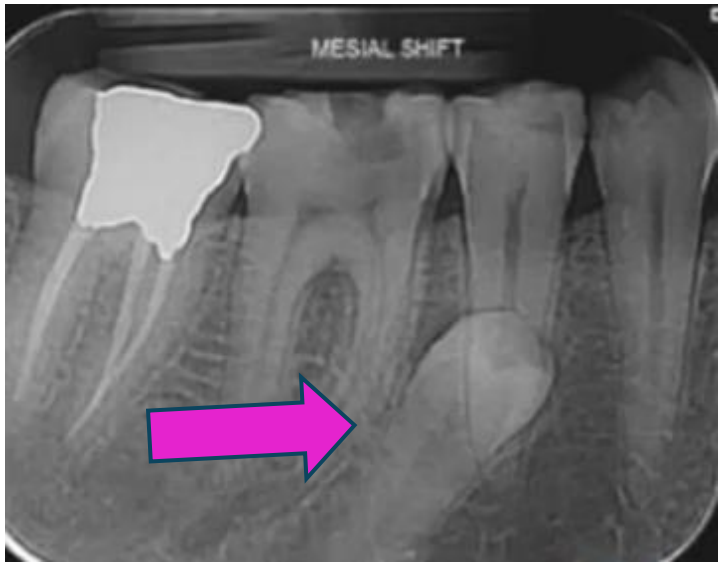

RECEPTOR
The STAR moved which direction?
LINGUAL
MESIAL
DISTAL
BUCCAL
Tube Shifted to the DISTAL

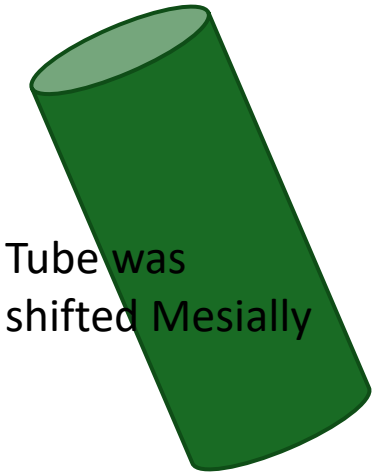
The premolar is mesial to the 1st molar

Tube was shifted Distally

The premolar moved distally (on top of) the 1st molar

The premolar is mesial to the 1st molar

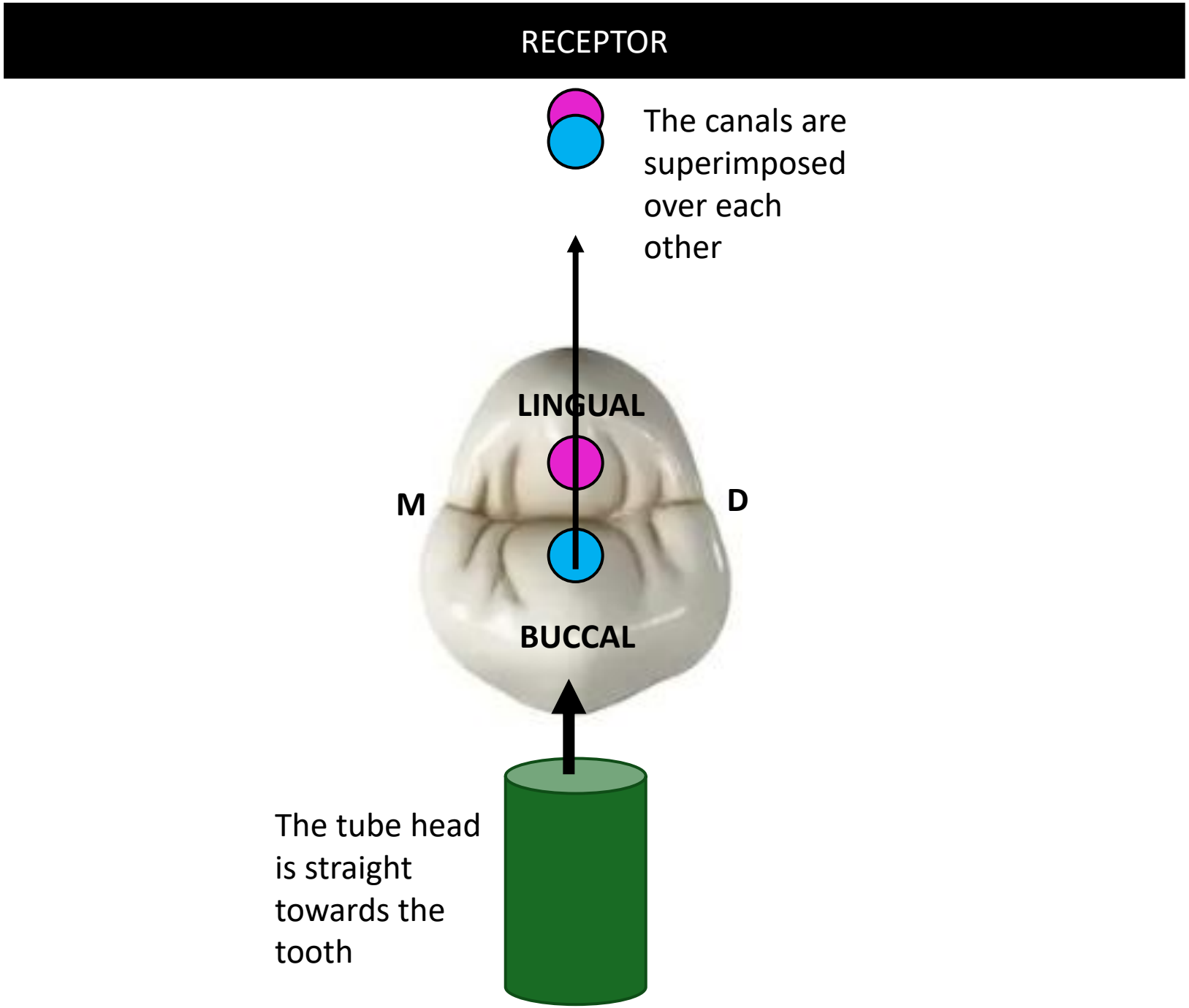




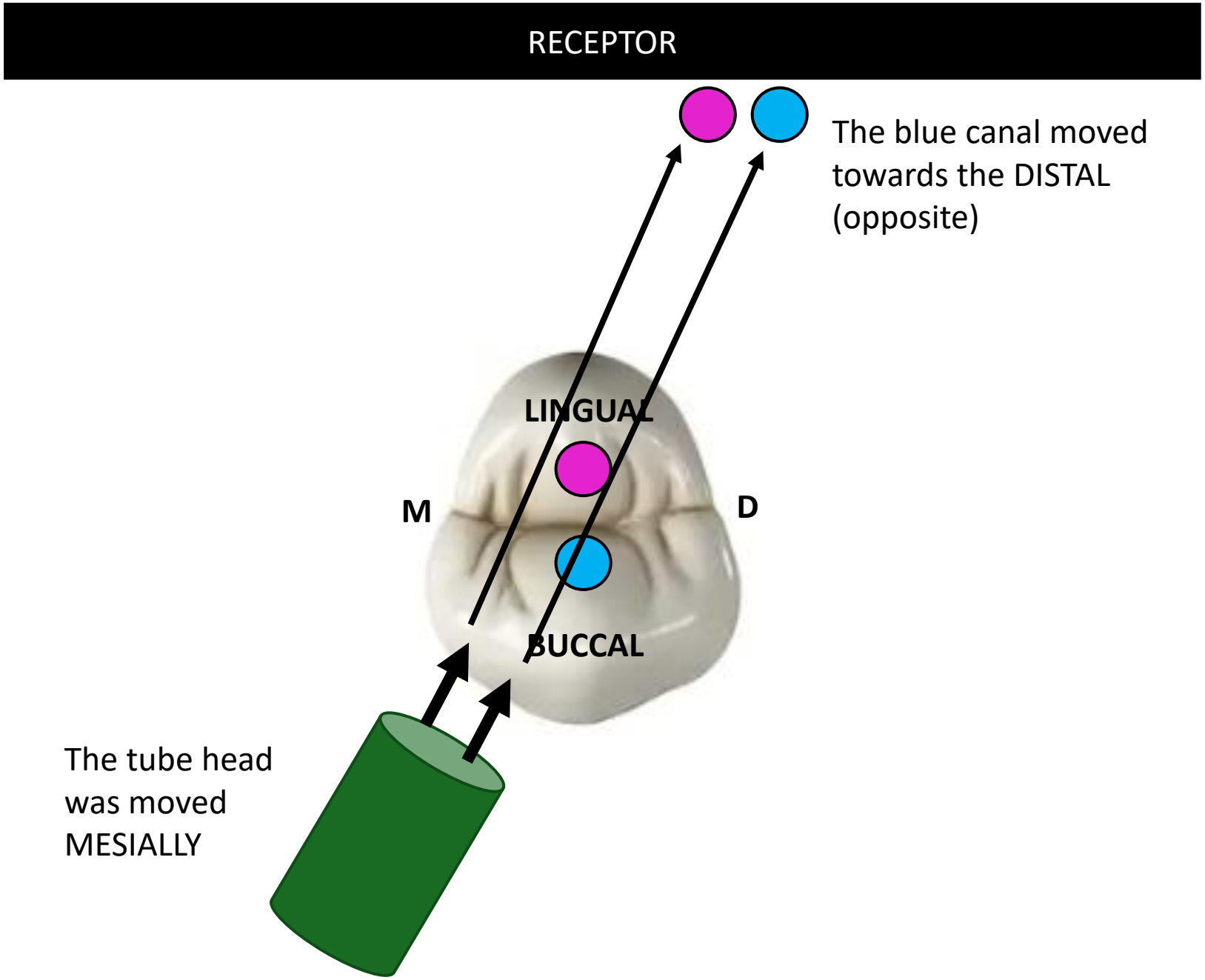
Tube was shifted Mesially

The premolar moved mesial overtop of the 2nd premolar towards the 1st premolar

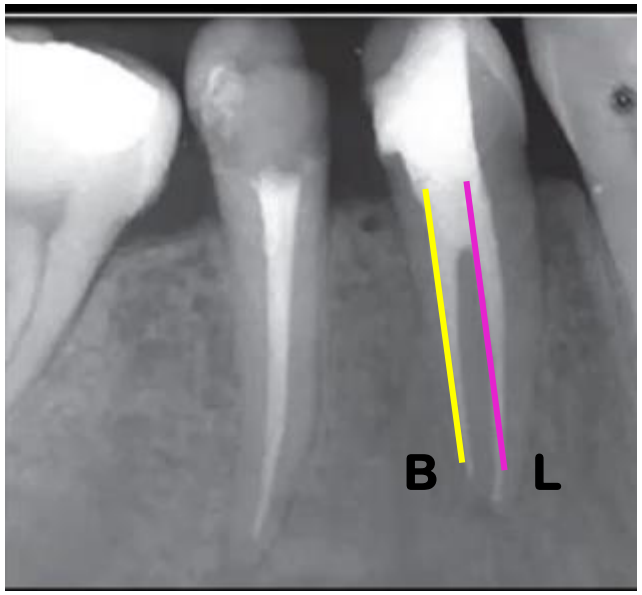
1st Image

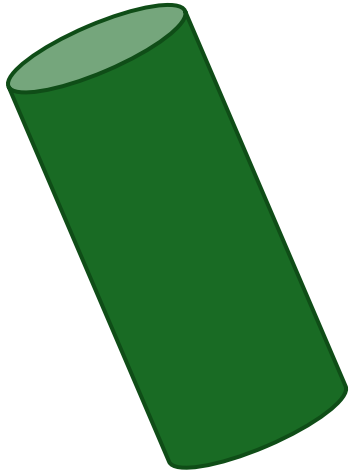

RECEPTOR
The canals are superimposed over each other
LINGUAL
M
D
BUCCAL
The tube head is straight towards the tooth

2nd Image


RECEPTOR
The blue canal moved towards the DISTAL (opposite)
LINGUAL
M
D
BUCCAL
The tube head was moved MESIALLY

In your OWN words, explain what is happening in each image.





Summary

We discussed,

1. Key terms associated with occlusal and localization techniques.
2. Purpose of the occlusal examination.
3. Uses of occlusal examination and the basic principles involved.
4. Patient's equipment and equipment preparations that are necessary before using the occlusal technique.
5. Recommended vertical angulations for the following maxillary occlusal projections: topographic, lateral (right or left) and pediatric.
6. Vertical angulations for the following mandibular occlusal projections: topographic, cross-sectional, and pediatric.
7. Purpose of localization techniques and list their uses.
8. Buccal object rule.
9. Right-angle technique.