DENTAL RADIOGRAPHIC TECHNIQUES FOR THE DOG AND CAT

The following descriptions are based on the animal placed in dorsal or sternal recumbency. They can be modified if lateral recumbency is preferred.

Standard Views for the Dog

1. Position the dog in sternal recumbency, with a sandbag supporting the head under the chin so that the hard palate is in a horizontal position.

- **Occlusal view of maxillary incisor and canine teeth - bisecting angle technique**
  - Open the mouth and place a #4 size film between the crowns of the canine teeth and the hard palate. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown. A tongue depressor may be inserted under the film along the tips of the canine teeth to prevent the film from bending over the endotracheal tube.
  - Position the dog’s head so that the film will be level with the table.
  - Looking from the lateral side of the dog, visualize an angle between the long axis of the root of the maxillary canine tooth and the plane of the film.
  - That angle is bisected with an imaginary line.
  - The central beam is placed perpendicular to the imaginary bisecting line.
  - Bring the cone as close as possible to the dog’s maxilla, and over the nose. The midline of the cone should match the midline of the dog.
  - The desired teeth are centered within the circumference of the cone.

- **Lateral view* of the maxillary canine teeth - bisecting angle technique**
  - Open the mouth and place #4 size film between the crowns of the canine teeth and the hard palate. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  - Position the animal’s head so that the film will be level with the table.
  - Looking from the front of the animal and into the mouth, visualize an angle between the long axis of the root of the maxillary canine tooth and the plane of the film.
  - That angle is bisected with an imaginary line.
• The central beam is placed perpendicular to the imaginary bisecting line.
• Bring the cone as close as possible to the animal’s maxilla, and over the length of the canine tooth.
• The horizontal direction of the beam should be perpendicular to the sagittal plane of the head.
• The desired teeth are centered within the circumference of the cone.

* Note: This is a true orthogonal projection of the canine tooth. The x-ray beam is perpendicular to the sagittal plane of the head; it is not an oblique view.

- **Rostral maxilla: P1-P3 - bisecting angle technique**
  • Open the mouth and place the film (#1 or #2 size) diagonally across the hard palate. The cusp tips of the maxillary premolar teeth to be radiographed should be touching the edge of the film, with the maximum amount of film in the mouth. Use gauze to hold that film into position, making sure the film is rostral enough to include P1.
  • Looking from the front of the dog, visualize an angle between the buccal roots of maxillary P1 or P2 and the plane of the film.
  • That angle is bisected with an imaginary line.
  • The central beam is placed perpendicular to the imaginary bisecting line.
  • Bring the cone as close as possible to the dog’s maxilla as the forehead will allow.
  • The film is centered within the circumference of the cone.

- **Caudal maxilla: P4-M2 - bisecting angle technique**
  • Open the mouth and place the film (#2 or #4 size) diagonally across the hard palate. The cusp tip of the maxillary P4 to be radiographed should be touching the film, with the maximum amount of film in the mouth. Use gauze to hold that film into position, making sure the film is caudal enough to include M2.
  • Looking from the front of the dog, visualize an angle between the mesial buccal root of maxillary P4 and the plane of the film.
  • That angle is bisected with an imaginary line.
- The central beam is placed perpendicular to the imaginary bisecting line.
- Bring the cone as close as possible to the dog’s maxilla as the forehead will allow.
- The desired teeth are centered within the circumference of the cone.

2. Position the dog in **dorsal recumbency**, supported by sand bags as needed.

- **Occlusal view of the mandibular incisors and canine teeth - bisecting angle technique**
  - Open the mouth and place a #4 size film between the crowns of the canine teeth and the tongue. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  - Position the dog’s head so that the film will be level with the table.
  - Looking from the lateral side of the dog, visualize an angle between the long axis of the root of the mandibular canine tooth and the plane of the film.
  - That angle is bisected with an imaginary line.
  - The central beam is placed perpendicular to the imaginary bisecting line (or the plane of the cone is parallel with the plane of the film).
  - Bring the cone as close as possible to the dog’s mandible, with the midline of the cone matching the midline of the dog.
  - The desired teeth are centered within the circumference of the cone.

- **Lateral view* of the mandibular canine teeth - bisecting angle technique**
  - Open the mouth and place a #4 size film between the crowns of the canine teeth and the tongue. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  - Position the animal’s head so that the film will be level with the table.
  - Looking from the front of the animal and into
the mouth, visualize an angle between the long axis of the root of the mandibular canine tooth and the plane of the film.

- That angle is bisected with an imaginary line.
- The central beam is placed perpendicular to the imaginary bisecting line for small dogs. For medium to large dogs, the central beam will need to be set a few degrees higher than the bisecting angle (“bisecting the bisecting”) to prevent superimposition of the canine tooth’s apex over the symphysis.
- The horizontal direction of the beam should be perpendicular to the sagittal plane of the head.
- Bring the cone as close as possible to the animal’s mandible and over the length of the canine tooth.
- The film is centered within the circumference of the cone.

* Note: This is a true orthogonal projection of the canine tooth. The x-ray beam is perpendicular to the sagittal plane of the head; it is not an oblique view.

Rostral mandible: P1-P4* - bisecting angle technique

- Open the mouth and place the film (#1 or #2 size) diagonally across the symphysis area and floor of the mouth. The cusp tips of the mandibular premolar teeth to be radiographed should be touching the edge of the film, with the maximum amount of film in the mouth. Use gauze to hold that film into position, making sure the film is rostral enough to include P1.
- Looking from the front of the dog, visualize an angle between the buccal roots of mandibular P1 or P2 and the plane of the film.
- That angle is bisected with an imaginary line.
- The central beam is placed perpendicular to the imaginary bisecting line.
- Bring the cone as close as possible to the dog’s mandible.
- The film is centered within the circumference of the cone.

* Note: In large dogs it may not be possible to fit all premolar teeth on one film and it may be necessary to obtain an additional film centered on P4.

Caudal mandibular: P4 - M3* - parallel technique

- Open the mouth and place film (#2 or #4 size) intraorally behind desired teeth, next to tongue, so that the film is parallel to the long axis of those teeth.
- Be sure to place the film deep enough to cover the apices of M1, and caudal enough to cover the apex of M3. Use gauze to hold film in position.
• Position the plane of the cone so that it is parallel to the long axis of the film (or so the central beam is perpendicular to the film).
• Bring the cone as close as possible to the dog’s mandible.
• Be sure the desired teeth are centered within the circumference of the cone.

* Note: In large dogs it may not be possible to fit all molar teeth and P4 on one film and it may be necessary to obtain an additional film to image M3, as in the above example.

Standard Views for the Cat

1. Position the cat in sternal recumbency, with a sandbag supporting the head under the chin.

- **Occlusal view of the maxillary incisors and canine teeth - bisecting angle technique**
  - Open the mouth and place #4 size film between the crowns of the canine teeth and the hard palate. For more efficient use of the film, it can be placed in the mouth diagonally. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  - Position the cat’s head so that the film will be level with the table.
  - Looking from the lateral side of the cat, visualize an angle between the long axis of the root of the maxillary canine tooth and the plane of the film. That angle is bisected with an imaginary line.
  - The central beam is placed perpendicular to the imaginary bisecting line.
  - Bring the cone as close as possible to the cat’s maxilla, and over the nose. The midline of the cone should match the midline of the cat.
  - The desired teeth are centered within the circumference of the cone.

---

Figure 1: Occlusal view of the maxillary incisors and canine teeth in the cat (BSA - bisecting angle) (from Lommer MJ, Verstraete FJM, Terpak CH. Dental radiographic technique in cats. Compend Cont Educ Pract Vet 2000;22:107-117)
Lateral view* of the maxillary canine teeth - bisecting angle technique

- Open the mouth and place #4 size film between the crowns of the canine teeth and the hard palate. For cats, the film can be placed in the mouth diagonally. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
- Position the animal’s head so that the film will be level with the table.
- Looking from the front of the animal and into the mouth, visualize an angle between the long axis of the root of the maxillary canine tooth and the plane of the film.
- That angle is bisected with an imaginary line.
- The central beam is placed perpendicular to the imaginary bisecting line.
- The horizontal direction of the beam should be perpendicular to the sagittal plane of the head.
- Bring the cone as close as possible to the animal’s maxilla, and over the length of the canine tooth.
- The horizontal direction of the beam should be perpendicular to the sagittal plane of the head.
- The desired teeth are centered within the circumference of the cone.

2. Position the cat in lateral recumbency.

Extraoral view of the maxilla: P2-M1 - near-parallel technique

- Open the cat’s mouth with a gag. Place a #2 size film on the table under the cat’s head, turning the head so that the roots of the teeth to be radiographed are parallel with the film. Support the cat’s head in this position with a roll of 1-inch tape under the chin.
- The cusp tips of the premolar teeth should be lined up along the edge of the film, so that a maximum amount of film is under the cat’s maxilla. Be sure to bring the film rostral enough to include P2.
- Place one or two 2”X2” gauze squares under the rostral portion of the film to lift it up, closer to the cat’s face.
- Gently guide the endotracheal tube towards the mandible, and away from the maxillary arch to be radiographed. It may be secured with tape or a small sandbag.
- Visualize an imaginary line that will be directed past the opposite quadrant and fall precisely on the apices of the teeth nearest the film. Match that imaginary line with the central beam of the cone.
- Bring the cone as close as possible to the cat’s maxilla.
3. Position the cat in **dorsal recumbency**, supported by sand bags as needed.

- **Occlusal view of the mandibular incisors and canine teeth - bisecting angle technique**
  - Open the mouth and place #2 size film between the crowns of the canine teeth and the tongue. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  - Position the cat’s head so that the film will be level with the table.
  - Looking from the lateral side of the cat, visualize an angle between the long axis of the root of the mandibular canine tooth and the plane of the film.
  - That angle is bisected with an imaginary line.
  - The central beam is placed perpendicular to the imaginary bisecting line.
  - Bring the cone as close as possible to the cat’s mandible, with the midline of the cone matching the midline of the cat.
  - The film is centered within the circumference of the cone.
• **Lateral view of the mandibular canine teeth - bisecting angle technique**

  - Open the mouth and place the size #2 film between the crowns of the canine teeth and the tongue. Both canine crown tips should be touching the film, near the edge, allowing the maximum portion of the film into the mouth. If one canine tooth is shorter than the other, build up the shorter crown with gauze between the film and the crown until it approximates the height of the longer crown.
  
  - Position the animal’s head so that the film will be level with the table.
  
  - Looking from the front of the animal and into the mouth, visualize an angle between the long axis of the root of the mandibular canine tooth and the plane of the film.
  
  - That angle is bisected with an imaginary line.
  
  - The central beam is placed perpendicular to the imaginary bisecting line.
  
  - The horizontal direction of the beam should be perpendicular to the sagittal plane of the head.
  
  - Bring the cone as close as possible to the animal’s mandible and over the length of the canine tooth.
  
  - The film is centered within the circumference of the cone.

• **Mandible: P3-M1 - parallel technique**

  - Open the mouth and place a size #0 film intraorally behind desired teeth, next to tongue, so that the film is parallel to the long axis of those teeth. Be sure the embossed dot on the film is placed caudal to M1.
  
  - Place the film deep enough to cover the apices of M1, and rostral enough to cover P3. Use gauze to hold film in position.
  
  - Position the plane of the cone so that it is parallel to the long axis of the film (or so the central beam is perpendicular to the film).
  
  - Bring the cone as close as possible to the cat’s mandible. The film is centered within the circumference of the cone.

**Special Views for the Dog and Cat**

• **Separating the superimposed mesiobuccal and mesiopalatal roots of the maxillary fourth premolar teeth**

  - Follow the techniques listed for Caudal Maxilla: P4-M2 for dogs, and Maxilla: P2-M1 for cats.

  - The horizontal direction of the central beam is angled slightly caudal or rostral, depending on the anatomical position of the mesiobuccal root with the mesiopalatal root. Every individual animal is different.

  - When using the intraoral technique (dog), the palatal root moves in the direction of the incoming beam. Therefore, if the beam was angled from a rostral direction, then the root most rostral (mesial) on the radiograph will be the palatal root.
• When using the extraoral technique (cat), the mesiobuccal root moves in the direction of the incoming beam. Therefore, if the beam was angled from a rostral direction, then the root most rostral (mesial) on the radiograph will be the mesiobuccal root.