VCS 502: VETERINARY ORTHOPAEDICS AND RADIOLOGY

MUSCULOSKELETAL RADIOLOGY

INDICATIONS

∗ To reveal the type, extent and positions of fracture and dislocations.

∗ To identify hereditary bone disorders in clinically normal animals.

∗ To identify the metabolic cause of bone fracture

∗ To identify the presence, extent and position of bone neoplasm.

∗ To investigate joint diseases.

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∗ To evaluate fracture alignment, assess progress of fracture healing and ensure timely removal of immobilization devices.

∗ To confirm site and character of spinal disorders.

∗ To evaluate the extent of traumatic injuries.

INTERPRETING BONE RADIOGRAPHS

∗ Determine if the findings is normal, an artifact, a normal variant or a true abnormality.

∗ Determine the aggressiveness of the lesion. This is based on the specific appearance of the osteolytic and osteo-productive responses. Criteria used include presence of bone disruption, pattern of bone lyses, and type of periosteal reaction and characteristics of the zone of transition.

* Determine the location within the bone as epiphyseal, physeal, metaphyseal or diaphyseal.
* Determine the number of bones involved in the lesion.

* Evaluate the alignment of the joint or bone for incongruity or joint space widening.
* Evaluate the bone for size, shape, position, opacity and margin.
* Evaluate the cartilage for opacity and intra capsular soft tissue.

EXPECTED VARIATIONS

Radiolucent lines a normal part of the bones in young animals.

These radiolucensises include the physis, nutrient canal and foramina.

Additional radiopacities that are smooth and oval are seen in and around a number of joints. They may be sesamoid bones or periosteal remodeling.

RADIOGRAPHY OF FRACTURE

- Fracture is a disruption in bone continuity with varying degree of alterations in bone size, shape, position and function.
- Fracture non-visualization may be due to poor quality radiographs, a fracture line not tangential to the X-ray beam, obscure visualization by overlying structures and minimal displacement.
- Normal or variant anatomic structure may be wrongly diagnosed as fracture e.g. ectopic nutrient foramina, normal

and accessory ossification centers, inconstant and multipartite sesamoid bones, open physes and syndesmoses.

The following should be evaluated when assessing radiographs for fractures:

- Direction and location of fracture line.
- The positional changes of the major distal fragment relative to the proximal fragment.
- The direction, displacement and coagulation of fracture fragments.
- The amount of soft tissue changes should be characterized in terms of size and opacity.

RADIOGRAPHIC EVALUATION OF POST –REDUCTION FILMS

- Evaluate for any changes in alignment reduction or rotation of the fracture.
- Evaluate the articular cartilages for apposition, joint effusion and periosteal reactions.
- Evaluate the position of orthopedic device for movement, bending or breakage.
- Evaluate the soft tissue for swelling, air pockets, e.t.c.

RADIOGRAPHIC SIGNS OF JOINT DISEASE

- Compressed infrapatella fat pad.
- Increased synovial tissue.

- Altered thickness of the joint space

- Decreased subchondrial bone opacity

- Increased subchondrial bone cyst formation

- Altered perichondrial bone opacity

- Perichondrial bony proliferation.

- Mineralization of joint soft tissues

- Intra-articular calcified bodies

- Joint displacement

- Joint malformation

Radiographic techniques of the skull

Lateral and ventrodorsal views routinely taken

Ventrodorsal preferred to dorsoventral because calvarium is closer to the film.

Frontal view is useful in assessing fractures and evaluating the sinuses.

Open mouth projection with the x-ray beam directed at the palate allows for the assessment of nasal cavities, cribiform region and rostral calvarium oblique projection may also be used.

Requirements

- High mA and low kV peak to accentuate osseous detail.

- Use high detail screen film combination.

- Sedate or anaesthetize animal because of long exposure period

- Light collimation of beam to region of interest.

- Use grid to remove scatter and improve image quality