Imaging the Skull

Reading Assignment

- 71-87
- 87-89

Skull is Anatomically Complex

- Use symmetry
- Creates problems 3D → 2D
- DV & lateral views are typically inadequate for complete evaluation
Ancillary views necessary because of anatomic complexity

- Nasal passage
- Maxilla
- Mandible
- Frontal Sinus
- Tympanic Bulla
- Temporomandibular Joint

Nasal Passage/Maxilla

Nasal Passage

Film must be paper-wrapped...conventional cassette cannot be positioned adequately
**Equine Skull Radiography**
- Imaged standing
- VD/DV difficult to acquire
- Anatomy even more complex than in the dog

**Skull Radiography in Perspective**
- Largely replaced by CT and MR imaging
- Why
  - Reduces complexity
  - Tomographic aspect valuable
  - Contrast resolution
Uses of Radiography
- Otitis media
- Mandibular and maxillary tumors
- Sinusitis
- Nasal cancer
- Rhinitis
- Dental disease

Otitis Media
- Common in dog and cat
- Uncommon in horse
- Radiographs not sensitive
  - Positioning problems
  - Contrast resolution
- Signs
  - Increased opacity
  - Wall thickening
Otitis Media?

Can’t tell from this radiograph

CT is much more accurate for detecting otitis media

Otitis Externa

Otitis Externa & Media

Tympanic bulla expansion due to chronic otitis media
Mandibular/Maxillary tumors

- Much more common in small animals than horses
- Radiography will “understage” disease
- These tumors will have radiographic signs of an aggressive bone disease

Note aggressive primarily lytic aggressive lesion
Osteosarcoma of zygomatic arch is better seen in the CT images.

**Sinusitis**

- Rare in small animals as isolated problem
- More common in horses
  - Secondary to tooth root abscesses
- Fluid accumulation
  - Standing position helpful to detect fluid line
- Bone changes unusual

Normal Maxillary sinus fluid with fluid lines
Conspicuous fluid lines

CT image is inverted from acquisition position so fluid is on “top” of the sinus gas.

In the CT, fluid is seen but sinus mucosal lining is also thick.
Nasal Cancer

- Common in dogs
  - Less common in cats
  - Rare in Horses
- Increased opacity
  - Secondary sinusitis common
- Turbinate destruction
- Radiographs will underestimate the extent of the process

Nasal adenocarcinoma

Normal radiograph

One month later

Nasal adenocarcinoma with increased opacity and bone destruction
CT provides superior staging

Reformatting valuable in staging disease...intracranial extension seen here

MR can distinguish between tumor and exudate; this is impossible in radiographs. Exudate has more signal than tumor in the MR image on the left.
MR is also more specific for detecting intracranial extension.

Nasal Lymphoma in a Horse

Aggressive nasal tumor in a horse

Nasal Lymphoma in a Horse
Nasal Lymphoma in a Horse

Equine nasal lymphoma successfully treated with radiation

2005.06.29

2005.12.15
Rhinitis

- Not common
- Aspirgillosis in dogs
  - Can have increased nasal opacity, but punctate destructive changes are typical.
- Rare in horses except in combination with sinusitis
Dental Disease

- Common in small animals but radiography has limited role
- Significant problem in horses
  - Young vs. old horse tooth appearance
  - Deciduous vs. permanent teeth
Periapical radiolucent regions normal in young horses

Note "caps"

Retained deciduous tooth "cap"

With ageing, roots occupy less of mandible
Mandibular tooth root abscess with fractured root

Maxillary PM2 root abscess; more caudal root abscesses result in maxillary sinusitis