

1 Reptile and Amphibian Imaging

E. MARIE RUSH, BS, DVM, DIPL. ACZM
ANTECH IMAGING SERVICES

2 Reptile/Amphibian imaging

- ▶ Orthogonal projections necessary (3 views for chelonians)
- ▶ Positioning may be facilitated with stockinette, foam padding, florescent light bulb boxes/plastic tubes (snakes), cups/buckets (chelonians), etc.
- ▶ Assure there is no radiographic interference with positioning materials
- ▶ Amphibians require clean and moist area (cutaneous respiration and absorption)
- ▶ Musculoskeletal structures more well defined in reptiles than coelomic soft tissue with radiographs
 - ▶ For soft tissues US, CT and MRI may be helpful to amplify architectural and organ changes in the coelomic cavity
- ▶ Settings vary based on equipment. Recommend custom chart for your hospital.

3 Snakes

- ▶ Radiographs recommended for initial evaluation/overview diagnostics.
- ▶ GI contrast often helpful to outline of pathology
- ▶ Soft tissues may be abnormal, but radiography less sensitive for definition than US or CT/MRI
- ▶ DV straight position most critical for pulmonary changes and in smaller snakes (narrow bodied).
- ▶ Lateral strait position important for focus (body curvature away from table decreases focus)

4 Anatomy

5 Snakes-normal

6 Snakes -normal

7 Snake skull- Normal

8 Osteomyelitis

- ▶ Can occur in all reptiles and amphibians
- ▶ Often due to puncture wounds, bite wounds, abrasions, sepsis
- ▶ Next case: 3 year old Boa Constrictor with severe stomatitis noted (not eating)

9 Stomatitis and osteomyelitis

10 Spinal disease

- ▶ Proliferative spinal osteopathy- most commonly seen in snakes
- ▶ Osteoarthritis similar to osteitis deformans (Paget's disease) in humans
- ▶ Inflammatory vs Noninflammatory
 - ▶ Causes include trauma, chronic inactivity (caged), viral/bacterial infections, dietary deficiencies, neoplasia
 - ▶ Possible immune mediated reaction and bacterial septicemia
- ▶ Often affiliated with Salmonella sp.
- ▶ Most commonly seen in snakes, but also seen in lizards and turtles
- ▶ Secondary fractures are common
- ▶ Signs may include hyperreflexia/UMN signs cranial to lesion, with deficits caudal to lesion, torticollis, trembling, spinal kinking
- ▶ Progressive -and alterations in mobility and ability to feed lead to poor prognosis

11 Spinal disease

- ▶ Proliferative spinal osteopathy
- ▶ Osteoarthritis similar to osteitis deformans (Paget's disease) in humans
- ▶ Inflammatory vs Noninflammatory
 - ▶ Causes include trauma, chronic inactivity (caged), viral/bacterial infections, dietary deficiencies, neoplasia
 - ▶ Possible immune mediated reaction and bacterial septicemia
- ▶ Often affiliated with Salmonella sp.
- ▶ Most commonly seen in snakes, but also seen in lizards and turtles
- ▶ Secondary fractures are common
- ▶ Signs may include hyperreflexia/UMN signs cranial to lesion, with

- deficits caudal to lesion, torticollis, trembling, spinal kinking
- ▶ Progressive and alterations in mobility and ability to feed lead to poor prognosis

- 12 **10 y.o. Rainbow Boa, routine exam, nonclinical**
- 13 **(cont.)**
- 14 **Severe Osteoproliferative disease + fractures**
- 15 **Snakes- Osseous disease**
- 16
- 17 **Egg retention**
- 18 **Splenopancreatic and hepatic enlargement**
- 19 **Renal- defined using GI contrast**
- 20 **Renal neoplasia**
- 21 **Snake pneumonia**
- 22 **Cardiomegaly and pneumonia**
- 23 **Constipation/fecal impaction**
- 24 **Anatomy**
- 25 **Lizard- normal**
- 26 **Secondary hyperparathyroidism**
 - ▶ Most common radiographic diagnosis of osseous pathology of captive reptiles
 - ▶ Nutritional (often younger animals) vs. renal (often older or chronically dehydrated animals)
 - ▶ Nutritional= lack of calcium/vitamin D in diet
 - ▶ Lack of adequate UVB light for cutaneous photolysis and conversion of calcium into usable vitamin D (liver and kidneys also serve in metabolism)
 - ▶ More common in lizards, chelonians and alligators
 - ▶ Commonly present weak/neurological, lack of trunkal lifting, soft/malleable mandible, fractures, GI stasis, osteodystrophic

change, etc.

- 27 **Lizards (Bearded Dragon)- NSHP**
- 28 **Iguana Severe NSHP and fibrous osteodystrophy**
- 29 **Chameleon SHP -renal**
- 30 **Tegu NSHP-Fracture, osteomyelitis**
- 31 **Chameleon NSHP/RSHP with fractures**
- 32 **Hypercalcemia/hypervitaminosis D – Mineralization of GI tract due to dietary over supplementation**
- 33 **Bearded Dragon gout**
- 34 **Lizards**
 - ▶ Whole body radiographs recommended for initial evaluation
 - ▶ Coelomic soft tissues can be difficult to differentiate on radiographs if pathology is present
 - ▶ CT/US and GI contrast may help to delineate and define organs systems/pathology of the coelom
 - ▶ DV and lateral critical to diagnostic quality study (especially for pneumonia, renal, hepatic change)
- 35 **Cardiomegaly/thoracic/ coelomic mass**
- 36 **Pneumonia- severe**
- 37 **Heptomegaly**
- 38 **Folliculogenesis**
- 39 **Oviductal inertia**
- 40 **Foreign body consumption**
- 41 **Lizards- Calculi (chronic)**
- 42 **Chelonians**
 - ▶ Orthogonal 3 view projections needed to confirm pathology
 - ▶ Some changes only accurately definable in 1-2 projections due to summation of tissues, bones of the carapace and plastron

- ▶ Soft tissue pathology more difficult to define without advanced imaging if outside of the GI, urogenital and respiratory tracts (i.e. liver, cardiovascular, renal).

- 43 **Anatomy**
- 44 **Chelonian normal**
- 45 **Carapacial osteomyelitis**
- 46 **Chelonians- NSHP**
- 47 **Chelonian- Shell fracture**
- 48 **Chelonians- Pneumonia**
- 49 **Chelonians-
GI impaction**
- 50 **Reproductive**
- 51 **Chelonian urolith**
- 52 **Amphibians**
- 53 **Amphibian contrast study confirms cystolith**
- 54 **Amphibian coelomic effusive change (axolotl)**
- 55 **Axolotl ultrasound- coelomic effusion with areas of fluid distention of the liver**