Case 50: 13-1138

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Signalment and History

- 2 week old male alpaca
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- Slow growth since birth
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- Lost 7.2% body weight in last 2 days of life
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- 1 day history of ataxia, seizures, and collapse
Signalment and History

- 2 week old male alpaca
- Slow growth since birth
- Lost 7.2% body weight in last 2 days of life
- 1 day history of ataxia, seizures, and collapse
- Last known urination 24 hours prior
Presentation

- Laterally recumbent
- Obtunded
- Bradycardia
Diagnostics

- Clinical pathology:
  - Metabolic acidosis, hyperkalemia, profound azotemia
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  - Metabolic acidosis, hyperkalemia, profound azotemia

- Ultrasound:
  - Bilaterally enlarged kidneys with perirenal fluid; small bladder
Gross Necropsy Findings
Microscopic Findings
Morphologic Diagnoses

- Severe diffuse glomerular and tubular basement membrane mineralization with intratubular protein casts
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- Moderate multifocal gastric (C3) mucosal and muscularis mineralization
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- Moderate multifocal choroid plexus mineralization
Morphologic Diagnoses

- Severe diffuse glomerular and tubular basement membrane mineralization with intratubular protein casts
- Moderate multifocal gastric (C3) mucosal and muscularis mineralization
- Moderate multifocal choroid plexus mineralization
- Moderate multifocal bronchial mineralization
Additional Information

- Received 10 mL vitamin supplement
- Minimum of 100,000 IU Vitamin D
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- Recommended dose: 1000-2000 IU/kg
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- Recommended dose: 1000-2000 IU/kg
- Usually 7000 - 16,000 IU per cria
Toxicology

- Renal 25-OH-Vitamin D₃ level:
Toxicology

- Renal 25-OH-Vitamin D₃ level:
  - 740 nmol/L
Toxicology

- Renal 25-OH-Vitamin D$_3$ level:
  - 740 nmol/L
  - Levels $>85$ nmol/L are suggestive of intoxication

Testing performed by Diagnostic Center for Population and Animal Health
Final Diagnosis
Final Diagnosis

• Vitamin D₃ Toxicity
Vitamin D Supplementation

- Crias prone to rickets
  - Fall birth
  - Dark haircoat
Vitamin D Toxicity

- Reported in many species
  - Calcinogetic plants
  - Cholecalciferol rodenticides
  - Food manufacturing errors
  - Medications
  - Supplements
Pathogenesis
Cholecalciferol (D$_3$)
Cholecalciferol (D₃) → Liver: 25-hydroxylase → Calcidiol [25(OH) D₃]
Cholecalciferol (D₃)

Liver: 25-hydroxylase

Calcidiol [25(OH) D₃]

Kidneys: 1-α-hydroxylase

Calcitriol [1,25(OH)₂D₃]
Increased calcium absorption/resorption
Increased calcium absorption/resorption

Increased serum ionized calcium
Increased calcium absorption/resorption

Increased serum ionized calcium

Soft tissue mineralization
Thank you!

- Dr. Shelley Newman
- Dr. Ricardo Videla
- Resident mates
- UT Histology Lab

WANNA GO ON A PICNIC?

ALPACA LUNCH