

Analysis of the Osteopathology in a Captive-born Spectacled Bear

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Introduction

A male, captive-born spectacled or Andean bear from Riverbanks Zoo & Garden lived to be nearly 22 years old before being euthanized for an advanced *Pythium insidiosum* infection. While pythiosis may damage osseous tissue much of the gross pathology can be attributed to his old age. Osteophyte growth and erosion stemming from arthritis was among the most conspicuous. In accordance with what is commonly found in adult ursids, areas of prominent deterioration include lumbar vertebrae, joints of the appendicular skeleton, and oral/dental pathologies.¹

Materials and Methods

The skeletal remains of the spectacled bear Pizzaro were obtained and prepared by GC&SU in 2001. Utilizing the known medical history, observed osteopathologies were correlated with experienced diseases. Unknown abnormalities were compared with those of related species to aid pairing of pathology with the likely disease-causing agent.



Figure 1. Image of Spectacled/Andean bear, *Tremarctos ornatus*. (SBC Peru)



Figure 2. Articulated skeleton of spectacled bear from Riverbanks Zoo & Garden.



Figure 3. Reabsorption and osteophytosis of patellae.



Figure 5. Arthritic wear of the tarsals/metatarsals.



Figure 8. Ankylosis of right ulna and radius.



Figure 4. Vertebral degeneration marked by non-marginal syndesmophytes of the lumbar vertebrae.

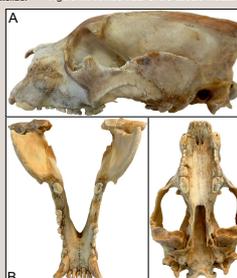


Figure 6. Skull and mandible. (A) Potential osteomyelitis of rostrum. Mandibular (B) and maxillary (C) periodontitis.



Figure 7. Fusion of tibiofibular joint.



Figure 9. Arthritis of the distal femur.

Results

Observed osteopathologies include wear characteristic of arthritis at synovial joints of the appendicular skeleton accompanied by incidences of ankylosis in the distal skeleton. Severe osteophytosis and erosion concentrated at the tibioapatellar joint extend to the proximal tibiofibular joint and surrounding structures. Spondylarthritis of the lumbar vertebrae marked by non-marginal syndesmophytes. Abnormal lesions of carpals/tarsals aggregate on the lateral side and expand to the interphalangeal joints. Dental deterioration encompasses attrition/abrasion of occlusal surfaces and signs of periodontitis.

Discussion

Description of the osteopathologies found in this modern spectacled bear can be utilized to identify the source of an abnormality in a specimen lacking medical records. It is a tool for the identification of diseases in preserved remains and offers insight on pathologies in partial skeletons/bone fragments. These findings have additional application to research on extinct species of short-faced bears and help aid the understanding of their existence.

Literature Cited

1. Wildlife Information Network. Arthritis and Skeletal disease in Bears. http://wildpro.twycrosszoo.org/S/00dis/Miscellaneous/Arthritis_Bears.htm. Accessed November 20, 2019.