MANAGEMENT OF PERIODONTAL DISEASE IN LIZARDS

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McCracken and Birch (1994) were the first to describe a periodontal disease-like condition in agamid lizards and old world chameleons. These lizards all acrodont teeth (not rooted, but simply attached to the surface of the mandibular and maxillary bones), which predisposes them to periodontal disease, stomatitis and potentially osteomyelitis. This unique dentition results in a thin gum line along the lateral surface of the mandibular and maxillary bones. When this fragile gum tissue is damaged or abraded bone is exposed and becomes readily permeable to bacteria.

Commonly kept species of lizards seen in practice with acrodont dentition include bearded dragons, Asian water dragons, frilled dragons, and all old world chameleons.

EXAMINATION AND DIAGNOSTICS

On physical exam, these lizards often present with signs of stomatitis or swellings along the mandibular and maxillary bones. On close inspection these bones will be discolored, specifically green or brown-black, along their surfaces. Often lysis of bone is evident on presentation. Swellings of the soft tissue over the mandibular or maxillary bones is also common as the soft tissue adjacent to the periodontal disease becomes infected.

Regular oral exams should be performed to inspect the gum line for signs of discoloration, irregularities in the surface, and loss of tissue. If suspicious lesions are present, gentle curettage with dental instrumentation is useful to assess soft tissue and bone involvement.

Abnormal physical exam findings consistent with mandibular and maxillary bone involvement should be assessed with radiographs. Osteomyelitis in reptiles is characterized radiographically by bone lysis. Radiology is useful to assess the severity of the bone involvement and thus help to formulate a therapeutic regimen. Additionally, radiographs can be used to monitor therapeutic progress.

Culture and sensitivity can be utilized to identify the bacterial (or fungal) organisms involved and to determine the most appropriate antimicrobial for treatment. Since mixed infections are common, both aerobic and anaerobic cultures should be taken. A sterile prep should be performed over the site to be sampled, and a sterile scalpel or needle should be used to collect a deep culture sample. Blood cultures may also be diagnostic as reptiles with osteomyelitis may often be septic.

Biopsy of bone or associated soft tissue may also be useful as a method for identifying organisms involved. Histopathology of these lesions with special stains can help to identify other possible pathogens such as fungal organisms and mycobacteria.

Isaza and Jacobson (1995) found the most common bacterial organisms isolated in cases of osteomyelitis in reptiles were gram-negative bacteria, including *Salmonella* spp., *Aeromonas* spp., *Pseudomonas* spp., *Escherichia* spp. and *Morganella* spp. They also fund gram-positive bacteria such as *Streptococcus* spp., *Staphylococcus* spp., and *Corynebacterium* spp., and anaerobic bacteria such as *Clostridium* spp. and *Bacteroides* spp. were occasionally isolated from infected reptile bone, but often in conjunction with aerobic bacteria.

TREATMENT

Prior to treatment, the overall status of the patient must be assessed. Supportive care may need to be initiated prior to treating the disease. The reptile should be warmed to the high end of its preferred optimal temperature zone (POTZ). Fluid therapy should be initiated at 20-25 ml/kg daily as needed.

After rehydration, and while awaiting the results of culture and sensitivity, the lizard may be started on a broad spectrum antibiotic regimen. Due to the high incidence of mixed bacterial infections and the severity of osteomyelitis, a combination of two antimicrobials is recommended initially (Isaza and Jacobson, 1995).

*Amikacin at 5mg/kg IM/SQ as an initial dose followed by 2.5 mg/kg IM/SQ every 72 hours OR enrofloxacin at 5-10 mg/kg IM/SQ/PO every 24-48 hours in combination with ceftazidine (20mg/kg IM/SQ every 72 hours) or carbenicillin (400 mg/kg IM every 24 hours) are good initial choices.*

*Anaerobic and gram-positive bacteria may have resistance to enrofloxacin and amikacin, so antibiotics such as ceftazidine (as above), ampicillin (20 mg/kg IM every 24 hours), and metronidazole (20-40 mg/kg PO every 24-72 hours) may be more appropriate or should be utilized concurrently with another drug depending on the results of culture and sensitivity.*

Aggressive surgical debridement of affected areas is important to open and expose the infected tissue. Standard wound flushing solutions with chlorhexidine or betadine can be used to aggressively flush wounds once or twice daily for several weeks. Unhealthy or discolored bone should be curetted and removed. Again, radiographs are important in helping to determine what bone(s) may need to be removed.

A topical treatment which can be used to encourage deep local penetration of antibiotics after flushing is a solution of DMSO and amikacin (7.5 ml of DMSO is added to .25 ml of amikacin 50 mg/ml or, depending on culture and sensitivity results, DMSO and enrofloxacin (7.5 ml of DMSO to 0.5 ml of injectable enrofloxacin 22.7 mg/ml). These solutions are typically applied once or twice daily, depending on the severity, for 3-4 weeks. Alternatively, silver sulfadiazine crème can be packed into the wound once daily after flushing.

Osteomyelitis in reptiles must be treated in most cases for a minimum of 8-12 weeks and sometimes up to 6 months (Isaza and Jacobson, 1995). Treatment may not need to be as long if aggressive bone curettage is
successfully utilized because the primary bacterial nidus has been eliminated.

The prognosis for lizards with periodontal osteomyelitis and loss of bone is guarded to fair depending on severity and progression. Lifetime dental prophylaxis with an oral cleansing product (Maxiguard Oragel, Addison Biological Laboratory) will be necessary to reduce progression and minimize recurrence of osteomyelitis.

References