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Submandibular abscess associated with periodontal disease in *Pogona vitticeps*: a case report[1]

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ABSTRACT. Pereira LG, Moreira AC, Prazeres Júnior FR, Malta VFM, Lima MPS, Maranhão ACPM. **Submandibular abscess associated with periodontal disease in *Pogona vitticeps*: case report.** *Pesquisa Veterinária Brasileira 46:e07810, 2026.* Pato – Laboratório Veterinário, Rua Tereza de Azevedo 1052, Gruta de Lourdes, Maceió, AL 57052-560, Brazil. E-mail: lauragoper@gmail.com

Oral conditions are common in reptile medicine, especially in captive lizards, with periodontal disease being one of the most frequently observed. This paper reports a case of a submandibular abscess associated with periodontal disease in *Pogona vitticeps*, as well as the clinical-surgical treatment instituted. An adult specimen of *P. vitticeps* was presented for examination with swelling in the submandibular region, in addition to dental calculus, gingivitis, and gingival recession. Following a medical history, physical examination, complete blood count, radiography, and bacterial culture with antimicrobial susceptibility testing, a submandibular abscess caused by a mixed bacterial infection secondary to periodontal disease was diagnosed. The bacteria *Providencia* sp. and *Proteus* sp. were isolated in the microbiological analysis. Treatment included systemic antibiotic therapy, marsupialization of the abscess, and topical lavage. The animal showed good clinical progress with a reduction of the infectious process. In conclusion, periodontal diseases can progress to severe infectious conditions in reptiles, making an integrated approach and the adoption of preventive dentistry practices essential in wildlife and exotic animal medicine.

INDEX TERMS: *Pogona vitticeps*, periodontitis, reptiles, veterinary dentistry.

RESUMO.- [**Abscesso submandibular associado à doença periodontal em *Pogona vitticeps*: relato de caso.**] Afecções orais são frequentes na medicina de répteis, principalmente em lagartos mantidos em cativeiro, sendo a doença periodontal uma das mais observadas. Este trabalho relata um caso de abscesso submandibular associado à doença periodontal em *Pogona vitticeps*, bem como o tratamento clínico-cirúrgico instituído. Um espécime adulto de *P. vitticeps* foi atendido apresentando aumento de volume em região submandibular, além de cálculos dentários, gengivite e retração gengival. Após anamnese, exame físico, hemograma, radiografia e cultura bacteriana com antibiograma, diagnosticou-se abscesso submandibular por infecção bacteriana mista decorrente de doença periodontal. As bactérias *Providencia* sp. e *Proteus* sp. foram isoladas na análise microbiológica. O tratamento incluiu antibioticoterapia sistêmica, marsupialização do abscesso e lavagem tópica. O animal apresentou boa evolução clínica com redução do quadro infeccioso. Conclui-se que doenças periodontais podem evoluir para quadros infecciosos graves em répteis, sendo fundamental a abordagem integrada e a adoção de práticas de odontologia preventiva na medicina de animais silvestres e exóticos.

TERMOS DE INDEXAÇÃO: *Pogona vitticeps*, periodontite, répteis, odontologia veterinária.

INTRODUCTION

The bearded dragon (*Pogona vitticeps*) is a species of lizard belonging to the family Agamidae, native to the arid and semiarid regions of Australia. Due to its docile temperament

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and relatively small size, it has become one of the most popular reptiles as a pet in many parts of the world, including Brazil (Valdez 2021). Despite their growing popularity, the care required to maintain the health of these animals is still often underestimated, which predisposes them to numerous diseases, including oral cavity conditions (Sollom & Baron 2023).

Oral health in reptiles is an often-neglected aspect, although it is extremely relevant for maintaining the quality of life of these animals. The main oral complications found are stomatitis, parasitemia, foreign bodies, presence of masses, and trauma; among these, periodontal disease is particularly noteworthy (Prazeres et al. 2009). It is characterized by a chronic inflammatory process that affects the supporting tissues of the teeth, which can progress to tooth loss, secondary infections, and abscess formation (Wilkinson 2020).

Abscesses in the submandibular region and adjacent areas are clinically important due to their proximity to vital structures, as the oral cavity of these animals is a complex system that depends on immunity, resistance, and nutrition for proper function (Mehler & Bennett 2003). In mammals, abscesses are composed of liquid purulent material; however, in reptiles, they are predominantly caseous and encapsulated, which hinders spontaneous drainage and clinical treatment alone (Martins et al. 2024). In these circumstances, surgical treatment becomes essential.

Marsupialization, a surgical technique consisting of opening the abscess and suturing the capsule borders to adjacent tissue, promotes continuous drainage and is indicated when complete excision of the capsule proves difficult or impractical (Salvado 2023). The technique, in addition to being less invasive, provides access to the infectious focus and facilitates infection control with a lower risk of recurrence (Santiago et al. 2024)

Any disease or condition involving the oral cavity considerably reduces the efficiency of the animals' feeding cycle, which can lead to anorexia, contributing to the clinical instability of a sick reptile (Mehler & Bennett 2003). Therefore, veterinary dentistry applied to reptile medicine is important for quality of life, as oral abnormalities can compromise an individual's growth and well-being (Reavill & Griffin 2014). Despite the growing demand for specialized medical care, the literature on clinical-surgical dental approaches in reptiles is still limited.



Fig. 1–4. Physical examination findings of *Pogona vitticeps* with a submandibular abscess associated with periodontal disease. (**1**) Swelling of the right submandibular region. (**2**) Swelling of the right submandibular region, dorsoventral view. (**3**) Presence of dental calculus and erythema. (**4**) Presence of dental calculus, erythema, and gingival recession.

Therefore, this study aimed to report a clinical case of submandibular abscess associated with periodontal disease in *P. vitticeps*, describing the treatment implemented and discussing the anatomical, pathophysiological, and therapeutic aspects involved, in addition to highlighting the importance of preventive dentistry in the clinical routine of wild and exotic animals.

CASE REPORT

Ethical approval. This study was conducted using a clinical case report; therefore, it did not require submission to the Animal Use Ethics Committee or a review by any committee.

A three-year-and-three-month-old male bearded dragon (*P. vitticeps*) was seen at a private clinic specializing in exotic pet medicine with a chief complaint of progressive swelling in the submandibular region. During history-taking, the owner mentioned that the patient presented with a reduced appetite, with no other behavioral changes, and that its diet consisted of insects (mealworms and crickets) combined with fruits and vegetables, with regular mineral supplementation. It was also reported that UVB lighting and adequate heating were provided in the animal's terrarium.

Physical examination revealed that the animal was active, weighed 533 g, and showed no abnormalities in hydration, nutrition, mucous membranes, or Doppler cardiac auscultation. However, a well-demarcated, firm swelling was noted in the right submandibular region, where the patient showed discomfort upon palpation. Evaluation of the oral cavity revealed dental calculus, gingivitis, and gingival recession, suggesting active periodontal disease (Fig. 1–4). After the physical examination, ancillary diagnostics were requested, including a complete blood count (CBC) to assess the patient's systemic response to the inflammatory/infectious process, skull radiographic examination in dorsoventral and lateral projections (right and left) to observe the depth and severity of the lesion, and bacterial culture and antimicrobial susceptibility testing to identify the infectious agent and determine the antimicrobial susceptibility profile.

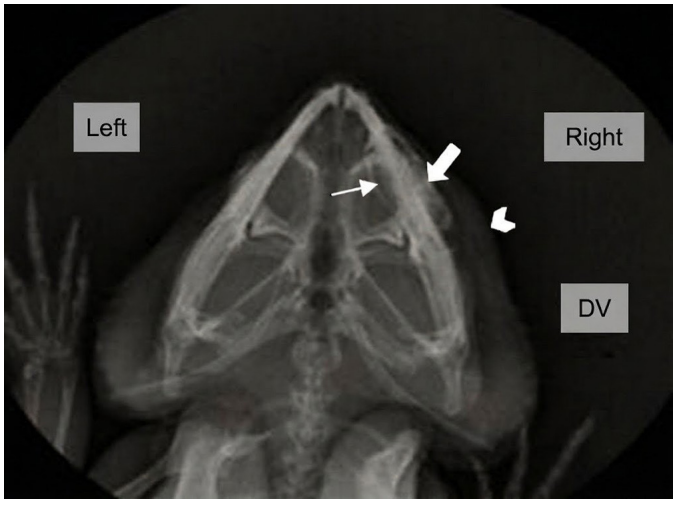


Fig. 5. Radiographic examination of Pogona vitticeps with a submandibular abscess associated with periodontal disease. Radiograph of the animal in a dorsoventral projection, showing an osteolytic (small arrow) and osteoproliferative (large arrow) lesion in the rostral portion of the right mandible, in addition to adjacent soft tissue swelling (arrowhead).

Analysis of the CBC revealed mild anisocytosis, erythroid precursors, heterophil degranulation, and activated thrombocytes. Radiographic examination identified an osteolytic and osteoproliferative lesion in the rostral portion of the right mandible, associated with thickening of the bone margin and periosteal reaction, as well as adjacent soft tissue swelling. The other structures observed in the examination were anatomically preserved (Fig. 5). Bacterial culture and antimicrobial susceptibility testing isolated two agents, *Providencia* sp. and *Proteus* sp., which demonstrated sensitivity to gentamicin, ciprofloxacin, enrofloxacin, marbofloxacin, norfloxacin, and sulfatrim. Based on the clinical evaluation correlated with ancillary examinations, the suspected diagnosis of a submandibular abscess due to a mixed bacterial infection secondary to periodontal disease was confirmed. Therefore, surgical intervention was chosen.

The patient was referred to the surgical suite and administered pre-anesthetic medication consisting of 10% ketamine (5 mg/kg), 5 mg/mL midazolam (1 mg/kg), 1% morphine (0.3 mg/kg), and 0.5 mg/mL dexmedetomidine (10 mg/kg) intramuscularly. After signs of muscle relaxation and decreased palpebral reflexes, the patient was intubated to maintain the anesthetic plane with isoflurane inhalation anesthesia in a continuous flow system with intraoperative monitoring. The animal was then positioned in dorsal recumbency, and antisepsis of the affected area with 2% chlorhexidine and 70% alcohol was performed.

It was then drained using a 20G catheter attached to a 3-mL syringe, yielding approximately 2 mL of thick, yellowish-white caseous material. Then, an incision of the skin and abscess capsule was made, followed by debridement of all infectious content, preserving the capsule, which was subsequently sutured to the skin with simple interrupted sutures using a 4-0 nylon suture, completing the marsupialization. Lastly, the cavity was copiously irrigated with sterile saline solution. The patient recovered well from the surgical procedure and was kept hospitalized at the clinic for daily monitoring of the surgical wound (Fig. 6).

An antibiotic therapy protocol was instituted with 2.5% enrofloxacin at 5 mg/kg every 48 h for 10 days, in conjunction with ketoprofen at 2 mg/kg every 48 h for a total of 7 applications. Both drugs were administered intramuscularly. For the marsupialized cavity, lavage was performed once daily with 4% gentamicin diluted in sterile saline solution at a 1:10 ratio for seven days. Following completion of the initial protocol, lavage with ozonated physiological saline was instituted for an additional 17 days. The patient's condition progressed satisfactorily, eating spontaneously five days after the procedure, with good healing and regression of the infectious process (Fig. 7–8).

DISCUSSION

In bearded dragons, the development of periodontal disease is frequently associated with advanced age, concomitant diseases, and inappropriate diets of fruits and foods that are less abrasive than those found in nature (McCracken & Birch 1994). A prevalence study conducted in the United Kingdom by Mott et al. (2021) revealed that 50% of the 304 captive bearded dragons evaluated had some degree of dental compromise, especially in animals over five years of age and/or below ideal weight, with bone remodeling associated with dental wear being observed. This report, however, presents a different case from what was expected, since the patient was three years and three months old, with a good body condition score and dietary management within the recommendations

for captive animals, diverging from the conventional risk factors reported in the literature.

Acrodont dentition, present in chameleons and most agamids, such as bearded dragons, is characterized by the attachment of teeth to the top of the bony crest, without sockets, and by the absence of dental replacement in adult life, a characteristic known as monophyodonty (Bauer & Bauer 2014, O'Malley 2017). This feature makes the dental arch more vulnerable to wear, fractures, and dental pulp exposure over time (Divers & Mader 2005). In a study by Haridy (2018), the dentition of 37 specimens of *Pogona vitticeps* was histologically analyzed, indicating that the anterior teeth, in the rostral region, have pleurodont implantation, even in adulthood. This dental combination can influence the distribution of conditions in the oral cavity, since the lack of replacement of acrodont teeth hinders tissue regeneration after mechanical or inflammatory injuries, which favors the retention of food debris and biofilm accumulation, predisposing the reptile to the development of periodontal disease (Hedley 2016). In the present report, the alterations presented by the animal were also located in the rostral portion of the oral cavity, revealing the severe progression of the periodontal disease.



Fig. 6. Post-marsupialization appearance of a submandibular abscess associated with periodontal disease in *Pogona vitticeps*.

The periodontal disease grading system described by Divers & Mader (2005) was used as the evaluation parameter, which classifies the condition into five stages: Grade 1 – mild gingival inflammation; Grade 2 – moderate gingival inflammation with dental mobility accumulation; Grade 3 – gingival recession with root exposure; Grade 4 – dental mobility and local osteolysis; and Grade 5 – tooth loss, osteomyelitis, and abscess formation. In the case presented here, the observed periodontal lesions fell within Grades 4 and 5, with bone involvement confirmed by radiographic examination and an evident submandibular abscess.

CBC revealed that the total leukocyte count remained within the expected reference range for the species (10,500/µL); however, the absence of marked leukocytosis was consistent with reptile physiology, wherein the hematological response to infections is more restrained than in mammals (Howert 2019). Nevertheless, compared with the examination performed three months prior during a check-up, the total leukocyte count had increased dramatically (from 2,500/µL), which, together with the description of heterophil degranulation observed on the blood smear, indicates an active inflammatory pattern (Stacy & Harr 2020). This finding corroborates the silent progression of periodontal disease in reptiles, which can advance with subtle clinical signs, reinforcing the need for imaging exams to assess the extent of local involvement, as the absence of hematological changes can mask the severity of the condition.

The radiographic findings of a bone lesion with a poorly defined transition zone, evident in the rostral portion of the right mandibular body, which is characterized by trabecular alteration with areas of osteolysis, osteoproliferation with a marked expansive periosteal reaction, thickening and irregularity of the ventral bone margin, and increased volume of adjacent soft tissues, were consistent with those described in the literature for a chronic infectious process associated with an inflammatory process. In reptiles, this process often results from the progression of untreated periodontal





Fig. 7–8. Progression of marsupialization healing and regression of the infectious process of a submandibular abscess associated with periodontal disease in *Pogona vitticeps*. (**7**) Surgical wound 11 days postoperatively. (**8**) Surgical wound 24 days postoperatively.

infections and is difficult to resolve with antibiotic therapy alone (McCracken 1999). The choice of the surgical technique adopted in the present case was based on the anatomical location of the abscess, allowing for controlled drainage of the exudate, infection control, and healing by second intention, demonstrating the importance of radiographic examination in these cases.

Marsupialization is well-described in both human and veterinary medicine. Santiago et al. (2024) recognized the effectiveness of this technique in difficult-to-access anatomical regions, such as the mandible and floor of the mouth, with a high success rate and low recurrence, in addition to being conservative and minimally traumatic when compared to the surgical alternative of complete excision of the abscess capsule, where the removal of a 2 to 3 mm diameter surgical margin is necessary for the therapeutic protocol to be considered successful, making it impractical, especially with extensive bone and soft tissue involvement (Charland et al. 2018). Marsupialization, in addition to being viable in reptiles, proved effective in the present case as it helps preserve the structures near the affected area and in difficult-to-access locations, such as the submandibular region.

According to Isaza & Jacobson (1995), the microorganisms most commonly isolated in cases of osteomyelitis in reptiles are Gram-negative bacteria, such as *Morganella* spp., *Pseudomonas* spp., *Aeromonas* spp., *Salmonella* spp., *Providencia* spp., and *Escherichia* spp., among others. They also report Gram-positive bacteria, such as *Streptococcus* spp. and *Staphylococcus* spp., less frequently. In the present case report, the bacterial culture revealed the presence of two agents, *Providencia* sp. and *Proteus* sp., both genera composed of rod-shaped, flagellated, facultatively anaerobic enterobacteria. These bacteria can be found in the environment, but studies also report the presence of these microorganisms in the microbiota of several reptile species (Maria et al. 2007, Heynol et al. 2015). Although they are commensals, when there is an imbalance in the oral microbiota resulting from tissue injury or immunosuppression, they can multiply and act as pathogens (Pasmans et al. 2020). Thus, the relevance of these microorganisms in the present case must be analyzed in conjunction with the clinical and radiographic findings and the appearance of the collected sample, and not in isolation.

CONCLUSIONS

The present case highlights the complexity of dental management in reptiles, especially in lizards of the species *Pogona vitticeps*, whose oral anatomy and acrodont dentition pose diagnostic and therapeutic challenges. The absence of a periodontal ligament and the insertion of the teeth directly into the mandibular and maxillary bones contribute to the rapid progression of periodontal disease and lead to osseous involvement in chronic cases, as observed in this report.

A thorough clinical evaluation, combined with ancillary tests, was essential for the definitive diagnosis and the formulation of a treatment plan. Although hematological parameters remained within reference intervals, the combined interpretation of clinical and radiographic findings helped elucidate the progression of the inflammatory process. Furthermore, the bacterial culture and antimicrobial susceptibility testing reinforced the importance of the rational choice of antimicrobials, given the growth of opportunistic bacteria such as *Proteus* sp. and *Providencia* sp., which are increasingly reported in oral infections in reptiles.

Marsupialization proved effective in managing this case, enabling continuous drainage of the caseous content and facilitating access to the infectious focus for daily cleaning. The choice of technique considered the anatomical location of the abscess, the involvement of adjacent structures, and the feasibility of a less invasive procedure with a lower risk of recurrence. However, studies standardizing the use of this technique in these animals are still scarce. Thus, additional studies are necessary to enhance the understanding of the clinical evolution, recovery time, recurrence rate, and immunological response after the intervention.

Furthermore, the report emphasizes the importance of an individualized clinical approach in reptile medicine, considering the anatomical, physiological, and behavioral particularities of the species for the development of more effective and safe therapeutic protocols. Continuing education for professionals in the field and owner awareness are fundamental pillars to ensure the well-being and longevity of these animals under human care.

Conflict of interest statement.- The authors declare no conflicts of interest.

Credit author statement.- All authors contributed to the creation and elaboration of the manuscript. Amanda C. Moreira, Laura G. Pereira, Fabiano R. Prazeres Junior and Ana Carolina P. M. Maranhão contributed to material preparation, data collection and writing. Amanda C. Moreira, Laura G. Pereira, Fabiano R. Prazeres Júnior, Vitor F. M. Malta, and Maxsuel P. S. Lima performed the review and editing of the article.

Data availability statement.- If necessary, the authors can provide the data used in this case report upon request.

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