Archives of Razi Institute Journal
"Arch. Razi Inst."

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Case Report

# Management of Suspected Bacterial Stomatitis in a Ball Python (*Python regius)* Based on Cytological Findings and Azithromycin Therapy: A Case Report

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**How to cite this article** Rizal MF, Alya I, Sudarsyah HL, Saputri RA, Amien S. Management of Suspected Bacterial Stomatitis in a Ball Python (*Python regius*) Based on Cytological Findings and Azithromycin Therapy: A Case Report. Archives of Razi Institute Journal. 2026; 81(4):1075-1078. https://doi.org/10.32598/ARI.81.4.4044

https://doi.org/10.32598/ARI.81.4.4044

**Article info:**
**Received:** 14 Jan 2026
**Accepted:** 13 Jun 2026
**Published:** 01 Jul 2026

**Keywords:**
Azithromycin, Ball python, Cytology, Reptile medicine, Stomatitis

## ABSTRACT

**Introduction:** Stomatitis is a common inflammatory condition in reptiles and represents a significant clinical concern due to its association with pain, anorexia, impaired feeding, and the potential for secondary or systemic infection. In snakes, opportunistic bacteria originating from the normal oral microflora frequently contribute to disease development when mucosal integrity is compromised by trauma, stress, or suboptimal husbandry. In clinical practice, limited access to bacterial culture and antimicrobial susceptibility testing often necessitates the use of cytology-based assessment and empirical antimicrobial therapy as an initial management approach.

**Case Description:** A ball python (*Python regius*) was presented with a one-month history of anorexia and visible oral lesions consistent with stomatitis. Physical examination revealed marked oral mucosal inflammation accompanied by caseous exudate. Cytological examination of an oral swab stained with Diff-Quik demonstrated the presence of streptobacilli and gram-positive cocci, indicating bacterial involvement. Due to the unavailability of microbiological culture and susceptibility testing, empirical antimicrobial therapy with azithromycin was initiated at a dosage of 10 mg/kg body weight. Following seven days of azithromycin therapy, the snake showed marked clinical improvement. Oral inflammation and caseous exudate were substantially reduced, the mucosal surface appeared cleaner and closer to normal, and the animal exhibited increased activity and renewed interest in feeding. No adverse drug reactions or clinical deterioration were observed during the treatment period.

**Conclusion:** Cytology-guided empirical azithromycin therapy resulted in favorable clinical improvement in a ball python with suspected bacterial stomatitis. This approach may serve as a practical and effective initial management strategy in clinical settings where advanced microbiological diagnostics are not readily available. However, bacterial culture and antimicrobial susceptibility testing remain essential for definitive diagnosis, appropriate antimicrobial stewardship, and optimization of treatment protocols whenever feasible.

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## 1. Introduction

Stomatitis is a frequently encountered disease in reptiles and represents an important clinical concern because it can cause pain, impaired feeding, deterioration of body condition, and an increased risk of secondary infection if left untreated. In captive snakes, stomatitis is often associated with predisposing factors such as suboptimal husbandry, oral trauma, and chronic stress, which may compromise local mucosal immunity and facilitate opportunistic infection [1].

The oral cavity of snakes harbors a diverse bacterial community. Jho et al. [2] demonstrated that various gram-negative bacteria, such as *Pseudomonas*, *Proteus*, and *Aeromonas*, as well as gram-positive bacteria, including *Staphylococcus* and *Enterococcus*, can be isolated from the oral cavity of snakes. These microorganisms are typically commensal but may become pathogenic when mucosal integrity is disrupted. Bacterial stomatitis has been reported in multiple snake species, including wild reticulated pythons and boa constrictors, highlighting the clinical relevance of opportunistic bacterial infections in reptiles [3, 4]. Severe forms such as necrotic stomatitis associated with systemic complications have also been documented in pythons [5].

In exotic animal practice, limited access to bacterial culture and antimicrobial susceptibility testing often necessitates reliance on cytology and empirical therapy as initial diagnostic and therapeutic approaches [1]. However, reports describing cytological findings and therapeutic outcomes in ball pythons (*Python regius*) remain scarce. Therefore, this case report aims to describe the clinical presentation, cytological findings, and response to azithromycin therapy in a ball python with suspected bacterial stomatitis.

## 2. Case Presentation

A ball python (*P. regius*) of unknown age was brought by its owner to a veterinary clinic (Urban Animal Pet Care Clinic, Bandung, Indonesia) (Figure 1). According to the owner, the python had been anorexic for one month. On physical examination, the python weighed 0.8 kg, body temperature was not recorded, and oral lesions consistent with stomatitis were observed in the oral cavity.

Initial evaluation demonstrated marked oral mucosal inflammation and visible exudate, correlating with the prolonged anorexia observed in this case (Figure 2). Cytological examination confirmed the presence of streptobacilli and gram-positive cocci, supporting bacterial participation in the lesion (Figure 3). Bacterial culture and antimicrobial susceptibility testing were not performed; therefore, pathogen identification was limited to morphological characterization.

Following seven days of azithromycin therapy, substantial clinical improvement was observed. Oral inflammation and exudate were markedly reduced, and the mucosal surface appeared cleaner and closer to normal. The snake exhibited increased activity and renewed interest in feeding. No adverse reactions or clinical deterioration were observed during the treatment period (Figure 4).

## 3. Discussion

Stomatitis in reptiles is commonly associated with opportunistic bacterial colonization originating from the normal oral microflora. Jho et al. [2] demonstrated that the oral cavity of snakes contains diverse bacterial populations capable of becoming pathogenic under favorable conditions such as mucosal injury or immunosuppression. Similar bacterial involvement has been reported in wild reticulated pythons and captive boa constrictors, supporting the role of opportunistic bacteria in the pathogenesis of stomatitis across snake species [3, 4].

Severe manifestations of stomatitis, including necrosis and systemic involvement, have been documented in Indian rock pythons, emphasizing the importance of early diagnosis and appropriate intervention [5]. In the present case, cytological findings of streptobacilli and gram-positive cocci provided rapid evidence of bacterial involvement, enabling the timely initiation of antimicrobial therapy. This finding underscores the importance of rapid diagnostic approaches in preventing disease progression and potential systemic complications in reptile patients.

Cytology represents a practical diagnostic tool in clinical settings where microbiological culture is unavailable or delayed. Although culture and antimicrobial susceptibility testing remain the gold standard, empirical therapy guided by cytology and clinical judgment is commonly applied in exotic animal practice [1]. Azithromycin was selected based on its tissue penetration and antimicrobial spectrum, and the favorable clinical response observed supports its potential utility in similar cases.

The main limitation of this report is the absence of bacterial culture and susceptibility testing, as well as the short follow-up period and the evaluation of a single clinical case, which limits the generalization of the find-

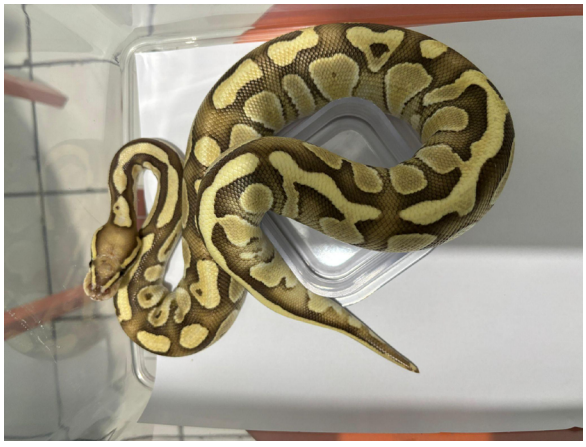


**Figure 1.** Ball python (*P. regius*) at the Urban Animal Pet Care Clinic during initial clinical evaluation before initiation of azithromycin therapy



**Figure 2.** Caseous exudate and mucosal inflammation in the oral cavity of a ball python (*P. regius*) during diagnostic swab collection

ings. Nevertheless, this case provides practical evidence supporting cytology-guided empirical therapy as an effective initial management strategy for suspected bacterial stomatitis in ball pythons. Future studies involving bacterial isolation, antimicrobial susceptibility testing, and larger case series are needed to further validate this approach.

## 4. Conclusion

Cytology-guided empirical azithromycin therapy resulted in favorable clinical improvement in a ball python with suspected bacterial stomatitis. This approach may serve as a practical initial management strategy in clinical settings where advanced microbiological diagnostics are not readily available. However, this report is limited by the absence of bacterial culture and antimicrobial susceptibility testing, the short duration of follow-up, and the evaluation of a single clinical case, which restricts generalization of the findings. Therefore, bacterial culture and susceptibility testing remain essential for definitive diagnosis and optimized antimicrobial stewardship whenever feasible.

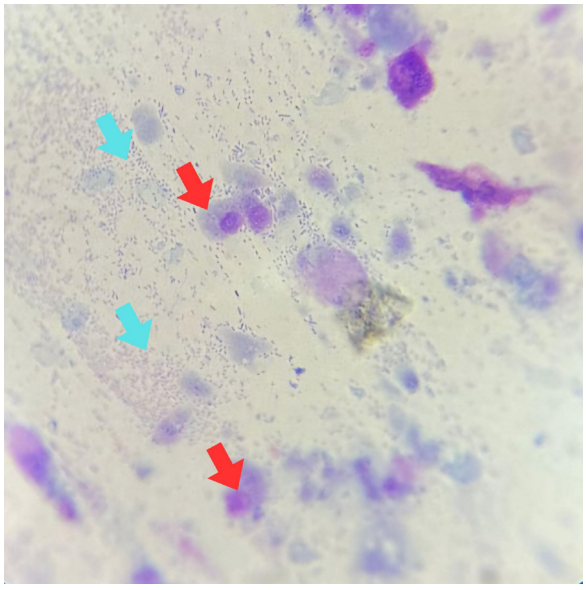


**Figure 3.** Cytological examination of an oral swab from a ball python (*P. regius*) showing epithelial cells (red arrows) and streptobacilli (blue arrows) stained with Diff-Quik (×1000 magnification)



**Figure 4.** Oral cavity of a ball python (*P. regius*) after 7 days of azithromycin therapy, showing a substantial reduction in caseous exudate and improved mucosal appearance

## Acknowledgements

The authors would like to express their sincere gratitude to the clinical staff of Urban Animal Pet Care Clinic, Bandung, Indonesia, for their assistance during case management and clinical documentation.

## Compliance with ethical guidelines

Ethical approval was not required for this case report because all procedures were performed as part of routine clinical treatment to alleviate the animal's suffering. Written informed consent was obtained from the owner.

## Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

## Authors' contributions

Surgical procedure, clinical supervision, and ; writing the original draft: Muhammad Farid Rizal; Technical support and assistance during surgery: Hilma Luthfia Sudarsyah and Rachma Ayu Saputri; Review and editing: Itfa Alya and Suseno Amien.

## Conflict of interest

The authors declared no conflict of interest.

## Data availability

All data supporting the findings of this study are available within this article.

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