

Alternative treatment of stomatitis in ball python (*Python regius*) with class IV laser therapy: a clinical case

Teerapat Rungnirundorn, Natruree Khamchomphu, Napaporn Senarat, Taksaon Duangurai

¹Exotic Clinic of Kasetsart University Veterinary Teaching Hospital, Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand

²Rehabilitation Center of Kasetsart University Veterinary Teaching Hospital, Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand

³Department of Small Animal Clinical Sciences, Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand

INTRODUCTION

Stomatitis (mouth rot) is a common disease in snakes. Bacterial infections tend to be associated with snake's stomatitis [4]. The bacterial agents are part of the normal microflora of the oral cavity or other parts of the digestive tract, which exhibit its pathogenic effect in periods of immunodeficiency or stressed animals [5]. Gram-negative bacteria are most commonly implicated in snake's stomatitis [6]. Clinical signs of stomatitis including anorexia, hypersalivation, pus or necrotic tissue in the mouth with erythema and swelling of gum, open-mouth breathing and death. Treatments are commonly applied with debridement, irrigation, antibiotics based on culture and sensitivity

result, and anti-inflammatory drugs. However, wound of snake heal slowly and because of this, it is important to treat any sick snakes in long term. Thus, alternative treatment of stomatitis with laser therapy is needed for good outcome treatment in this case.

Laser therapy, also called photobiomodulation, involves photothermal, photomechanical and photochemical processes, occurring when the energy is absorbed by molecules (chromophores) in the tissues. The most known photochemical effect is an increase in ATP production with improvement in cell energy metabolism. Irradiation with specific light wavelengths,

can result in higher availability of nitric oxide (vasodilator signaling) and production of reactive oxygen species (cytoprotective signaling) [8]. Laser radiation can induce a significant reduction of specific mediators of inflammatory response, such as prostaglandin E2 (PGE2), interleukin 1 β (IL-1 β) and tumor necrosis factor α (TNF α) [7]. Effects of laser therapy include: promotion of neovascularization stimulation of fibroblast migration, keratinocyte proliferation, and production of growth factors. These effects can enhance wound healing, reduce edema and infection. Thus, in this case, we evaluated the effectiveness of laser therapy in enhancing the healing rate.

AIMS

Class IV laser therapy is used extensively in veterinary medicine. It is seen as an effective alternative in reducing pain, inflammation and promoting tissue healing. The applications of therapeutic laser for treatment in various conditions have grown dramatically. This objective of this study was to evaluate the effect of laser therapy for stomatitis in a snake.

MATERIALS AND METHODS

A 2-year-old male ball python (*Python regius*) with body weight of 1.2 kg was brought to the exotic clinic of Kasetsart university veterinary hospital, Bangkok, Thailand, with severe inflammation of oral mucosa. The lesions showed some necrotic areas of oral mucosa and mucoid oral discharge (fig 1). This patient was diagnosed for severe stomatitis. Cause of infection has been diagnosed, based on bacterial culture and drug sensitivity test. Bacterial culture yielded positive

results for *Escherichia coli* and *Salmonella* spp. Medical treatments with antibiotic (gentamicin sulphate 2.5 mg kg⁻¹ q72h), based on drug sensitivity result and NSAIDs (carprofen 2 mg kg⁻¹ q 48h) were administered in this case for 14 days. The outcome was unsatisfied. Thus, alternative treatment with class IV laser therapy was considered after 7 days of medical treatment. The Multiwave locked system (MLS[®], ASA srl, Italy) laser therapy was introduced for 8 treatments in 23 days. The therapeutic protocols were infected wound (2.28 joules/cm²) and chronic inflammations (4.04 joules/cm²). During laser therapy, the snake was covered around the eye area with thick towel to avoid exposure of the laser beam.

RESULTS

The clinical signs markedly improved after 3 times of laser therapy in 6 days (fig 3). After 8 times of laser therapy in 23 days, the inflammatory tissue was barely observed (fig 5). The necrotic tissue and oral discharge were not detected.

DISCUSSION

Laser therapy represents currently an evolution of veterinary treatment modalities. Many clinical studies shown the beneficial outcomes of using laser in reducing inflammation and infection [2,3]. The use of therapeutic laser treatment in exotic animals has also been described in many reports by exotic practitioners [10,11,12,13]. The most frequent use is on wounds, edema, pain and inflammatory-based disease [9]. Effects of laser with anti-edema, anti-inflammatory and pain relief, allow to reduce the use for drugs and accelerate the healing process [9]. Accordingly, laser therapy in snakes



Figure 1: The first day of presentation in the hospital, this snake showed severe inflammation of oral mucosa and necrotic tissue. (Wound size 7.6 x 10.9 mm)



Figure 2: After 7 days of treatment with injection antibiotic (gentamicin sulphate) and NSAIDs (carprofen), the improvement was hardly observed. Therefore, Multiwave locked system (MLS[®]) with class IV laser therapy was applied in this case. (Wound size 7.0 x 10.1 mm)



Figure 3: After 3 times in 6 days of class IV laser therapy, the inflammation tissue was markedly improved. (Wound size 3.8 x 7.5 mm)



Figure 4: After 5 times in 12 days of treatment, less necrotic tissue was noticed.



Figure 5: After 8 times in 23 days of treatment, the inflammatory tissue was barely observed. The necrotic tissue and oral discharge were not detected.



Figure 6: During laser therapy, this snake was covered with towel around the eyes area to avoid exposure the laser beam.

with stomatitis, that generally heal slowly, is advised. As the alternative treatment in reptiles, the outcome in this case was satisfactory and showed no undesirable effect during the procedure.

CONCLUSIONS

This report showed that class IV laser therapy was safe and effective. It can be considered as an alternative therapeutic method for stomatitis in snakes. Finally, we provided insights on the possibility to apply the laser therapy in other exotic pet treatments.

ACKNOWLEDGEMENTS

The authors in this article would like to express their sincere thanks to Dr. Kaset Sutasha for his advice and encouragement in this study. We are also grateful to Assist. Prof. Pornchai Sanyathitiseree for his comments and suggestions for the manuscript.

REFERENCES

1. James W. Carpenter. Exotic Animal Formulary Fifth Edition. Elsevier Inc, St. Louis, Missouri, 2018, pp 81-166.
2. Robert D. Ness. Class IV laser therapy in avian, exotic pets. Veterinary practice news, 2015.
3. Mihaela A. Calin and Toma Coman: The laser in veterinary medicine. Turk J. Vet. Anim. Sci. 2011, 35(5): 351-357.
4. Mark A. Mitchell and Thomas N. Tully, JR. Manual of Exotic Pet Practice. Saunders, an imprint of Elsevier Inc, St. Louis, Missouri, 2009, pp 136-163.
5. Seven Mustafa and Teodora Popova. Enterobacter agglomerans. – A Cause of Stomatitis in a Snake. Tradition and Modernity in Veterinary Medicine. 2017, vol. 2, No 1(2): 39-44.
6. Charles Innis and Joerg Mayer. Fact Sheet of Ulcerative Stomatitis. American Association of Zoo Veterinarians Infectious Disease Committee Manual, 2013.
7. Barbara B. et al. Essential Facts of Physical Medicine, Rehabilitation and Sports Medicine in Companion Animals. VBS VetVerlag, Babenhausen, 2019.
8. Mikel S. Gonz lez. Technological Advances in Wound Treatment of Exotic Pets. Vet Clin Exot Anim 22, 2019: 451-470.
9. MLS® Laser Therapy user guide on Exotic Animals, ASA srl, 2019.
10. Chris Griffin. Therapeutic laser treatment for exotic animal patients. Journal of avian medicine and surgery. 2015, 29(1): 69-73.
11. Alexandra Kilgore. Therapeutic laser treatment for exotic animal patients. Journal of avian medicine and surgery. 2015, 29(1): 69-73.
12. Jörg Mayer. Therapeutic laser treatment for exotic animal patients. Journal of avian medicine and surgery. 2015, 29(1): 69-73.
13. Robert Ness. Therapeutic laser treatment for exotic animal patients. Journal of avian medicine and surgery. 2015, 29(1): 69-73