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Successful management of retained spectacles, bilateral subspectacular abscess and infectious stomatitis in an Indian spectacled cobra (*Naja naja*)

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Abstract

The veterinary healthcare aspects of the Indian spectacled cobra (*Naja naja*) have not been studied extensively in India. This snake suffers from a wide variety of diseases; however, a well-established systemic classification of healthcare issues is not available in India. Out of all systemic disorders, ophthalmic affections have been documented as a frequent healthcare issue observed in snakes throughout the world. Snakes do not have mobile eyelids, but spectacles protect the cornea. The present paper describes successful management of retained spectacles, bilateral subspectacular abscessation and infectious stomatitis in an Indian spectacled cobra brought to Postgraduate Institute of Veterinary Education & Research (PGIVER), Kamdhenu University, Rajpur (Nava), Himmatnagar, Gujarat. An effort has been made utilizing available resources to create a disquisition on ophthalmic diseases in snakes which will enable veterinary practitioners to adopt similar therapeutic approaches in future.

Keywords: Indian spectacled cobra, retained spectacles, subspectacular abscess, infectious stomatitis

Introduction

India is home to different types of venomous and non-venomous snakes. Increasing international trade of legally permitted species has also led to introduction of newer exotic snakes and pythons in the country. Snakes have shown greater tolerance and survival instincts from a long period of time and have developed remarkable adaptations over a period. Wild or free-living snakes have adaptation to avoid unnecessary health issues. On the other hand, healthcare of captive (e.g., kept in zoos) or pet snakes depends on knowledge level and managerial practices (e.g., housing, feeding, hydration, deworming, regular health checkup, breeding etc.) adopted by caretakers or owners.

Captive or free-living snakes may suffer from different diseases including ocular affections. It is important to know that snakes do not have mobile eyelids and eyelashes as observed in many other animals. The shape of pupil in snakes can be round, elliptical/slit-like or horizontal elliptical/slit-like depending on type of snake, its evolution process throughout the years, adaptation, and habitat. They have a transparent-immovable-disc shaped spectacle covering the cornea for protection. This structure is also termed as 'Ocular scales', 'Eyecaps', 'Lens cap' or 'Brille' and it is generally shed during normal ecdysis.

Ophthalmic disorders in reptiles (including snakes, lizards, turtles etc.) have been documented throughout the world. Some of the examples include retained eyecaps; presence of retained scales on spectacle; subspectacular abscessation; adhesions; traumatic injuries; foreign body penetration; panophthalmitis [1]; occluded lacrimal duct [2]; cataracts; uveitis; microphthalmia; keratoacanthoma [3]; congenital abnormalities such as cyclopia; bullous spectaculopathy [4]; anophthalmia [5]; conjunctivitis; sub spectacular nematodiasis [6]; subspectacular fluid opacity [7]; fungal infections; ectoparasitic infestation (such as mites and ticks); keratitis of bacterial origin, hypopyon, keratomalacia [8] etc. The present paper highlights diagnosis, management, and disquisition on retained spectacles, subspectacular abscessation and infectious stomatitis in an Indian spectacled cobra.

Case details and management

An adult male Indian spectacled cobra (*Naja naja*) was rescued from a village nearby Himmatnagar (Gujarat) and brought to the Veterinary Hospital functional under the Postgraduate Institute of Veterinary Education & Research (PGIVER), Kamdhenu University, Rajpur (Nava), Himmatnagar. Anamnesis included sluggish and lethargic movements, vision issues, reduced response to stimuli and haphazard attempts of self-defense without provocation. Anamnesis did not reveal any specific details on onset, duration, and cause of the condition because it was a direct rescue operation of a free-living cobra.

Presence of remarkable debris-dirt-dry scales on head (Figure-1), retained spectacles accompanied by bilateral subspectacular abscessation (Figure-2) and moderate sticky salivation were observed during external evaluation. The cobra was observed to have reduced response to external stimuli and diminished ophthalmic reflexes. The mouth opened with sterile forceps was found to have initial lesions suggestive of infectious stomatitis, mild petechiae and slightly damaged fangs (Figure-3). The cobra was carefully restrained using a plastic pipe and the debris-dirt-dry scales on head were cleaned using lukewarm water (Figure-4). Sticky salivation, mild petechiae and lesions of stomatitis were also cleaned using a cotton swab soaked in lukewarm water and a safer antiseptic devoid of iodine.

It was decided to use general anesthesia at standard

recommended dose (*i.e.*, Ketamine @ 44 mg/kg b.wt. IM) considering the requirement of minor surgical intervention in head region of a venomous snake. A sterile needle was used to puncture subspectacular abscess (*i.e.*, for removal of pus-mixed liquid) and membrane was gently lifted for surgical excision/opening (Figure-5). The cobra was monitored for tail movements as well as depth and frequency of respiration throughout the procedure. Surgical procedure was followed oral administration of anti-stressor multivitamins (Figure-6), intramuscular injections of a non-steroidal anti-inflammatory drug (Meloxicam) and a long-acting antibiotic (Enrofloxacin). A sterile artificial-insemination sheath was used for oral administration while preventing the tracheal opening from any kind of damage. Topical eyedrops containing antibiotic and anti-inflammatory drugs were also applied to prevent sepsis and pain. No bleeding was observed at the site of incision.

Noticeably, both the eyeballs were found intact and responsive to external stimuli (in terms of pupil dilation/constriction, reflexes, and movements) after the surgical procedure (Figure-7). The comparison of pre-operative and post-operative status of eyeballs is shown in Figure-8. The cobra was observed for post-anesthetic recovery for 2 hours until it started responding normally to all external stimuli. Later, the cobra was released in suitable habitat without any complications Figure-9.



Fig 1: Presence of debris, dirt, scales on head; retained spectacles and subspectacular abscessation in an Indian spectacled cobra



Fig 2: Retained spectacles and subspectacular abscess



Fig 3: Partially damaged fangs, petechiae and lesions of stomatitis with sticky discharge



Fig 4: Restraining of Indian spectacle cobra using plastic pipe to wash debris on head (Left) and appearance of head after cleaning (Right)



Fig 5: Gentle puncturing and lifting of the membrane to remove abscess keeping eyeballs intact



Fig 6: Oral administration of anti-stressor multivitamins



Fig 7: Post-operative appearance of affected eyeballs



Fig 8: Pre-treatment (Left) and post-treatment (Right) comparison



Fig 9: Screenshots of a video on successful post-operative release of Indian spectacled cobra with normal vision and alertness

Discussion

Retained spectacle is more commonly observed in pet snakes having a history of abnormal ecdysis. Owners of pet snakes may also try to remove retained spectacle using tools which may cause damage to the eyeballs. Normally, transparent fluid is present between spectacle and cornea for its protection. However, retained spectacles may also accompany fluid accumulation in abnormally large amounts because of various reasons. Excessive amounts of fluids or pus may also block nasolacrimal duct with distended bulge, *i.e.*, bullous spectaculopathy or pseudobuphthalmous^[9]. Additionally, abnormally shed skin (dysecdysis) may also show presence of dry scales over the eyeball. This condition generally occurs

due to dehydration and deficiencies. It does not require surgical intervention and use of anesthesia.

Subspectacular abscesses in snakes can be unilateral (*i.e.*, involving one eye) or bilateral (*i.e.*, involving both eyes). Cases of unilateral subspectacular abscess have been documented in pythons ^[10, 11]. Reasons for development of subspectacular abscesses in snakes include improper management, improper diet, improper housing care (in case of captive snakes), subspectacular nematodiasis ^[6], ongoing bacterial infections (e.g., stomatitis caused by *Clostridium perfringens*) ^[7], post-respiratory infections, bacterial keratitis, spectacle trauma, inadequate sterilization of equipment kept for captive snakes, group housing, lack of deworming, improper shedding of skin, retention of eyecaps with ongoing bacterial sepsis ^[11] etc.

Such cases can be managed with a conservative approach initially; however, chronic cases may require surgical interventions. It has been documented in a study that tortuous course of lacrimal duct of a snake (depending on species) must be kept in mind for occlusion while performing invasive ophthalmic surgical procedures in snakes ^[9]. Some of the previously published reports have also suggested post-operative complications such as engorged spectaculacular vessels and edema near wound edges in pythons ^[12]; however, such post-operative complications could not be observed in the present case. In past, scientists have described that partial spectacullectomy may possess increased risk of ocular penetration and adhesions ^[12]. It has been described in literature that recovery in such cases may appear as formation of an amorphous plaque of homogenous proteinaceous material within 24 hours along with re-establishment of space and normal wetting of eyeball surface within a week ^[12]. Mild cases of subspectacular abscess or edema may not require use of general anesthesia ^[12]; however, the cobra mentioned in the present case is a venomous snake and it was found to have bilateral ophthalmic involvement required to be corrected using general anesthesia at recommended doses. Tail movement and respiratory rate (depth and rate) were monitored throughout the period of anesthesia. Bleeding and sepsis were not observed after the procedure. Oral administration of anti-stressor multivitamins was performed to enhance healing process, long-acting antibiotic was administered intramuscularly to prevent infection while anti-inflammatory agent was given for pain relief. Eyedrops containing antibiotic and anti-inflammatory drugs were also applied on eyes to prevent sepsis and pain.

The cobra mentioned in the present case was also found with partially damaged fangs, petechiae in mouth and initial signs of infectious stomatitis. Correlation of ascending infectious stomatitis (or 'Mouth rot', an upper alimentary tract disease) with development of subspectacular abscessation in snakes has been documented by various scientists ^[7, 11]. Untreated stomatitis has also been described to cause osteomyelitis, pneumonia, panophthalmitis and death in different reptiles. Stomatitis is generally caused by Gram-negative bacteria, impaired immune system, renal failure, viral infections, chronic oral ulcerations, diptheriasis, severe mite infestation around mouth etc. Pre-disposing factors include malnutrition, improper hygienic conditions, improper husbandry etc. The mouth parts of snakes are soft, and stomatitis can occur in captive snakes which are subjected to hand feeding or force-feeding. Stomatitis is generally accompanied by erosive lesions in mouth, petechiae in mild cases, sticky salivation / secretion, tissues with degenerative changes and presence of

dirt or debris. Therefore, care should always be taken to prevent further damage to mouth parts during handling and surgical procedures. Moreover, the approach for treatment of stomatitis also differs between venomous snakes and non-venomous snakes. The cobra depicted in the present case is one of the four major venomous snakes found in the region. Therefore, care was taken to restrain the mouthparts properly even during anesthesia.

Stomatitis is generally accompanied by symptoms such as anorexia, changed mentation, gingival swelling, oral discharge, excessive salivation, anorexia, weight loss, debility, vomition/regurgitation, open-mouth breathing, presence of deep ulcerative or necrotic tissues in mouth, presence of caseous exudation in mouth etc. Chronic cases of stomatitis may lead to osteomyelitis and loosening of teeth. Such symptoms were not evident in the anamnesis of the present case because it was a direct rescue operation of a free-living cobra. The damaged fangs in the present case could have been observed due to attempts made by the snake to catch and envenomate a hard object mistaking it as a prey.

It can be undoubtedly said that a noticeable population of captive or wild Indian spectacled cobra must have an unknown prevalence of ophthalmic affection. The present paper has highlighted a case of retained spectacles, subspectacular abscess and infectious stomatitis in an Indian spectacled cobra. Similar ophthalmic affections have not been observed in the region from a long period ^[13]. The list of ophthalmic affections highlighted in the paper and relevant disquisition of case management has practical significance to encourage veterinary practitioners for implementation of similar approaches in snakes.

Conclusion

Ophthalmic conditions and infectious stomatitis in Indian spectacled cobra are not extensively studied in India and their existing prevalence is not known. Successful management of retained spectacles, bilateral subspectacular abscess and infectious stomatitis was carried out by judicious use of anaesthesia, antibiotics and supportive medications in an Indian spectacled cobra. Similar approach can be implemented in field and documentation of such rare disease conditions is encouraged to generate a strong database on existing diseases of Indian spectacled cobras in India.

Conflict of interest

Authors declare no conflict of interest with regards to funding. The hospital is regularly involved in diagnosis and life-saving treatment of diseases and disorders of domestic as well as non-domestic animals, birds and reptiles.

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References

1. Millichamp NJ, Jacobson ER. Diseases of the eye and ocular adnexae in reptiles. J Am. Vet. Med. Assoc 1983;183(11):1205-1212.
2. Millichamp NJ, Jacobson ER. Conjunctivostomy for treatment of an occluded lacrimal duct in a blood python. J Am. Vet. Med. Assoc 1986;189(9):1136-1138.
3. Hardon T, Fledellus B, Heegaard S. Keratoacanthoma of

- the spectacles in a Boa constrictor. *Vet. Ophthalmol* 2007;10(5):320-322.
4. Cullen CL, Wheler C, Grahn BH. Bullous spectaculopathy. *Can. Vet. J* 2000;41:327-328.
 5. Sabater M, Perez M. Congenital ocular and adnexal disorders in reptiles. *Vet. Ophthalmol* 2012, 1-9.
 6. Hausmann JC, Mans C, Dreyfus J, Reavil DR, Lucio-Forster A, Bowman DD. *Subspectacular nematodiasis* caused by a Novel *Serpentirhabdias* species in Ball pythons (*Python regius*). *J Comp. Pathol* 2015;2:260-264.
 7. Cleymaet AM, Ehrhart EJ, Sadar MJ, Johnston M, Wotman K, Henriksen M dL. Unfolding the diagnosis of subspectacular fluid opacity in a corn snake (*Pantherophis guttatus*). *Vet. Ophthalmol* 2020;23(4):754-759.
 8. Ledbetter EC, Marion JS, Morrisey JK. Amniotic membrane grafting for traumatic complete spectaculectomy and keratomalacia in a Boelen's python (*Simalia boeleni*). *Vet. Ophthalmol* 2021. <http://doi.org/10.1111/vop.12869>.
 9. Souza NM, Maggs DJ, Park SA, Puchalski SM, Reilly CM, Paul-Murphy J *et al.* Gross, histologic, and micro-computed tomographic anatomy of the lacrimal system of snakes. *Vet. Ophthalmol* 2014, 1-8. (Doi:10.1111/vop.12184)
 10. Lee S-Y, Kim JW. Subspectacular abscess involved with MRSA (methicillin resistant *Staphylococcus aureus*) in a snake. *J Vet. Clin* 2011;28(4):446-448.
 11. Kurniawan LKL, Govendan PN. Unilateral spectaculotomy on a Burmese python (*Python bivittatus*) with subspectacular abscess: A case report. *J Indonesian. Vet. Res* 2020;4(1):8-11.
 12. Mass AK, Paul-Murphy J, Kumaresan-Lampman S, Dubielzig R, Murphy CJ. Spectacle wound healing in the Royal python (*Python regius*). *J Herpetological Med. Surg* 2010;20(1):29-36.
 13. Bhadesiya CM, Chaudhary GR, Patel TP, Sorathiya LM, Patel VA, Gajjar PJ *et al.* Prevalence of diseases and disorders of reptiles at Veterinary Hospital of Kamdhenu University, Gujarat, India. *Journal of Entomology and Zoology Studies* 2020;8(3):1477-1483.