A Rare Case of Pediatric Ocular Injury Secondary to a 2 Burmese Python Bite

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Received date: September 22, 2016; Accepted date: October 03, 2017; Published date: October 09, 2017

Abstract

Human ocular snake-bite injuries outside of natural habitats are rarely reported. This case report describes the first python bite causing penetrating ocular injury in a pediatric patient in the English literature with the unique highlight of an excellent visual outcome despite no initial primary globe repair was performed.

Keywords: Burmese python; Penetrating ocular injury

Introduction

Snakes can be divided into two broad categories—venomous and non-venomous. The venomous snakes largely belong to two families, namely Elapidae (e.g., cobras, sea-snakes, coral snakes) and Viperidae (e.g., vipers, rattlesnakes, adders). In contrast, pythons belong to the non-venomous Pythonidae family, which can suffocate their prey by coiling around their victims' bodies. Ocular injuries secondary to non-venomous snake bites are rare.

<table>
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<tr>
<th>Authors</th>
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<th>Year</th>
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<th>Age (year)/gender/Country of injury</th>
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<tr>
<td>Muthusamy et al. [8]</td>
<td>Contact Lens &amp; Anterior Eye</td>
<td>2012</td>
<td>Boa constrictor</td>
<td>Boidae</td>
<td>35/female/Brazil</td>
<td>Full thickness corneal laceration</td>
<td>Primary closure, AC washout, Ciprofloxacin, metronidazole</td>
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Table 1: The majority of the reported penetrating globe injuries from snake bite are inflicted by 2 Boa constrictors. Non-venomous snakebite injuries tend to have good visual outcome with proper medical and surgical managements. There are only two reported venomous snake bite, which required evisceration or enucleation for venom source control, despite initial aggressive medical management for salvage of vision.
There are only six cases of penetrating globe injuries from snake bites reported in the English literature since 1992 by Pubmed search, and one other case was a partial thickness corneal laceration of a LASIK flap (Table 1).

Burmese pythons- *Python morulus bivitattus*, a subspecies of Asiatic rock python (*Python morulus*), is a non-venomous snake. Burmese pythons are one of the most commonly sold snakes, as well as one of the most beautiful in its varied color morphs. 1 Female Burmese pythons can grow up to 18 feet (5.4 m) and males can grow up to 17 feet (5.1 m) [1]. Burmese pythons can achieve a weight of more than 90 kg [2]. They possess sharp teeth and fangs in their upper jaw. There are at least 7 human fatalities in the US attributed to Burmese pythons, mostly reported in the state of Florida [2].

**Case Report**

The patient is a 6 year-old, previously healthy, Caucasian female who was transferred to Arkansas Children's Hospital emergency department after being attacked by a 5 year-old family pet Burmese python from 5 to 10 feet away. The family described that the python lunged forward, and hit the patient's left forehead, extending over to her right eye. The snake was immediately terminated by the patient's father. She received 1 g of IV Cefazolin prior to arrival. Her vaccinations were up to date.

On examination, linear skin abrasions were noted at the left forehead and right lower eyelid (Figure 1). The near visual acuity was count fingers in the right eye and 20/70 in the left eye. Extraocular movements were intact. Examination of right eye was significant for a 3 mm horizontal, largely partial thickness corneal laceration. There was a pinpoint area of this laceration that appeared to be full thickness, at approximately 9 o'clock, with an irregularly shaped iris bowing toward this point (Figure 2). However, the laceration was self-sealed, stable, and remained Seidel negative with repeated gentle manipulations of the cornea in examination of the laceration. There was also a 50% hyphema with a slightly shallow anterior. The anterior capsule of the right lens appeared to be violated. There was no funduscopic view of right eye. The examination of the left eye was normal.

The patient was started on tobramycin/dexamethasone ointment QID, moxifloxacin 0.5% ophthalmic solution TID, atropine daily, limited activities, and eye shield at all time for protection. As the laceration was found to be Seidel negative, no immediate surgical intervention was required. She was admitted to the Arkansas Children's Hospital overnight for close observation.

Repeat examination the next morning after the initial injury showed visual improvement in the right eye to 20/400 with a resolving hyphema. The laceration remained Seidel negative, and the patient did not require any initial surgical intervention for her sealed corneal laceration. She was also found to have a dense cataract.

The patient was monitored closely, and the corneal laceration healed well, with only topical medications required. The patient did have a visually significant traumatic cataract which required surgical extraction. Six weeks after the initial injury she underwent an examination under anesthesia with B scan and A scan ultrasound, cataract extraction with sulcus 3-piece lens implantation (due to questionable capsular support), and iris synechiolysis. Cycloplegic streak examination was +1.5D in the left eye. The anterior capsule was found to be membranous with extensive scarring of the lens capsule.

On one week post-operative visit, her visual acuity was 20/125 in the right eye. The family was instructed to patch her left eye a few hours daily. On the three-month post-operative visit, the corrected visual acuity of the right eye was 20/30 with polycarbonate lens correction (plano+0.25 × 063), with an intraocular pressure of 10 mmHg. Corneal scar was noted at the site of the initial laceration (Figure 3).
Discussion

Ocular injuries secondary to snake bites are rare, particularly from non-venomous snakes. Ocular injuries from venomous snakes include venom spurt injury and bite injury. Both types of injuries from venomous snakes can cause snake venom ophthalmia. Snake venom ophthalmia is seen from members of the snake family Elapidae consisting of spitting snakes like the cobra. Common clinical manifestations after venom is sprayed onto the eye include chemical conjunctivitis, corneal ulceration, and anterior uveitis [3]. Direct inoculation of venom into the eye has been known to cause globe necrosis, keratomaclastic, and uveitis [4]. The venom is a complex mixture of high molecular weight proteins, mainly proteases, peptide hydrolases, hyaluronidase, and phospholipases [3]. The action of venom components can result in, hemotoxic, myotoxic, and secondary nephrotoxic effects [4]. Ocular injuries from venomous snake bites often require local anti-venom administration and sometimes evisceration for venom source control in the case of penetrating venomous snake bite ocular injuries.

Among the six previously reported penetrating globe injuries, three cases are from boa constrictors belonging to the family of Boidae, and two cases are from vipers (Table 1). There is only one penetrating ocular injury from the species of a python family-Python molurus, in a 26 year-old male resulting in a full thickness corneo-scleral laceration, with final visual acuity of 20/30 after primary globe repair, hyphema washout and laser retinopexy [4]. Chen et al. reported a case of scleral laceration from a venomous viper (Deinagkistrodon acutus) which was complicated by venom ophthalmia despite antivenom administration, resulting in evisceration of the injured eye [5].

Our patient is only the second reported case of ocular injury inflicted by a python species. This is also the first pediatric case of non-venomous snakebite ocular injury, with both corneal laceration and traumatic cataract. In this case, the only IV antibiotic given at initial presentation was cefazolin. Broad spectrum antibiotics were not given as this was a family pet with generally good health. No endophthalmitis developed in this case.

When examining patients with snakebites, consideration should also be given for infectious stomatitis, a disease most commonly predisposed by not providing the snake its preferred optimal temperature range. It is common among captive snakes [6]. Common microorganisms associated with infectious stomatitis include Gram-negative bacteria, mainly Pseudomonas, Salmonella, Klebsiella, and Peronomonas species [7]. Fewer than 5% of patients develop infections from cutaneous injury of snake bite, thus antibiotic prophylaxis is rarely required. However, the risk of endophthalmitis from non-venomous snake bites is unknown [8].

Child abuse was considered as a possibility in this case, but the child arrived with both parents and grandparents, all of whom were consistent with the story. In fact, the patient, herself, told the story with such detail that doubt was quickly assuaged, especially in light of the fact that the bite marks on the left forehead, right lower eyelid, and the pattern and shape of the (presumed) fang entrance of the cornea in the same directional vertices indicated that this was the only conceivable way that this could have happened (Figure 1). The shape of a maw was well defined.

In conclusion, non-venomous snake bite injuries require close follow-up and careful management. Child abuse should always be considered when snake bite injury to a child is reported in the history. With the invasion of the Burmese python into the Florida everglades, encounters with these animals may become more commonplace. Appropriate systemic broad spectrum antibiotics should be considered on initial presentation of the injury, although in our case, it proved to be unnecessary. The IV cefazolin in combination with the topical tobramycin and moxifloxacin proved to be adequate in this case. This patient was able to achieve an excellent visual outcome, after close monitoring, and appropriate medical and surgical management of her ocular injury.

References