Bilateral Angle Closure Glaucoma Following Snake Bite

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Abstract
Snake venoms are complex heterogenous poisons with multiple effects. Ocular complications with snake bite are rare. This report describes two cases which developed bilateral acute angle closure glaucoma following snake bite. There was complete recovery in the two patients following timely diagnosis and treatment.

INTRODUCTION
Snakebite is a common medical emergency. Systemic manifestations of snake envenomation are varied. Elapidae (cobras and krait) are neurotoxic. Viperidae are hemotoxic and vasculotoxic. Ophthalmic manifestations of snakebite are rarely reported in literature. Ptosis, ophthalmoplegia, optic neuritis including uveitis have been described. But to our knowledge there has been no report of angle closure glaucoma. Herein, we report two patients, who developed acute angle closure glaucoma following snake bite. The second patient also had fibrinous uveitis.

CASE REPORT
Case 1
A 30 years male was admitted with a history of snake bite on the right big toe with cellulitis. Patient was already started on antisnake venom elsewhere. He complained of a sudden decrease in vision in both eyes 48 hours after the snake bite. On examination, the visual acuity was 6/36 in both eyes and there was circumciliary congestion, conjunctival chemosis with corneal edema and shallow anterior chamber (Figs. 1 and 2). Extraocular movements were full. The pupils were sluggishly reacting and the intraocular pressure by applanation tonometry was 37 mm Hg in right eye and 30 mm Hg in left eye. Slit lamp examination revealed moderate uveitis. Indirect gonioscopy showed closed angles. Fundus examination was normal in both eyes. A diagnosis of bilateral acute angle closure glaucoma was made.

Case 2
A 42 year old lady was admitted with a history of snakebite on the dorsum of left foot and one episode of hematuria. A provisional diagnosis of hemotoxic envenomation was made. Hematological evaluation showed a markedly reduced platelet count of 10,000/mm³ with neutrophilic leucocytosis. Bleeding time was 1min 36 secs and clotting time was 2 mins 25 secs. Biochemical analysis of blood and urine was indicative of acute renal failure. Tetanus toxoid was given and broad spectrum antibiotics were started. The patient received 150 ml of antisnake venom after sensitivity test. Six days after the bite, she complained of severe pain and redness in both eyes. Anterior chamber was very shallow and pupillary reactions were sluggish in both eyes. The intraocular pressure by indentation tonometry was 43.3 mmHg in right eye and 50 mmHg in left eye. Fundus examination showed a small superficial retinal hemorrhage adjacent to disc in left eye. Visual acuity, slit lamp examination and
gonioscopy were not possible as the patient was in altered sensorium. A diagnosis of bilateral acute angle closure glaucoma was made. Patient was started on topical treatment with 2% pilocarpine, 0.5% timolol and 0.1% dexamethasone drops. The intraocular pressure reduced to 28 mmHg in both eyes on the third day follow up and 17.3 mmHg on day 7. The anterior chamber depth gradually returned to normal over this period. However on day 8 the patient developed severe fibrinous uveitis in both eyes (Fig. 3). Dosage of topical steroids was increased to one hourly frequency and oral steroids 60 mg was also given for 10 days. The uveitis responded well to treatment and the patient regained normal vision (6/6).

**DISCUSSION**

Systemic manifestations of snakebite are dependent on the toxins present in the venom. Polypeptide toxins prevent acetylcholine release from nerve terminals. In eye, these toxins may produce ptosis and ophthalmoplegia. In fact, ptosis and ophthalmoplegia may be the only manifestations following elapids. Antihemostatic factors present in viper venom can lead to acute fibrinogenolysis, acute reduction of platelet levels and damage to vascular endothelium. Viper venom causes breakdown of permeability barriers leading to extravasation and edema. Though the snakes were not identified in our patients, one can presume from the hemotoxic symptoms that the snakes could have been of viperidae variety.

Ophthalmic manifestations of snakebite have rarely been reported in literature. Vision threatening complications, rarely occur following snakebite. Incidence of ghost cell glaucoma after snakebite has been reported. Certain types of cobra (N.nigricollis) have the capacity to spray their venom for a few meters. Venom ophthalmia is an acute and severe form of conjunctivitis and anterior uveitis following ocular exposure to the venom of such snakes. Acute angle closure glaucoma in both eyes following snakebite which is an ophthalmic emergency and a potentially vision threatening condition has not been reported so far (Medline search). Both the patients developed acute rise in intraocular pressure after receiving ASV, the first patient on the third day and the second on the seventh day following the bite. The possible causes could be the snake venom, allergy to ASV and capillary damage. We believe that the venom would have induced ciliary body edema and iris edema. This would have led to forward movement of the iris lens diaphragm and shallowing of the anterior chamber with resultant pupillary block preventing aqueous flow from posterior chamber to anterior chamber. The intraocular pressure spike was higher and other manifestations were severe in the second patient which may possibly be due to exposure to large dose of venom toxins. Uveitis following snakebite has been reported earlier. The fibrinous uveitis that occurred 8 days after the onset of glaucoma in the second patient may not be directly related to venom toxins. Possibly
this uveitis was a serum sickness like response to the ASV antisera which is raised from horse serum. Steroids have been used to treat optic neuritis following snake bite. We gave steroids for the second patient when fibrinous uveitis developed. This helped in faster recovery of the patient.

The two cases emphasize the need for ocular examination in the systemic evaluation of a patient with snake bite especially when the patient is too sick to complain. The occurrence of vision threatening complications following snake bite that are reversible with early treatment should be borne in mind of the attending physician. Further reports of similar findings are needed to suggest that angle closure glaucoma is a distinct entity and ocular complication akin to optic neuritis.

REFERENCES