

## Cortical Blindness After Snake Bite Envenomation



### Medical Science

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**Dr. Vivek Arora**

Prof. Pediatrics, D-18, M.B. Hospital Campus, Udaipur – 313001 (Raj.)

**Dr. Chaksu Choudhary**

Jr. Resident, RNT medical college Udaipur-313001

### ABSTRACT

*Snakebite is one of the common life-threatening medical emergencies, owing to the effects of the various toxins present in the venom and it is encountered in Indian population particularly in rural and farming areas. Cortical blindness following bites containing neurotoxin is a rare complication. Here we report the case of a patient with cortical blindness due to snake bite. Also we describe the clinical findings and imaging of a patient with hypoxic brain damage.*

### INTRODUCTION

Several ophthalmic effects may follow snake bite. This report describes an instance of cortical blindness that result from snake bite.

The ophthalmic effects of envenomation are varied and some of those described are: ptosis, muscle palsies, hemorrhages into conjunctiva, anterior chamber, vitreous or retina, papillary changes, optic neuritis, optic atrophy and cataract<sup>1,2</sup>.

Cortical blindness resulting after snake bite is rare and was reported in 1993 from South Africa<sup>1</sup> and only one case has been reported from India in past<sup>3</sup>.

### CASE REPORT

Four year male child, 11 kg was brought to emergency department 6 hours after sustaining a snake bite on lateral aspect of left thigh. The bite was painful and child was unconscious soon after. He was taken to nearby PHC where antivenin was not available, he was transferred to RNT Medical College a tertiary hospital, Udaipur.

At our institution child was brought unconscious, occasional heart, respiratory rate nil, pupils dilated, sluggishly reacting. Bite mark was seen on left thigh. Patient was immediately intubated and CPR was started. Patient was put on mechanical ventilation. After 5 minutes, patient was in coma stage III, HR – 112, SpO<sub>2</sub> 94%, BP 70 mmHg SBP, pupils reacting sluggishly. A antivenin 10 vials were administered in 300 ml of N.S. over 3 hours. Patient received injection tetanus toxide, inj. Ceftriaxone 500 mg was given I.V., B.D. to avoid secondary infection.

ABG analysis revealed pH 7.25. PO<sub>2</sub> 145 mmHg, PCO<sub>2</sub> 35 mmHg, HCO<sub>3</sub> 14.2 mEq/L. Inj. Neostigmine and inj. Atropine 0.01 µg/Kg I.V. were given. Dopamine infusion was given by 10 mg/kg/min.

On day 2, Ptosis was present, pupils normal size, normal reaction, patient was drowsy, BP 102/ 65 mmHg, SPO<sub>2</sub> 95%, GCS E<sub>1</sub> M<sub>3</sub> V<sub>3</sub>. On day 6 child improved. Ptosis resolved and it was noticed that vision was lost. Perception of light was absent. C.T. scan of the brain was done and it showed infarction in right frontal, parietal and both occipital lobes. After 3 months child was responding to command. Cortical blindness persisted after 3 months.

### DISCUSSION

The incidence of snake bite is probably underestimated. A large number of victims die unreported, particularly in rural areas. Morbidity and mortality are also related to the non availability of or delay in administration of antivenin. Antivenin is the only specific treatment for envenoming and often causes marked

symptomatic improvement. Cobra venom is predominantly neurotoxic, resulting in flaccid paralysis, including respiratory paralysis<sup>4</sup>. Neurotoxicity may appear as early as 3 minutes after the bite<sup>4</sup> but may be delayed for 19 hours<sup>5</sup>. Mild envenoming may cause no neurotoxic effects or only mild ones like ptosis or external ophthalmoplegia. Severe envenoming, however, results in death or disability. Most deaths after cobra bite are due to respiratory failure. If the patient has been well oxygenated, the neurotoxic effects may reverse completely in response to antivenin or anticholinesterase<sup>4</sup> or they may wear off spontaneously in a week<sup>1</sup>.

Cobra venom can cause blindness by damaging the retinal cells, causing bilateral optic neuritis or it can cause cortical blindness<sup>1</sup>. Damage to the retina or optic nerve is due to the direct effect of the venom; or hypersensitivity reaction to antivenin, or extensive hemorrhage and capillary damage<sup>4,6</sup>. It causes derangement of the pupillary light reflex and ophthalmoscopically visible abnormalities. Cortical effects after neurotoxic snake bite are less well studied. Direct damage to the, central nervous system by venom has not been described. An experimental study in 1985<sup>7</sup> suggested that cobra venom decreased cerebral blood supply thereby decreasing the supply of blood-borne substances, including venom, to the brain. The effect on the brain is more likely related to respiratory paralysis and cardiac arrest that occurs after neurotoxic envenomation. The child described here had cardiac arrest and prolonged respiratory paralysis following snake bite. This resulted in widespread cerebral hypoxia as documented in the CT scan. Early respiratory support followed by antivenin treatment could have substantially reduced hypoxic brain damage. Paucity of literature on cortical blindness following neurotoxic snake bite may be a reflection of the high mortality of those patients in whom respiratory paralysis is prolonged or severe.

This case highlights the need for evaluation of victims of neurotoxic snake bite for early signs of respiratory depression and prompts respiratory assistance even if antivenin is not available. The catastrophic consequences of persistent neurological deficits, including blindness, may thus be minimized in victims who survive.

### REFERENCES

- Berger RR, Brook S. Cobra bite: Ophthalmic manifestations. Haretivah 1993; 125: 265-66 [In Hebrew].
- Eapen KE, Anthrayose CV, Mani EJ, Joseph E. Indirect ocular trauma-ocular manifestations of snake bite. Proceedings of the All India Ophthalmological Conference 1996; 67-68.
- Dhaliwal U. Cortical blindness: An unusual sequela of snake bite. Ind J Ophthal 1999; 47: 191-92.
- Sanford JP. Snake bites. In: Bennet JC Plum F, editors, Cecil's Textbook of Medicine, 20th ed. Philadelphia, USA:W. B Saunders Company; 1996. p 1951-53.

5. Mitrakul C, Dhamkrong-At A, Futrakul P, Thisyakorn C, Vongsrisart K, Varavithya C, et al. Clinical features of neurotoxic snake bite and response to anti-venin in 47 children. *Am J Trop Med Hyg* 1984; 33:1258-66.
6. Menon V, Tandon R, Sharma T, Gupta A. Optic neuritis following snake bite. *Indian J Ophthalmol* 1997; 45:236-37.
7. DiMattio J, Weinstein S, Streitman J. In vivo effects of snake venoms on passive and facilitated glucose transport across blood-ocular and blood-CSF barriers of the rat. *Toxicon* 1985; 23:63-71.