

## Case Report

# Orbital cellulitis and pyogenic meningitis rare sequelae after snake bite

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### ABSTRACT

The incidence of snake bite is underestimated. Worldwide around 2800 species of snakes are known out of which 375 species are venomous. Snake bite effects on nervous, cardiac, renal systems. A 10-year-old male boy was got admitted after five days treating with a local snake bite professional. On admission, he was treated with antibiotics for an infection. His cerebellum and most of the brain noted with streaks of pus. Here a case of intracranial complication following snake bite is reported.

**Keywords:** Snake bite, Pyogenic meningitis, Orbital cellulitis

## INTRODUCTION

There are 2,800 species of snakes out of them 375 noted as venomous. In India, only 242 species are known when compared to this huge number of snakes. There are 57 species of poisonous snakes in India.<sup>1</sup> The common four venomous snakes noted in India include the common krait (*Bungarus caeruleus*), common cobra (*Naja Naja*), Saw-scaled viper (*Echis carinatus*), and Russell's viper (*Vipera Russellii*).<sup>2,3</sup>

Snakebite is one of the neglected tropical diseases of global importance.<sup>1</sup> In India it is reported (after studying a million deaths due to snakebite) that deaths are greater than 30 times higher than noted in official hospital returns.<sup>4</sup>

The key effects of a snake bite are on the nervous system, renal, cardiac systems and in hemopoietic system. The organs/tissues mainly affected are kidneys, vascular endothelium, heart and locally at the site of the bite.<sup>5,2,6</sup> Snake Bites mainly due to krait and cobra leads to paralysis of the bulbar, ocular, and limb girdle muscles

whereas following viper bites causes bleeding from mucocutaneous sites, hemolysis, acute tubular necrosis, and occasionally shock.<sup>6</sup> In India where snake bites are more frequent, the majority of victims initially getting treated by professional snakebite healers, and religious men, who use herbal therapies, chant divine mantras.<sup>7</sup>

Snake venoms contain complex heterogeneous poisons that can induce multiple effects. Most of the ophthalmic effects of snake bite are well known like ptosis, muscle palsies, venom ophthalmia, hemorrhages into the anterior chamber, bulbar and palpebral conjunctiva, , edema of eyelids, retina, conjunctival chemosis, edema over the retina and optic nerve, pupillary changes, optic neuritis, optic atrophy and, cataract.<sup>8,9</sup>

Here we are reporting a case of pyogenic meningitis and orbital cellulitis following a snake bite that rarely reported.

## CASE REPORT

A 10-year-old boy was brought to our casualty with unresponsiveness for the last few hours. Enquiring with

parents revealed that he was bitten by a snake five days back while sleeping on the floor. The mother has witnessed the scene. After the snake bite they reached to a local hospital within 30 minutes and got admitted. From there he was referred to our hospital. Examination of the right orbit revealed swollen along with some points of pus (Figure 1). The left eye was normal. Fang marks were difficult to appreciate as baby reached hospital with granulation tissue and necrosis over the bite area. Ophthalmoplegia and ptosis were also noted. His GCS was E1 VT M4. The pupils are dilated, reacting to light, and the ocular fundus showed mild disc edema in both eyes. After starting antibiotics, Lumbar puncture and contrast-enhanced computed tomography (CECT) was advised to exclude intraocular and intracerebral extension. Meanwhile, lumbar puncture (LP) showed CSF glucose - 1 mg/dL, protein - 458 mg/Dl, chlorine -114 mEq/L suggestive of pyogenic meningitis. CECT revealed soft tissue density, right ethmoidal cells with air pockets. A Howarth lynch incision made in the right upper eyelid, and soft edematous tissue was removed till periosteum of the superior orbital wall is reached. Periosteum incised and pus drained. Intracranial space cleaned with betadine and normal saline by making a 1mm incision on orbital septum between superior medial rectus. The intraocular extension was ruled out. Blood culture was positive for bacteria staphylococci. Blood glucose (375 mg/dl), urea (21 mg/dl), creatinine 0.7mg/dl, Na+ >160 mEq/L, K+ 4.5 mEq/L. Pus cells were noted (5-10 /LPF) on microscopy. Electrocardiogram showed sinus rhythm. CK Total - 582 (20-170 IU/L), CK-MB- 55 (<6 IU/L). Once a sudden noticed Blood pressure became very high and bradycardia. They shifted to Pediatric Intensive Care Unit and even with all continuous efforts to conclude he succumbed to neurogenic shock.



**Figure 1: Swollen right eye.**

On autopsy, there was no identifiable bite mark. The built was moderate with 20 kg. There was no evidence of bleeding or swelling. The right orbit noted with an abrasion of size 2 cm x1cm and swollen along with flakes of pus. No other external injuries were noted. Brain liquefied with multiple areas of flakes of pus points in the entire brain more in the base of bilateral frontal lobes and

posterior lateral aspect of the cerebellum (Figure 2). On opening the thoracic cavity, 500 ml of transudate fluid was noted. Rest all organs were congested. Viscera sent for chemical analysis was reported negative for any type of poison. A post mortem CSF sample from brain for culture was revealed anaerobic bacteria. The opinion as the cause of death is concluded to be sepsis as a complication of unknown bite.



**Figure 2: Streak of pus at the cerebellum.**

## DISCUSSION

Management of snakebite by Indian doctors through advanced clinical insight and the arrow heads poisoned with lethal venom from Russell's viper impressed Alexander the great who conquered India in 327-325 BC.<sup>10</sup> The incidence of these snake bite is underestimated. Delay in administration and non-availability of antivenin are the two causes of increased mortality and morbidity. Treatment with antivenin for the snake envenomation causes marked improvement.<sup>11</sup>

Local and Systemic manifestations are dependent on the toxins present in the venom. These toxins prevent acetylcholine release from nerve terminals. Upon acting on the eye, ptosis and ophthalmoplegia may occur because of these polypeptide toxins. Sometimes ptosis and ophthalmoplegia are the only manifestations after elapid bite.<sup>12</sup> The common snake bite sites are not discussed in the Indian textbooks even though snakes are high in number. In the west snake, the bite is not a major problem, so there is no room for great discussion for these in western books. Wallace described the common sites of venomous snakes.<sup>13</sup>

Pandey S in is study described that lower extremities are more common (60.8%) site for snake bites followed b upper extremities (34.8%) and least (4.5%) in head and neck. The reason for delay in treatment is due to two reasons; (1) Hospital distance; (2) First approach to traditional healers as they are nearby. Lower extremities are common sites because of barefooted agricultural work and labor. Commonly noted snake bites are belong to

Cobra 53.6%, Nonpoisonous snakes 20.2%. Kraits occupied 13.7% and Viper 12.3%. In the category of deaths following snake bites cobras 61.5% stood first, vipers 23.0%, krait 15.3%. The majority reached hospital after krait and cobra bite with the last stage of respiratory failure and died due to hemorrhagic shock. He also documented polyvalent antivenin is effective in all cases with an effective dosage 10-25 vials.<sup>14</sup>

Fever and periorbital swelling are the manifestations of a broad array of diseases. These symptoms may be local or systemic. Nevertheless, their impact can be systemic if they evade diagnosis. The various causes for fever and periorbital edema are Infectious diseases and non-infectious diseases (autoimmune diseases, inflammatory and allergic diseases and trauma). A thorough physical examination along with the history of the patient in association with targeted tests in contrast to the range of diseases (radiological tests, serological tests, cultures from the periorbital area and skin biopsy) can confirm the diagnosis.<sup>15</sup>

Kumar PS reported a case of bilateral acute anterior uveitis and optic disc edema following a hemotoxic snake bite. Steroids play a beneficial role in the management of these symptoms.<sup>16</sup> Rao in 1981 reported the immediate development of blindness after a cobra bite and recognized it to the lethal influence of the venom per se.<sup>17</sup> Mathur described a case of nonpoisonous snake bite that developed optic neuritis following administration of ASV.<sup>18</sup> Mortality in tropical developing countries is high because of lack of availability of antivenins, difficulties in accessing health centers and poor health care services.<sup>19</sup>

Monteiro FNP studied 20 cases of confirmed cobra snake-bite patients who got admitted. Most of the victims were females (n=12, 60%) with male to female ratio 1: 1.5. The minimum age was 18 years and 70 years were maximum and the mean age of victims 41.9 years (40.6 years for males and 42.8 years for females). Majority of victims were bitten during the day time (n=16, 80.0%) and in out-of-doors (n=11, 55.0%). Upper limbs (n=11, 55.0%) Lower limbs (n=8, 40.0%) and Trunk (n=1, 5.0%) were involved respectively. Almost all cases (n=16, 80.0%) involved in agriculture activities. 19 patients noted with Fang marks. Double punctured (Fang) marks were present (n=14, 70.0%) in most of them. Cobra bites were more during April and June. Cases (n=18, 90.0%) brought to the hospital less than first twelve hours of the incident. Most of them (55%) got their first aid measures before hospitalization. Local and systemic signs of envenomation were evident in ninety-five percent victims. At the time of admission the common symptoms noted are vomiting pain and swelling at the bite site, confusion, and difficulty in breathing. Systemic signs like the blurring of vision, Ophthalmoplegia, Ptosis, dysarthria, respiratory embarrassment. Ptosis was the principal neurotoxic feature. Cellulitis in 15 cases seen as a complication. The

number ASV vials administered to each patient of cobra bite ranged from 0 to 26 vials, with an average of 12.4 ASV vials per patient. No fatalities reported from cobra bites during the study period. Seventeen victims completely recovered in the hospital after giving ASV ranging 0-26 vials with an average 12.4 vials per patient. Three left the hospital against medical advice.<sup>20</sup>

Cobra and Krait bites lead to paralysis of the ocular, bulbar, and limb girdle muscles. Viper bites mainly causes bleeding from mucocutaneous sites, hemolysis, acute renal failure and sometimes may cause shock.<sup>21</sup>

In the present case, the snake was unknown, and he shifted to the local hospital within half an hour. He was referred to JIPMER hospital after five days within these days he might have consulted to the locally available remedies for the management. After all days, he may have got infected. If could have taken immediately to the hospital and started antibiotics we could have saved him from sepsis.

This case highlights the importance of immediate referral to the nearby higher centers so as to prevent the preventing the consequences like pyogenic meningitis, orbital cellulitis, fever, etc.

As for my knowledge, this is the first case report in the literature reporting the orbital cellulitis and pyogenic meningitis after snake bite.

## CONCLUSION

In a case of snake bite along with the known neurological and hematological complications, there should be given equal importance in preventing sepsis. There is a need to identify the intracranial complications especially orbital cellulitis and pyogenic meningitis following snake bite in the unusual sites of bite (eye).

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