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SUMMARY

Spitting cobra is the name given to some snakes of the family of Elapidae, belonging to the genus Naja or Hemachatus that have the ability to spitt heir venom (up to 3m) to blind their predators. Naja mossambica is the most answered species in Africa.The precise statistics of attacks due to this snake are available, let alone those related to the rate of blindness in relation to its venom.This venom, harmless to the skin,can cause corneal necrosis responsible within hours of blindness in the absence of abundant rinsing of eyes with water. This observation has aimed to report a case of bilateral blindness due to corneal opacification, effects of an attack by a Naja mossambica in a 15 years old woman from Democratic Republic of Congo (DR Congo).

INTRODUCTION

A spitting cobra is any of several species of cobras that can project venom from their fangs when defending themselves.Spitting typically is their primary form of defense.The venom sprays out in distinctive geometric patterns when muscles squeeze the glands to squirt it out through forward-facing holes near the tips of the fangs (1 – 4). Naja mossambica is the most answered species in Africa (South Africa, Namibia, Angola, Swaziland, Mozambica, Zimbabwe, Botswana, Zambia, Malawi, DR Congo, Tanzania, Somalia).This venom is significantly cytotoxic, it can cause massive corneal necrosis responsible of the blindness within hours. The abundant rinsing with water in the seconds after the attack, is usually enough to avoid this fatal outcome (5, 6). This observation has aimed to report a case of blindness due to an attack, 5 years ago, by a Naja mossambica in a patient from DR Congo.

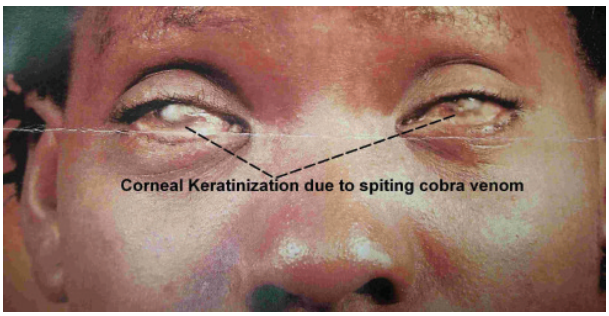
CASE REPORT

A young woman aged 15 consulted our department for an old bilateral blindness. She was the victim of an attack by a Spitting Cobra five years ago. She received the venom all over her face. She had to walk for 5 hours (about 8 km) before reaching the nearest health center. Flushing eyes hadn't been done in the place of the accident. On arrival at the health center, she couldn't see the light. Her medical record of that time mentions a blackish necrotic appearance of the cornea. On admission to our department, the review noted (both sides):

- an absence of light perception
- a total Symblepharon
- a keratinisation of the conjunctiva
- an opaque cornea completely vascularised (Figure 1)
- Eyelid skin was healthy.

The patient was referred to an unit of low vision

Figure 1
Spiting cobra atipo



DISCUSSION

The severity of lesions observed in case of attack by spitting cobra depends on several factors. In particular, the quantity of venom received on the face, care administered immediately after the attack (abundant water washing), and the presence of a health center that can take over in case of serious corneal injury (5 – 7).

The venom of the cobra snake contains a mixture of several toxic enzymes and proteins.

The kind of snake probably also plays a role, because the venom toxicity must certainly varied from

one species of spitting cobra to another. Related eye injuries due to Naja nigricollis would be responsible for about 15% of cases of blindness (5, 6). This assertion is questionable because these studies cover only small samples.

Patients often present with pain, hyperemia, blepharitis, blepharospasm and corneal erosions. Delay or lack of treatment may result in corneal opacity, hypopyon and/or blindness. Sometimes cranial nerve VII may be affected (5). Optic neuritis and cortical blindness are possible through direct toxicity of the venom but only if bitten by the African cobra (8). The existence of an underlying eye disease, such as river blindness (onchocercosis), is a poor prognostic factor (7). The following therapeutic measures can significantly improve the visual prognosis (5):

- an urgent decontamination by copious irrigation
- an analgesia by vasoconstrictors with weak mydriatic activity (e.g. epinephrine) and limited topical administration of local anesthetics (e.g. tetracaine)
- an exclusion of corneal abrasions by fluorescein staining with a slit lamp examination and application of prophylactic topical antibiotics
- a prevention of posterior synechiae, ciliary spasm and discomfort with topical cycloplegics
- antihistamines in case of allergic kerato-conjunctivitis

Topical corticosteroids are contraindicated (5). Topical or intravenous anti venom does not have the consensus of all authors (5, 6). A New Zealand clinical study in rabbits showed that topical heparin or anti venom therapy significantly improved overall outcomes in rabbit corneas exposed to Naja sumatrana venom (9).

The prevalence of ocular lesions associated with spitting cobra venom is probably underestimated. This snake is found essentially in the tropics, so most of the time in poor countries where correct health surveillance is rarely the rule. If some points of the treatment of this emergency are not consensus, immediate irrigation of the eye with water, careful examination of corneal abrasion, and prevention of secondary infection are recommended (10, 11).

REFERENCES

1. Young, B. A., Dunlap, K., Koenig, K. and Singer, M.''The buccal buckle: The functional morphology of venom spitting in cobra''. *J Exp Biol*. **207**: 3483–3494.
2. Tan ,H. H. Epidemiology of snakebites from a general hospital in Singapore: a 5-year retrospective review. *Ann Acad Med Singapore*. **39**: 640-647.
3. Rasmussen, Sara; Young, B., Krimm, Heather. "On the 'spitting' behaviour in cobras (Serpentes: Elapidae)". *J Zool.* **237**: 27–35.
4. Ang, L. J., Sanjay, S. and Sangtam, T. Ophthalmia due to spitting cobra venom in an urban setting--a report of three cases. *Middle East Afr J Ophthalmol*. **21**: 259-261.
5. Chu, E. R., Weinstein,, S. A., White, J. and Warrell, D. A. Venom ophthalmia caused by venoms of spitting elapid and other snakes: Report of ten cases with review of epidemiology, clinical features, pathophysiology and management.*Toxicon*. **56**: 259-272.
6. Goldman, D. R. and Seefeld, A. W. Ocular toxicity associated with indirect exposure to African spitting cobra venom. *Wilderness Environ Med*. **21**: 134-136.
7. Fung, H. T., Lam, K. K., Wong, O. F. and Lam, T. S. Local antivenom treatment for ophthalmic injuries caused by a Naja atra. *J Med Toxicol*. **6**: 147-149.
8. Westhoff, G., Boetig, M., Bleckmann, H. and Young, B. A. Target tracking during venom 'spitting' by cobras. *J Exp Biol*. **213**: 1797-1802.
9. Cham, G., Pan, J. C , Lim, F. and Earnest ,A. Effects of topical heparin, antivenom, tetracycline and dexamethasone treatment in corneal injury resulting from the venom of the black spitting cobra (Naja sumatrana), in a rabbit model. *ClinToxicol (Phila)*. **44**: 287-292.
10. Hoffman, J. Venom ophthalmia from Naja mossambica in KwaZulu Natal, South Africa: a reminder to all that for ocular chemical injury, dilution is the solution. *Trop Doct*. **45**: 250-251.
11. Rouvin, B., Kone, M., N'diaye, M, Seck, M. and Diatta, B. Spitting cobras: description of 2 cases in Djibouti. *Med Trop*. **70**: 95-96.