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Case Report: Approach to Dog Bite Eyelid Injury in Rabies Endemic Area

Birapadian SM¹, Ting SL², Lim CW¹

¹Ophthalmology Department, Sarawak General Hospital, Sarawak, Malaysia; ²Ophthalmology Department, University Malaysia Sarawak (UNIMAS), Sarawak, Malaysia.

ABSTRACT

Sarawak has recorded 24 rabies cases, since an outbreak was declared on July 1, 2017. We are presenting a case report discussing the approach to dog bite eyelid laceration in Rabies endemic area. A 13-year-old boy came with full-thickness lid laceration wound, after being attacked by a stray dog. The patient received a dose of intramuscular anti-tetanus injection, followed by immunoglobulin injection at the laceration site, rabies vaccine as well as completed a course of antibiotics. The laceration was allowed for primary closure, and it healed well with adequate apposition. This paper we outlined the importance of immediate accurate risk category stratification for early identification of those at risk in the primary care setting help minimize the risk of rabies infection and save a life.

Key Words: Dog bite, Eyelid injury, Rabies

INTRODUCTION

Rabies is caused by the RNA family of *Lyssavirus* that spreads through bites or scratches of infected animal's saliva and results in a fatal zoonotic encephalomyelitis.¹ The organism multiplies quickly at the site of inoculation and then invades the central nervous system. Bites involving the head and neck region have a higher potential for the rapid spread of the disease centrally. Sarawak has recorded 24 rabies infection cases; 23 were fatal since an outbreak was declared on July 1, 2017. Rabies is caused by a virus that is transmitted through bites or scratches of infected animals. Initially, the patient may experience high fever, pain or tingling and burning sensation at the site of the wound. Once the patient is symptomatic, rabies is nearly always fatal. This paper we outlined the importance of immediate accurate risk category stratification for early identification of those at risk in primary care setting help minimize the risk of rabies infection and save life.^{2,3}

CASE PRESENTATION

A young boy presented to the primary care setting with a left lower lid laceration wound, after being attacked by a

stray dog. On examination, the full thickness laceration wound involving the lower eyelid margin with minimal tissue loss. The conjunctiva and cornea were spared (Figure 1). His vision was 20/20 and no other significant eye findings.

At the health care facility, the patient was attended promptly by the infectious disease team. Risk category 3 was immediately classified for him as the bite cut through the skin by a stray dog in Rabies endemic area. He has injected a dose of intramuscular anti-tetanus as well as immunoglobulin at the laceration site. Subsequently, a dose of rabies vaccine was administered and he completed a course of antibiotics. The wound was allowed for primary closure and not sutured. During follow up, the patient was completed further three doses of rabies vaccine. The eyelid laceration wound healed well with adequate apposition.

DISCUSSION

Most victims are familiar with the causative animal and a study states that dog bites are a frequent result in facial injuries and specifically eyelid lacerations, amounting to 4% to 17% of ocular and periorbital injuries in a dog bite cases.⁴ A

Corresponding Author:

Birapadian SM, Ophthalmology Department, Sarawak General Hospital, Sarawak, Malaysia.
Email slting@unimas.my

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full-thickness lid margin laceration with minimal tissue loss was seen in the patient aforementioned. Prompt treatment initiated in less than eight hours reduces the risk of wound infection.⁵ Head, face, and neck trauma are more often seen in the younger age group and account for 70% of such injuries⁶. This includes severed eyelid muscles, canaliculi, facial nerve, lacrimal gland and rectus muscles with rare entities of globe rupture and orbital fractures.

A dog's saliva has a broad diversity of bacteria and in almost 100% of dog bites, harmful bacteria and other dangerous pathogens can be transmitted to the bite wound³ namely, *Pasteurella multocida*, *streptococcal* and *staphylococcal* species, and rarely *Capnocytophaga canimorsus*⁴. The wounds involving the head and face region are least commonly infected. The risk for infection, however, can be greatly reduced with high-pressure irrigation and prophylactic antibiotics.

The Interim Guideline for Human Rabies Prevention & Control in Malaysia (Table 1) reiterates that post-exposure prophylaxis (PEP) includes treatment of the site of virus inoculation, rabies immunoglobulin (RIG) administration and prompt vaccination. Our patient received an injection of a dose of intramuscular anti-tetanus and a course of antibiotics post irrigation. Typically, antibiotics are given over three to five days for prophylaxis and seven to 14 days in patients with soft-tissue infections. Infections involving deeper structures like bone and/or joints are advocated for a course of antibiotics for three or more weeks.⁴ According to Prendes et al.⁴ patients without prior tetanus vaccination, have a 13% mortality rate in cases of animal bites, despite optimal treatment. Thus, administration of both toxoid and tetanus immunoglobulin (TIG) is superior, if the dog bite victim has an unascertained tetanus vaccination status.⁵ The number of rabies vaccine given as PEP also depends on the immunization status of an individual (Table 2). Those previously unvaccinated and those vaccinated are advised to receive four doses and two doses of rabies vaccine respectively. Immunocompromised patients, on the other hand, require five doses of the rabies vaccine.⁷ RIG is concurrently administered with the first dose of rabies vaccine to promote clearance of infection by neutralizing the virus before the invasion of the nervous system and thus, provides immediate protection that persists until the vaccine works. This patient was administered RIG surrounding the wound area and four doses of rabies vaccine in total during the period of treatment.

CONCLUSION

Rabies kills thousands of life yearly despite the availability of vaccines. This has led to the launching of 'Zero by 30' by WHO, to end human deaths due to rabies by the year 2030. Therefore, immediate accurate risk category stratification for early identification of those at risk in the primary care setting help minimize the risk of rabies infection and save a life.

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Author's Contribution

SMB: Collected and analysed data, drafted the manuscript

SLT: Managed and analysed the data, wrote the manuscript

CWL: Participated in design and drafted the manuscript

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Table 1: General Guideline for Dog Bite Management according To Category of Exposure, Adopted from The Interim Guideline for Human Rabies Prevention & Control in Malaysia (Post Exposure Prophylaxis is given for risk category 2 and 3 accordingly. Rabies Immunoglobulin is given for risk category 3 only)

Risk Category	Type of exposure	Action to be taken
1	Handling/feeding infected animal. Infected saliva comes into contact with intact skin.	Nil if history is reliable. Treat as category 2 if history is not reliable.
2	Bite over uncovered skin/ superficial scratch without bleeding. Infected saliva comes into contact with broken skin.	Treat wound site. Provide vaccination. Anti-rabies immunoglobulin not administered. For vaccination if animal is not found or captured. Defer vaccination if animal is tested negative for rabies or remains healthy after 10-14 days.
3	Bites/scratches that cut through the skin, with associated bleeding. Infected saliva comes into contact with mucous membrane. Multiple wounds/ any wild animal bites.	Treat wound site. Provide vaccination. Anti-rabies immunoglobulin, anti-tetanus and antibiotic treatment is administered. For vaccination if animal is not found or captured. Defer vaccination if animal is tested negative for rabies or remains healthy after 10-14 days.

Table 2: Post Exposure Prophylaxis (PEP) Vaccine and Rabies Immunoglobulin (RIG), adopted from The Interim Guideline for Human Rabies Prevention & Control iMalaysia. (The number of doses required is determined by the previous immunization status of the individual). RIG is given during the first dose of the vaccine for a swift response.

IMMUNIZATION STATUS	VACCINE DOSES
Previously unvaccinated	4 doses of vaccine (Day 0, 3, 7 and 14)
Previously received vaccination	2 doses of vaccine (Day 0 and 3)
Immunocompromised patients	5 doses of vaccine (Day 0, 3, 7, 14 and 28)



Figure 1: Left lower lid margin laceration wound with least tissue loss, sparing the canaliculi.