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POST-EXPOSURE IMMUNOLOGICAL AND SURGICAL MANAGEMENT FOR RABIES PREVENTION FOLLOWING DOG BITE IN THE MAXILLOFACIAL REGION

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ABSTRACT

Introduction: Dog bite is frequent among animal aggression and can affect victims of varying age range, especially children. The injury can be present in any anatomic region of the body especially pertaining to the maxillofacial region. The aim of this article is to emphasize the treatment for such injuries including appropriate immunotherapy along with uneventful primary septic wound closure in the maxillofacial region. **Case report:** A 5 year old male patient reported to the emergency department followed by a dog bite with laceration involving the lower lip extending inferiorly to the chin region. Multiple superficial lacerations were present in the vicinity of neck. (Bite marks following teeth penetration) An appropriate peri-operative care of active and passive immunization followed by wound closure was performed under general anesthesia with an uneventful post-operative period. **Discussion:** The immunological and surgical guidelines such as anti-rabies vaccine schedules and peri-operative wound closure for management of Category III patient following dog bite in the maxillofacial region is discussed.

KEYWORDS: Animal Bites, Immunoglobulins, Rabies vaccine, maxillofacial injuries.

INTRODUCTION

Injuries inflicted by animal attacks are common in pediatric patients, especially the dog bite. The commonly affected body region differs with the age of the victim. The pediatric patient are affected commonly in the maxillofacial region (Face and neck).[1-4] Such injuries cause serious systemic and esthetic disabilities especially in the maxillofacial region as the incubation period is comparatively shorter[2] and if adequate management is not initiated such as proper wound debridement, topical immunoglobulin application followed by wound closure, anti-rabies vaccine, anti-biotic prophylaxis and Tetanus Toxoid injection.

CASE REPORT

A 5 year old male patient reported to the emergency department with history of dog bite 5 hours post-exposure. The child had laceration involving the lower lip extending inferiorly to the chin region measuring approximately 3cm. Multiple superficial lacerations were present in the neck and shoulder region. Abrasion and edema in right periorbital region was also evident. (Fig. 1) An informed consent was obtained from the child's parent before the initiation of the procedure.

Under General Anesthesia, with aseptic precautions, copious irrigation and debridement of the wound was done using warm saline and antiseptic povidone iodine solution for 10 minutes. Since the patient had transdermal laceration involving a breach in the mucous membrane, he was categorized under Category III of Rabies Exposure. (Table 1) Human Rabies Immunoglobulin (SUYA-HRIG), 2ml was injected around the wounds with Purified Chick Embryo Cell Vaccination (PCECV – Rabipur). Primary wound closure was done in layers using 4-0 Polyglactin 910 and 4-0 Ethilon. (Fig. 2) and patient was monitored in an intensive care unit. A follow up period of 12 months post-operatively was uneventful.

DISCUSSION

Literature highlights that dog bite is common among injuries caused by animals and pediatric patients are more pre-disposed to it.[5-7] In this case report we have emphasized the importance of the use of peri-wound injection of immunoglobulins over the wound surface in Category III exposure followed by wound closure to establish form and function which is essential in growing children.

The treatment of a victim of dog bite should be immediate even when the patient gives a history of long standing case. The recommended management for patients who are victims of a suspected or probable case of dog bite is explained. (Table 2) A three-pronged approach for post-exposure prophylaxis (PEP) should be carried out simultaneously as per the exposure category which involves 1) Animal bite wound management, 2) Passive immunization – Rabies Immunoglobulin (RIG), 3) Active immunization – Anti-rabies Vaccines (ARV).

In this case report, we have emphasized that the local infiltration of RIG in and around the wound in a dog bite injury to the maxillofacial region followed by primary wound closure is safe and effective as literature suggests that suturing a dog bite injury should be avoided or minimum loose suture can be applied after infiltration with RIG. The maximum dose of human RIG is 20 IU/ kg (Maximum 1500 IU) and 40 IU/ kg of Equine RIG (Maximum 3000 IU). If there is insufficient calculated dose, sterile saline may be used to dilute it 2 to 3 fold to permit infiltration. Category II and III patients require the same number/dose of injections.

The potency of the vaccines has a value of ≥ 2.5 IU/IM dose irrespective of the reconstituted volume. The same vaccine when administered ID with 0.1 ml of vaccine as per the schedule. The updated Thai Red cross regimen is an ID injection technique where a bleb should be raised after ID inoculation of the vaccine when administered properly. Essen regimen is a five dose IM schedule where a sixth injection on 90th day should be administered in immunocompromised patients, patients on steroid therapy. Gluteal region is less preferred for anti-rabies vaccine as the fat retards the antigen absorption causing impaired production of immune response.[8]

In our case, we have followed a proper wound care management along with necessary administration of RIG and anti-rabies vaccination which produced an uneventful clinical result post-operatively securing the form and function in the affected maxillofacial region yielding in an overall well-being of the patient.

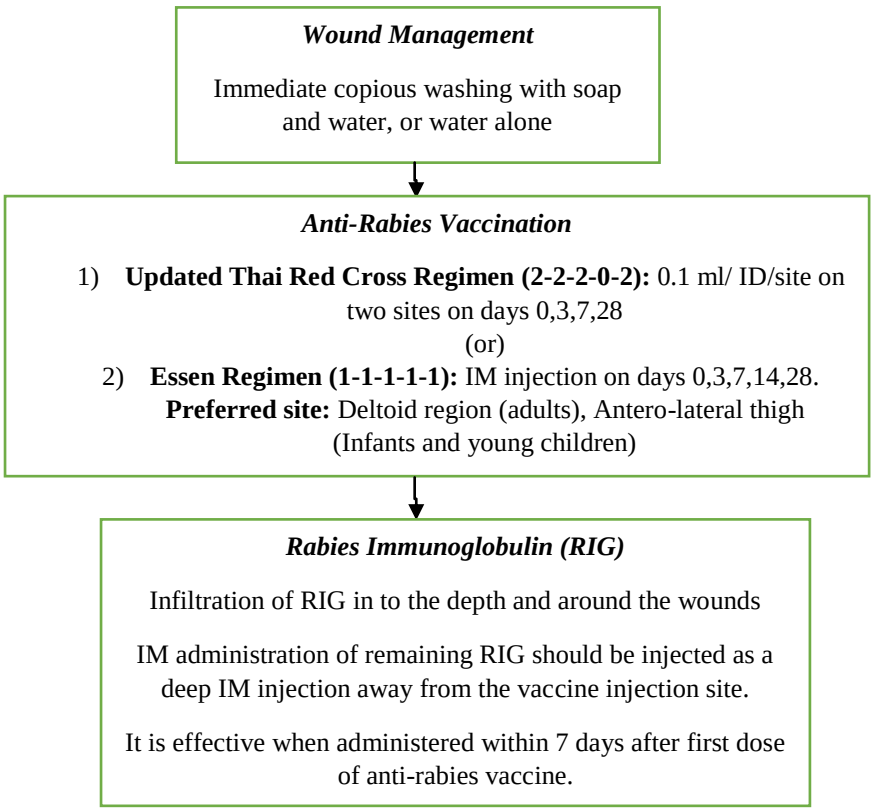
Fig. 1: Laceration present involving labial mucosa of lower lip extending inferiorly to the chin.

Fig. 2: Wound closure done in layers with 4-0 Polyglactin 910 and 4-0 Ethilon.

Table 1: Patient Category based on Exposure.

Category	Type of Contact	Recommended Post-exposure prophylaxis (PEP)
Category I None	Touching, Feeding of animals, Lick on intact skin, Contact on intact skin with secretions/excretion of rabid animal	No exposure No treatment if history is reliable
Category II Minor	Nibbling of skin, Scratches/Abrasions Absence of bleeding	Wound management Anti-rabies Vaccination alone
Category III Severe	Single/Multiple transdermal bites, scratches/contamination of mucous membrane with saliva (i.e. licks)	Wound management Rabies Immunoglobulin (RIG) Anti-rabies Vaccination

Table 2: A three prong approach for a suspected/probable case of dog bite consists of an appropriate surgical and immunological therapy.
ID: intra-dermal**,** IM: intramuscular**,** RIG: Rabies immunoglobulin



CONCLUSION

From this case report we highlight the use of RIG for local infiltration in and around the wound followed by wound closure in the maxillofacial region along with anti-rabies vaccination. The appropriate surgical, immunological management by peri-wound application of immunoglobulin and post-exposure prophylaxis in a dog bite injury in the maxillofacial region in a pediatric patients is vital for reducing morbidity.

Conflicts of interest: None.

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Ethical approval: Obtained. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from the patient involved in this study.

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