

Analysis of Ocular Injury Cases Caused By Dog Bite and Their Prevention

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Abstract: This was a Retrospective study of ocular injury cases presenting at our tertiary eye care centre caused by dog bite. Analysis of age, sex and social status of the patient, site and extent of injury, type of dog and season of dog bite was done. Thorough wash of the wound with normal saline was considered, Tetanus toxoid, anti rabies serum infiltration, anti rabies vaccination as per schedule and antibiotics were given with early repair of the wound by primary suturing. Canalicular tear was identified and repaired by probing it with silicon tube. Early management of such complex injuries usually gives satisfactory outcome. Prevention strategies should be considered for preventing dog bites.

Key words: Dog bite, facial injury, canalicular tear, primary repair.

I. Introduction

Orbital dog bite injuries, although uncommon, occur mostly in children and are reported to be associated with severe ocular adnexal injuries such as lid lacerations, cannalicular avulsion, ptosis from levator transection, and facial nerve damage without globe involvement, and in extreme cases, bone fractures¹. Generally, the dog's blunt canine tooth push the globe out of the way. Injuries sustained in the area of the ocular adnexae and lids probably protect the globe itself from injury. The blink reflex causes the ocular adnexae, lids and lacrimal apparatus to bear the brunt of a dog bite injury while protecting the globe. Bite injuries to the facial region can result in facial disfigurement with distressing physical and psychological consequences. Bite wounds have a special position in traumatology because of their high complication rate compared to similar soft tissue wounds caused by other reasons. Because of the large number of bacteria in the oral cavity of dog, dog bite wounds are generally contaminated, and their treatment is difficult because of the risk of infection, especially in extensive injuries². Early management of such complex injuries usually gives satisfactory outcome as noted in our cases.

II. Aim and Objectives

This retrospective study aims at finding out the effectiveness of primary repair of periocular dog bite wound and analysis of age, sex and social status of the patient, site and extent of injury, type of dog and season of dog bite with preventive strategy. According to the best of our knowledge, such type of study, have not been reported earlier from this geographical area till now.



Figure 1A: Pre operative dog bite injury showing lid laceration with dog teeth marks on eyebrow area (Up Left)
Figure 1B: Immediate post repair clinical photograph of same patient (Up Right)

III. Material and Methods

This is a retrospective study of 7 periocular dog bite cases during the period from July 2012 to December 2015 presenting at our tertiary eye care centre. After evaluation of general condition and giving anti rabies serum, anti rabies vaccination and tetanus toxoid, all patients were taken up for primary repair under general anaesthesia. A thorough wash was given for 10 minutes with normal saline containing injection gentamycin 80 mg. Gentle scrubbing was done with gauze and swab stick. Tissues were identified and an attempt was made to appose the ends for suturing. Layer by layer suturing was done. Orbicularis oculi muscle and skin were sutured in separate layers with interrupted sutures (Figure 1). For all internal structures 6-0 vicryl suture was used and skin incision was closed by 6-0 silk suture. Canalicular tear identified and repaired with proper suturing and probing with silicone tube in 1 patient and another canaliculus tear patient was probed with 24 gauge pediatric intravenous cannula. Post operatively systemic antibiotic (amoxicillin + clavulanic acid) , Diclofenac + serratiopeptidase + paracetamol ,0.5% gatifloxacin eye drop was given for 7 days and fusidic acid ointment was applied locally over stitches. Follow up was done on 1st day, 7th day, 14th day, 1 month, 3 months and 6 months. . Wound was examined for any discharge, gaping, and infection and sutures were removed on 7th post operative day whereas silicone tube was removed after 6 month with patent passage in one patient. Pediatric cannula was expelled automatically after 7 days with obstructed passage in another patient.



Figure 2A: Pre operative dog bite injury showing lid laceration (Up Left)

Figure 2B: Clinical photograph of same patient after 6 months of repair showing lid notching upper lid (Up Right)

IV. Results

Age of the patients varied from 4 years to 11 years. Out of these 7 cases, 5 were males and 2 were females. 6 patients were bitten by stray dogs while one patient was bitten by pet dog. 6 patients were from rural area and lower socioeconomic status and 1 patient was from urban area and middle class (Table 1). All the cases registered in our study occurred during April to August months. All 7 patients had lid laceration and 2 amongst them had canalicular tear, 1 patient had slight tissue loss. Anterior segment in all patients was normal. All patients were approached in casualty within 1-4 hours. Wound healing was good in all cases with cosmetically acceptable scar. Only 1 patient developed notching of lid margin (Figure 2). None of the operated patients acquired symptoms of rabies or local and systemic infections upto last follow up.

Table 1: Summary of details about patients & Dogs

	Data Analysed		Results found	
	<15 Years	>15 Years	<15 Years	>15 Years
Age of Patients	(7)	(0)	(7)	(0)
Sex	Male (5)	Female (2)	Male (5)	Female (2)
Background of Patient	Urban (1)	Rural (6)	Urban (1)	Rural (6)
Socioeconomic status	Lower class (6)	Middle class (1)	Lower class (6)	Middle class (1)
Type of Injury	With canalicular tear (2)	Without canalicular tear (5)	With canalicular tear (2)	Without canalicular tear (5)
Type of Dog	Stray Dog (6)	Pet Dog (1)	Stray Dog (6)	Pet Dog (1)
Results obtained	* Anatomical success (6)	**Functional success (6)	* Anatomical success (6)	**Functional success (6)

*Lid notching was present in 1 case and **Epiphora was present in 1 patient (Due to autoexpulsion of pediatric cannula used for canalicular repair within 7 days).

V. Discussion

Generally health care providers in remote areas remain reluctant to attend such cases of dog bite injuries. Primary care clinicians must be able to avoid infections by ensuring early wound care and timely referral at higher centre if required. Previously these wounds were left open in view of infection and were repaired after an interval but nowadays early primary closure is favoured for better cosmetic results. Antibiotic therapy is indicated for infected bite wounds and fresh wounds considered at risk for infection.³ Prompt assessment and treatment can prevent most dog bite wound complications⁴. The surgical approach to bite injuries includes primary closure of the wound whenever possible. Postoperatively, attention to patient counseling, wound dressings, use of ointment, wound cleaning, and scar revision help in assuring an optimal anatomical as well as functional outcome. Avulsive injuries with significant tissue loss are the most difficult cases for definitive management and are also most likely to require hospitalization³. Sometimes the challenges of reconstruction of such defects could be much more. Wound management with minimal debridement and closure gives good results on the face⁵. The results showed that the common risk factor for dog attacks include: school-aged children (highest rate of serious injury from dog bite is to children under 5 years of age). Early management of such complex injuries usually provides satisfactory outcome⁶. Primary reconstruction of all canalicular lacerations is generally recommended. Additionally, it is significantly easier to repair the drainage system during the primary surgery than to re-operate at a later date after canalicular scarring has occurred. The surgeon should know that when facial lacerations are the result of a dog bite, decisions regarding rabies vaccination require information about the dog. If the dog shows clinical signs of rabies, or tests positive for rabies, a 6-dose series of post-exposure prophylaxis is recommended. The first dose is given as soon as possible and the next 4 doses over a 28-day period.

The Universal truth such as prevention is better than cure should be employed. Caution and professional attitude should be maintained by health care providers. Universal precaution and (PPE) Personal Protection Equipments such as double gloves, water impermeable gowns, boots, sleeves, should be taken. Hand to hand pass of sharp instruments should be avoided. There should be a separate instrument set for such type of cases. Bag and label the contaminated linen and should be disposed off as per standard guidelines. Prevention strategies for general population include close supervision of child-dog interactions⁷, public education about responsible dog ownership and dog bite prevention, stronger animal control laws, better resources for enforcement of these laws, and better reporting of dog bites. Anticipatory guidance by pediatric health care providers should be given to public at regular intervals for dog bite prevention⁸. It is needed to improve community knowledge of rabies and the availability and affordability of rabies vaccine must also be highlighted⁹.

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