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Eyelid Avulsion from Monkey Bite

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Abstract

A 19-day-old infant was bitten by a macaque monkey in western Singapore, resulting in a full thickness laceration of his upper eyelid, which was successfully repaired with good structural, functional and aesthetic outcome. Periorbital injuries of children are of concern in view of the risk of visual impairment. In addition, monkey bite inoculations carry the risk of transmitting multiple bacterial, Rabies and Herpes B viral infections. The acute management and surgical repair, as well as learning points on management of Simian injuries are discussed.

Keywords: Monkeys bites; Eyelid laceration; Eyelid avulsion; Bacterial infection; Prophylaxis against animal bites

Introduction

Monkey bites are relatively uncommon, with no previous case reports documenting such lesions of the face or eyelid. Much of how we manage such injuries are learned from reports of other mammalian bites including human, dog and cat bites ,which have been much more well documented [1,2]. Such bites, which include superficial abrasions, lacerations, and puncture wounds, have a higher prevalence in children, are usually caused by pets and frequently involve the face [3-5]. The eyelids in particular are complex structures and repairs of eyelid injuries can be difficult, with a risk of ptosis in cases where the levator muscle is involved, or unsatisfactory surgical outcome with improper surgical technique [6,7].

In addition to primary repair of the injury, a major aspect in the management of mammalian bites is the prevention of infections, most often caused by gram positive and gram negative organisms in the saliva [8]. Monkey bites are of particular concern due to the possible transmission of virus infections such as Rabies and Herpes B (*Herpesvirus simiae*) viruses, in addition to bacterial infections [9,10]. Although the Herpes B virus is highly prevalent and asymptomatic in adult macaque monkeys, human infection can lead to fatal encephalitis, although early treatment with high-dose acyclovir, famciclovir, or ganciclovir can prevent this [11,12].

Most literature represents incidents in various developing nations. We herein report a monkey bite of the face and eyelid in Singapore that was successfully managed with good outcome.

Case Report

A premature 19-day-old male (corrected age one day) who was at an outdoor party was allegedly attacked by a monkey of undetermined species that bit him on the left side of the face and head.

On examination at the Emergency Department the baby was uncomfortable and fretful but otherwise hemodynamically stable. The fontanelles were normotensive and neck supple. Systemic examination revealed no abnormalities. Examination of the head revealed multiple superficial and deep lacerations of the scalp and face, including a 5cm irregular deep laceration over the left upper eyelid (Figure 1). This full thickness laceration extended from the medial canthal angle above the medial canthal tendon, superior to the tarsus involving the levator aponeurosis with extension to the temporal area (Figure 2). The underlying globe, ocular motility, anterior and posterior segment examinations were within normal limits. Intraocular pressure measured with a tonopen was 14 (5%) on the affected eye. He also had a 4 cm long laceration over the left parietal area and a jagged-edge 1.5cm laceration at the zygomatic-temporal region. The right eye and the adnexa were within normal limits.



Figure 1: Deep 5cm upper lid wound from the monkey bite.



Figure 2: Full-thickness upper lid laceration involving the forniceal conjunctiva.

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Hemorrhage control by compression dressing was performed, after which the child was given a parenteral administration of antibiotics (Amipicillin, Gentamicin and Metronidazole) to empirically cover for the wide-spectrum of microorganisms found in oral flora of monkeys and isolates from monkey bites in humans, which includes Streptococci, Enterobacteraecia, Bacteroides and Fusobacterium species [2]. In addition, intramuscular Anti-tetanus immunoglobulin was administered to the neonate in view of the open contaminated wound, and because he had not been immunized against tetanus.

After initial stabilization, the neonate was sent to the operating room for immediate surgery. Thorough wound debridement and lavage with copious normal saline and antibiotics was performed, important steps in the management of all bite wounds, which are presumed to be dirty with a high risk for infection [1]. We aimed for primary wound closure, which has has been found to be beneficial for bite wounds with no increased risk for subsequent infection [1]. A layered closure of the conjunctiva, levator aponeurosis including the medial and lateral horns and overlying skin was performed. The levator was isolated and reattached to the tarsus with 6-0 Ethibond suture. Orbicularis oculi and the subcutaneous tissue was opposed with 6/0 Vicryl subcutaneous sutures, and skin with 6/0 Prolene.

The child recovered well from anesthesia and surgery with gradual and progressive improvement of the left upper eyelid ptosis and orbicularis function. At 6 weeks follow up he had a mild residual ptosis with marginal reflex distance (MRD) 1 of approximately 2mm, and the lid crease was less distinct than the fellow eye (Figure 3). Levator function was minimally decreased, but lid movements were otherwise normal, there was no lagophthalmos and tearing ability was unaffected. His extraocular movements were otherwise full, eyes orthophoric and he was able to maintain central, steady fixation.

A follow up consult with the infectious disease physicians concluded there was no need for any Rabies vaccination as the risk was extremely low, with no documented Rabies in Singapore. Furthermore, vaccinations would not be immunogenic in a nineteen-day-old neonate, as neonates had limited capacity to respond to many antigens, given their deficiencies in both adaptive and innate immunity, as well as the potentially suppressive effects of maternally derived antibodies [13,14]. The team also decided there was no need for prophylaxis against Herpes B virus, a known virus prevalent in monkeys and transmissible to humans, but advised the parents to watch for any signs such as vesicles and flu-like symptoms.

Long term postoperative follow-up of the child revealed good cosmesis with well-healed facial and eyelid scars, and only a slight ptosis of the affected eye. At 3-month follow-up, the ptosis had improved, MRD1 was only 1mm less than the fellow eye (Figure 4). This continued to improve, and at 2-year follow-up, the MRD1 was only 0.5mm less than the fellow eye (Figure 5). The lid crease distance was 2mm on the affected eye, compared to 0.5mm on his fellow eye, although the asymmetry was not cosmetically unacceptable. Lid mobility remained full throughout, with no significant decrease in visual or tactile sensation to the affected eye and periorbital skin respectively. There were no abnormalities of the ocular development of the child otherwise and the parents were satisfied with the surgical outcome.

Discussion

Periorbital injuries in children have unique implications for visual impairment as compared to adults. Hence this traumatic and unique clinical case brings up a few interesting points for discussion, and serves as a useful guide for management of future cases in the future. It is interesting to note that children have been noted to be more than three times as likely to be bitten as adults, which may be attributed to the human infant's physical and behavioral resemblance to the neonatal monkey [9]. Dominance within the social hierarchy of macaques is established by aggression toward other monkeys, generally the younger and smaller members of the group [15].

Mechanical, traumatic or paralytic ptosis and orbital hematomas in children have a high propensity towards inducing amblyopia, hence necessitating immediate repair and rehabilitation. In particular, eyelid injuries should be repaired with proper technique and appropriate suture material, to avoid the unwanted sequelae of a kinked tarsal plate, notched lid margin, and long-term friction injury to the cornea [16].

While other mammalian bites such as dog, cat and human bites are more widely described and known to be a serious public health problem worldwide [3,5], monkey bite injuries are rare especially in developed nations, and have been discussed to a relatively narrow extent in our region. Such inoculations can transmit serious bacterial and viral infections to humans, with significant local and systemic manifestations [17].

The bacteriology of simian wounds is known to be diverse, and has been found to be similar to that of isolates from human bite wounds, with a predominance of alpha-hemolytic streptococci, enterococci, *Staphylococcus epidermidis*, *Neisseria* and *Haemophilus* species, *Eikenella corrodens*, and anaerobes, including *Bacteroides* and

Fusobacterium species [18]. Given the microbial flora of a primate's oral cavity, thorough lavage, debridement and appropriate antimicrobial prophylaxis is mandatory, as was done for our patient.

Herpesvirus simiae or B-virus is also highly prevalent in adult Macaque monkeys, with between 73% and 100% of Macaques



Figure 3: Postoperative follow up at 6 weeks.



Figure 4: Postoperative follow up at 3 months.



Figure 5: Postoperative follow up at 2 years.

exhibiting antibodies to the B virus by age 2–3 years [9,19]. Reviews of monkey bite injuries worldwide indicate that severe lacerations, wound infections, and permanent sequelae (e.g., flexure contractures, osteomyelitis, encephalitis) were present in 33% of cases [17,18]. Left untreated, this virus has a greater than 70% mortality in humans [9,20].

The argument for post-exposure prophylaxis for B virus infection is strong, as rapid administration of high-dose ganciclovir, famciclovir, or acyclovir has been shown to be effective in the prevention of encephalitis [11]. However, few data exist to assess the effectiveness of post-exposure prophylaxis for B virus infection in humans, and it has been reported that the use of post-exposure prophylaxis to prevent B virus infection in humans has not been proven to be effective [11]. Furthermore, infection with B virus is very rare relative to the number of possible exposures, and there is the worry among experts that Acyclovir therapy can suppress virus shedding and seroconversion, which may make diagnosis more difficult [11].

Hence such cases should be referred to an infectious disease specialist for their expert opinion, as the risks and benefits of postexposure prophylaxis differ for each individual case. In retrospect, the patient may have benefited from post-exposure prophylaxis in view of the deep puncture wound to the head, which is considered a high risk injury in terms of both location and depth of wound [11]. However, the infectious disease physician handling the case had discussed the risks and benefits of prophylaxis with the patient's parents and a decision was made against prophylaxis.

Conclusion

There have been few case reports of monkey bites around the world, especially in our region. However, monkeys are a common sight in many countries, and in certain cultures, patronized and worshiped. Hence there always exists the risk of attacks or contacts with monkeys. Much remains to be learned about the pathogenesis of B-virus infection in humans, as well as the acute and subsequent management of such an incident. This case can be extrapolated to persons of other age groups, and assist in the management of injuries by monkeys and other wild animals. Immediate resuscitation, appropriate antibiotic and antiviral prophylaxis, meticulous layered and principled surgical closure with close follow up ensures good outcomes in most patients with severe ocular adnexal and facial injury.

References

- 1. Jerrard D (2006) Bites (mammalian). Clin Evid 914: 1-8.
- 2. Goldstein EJ (1992) Bite wounds and infection. Clin Infect Dis 14: 633-638.
- Dire DJ (1992) Emergency management of dog and cat bite wounds. Emerg Med Clin North Am 10: 719–736.
- Overall KL, Love M (2001) Dog bites to humans demography, epidemiology, injury and risk. JAMA 218: 1923–1934.
- 5. Avner JR, Baker MD (1991) Dog bites in urban children. Pedriatrics 88: 55-57.
- Beadles KA, Lessner AM (1994) Management of traumatic eyelid lacerations. Semin Ophthalmol 9: 145-151.
- 7. Imran D, Mandal A (2004) A dog bite to the eyelid. J R Soc Med 97: 78-79.
- Griego RD, Rosen T, Oringo IF, Wolf JE (1995) Dog, cat, and human bites: A review. J Am Acad Dermatol 33: 1019-1029.
- Ostrowski SR, Leslie MJ, Parrott T, Albet S, Piercy PE (1998) B-virus from Pet Macaque Monkeys: An emerging threat in the United States? Emerg Infect Dis 4: 127-121.
- Abrahamian FM, Goldstein EJC (2011) Microbiology of animal bite wound infections. Clin Microbiol Rev 24: 231-246.
- Cohen JI, Davenport DS, Stewart JA, Deitchman S, Hilliard JK, et al. (2002) Recommendations for prevention of and therapy for exposure to B virus (cercopithecine herpesvirus 1). Clin Infect Dis 35: 1191–1203.
- Tregle RW Jr, Loe CL, Earhart RH, d'Autremont SB (2011) Cercopithecine Herpesvirus 1 risk in a child bitten by a Bonnet Macaque monkey. J Emerg Med 41: e89-e90.
- Demirjian A, Levy O (2009) Safety and efficacy of neonatal vaccination. Eur J Immunol 39: 36-46.
- Adkins B, Leclerc C, Marshall-Clarke S (2004) Neonatal adaptive immunity comes of age. Nat Rev Immunol 4: 553-564.
- Johnson-Delaney CA (1991) The pet monkey: health care and husbandry guidelines. Journal of Small Exotic Animal Medicine 32-37.
- Divine DR, Anderson RL (1982) Technique in eyelid wound closure. Ophthal Surg 13: 283-287.
- 17. Janda DH, Ringler DH, Hilliard JK, Hankin RC, Hankin FM (1990) Nonhuman primate bites. J Orthop Res 8: 146-150.
- Goldstein EJ, Pryor EP III, Citron DM (1995) Simian bites and bacterial infection. Clin Infect Dis 20: 1551–1552.
- Weigler BJ (1992) Biology of B virus in macaque and human hosts: review. Clin Infect Dis 14: 555-567.
- Huff JL, Barry PA (2003) B-virus (Cercopithecine herpesvirus 1) infection in humans and macaques: potential for zoonotic disease. Emerg Infect Dis 9: 246–250.

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