

Management of Animal Bites in Maxillofacial Surgery

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ABSTRACT

Bite injuries tend to be among the most typical forms of trauma to which man is exposed. Contamination is actually the most frequent problem in animal attack injuries. The surgical approach regarding facial bite injuries continues to be debatable. The controversy persists in the ideal time to do the wound debridement together with initial wound suturing as well as the use of antibiotic prophylaxis. On the contrary, human attacks are likely to be unnoticed with regard to making an evaluation within any casualty room. They can be especially notorious owing to the polymicrobial character associated with human saliva inoculated within the injury as well as the threat that they will present with for transmission of contagious health conditions. Prompt treatment plan, most appropriate prophylaxis in addition to precise evaluation are definitely critical for attaining desired results. In this article, we have presented two animal bite cases and 1 human bite case that presented to our department and our management protocol.

Keywords: Animal bite, Dog bite, Human bite.

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INTRODUCTION

Animal attacks call for specialized care in maxillofacial trauma. Cuts as well as wounds upon the epidermis are handled by trauma facilities globally. These are generally afflicted wounds having distinctive microflora.¹ Canine attacks account for 80 to 90% of animal bites and tend to be mainly on mouth, nasal area and cheeks.² As animal bite injuries are typically infected, the threat associated with contamination is substantial. One other issue linked to animal bite traumas would be the transmission of human rabies. More than 55,000 instances of human rabies passed on through dogs take place annually throughout the world, that is certainly an endemic issue in parts of Asia as well as in The African continent.³ Small children happen to be the most frequent patients (close to

50% of occasions), primarily owing to attention seeking behavior exhibited by them and also simply because of their low stature, which in turn exposes their face closer to animal's grasp.⁴⁻⁶ Treatment of animal attack wounds is comprised primarily of ample wound cleansing so as to minimize potential risk of disease together with the usage of effective antibiotics.⁷ Human bites take place consistently amid small children 2 to 4 years old. Despite the fact that the majority of bites arise in the course of quarrels in between kids, mainly with injury to the palms, arms as well as face, bites during play are generally common. When small children mature to adolescence and adulthood, attacks happen in the course of other fun-based activities, for instance sporting activities as well as sexual activity.⁸

CASE REPORTS

Case 1

A 24-year-old male patient presented to the casualty of Government medical college and hospital, Goa in May, 2012. The patient reported a facial attack caused as a result of a Rottweiler dog. He previously had leaped over a fence to steal mangoes and his face landed at the front of the rottweiler dog. Affected individual had no neurological/behavioral alterations associated with the injury as well as history of systemic illness and medication allergies.

Primary assessment demonstrated that the patient was conversing with the emergency team, hemodynamically steady, along with normal vital signs. Facial assessment exhibited a number of abrasions, a laceration relating to the upper labial region which went via the upper labial skin toward the mucosa detaching the underside of columella (Fig. 1). No bone or dental fractures were detected.

Because of the patient's young age, managing the injuries was conveniently achieved under local anesthesia. After proper facial disinfection and preparation of the operative field with sterile and clean surgical drapes, the wounds were meticulously irrigated with saline, wound debridement was carried out and sutures were attained under thorough care (5.0 polyglycolic acid absorbable sutures for the muscle together with oral mucosa; 6.0 nylon for skin (Fig. 2).

Human rabies prevention was accomplished at the very same day and 72 hours later, considering that the aggressor canine (family's dog) had been frequently

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Fig. 1: Preoperative photograph (case I)



Fig. 2: Postoperative photograph (case I)

immunized. Tetanus prophylaxis was not repeated since the patient had recent immunization. Amoxicillin with clavulanic acid was the selection for antibiotic regimen for 1 week. Follow-up of the patient did not reveal any indication of disease. The patient missed subsequent follow-up after which he showed up 12 months later exhibiting the lack of any kind of impairment to the facial area except for a hypertrophic scar for which his parents declined further treatment.

Case 2

A male patient aged 45 years turned up in the emergency unit of the Government Medical College and Hospital, Goa, India, in the year 1997, seeking treatment for a facial injury which transpired as a result of bear assault in the forest in the outskirts of Goa. He was examined by the maxillofacial surgery team and was observed to have obtained numerous lacerations to his face over the left zygoma, right paranasal area, right malar region, left eye lid, right eye lid, left paranasal region, left lower malar region and over his left commissure area (Fig. 3). His GCS was 10/15 and was first intubated by anesthetist team. He was thoroughly screened by ophthalmologist and his left eye had to be enucleated owing to irreparable harm as a result of the mauling. Intraoral assessment revealed loss of 24, 25 teeth. His facial lacerations were flushed with aqueous iodine solution and he was started on an intravenous course of Amoxicillin and clavulanic acid and paracetamol. Rabies vaccine and tetanus toxoid were immediately administered. Debridement was performed and sutures were completed (4.0 polyglycolic acid absorbable sutures for the muscle tissue and oral mucosa; 5.0 nylon for skin) (Fig. 4). The patient was transferred to our unit 3 days later, but unfortunately succumbed to sepsis after 7 days.



Fig. 3: Preoperative photograph (case II)



Fig. 4: Postoperative photograph (case II)

Case 3

A 35-year-old male was referred to the casualty of Government Medical College and Hospital, Goa, India, in June 2002, 24 hours after he sustained a human bite injury to the lower lip. The patient was bit while he was involved





Fig. 5: Preoperative photograph (case III)



Fig. 6: Postoperative photograph (case III)

in a scuffle with his opponent. The bite involved the central portion of the lower lip with complete avulsion of a piece of tissue 1.5 cm by 2.0 cm (Fig. 5). The patient presented within 24 hours to the emergency room of the Government Medical College and Hospital, Goa, India, where the wound was primarily repaired in one layer with interrupted 4.0 proline sutures. The avulsed piece of tissue that was brought with the patient in a piece of cloth was already contaminated and necrosed and could not be used in the repair. The patient was referred to our facility the following day for further wound exploration and revision for functional and cosmetic purposes. There was no sign of infection or wound dehiscence at that time. The sutures were removed and the wound was explored. The wound was cultured for both aerobes and anaerobes and copiously irrigated with normal saline and 5% povidone iodine solution. Closure was then done directly, in two layers with buried interrupted subcutaneous 5.0 vicryl sutures and interrupted 6.0 ethilon skin sutures after proper debridement of the wound (Fig. 6).

DISCUSSION

Animal assaults bring about traumas that induce either lacerations, puncture or crush injuries.⁹ The recent decline in forest area has, unfortunately, raised the likelihood of animal-human interaction, hence resulting in injuries to humans. The majority of animal bite traumas come from pets or animals of close connection to the afflicted individuals, commonly seen to be children.¹⁰ These injuries tend to be brought on, on account of conflict by the victim on ground level, which forces dirt, grass as well as other contaminating materials into the cuts, so brisk irrigation and elimination of all foreign material happen to be of vital importance.¹¹ Accidental injuries attributable to cats may exhibit distinct patterns as their pointed teeth induce a tiny but deep injury which may facilitate microbial growth. On the contrary, canine attacks typically exhibit as crush injury associated with lacerations, especially pertaining to larger dogs.¹² The 2 main forms of bear assaults are usually defensive and predatory.^{13,14} Defensive, attacks tend to be the consequence of sudden, unpredicted encounters that follow as a result of a perceived danger to cubs, individual room or space or food supply, and frequently involves fun-based activities such as mountaineering and hunting. Predacious episodes tend to be far less common and happen whenever human beings are regarded as a source of food. In such cases, the bear more frequently invades human territory, e.g. hiking or picnicking locations. Predacious strikes produce the greater part of lethal encounters. Bear attack accidents with tissue deficit may lead to significant disfigurement with considerable functional and cosmetic concern.^{14,15} Initial management is accomplished by a detailed history of the trauma itself and information of patient's medical history including vaccines and immunization profile.^{15,16} Vulnerable areas of the face are eyelids, lips and nose.¹⁷ Some injuries may require surgical flaps or skin grafts for adequate closure. Image exams might help to exclude fractures or foreign bodies associated to the wounds.¹⁶ A major concern in all bite wounds is infection due to the presence of the large number of bacteria in the oral cavity. Hence, all bite wounds should be considered contaminated. The relative risk is determined by the species of the inflicting animal, bite location, time until wound management, type of wound, host factors, and local wound care. Infections can be caused by wide spectrum of pathogens (bacteria, viruses, rickettsia, spirochetes, fungi). Typically the infections are polymicrobial, with mixed aerobic and anaerobic species.¹⁸ Antibiotic therapy is indicated for infected bite wounds and fresh wounds considered at risk for infection, such as large wounds, large hematoma, full-thickness skin punctures and wounds with tissue loss.

Tetanus and rabies prophylaxis should be considered for all bite wounds. Though surgical management in animal bites remains a controversy, there is no doubt that role of primary wound management specially emphasizing on highest level of wound toileting plays a very important role.¹⁹ In the past, surgical treatment used to be delayed and secondary intention wound healing was commonly seen.²⁰ That management was believed to be safer as infection was believed to happen after primary closure. Nowadays, it is well known that even after few hours of the trauma, the facial region is richly vascularized so proper wound management and primary closures are possible. When different tissues such skin, muscle and oral mucosa are closed with appropriate material, better esthetic results are obtained and major secondary reconstruction interventions can be avoided.^{21,22}

Infection is a common problem following animal attacks,²³ therefore we prescribed a broad spectrum antibiotic for 1 week. The first option antibiotic should be effective against β -lactamase producing bacteria such as commonly seen by *Staphylococcus aureus* and *Prevotella*. Penicillin derivatives associated with a β -lactamase inhibitor, such as the clavulanic acid are usually the first choice but the inhibitor may also be found associated to a cephalosporin.²⁴

In Human bite wounds, the lower lip area as well as the ear happen to be the most frequently injured sites.²⁵ This may turn out to be attributed to the lip area getting easily wedged within the assailants teeth owing to its location upon the face. In instances where the tongue is actually dismembered the surgeon encounters a great struggle to restore the complex tongue functions. If the nasal area is mauled, the ENT surgeon combined with maxillofacial surgeon can help attain best achievable visuals and functionality.

Contamination is the primary issue encountered in animal as well as human bites. The infection rate is just about 8.3% in human attacks however if we take into account the particular character of the local microflora within the mouth, broad spectrum antibiotics ought to be selected.²⁵

Even though the actual strategy to deal with human attacks is a major controversy, we in our unit perform primary closure for all attack patients devoid of evidence of contamination irrespective of the time frame elapsed since trauma.

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