

Vascular Injury in Pediatric Patient to a Dog Bite

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Abstract

The bites from animals to humans are a significantly frequent problem that represent serious consequences and occasionally fatal. In Mexico is a major health problem being pediatric patients the most affected.

Clinical Case: Female patient age 8 is attacked by a dog breed Rottweiler, unprovoked, receiving several bites, the most serious in region of the left groin, causing significant bleeding and hypovolemic shock treated with compression, hemostatic clamp to stabilize the patient, diagnosed vascular trauma and left femoral artery bypass surgery is performed with a synthetic graft polytetrafluoroethylene subsequently handled with antibiotics, transfusion of blood and fresh frozen plasma. No data of complications, the patient progressed satisfactorily.

Conclusions: The dog bite should be handled immediately according to the conditions of the wound management should be seen in proper grooming and valuation of antibiotics, solutions, blood transfusion and vaccines indicated according to the type of wound and microbiology. Occasionally, the severity of the injury requires handling with reconstructive surgery and/or vascular order to reduce fatal outcomes for these attacks. It should prevent and educate the general population, and significantly to children and pet owners about the risks associated with these accidents.

Keywords: Canine bite; Vascular trauma; Pediatrics

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Introduction

The bites from animals to humans are significantly a frequent problem that represent serious consequences and occasionally fatal. It is estimated that 1% of consultations in emergency units are due to animal bites, including pets related to the victim. Dog bite is the most common among all the aggressions caused by animals, corresponding to 90% of them [1]. In E.U.A. these attacks generate ~1% of care in the emergency services, of which 10-15% should be sutured and 1% of patients hospitalized for this cause [1-4]. About 1% of care in emergency departments for children under 12 years are due to dog bites and although most of the injuries are minor and do not need health care, severe vascular injury may require surgery and/or reconstructive [2]. The true incidence is unknown because of under-reporting the accident, not all patients consulting a hospital emergency and most are managed at home, a situation which corresponds to twice those serving in emergency services. A large proportion of attacks occur in the home of the victim or his own family and is more common in pet owners, caused by the own pets rather than stray dogs.

Clinical Case

Its paediatric patients 8 years old female, school eutrophic without significant medical history, surgical history and no allergic, with psychomotor development within normal parameters.

The patient is attacked after leaving school at midmorning, an adult Rottweiler dog breed about 60 cm tall, owned by locals. The dog was inside a house, the door was accidentally opened; no provocation directed relates more to the fact of spending running ahead of the place, which resulted in inadvertent persecution for the child from the dog. The patient receives several bites, the most serious in the left groin region, other less severe in thighs and buttocks; the groin injury presents major bleeding and hypovolemic shock, which is treated by family and paramedics with compression bandage, the patient is channeled to Hartman solutions for volume replacement and is taken by ambulance to a secondary hospital where he is immediately served in operating room and anesthetized, the bleeding is controlled by placing several hemostats (Figure 1), bone involvement is discarded and articulate, and decided that the specialized treatment of

vascular surgery should be performed in a tertiary institution, so that is transferred to Hospital Centenario Miguel Hidalgo, Aguascalientes, Ags, being diagnosed with femoral vascular trauma. And in the operating room it is performed left femoral vascular examination, finding total irregular section of left common femoral artery and partial section with two perforations in the femoral vein, prior removal hemostats and hemorrhagic control proceeds to repair injuries, sutured vein puncture with nylon 5-0, obtaining immediate venous drainage, in the artery edges are regularized and a polytetrafluoroethylene (PTFE) synthetic graft is placed approximately 4 mm thick (Figure 2), end-terminal approximately 4 cm in common femoral artery, obtaining immediate pulse and limb revascularization about seven hours after the dog attack; in the intraoperatively, blood and fresh frozen plasma were transfused. The patient successfully develops after surgery, with antibiotics, without fever, data of infection, bleeding or bruising, and with revascularization of the left lower extremity confirmed by a Doppler portable ultrasound. After 8 days, the patient is discharged to home with satisfactory evolution, presenting normal levels of CBC. Ten days later the patient was again reviewed and the skin stitches were dropped. It is noteworthy that three years later of the trauma the patient has not presented complications.

The dog was kept under observation for eight days without finding traces of anger, considering the possibility of being sacrificed.

Discussion

Dog bite does not represent a major cause of morbidity and even less a major cause of mortality [3], but its consequences are often significantly devastating, not only aesthetically, but due to the important psychological effect as sequela [4], because the main victims of dog bites with serious and fatal outcome are children. There is a greater tendency for these accidents to occur in evening hours and at spring or holidays season [5-9]; children spend more time away from home, which increases the possibility of contact. A slightly higher incidence in males and the greater presented occurrence age is between 2 and 9 years old. Also, its location has a close relationship with the age of Child [6]; in children less than five years old the anatomical regions most affected are the head,



Figure 1 Patient arrival at the specialized hospital with various hemostats in femoral vessels.

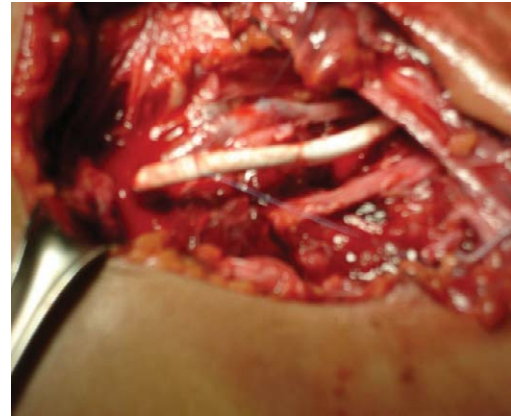


Figure 2 Femoral Access with vein repair and interposition of synthetic femoral PTFE graft into the artery.

neck and face. This is due to the small stature of children and therefore its proximity to the dog, which increases the likelihood of injury to face, soft tissue and facial fracture [4]. Other injuries include facial nerve damage, tear duct with ocular involvement, ptosis and loss of blood, where reconstructive surgery is usually indicated. Similarly, severe emotional stress can be significantly associated with facial injuries [5-7]. In older children, the bites are more common in the upper and lower limbs; sometimes, victims are injured in the arms and hands, usually right, as the victim tries to defend him, however, lower limb injuries are common in relation to the attempted escape of aggression and the dog attacker height. Occasionally, this location usually requires more vascular surgery, due to the condition of major blood vessel.

Moreover, even though most of the dogs are loose in the attack, many attacks are caused by dogs that are contained in one way or another. In developed countries are more frequent bites of owned dogs, while in developing countries, stray animals are responsible for most of them [8,9]. However, consider that people bitten by stray dogs think that their attacks are more dangerous than a domestic dog, assuming that the latter has the required vaccination, therefore, they are more likely to receive medical treatment, and clinicians often declare this type of biting with greater frequency [10,11]. As for the characteristics of the canines, neutered male dogs are the most involved, and some studies suggest that spayed females are more prone to bite than those who do not are [12]. Moreover, so-called races of "attack" (Pit Bull, Rottweiler, German shepherd, Terrier, Brazilian Fila, Husky, Alaskan malamute, Akitas, Chow-Chow, wolf hybrids and certain crossings) are related in high proportion to most fatal attacks due to their large size, weight and their behavior as attack dogs that usually cause major damage because they can bite with a force greater than other canines. In addition they are often characterized by attacks without previous signs of aggression to prevent the victim [5], and although in some cases they can objectify risk situations for possible aggression (the animal is eating, in heat, sleeping or surrounded by puppies), a large number of attacks are not associated with any provocation by the children [2]. However, it should be considered that data on deaths and mutilations by these attack dogs may be overrepresented, as for example, "Pit Bull" is a generic term that groups several types

of dogs with similar physical characteristics which can cause errors of identification [6,13]. The above data are consistent with the case of a female patient presented 8 years old who was attacked in an untimely manner by a Rottweiler dog breed 60 cm tall, causing major injuries in the left lower limb, causing major vascular involvement. Although in most cases, the injuries caused by dog bites are not usually serious, 50% of bites leave permanent scars, 10% often requires sutures, between 5 and 21% require care by a specialist and the hospitalización [5] 1-5% is necessary. Treatment depends on the severity of the injury but generally includes a strict cleaning, high pressure irrigation and careful debridement. Indications for hospitalization constitute: major bleeding wound or hypovolemic shock, tendons or joint commitment, the presence of systemic manifestations, injuries requiring reconstructive surgery, severe cellulitis, wounds in immune compromised patients and antimicrobial treatment failure oral [1,14,15]. The patient must be stabilized first and the wound should be washed with water or physiological saline (NaCl 9%) sterile. Such injuries are generally not suture, unless it is located on the face and has less than eight hours of evolution. Uninfected wounds that need it, can be sutured under local anesthesia after the prescribed treatment or after it has resolved the infection [2,5]. The deep, stabbing wounds, located in hand, with more than 8 hours of evolution, and in patients with risk factors are more likely to become infected, with a frequency ranging between 15 and 20% [1]. In case of necrosis is essential debride and clean carefully, classify the type of wound and its extension and be suspected a commitment of joint or bone, by making radiographs [1]. In addition a history should be realized to discard cofactors that increased risk of developing a bacterial infection; It must be reported to the type of accident and whether motive for the attack and if it was carried out by an identifiable or stray dog; in first case ask about the status of anti-rabies vaccination and veterinary checks. Always should be asked to the affected their scheme of anti-tetanus vaccination [1]. One of the important consequences that involve an animal bite is the tendency to wound infection. The risk is greater in lesions on the hands and the most frequently isolated bacteria is *Pasteurella multocida*, which can be cause of 50 to 90% of infections caused by the bites of dogs and cats, respectively [5,10]. In a Cochrane Library review that comprised eight randomized trials comparing antibiotic prophylaxis versus placebo or no intervention, it was concluded that prophylactic regime does not appear to decrease the infection rate in bites from dogs or cats, and that the type of wounds, either puncture or laceration, do not have any influences in the efficiency. Therefore, antibiotic like a prophylaxis is used only in deep wounds, located in hand and those requiring surgery; in clean and superficial wounds it only must be controlled the evolution [1]. Antibiotics recommended

are: associated with amoxicillin and clavulanate alternatively clindamycin associated with levofloxacin or moxifloxacin based mono therapies, imipenem or meropenem [1]. It should be determined the immunization of rage in the aggressor animal and the history of rage immunization and tetanus of the victim [5]. Significant injury with complications such as lacerations includes in its treatment a surgical management that may include reconstructive surgery and vascular surgery. In the case of the patient after the cessation of bleeding by hemostatic clamping, vascular surgery with placing a polytetrafluoroethylene graft length 4 cm into the left common femoral artery is determined. This is a non-biological prosthetic inert material so induce less inflammation, because of being hydrophobic so it infiltrates easily in body fluids, and due to its high porosity blood elements tend to quickly fill its structure. Does not require pre clotting, it can be re sterilized ten times without altering its structure and PTFE appears to be more resistant to infection. Prompt surgical repair, avoids the deadening of tissue and a lower rate of infections. In this occasion, surgery is performed successfully, the patient is handled with volume replacement measures and prophylaxis, and evolving favorably.

Conclusions

The implications for public health of dog attacks are significantly important especially for children that because of their characteristics can motivate attacks by the animal, plus the relative difficulty to defend themselves and escape if they are attacked [5]. The location of the wounds has a close relationship with the child's age; thus, the greater the patient, more frequent are injuries to the extremities, while younger, the greater the commitment to face, head and neck [2,6] being more likely that the attack is present in evening hours and holidays. Its main consequences derive not only the possibility of infection of the injury, but also the scars, the psychological scars, derivative financial costs of medical treatments, especially if surgery and most important of all is required: the death of the victim, either directly caused by injury or some of the transmitted diseases caused by the bite [5]. We recommend appreciating the application of antibiotic therapy in relation to the severity of injury, and the application of tetanus immunization as a prophylactic management routine [3]. And since it has been shown that most of the attacks are produced by known canines, contents of one form or another and about half of them involved in fatal attacks had a previous history of aggression, we consider it necessary to emphasize education of the population in general and specifically, the instruction on the necessary measures in the management and treatment of these animals by the owners, with the sole purpose of preventing these accidents that are devastating and sometimes fatal.

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