

CASE REPORT

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Evaluation of Fatal Dog Bites: The View of the Medical Examiner and Animal Behaviorist

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ABSTRACT: The multidisciplinary evaluation of fatal dog bites in the context of a case is discussed. This approach emphasizes detailed examination of the animals including matching of bite marks, autopsy, and canine behavioral analysis. It further provides details such as contributory medical conditions, past animal behavior and physical evidence linking the dogs to the attack. Such information is important in the legal proceedings that usually accompany these events.

KEYWORDS: forensic science, dog bite, bite mark, death

Fatalities due to dog bite are rare. From 1979 to 1988, 157 deaths were recorded in the United States. Most of the victims are children under 10 years old. The pit bull and German shepherd are the breeds most often implicated. Nearly 70% of the attacks were by the pet dog. These attacks are often directed against an infant by the family dog [1,2].

A case of fatal dog bites inflicted on a four-year-old girl is presented as an illustration of a suggested approach to these cases.

Case Report

A four-year-old girl lived with her mother, father and infant sibling in rural Alabama. The family did not keep dogs or other animals except for rabbits in a pen near the house. The four-year-old was playing alone in the yard about 50 m from the house near a wooded area. The mother heard dogs barking and apparently fighting and upon investigation found the child dead and two strange dogs were in the yard. They were not aggressive and did not run when the mother entered the yard. She took the body into the house and called authorities. The father shot the two dogs about one half hour after the attack.

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Dogs

The two dogs were of a mixed breed with no specific identifying marks. The smaller dog was a 20 pound male approximately one to two years old. The larger dog was a 40 pound female approximately four years old. Both dogs had blood but no tissue or hair in the oral cavity.

At autopsy the stomach of the larger dog contained scalp hair from the victim but no tissue or clothing. The smaller dog had no evidence from the victim in the stomach. Both dogs had apparent commercial dog food and cooked chicken meat in the stomach. The female dog was not in estrus. With the exception of heavy *Dirofilaria immitis* infestation in the heart of the large dog, they were free of medical conditions. No trace evidence relating to the victim was recovered from the dogs. Laboratory study revealed that the dogs were free of rabies.

The maxilla and mandible were removed from each dog. These showed significant individual variation in the dentition.

Victim

The child died of exsanguination and compressive asphyxia from bites to the neck. Bite mark analysis showed that both dogs attacked the child. A diagram showing the distribution of the injuries is shown in Fig. 1. Figure 2 shows the maxilla from the small

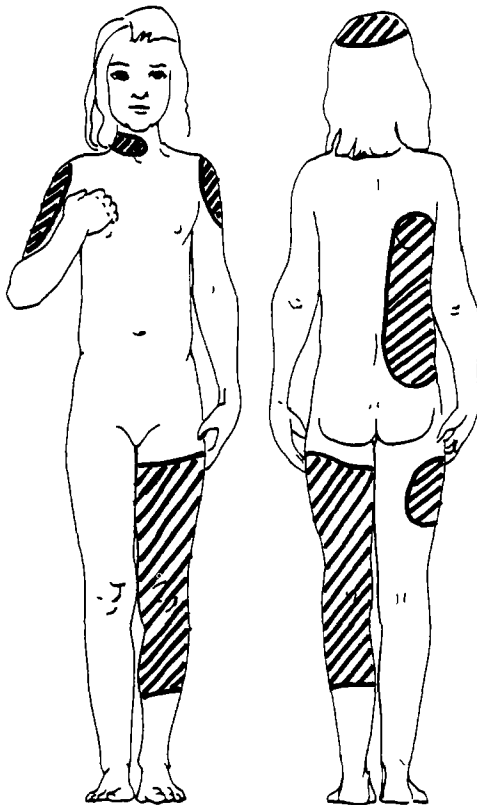


FIG. 1—Distribution of injuries.



FIG. 2—*Bite mark on arm.*



FIG. 3—*Typical canine bite on right arm.*



FIG. 4—Fatal wounds to neck.

dog placed over a bite mark on the child's arm. The canine definition matches the bite mark. Figure 3 shows the bite marks of the arm. Figure 4 shows wounds to the neck.

Behavioral Analysis

Wolves began to live as domesticated dogs, *Canis familiaris*, about 10 000 years ago when they began to be fed and kept by humans [3]. Breeding efforts have significantly altered the early wolf so that only a few of the hundreds of breeds of modern dog even physically resemble the wolf. Some dog behavior can be explained as a reversion to the original instincts of the wolf. Like its ancestor the wolf, the dog is a social pack animal. Now however, the pack is a "family pack" consisting of a human family and possible other animals. The dog seems to recognize people as large mostly hairless dogs in a pack.

Dominance aggression occurs when the dog challenges another member of the "human pack" in the dominance hierarchy. An example of this is the challenge a new baby may face in a family already consisting of a dog. Protective aggression may develop when a person or other animal approaches a protected area such as a yard, the dog's owners or even other animals. Possessive aggression occurs when a dog resists an attempt to remove an object "possessed" by the dog. These objects may include toys, food, or other items [4].

Predatory aggression occurs when a human is viewed as prey. This often involves more than one dog. The victim may unintentionally stimulate the attack by quick movements such as running or by demonstrating fright. The dogs begin stalking then chasing and biting. The initial bites are to the back of the legs. When the victim falls additional biting unusually directed to the neck leads to death or incapacitation. Additional biting to the trunk and head then occurs [5].

Redirected aggression may occur when a human becomes secondarily involved in aggressive canine behavior. An example is when a person is bitten in trying to break up a dog fight. Other types of aggression are: fear, inter-male aggression, inter-female aggression, maternal aggression, pain elicited aggression, and punishment-elicited aggression. These are virtually self-explanatory and are not discussed further, since they were not likely in the case presented. Additional details are provided by Fox [3].

Case Behavioral Analysis

The child was playing in the yard when she encountered two unfamiliar dogs. She became frightened and began to run. This stimulated this "pack" of two dogs to stalk and chase her as potential prey. They initially bit her in the back of the legs causing her to fall. Bites to the neck lead to her death. After death the dogs continued to bite and chew producing wounds to the top of the head and trunk. The dogs stopped biting when the mother appeared. They did not attack the mother because she did not present a prey stimulus. The wound patterns shown in the figure are consistent with this investigation.

Discussion

Detailed photography and body diagrams of the dogs will assist in establishing their identity. Collars, scars, or evidence of prior veterinary therapy are important. Ownership of dogs may become a point of contention if criminal or civil action develops. If ownership can be established, additional past behavioral patterns of the dogs can be documented. In some cases, the owner of the dog or dogs may not be cooperative. Increasing numbers of dog owners have specifically trained their dogs for attack and protection. This information may not be volunteered by the owner and other investigative techniques such as interviewing dog training schools may be necessary.

Infectious disease precautions are extremely important when examining the dog. Rabies is becoming more frequent in both domestic and feral dogs. This disease is potentially highly infectious by parenteral or mucous membrane exposure to saliva or other secretions [6]. Fresh cerebral tissue (the entire brain and brain stem) should be kept refrigerated and transferred to the appropriate laboratory for rabies testing. The presence of other medical conditions such as encephalitis, hydrocephalus, blindness, deafness, brain neoplasms, avitaminosis B and diabetes mellitus may also alter canine behavior. Female dogs must be examined for estrus or recent pregnancy as these are additional behavioral factors.

The dog should be searched for trace evidence. This includes items that link the dog with the victim (clothing fibers, hair of the victim, blood) and that may assist in recreating the actions of the dog (soil, grass, other dog hair, etc.). Exemplars of the dog's hair should be collected. Part of this examination includes the oral contents of the dog. Blood, tissue, or clothing of the victim will frequently be found in the mouths of suspect dogs.

An internal examination of the dogs is as important as the external examination. Consultation with a veterinary pathologist is recommended. If possible, the animal examinations should not be conducted in the human autopsy facility in order to avoid potential adverse public reaction to mixing human and animal remains. A complete necropsy is desirable when the animals have been killed allowing a detailed examination of the gastric contents for tissue or clothing related to the victim. Additionally other

components of gastric contents, such as commercial dog food or food obtained in the wild, will assist in recreating the behavior of the dogs.

If the dogs are alive, they should be anesthetized and their oral contents, dentition and gastric contents examined. If the dog is not to be sacrificed, and if bite mark analysis is needed, dental casting of the canine dentition can be made. For gastric analysis to be meaningful, the dog must be examined as soon as possible after the attack.

A complete examination of the victim will include autopsy, toxicology studies and collection of trace evidence. The victim's behavioral history may be valuable in reconstructing the event. Positive toxicology findings may help to explain behavior. Bite mark analysis using the specific photographic recommendations of the American Board of Forensic Odontology will facilitate a standardized report [7]. The causes of other injuries may not be obvious. Some may be paw marks, or tears resulting from bites.

Summary

The medical examiner can contribute to an objective analysis of these cases by undertaking a detailed assessment of the victim, the scene, and the dog or dogs. The examination of the dog may in fact involve more time and effort than the postmortem study of the victim. In the past, a complete examination of the dog has often not been included in these situations. Such an objective and complete evaluation will contribute to a reasoned public response. Furthermore, justice in any criminal or civil actions that may evolve will be better served.

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