F25   A Comparison of Animal Jaws and Bite Mark Patterns

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Learning Objective and Outcome: The purpose of this presentation is to compare the jaw shape and bite mark patterns of certain animals. This paper is intended to serve as a field guide of animal bite mark patterns that may be used to help investigators analyze animal bite marks and suggest the possible source of specific marks.

Background Information: According to the ASFO Manual of Forensic Odontology, human bites are, "oval or circular contusions, bruises, or abrasions." Humans have four incisors and two canines in each arch. Human canines are only slightly longer in relation to the incisors and premolars, and are short compared to animal canines. Animal bite marks are not oval or circular, like their human counterparts. Dogs have longer arches than humans, so the bite pattern is different. Dogs have six incisors, and two much longer canines in each jaw, which often leave deep punctures. The arch form of a cat is much smaller, and almost flat in shape. Often the incisors (also six in number), are not involved in the bites, as they are short compared to the very long canines. Most of the wild animals in the order Carnivora that were examined for this study are in the cat and the dog families, so their bite patterns were very similar to their domesticated relatives.

In the United States, there are approximately 2 million dog bites per year and 400,000 cat bites. A comparison of the jaw features and bite mark patterns for both groups may be useful in assisting investigators who are attempting to determine the animal or animals responsible for a bite or bites involving human victims. While reports of wild animal bites on humans are less numerous, as the human population increases and we continue to encroach on their habitats we can expect those numbers to increase. Recent mountain lion attacks in California and Colorado emphasize this trend.

Dogs have three distinct skull shapes: mesaticephalic, dolichocephalic and brachycephalic. The most common skull shape is the mesaticephalic; the Labrador Retriever is a good example. Dogs with longer skulls, such as Collies, are dolichocephalic. Dogs with shortened maxillas, for instance, English Bulldogs, are brachycephalic. Cats have two skull types. Most cats are mesaticephalic. Persians represent the brachycephalic, with their "pushed in" faces. It was hoped at first that the arch shape of the three skull types would vary enough to differentiate the bite patterns. However, the variance is seen more in the posterior portion of the arch, and is not discernable in the bite mark pattern.

Hypothesis: Careful analysis of the size, arch shape, intercanine width, and bite pattern of the dentitions of domestic and wild animals will assist forensic dentists in their differential diagnosis of animal bite patterns.

Methods and Materials: Domestic and wild animal skulls from the mammalian collection at the Field Museum of Natural History, Chicago, Illinois, were examined, photographed, and measurements were taken of the intercanine widths. Bite impressions of the anterior teeth were made with foamed polystyrene. The impressions were photographed with an ABFO #2 ruler in place, and the resulting images were imported into Adobe Photoshop CS and rendered life size. The date, the location the specimens were collected, and the sex of each animal was recorded, if the information was available.

Results: The impact of this study on the forensic sciences and or humanity is to provide a reference tool that may be used by medical examiners, forensic odontologists, or other investigators to guide in the scientific quest for identification of the correct perpetrator/ perpetrators of animal bite marks.

Dog Bites, Cat Bites, Bite Marks