

Case report

Canine scavenging of human remains in an indoor setting

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Abstract

This case study documents the nearly complete consumption of adult human remains by two domestic dogs (*Canis familiaris*) inside a residence. While scavenging behavior has been observed for coyotes, wolves, hyenas and other canines in natural outdoor environments, little information is available concerning canine scavenging of human remains in an indoor setting. In this case, the dogs were confined with the body inside a residence for approximately 1 month. The impact of intrinsic and extrinsic factors on canine scavenging behavior and the postmortem interval are examined, such as clothing on the body, perimortem trauma, drug ingestion and the availability of alternative food sources. While cases of canine scavenging of their owners are scant in the literature, this phenomenon is probably not uncommon, particularly among the elderly and indigent who live alone with pets and are socially isolated.

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1. Introduction

Much attention has been paid to the destruction of mammalian skeletons by wild and domestic canines but such studies have been limited to outdoor environments [1–6]. Conversely, little is known about the scavenging behavior or rate of consumption of human remains by domestic canines in an indoor setting [7]. This case study documents the scavenging behavior of pet dogs confined within a domestic residence for approximately 4 weeks. The amount of disarticulation, scatter and consumption is discussed, and additional circumstances of the case, including probable drug ingestion and clothing on the body, may shed new light on canine scavenging behavior as it relates to the postmortem interval.

2. Case report

2.1. Scene analysis

In February 2006, Sheriff Deputies were called to a domestic residence in upstate New York after a neighbor entered the house and observed human bones on the living room floor

(Fig. 1). Deputies responded and observed the bones, two domestic dogs (a Chow and a Labrador mix), and a considerable amount of animal feces throughout the house. The homeowner, a 54 year old woman who lived alone in the residence, was never reported missing. Police had a difficult time determining when she was last seen as interviews with neighbors suggested a time frame of anywhere from 1 week to 3 months.

The house was fully searched for biological remains, weapons, and other evidence related to the manner of death and the postmortem interval. The residence was small and consisted of a living room, bathroom, kitchen and bedroom on the first floor and an attic used for storage. The house was warm and the thermostat was set to 70 F. The living room furniture had been moved toward the center of the room, presumably to better allow heat to emanate from the floorboards. The windows were covered with plastic and the doors were locked from the inside.

All human biological evidence, including a mass of grey human head hair, a calvarium, and small fragments of long bones, were confined to the main walkway of the living room between the bedroom and bathroom (Fig. 2). Sweatpants, a sweatshirt, socks, a wristwatch, a hearing aid and dentures were also on the floor near the remains. The carpet was dark brown and dirty but did not reveal any staining or odor consistent with blood or decomposition fluids. There was no insect activity or pupal casings. Dog feces covered the floors and furniture

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Fig. 1. Long bone fragments scattered on the floor in the entry into the living room from the front door (photo courtesy of Chenango County Sheriff's Office).



Fig. 3. Nearly empty bags of dog food as well as dog feces on the kitchen floor. Note untouched boxes of cereal on the counter (photo courtesy of Chenango County Sheriff's Office).

throughout the lower story of the house. The dogs had free reign of the first floor but were unable to exit the residence or access the attic. The dog bowls were empty but two large bags of dog food were ripped open and laid empty on the kitchen floor amidst the feces (Fig. 3). Food on the counter, such as cereal boxes, was untouched. It is unclear if the dogs had a water source, though the toilet is a possibility. The dogs exhibited overall good health when found and were not emaciated.

2.2. Anthropological analysis

The anthropological goals were to provide evidence of personal identity, analyze evidence of perimortem and postmortem trauma, and estimate the postmortem interval. Recovered skeletal remains included only an intact calvarium (skull vault), tibial and femoral diaphyses, and approximately 60 long bone splinters (Fig. 4). Only the femoral shafts contained a small amount of ligamentous attachments while the rest of the bones were devoid of soft tissue. There were no

redundant skeletal elements and the size of the bones was consistent between elements, indicating the remains were of a single individual. The bones were cleaned in a heated solution of laundry detergent and sodium carbonate for 4 h.

The construction of a complete biological profile, consisting of age, sex, stature, ancestry and antemortem pathologies, was not possible in this case given the sparse amount of skeletal remains available. Ancestry and stature could not be estimated due to the lack of the facial skeleton and long bone ends, respectively. The only diagnostic indicators of sex were the nuchal crests, which were not well developed, and the thin and gracile long bone diaphyses. These indicators suggested female sex. There were no epiphyses available but the length and structure of the long bones suggested adult. The ectocranial Lambdoid, Sagittal and Coronal sutures exhibited significant closure following the scoring system of Meindl and Lovejoy [8], while the endocranial sutures were obliterated. This suggested a broad age range of 30–60 years. The bones were gracile and small, indicating a petite individual.



Fig. 2. Calvarium and additional long bones further into the main walkway of the living room (photo courtesy of Chenango County Sheriff's Office).



Fig. 4. Nearly 60 long bone splinters were recovered from the living room floor.



Fig. 5. Deep arachnoid fovea (Pacchionian pit) on the anterior right parietal that perforates the external table.

The long bone shafts and fragments available did not demonstrate fractures or diseases that affected the individual in life. A deep arachnoid fovea (Pacchionian pit) was present on the endocranial surface of the right anterior parietal. The outer table was thinned and exhibited a small, pinprick sized perforation (Fig. 5). While such a feature could be useful for identification, antemortem radiographs of the skull were unavailable in this case. There was no evidence of gunshot or sharp trauma on the available bones.

The recovered bones displayed evidence of canine scavenging in the form of punctures, furrows, pits and scoring [1]. All of the free edges of the calvarium demonstrated gnaw marks and scoring was present along the contours of the vault (Fig. 6). All of the long bones present were scavenged and, with few exceptions, modification was confined to the ends. Most of the long bones were splintered and all exhibit scoring, furrows and/or gnaw marks at the free ends (Fig. 7). Some bone fragments were found in the dog feces. Given the few skeletal elements



Fig. 6. Scavenging damage of the skull. Note scoring on the anterior bosses of the frontal bone.



Fig. 7. Scavenging damage of the long bones. Note absence of epiphyses and scooping out of trabecular bone of the metaphyses.

recovered it appeared that the consumption of the body was nearly complete.

2.3. Putative identification/case resolution

The biological profile was consistent with the information known about the homeowner—a petite (100 lb/45.4 kg) white female, 54 years old, with a reported stature of 5 ft (152.4 cm). A putative identification was made based on the dentures labeled with her name. The woman had a history of mental illness and had been treated for previous suicide attempts. Evidence of prescription drug abuse was also indicated at the scene. Her medicine cabinet contained twelve prescription drugs, including three antidepressants, three pain relievers, two antibiotics, a muscle relaxer, two potassium bottles, and an unidentified drug. Of the 12 medications, only 2 were prescribed by the same doctor, indicating a strategy of “doctor shopping” to obtain multiple supplies of particular drugs. Acquaintances and neighbors stated that the victim had become increasingly reclusive.

The individual likely died approximately 4 weeks prior to discovery of the remains. She was under the care of a mental health professional but had not been seen at his office since late November of 2005. Her debit card was last used to buy groceries in late December and mail in her post office box dated to late January, 2006. In addition, the amount of dog feces in the house is consistent with a few weeks of indoor captivity for two dogs. The victim did not have any family in the area and her remains are still unclaimed.

3. Discussion

It was necessary to determine if the postmortem interval suggested by circumstantial evidence (e.g., dates of mail left in the post office box) was consistent with the state of the body. The postmortem interval is typically estimated from a variety of factors, including temperature, insect activity, and stage of decomposition. In this case, however, the cold weather precluded insect involvement and scavenging by the pet dogs altered the body to such a degree that traditional means of estimating the postmortem interval were not feasible. Thus, the

principle issue is how quickly two domestic dogs in an enclosed, confined environment can reduce a human body to the extent seen in this case. To address this question, many factors must be understood, including general canine scavenging behavior as well as relevant intrinsic properties of the body (e.g., disease, trauma) and extrinsic environmental factors, such as alternate food sources.

Some decomposition would be expected given the warm temperature inside the house. However, an examination of the scene did not reveal any decomposition stains, blood or odor, suggesting that consumption of the soft tissue began soon after death and was relatively rapid. Studies of canine behavior suggest they scavenge remains when they are relatively fresh and soft tissue reduction can be swift [6,9,11]. Further, the sequence of consumption and disarticulation of human bodies is relatively constant [3]. Feeding typically begins at the face and neck and then moves to the thorax (chest). The upper extremities are then disarticulated from the trunk followed by the lower extremities. Finally, the trunk is disarticulated and consumed. In their natural environments, coyotes and wolves are known to disarticulate body parts and scatter them over a wide area [3–6]. Outdoor domestic dogs also scatter human remains, as Haglund et al. [3] report a mandible found 0.4 km from the rest of the skeleton. From the evidence available in this case it is impossible to determine if the expected disarticulation sequence was followed, although the amount of scatter was minimal and confined to the one area of the living room.

A retrospective study of canine modified remains from the American Northwest indicates that bodies found outdoors at the same stage of disarticulation from canines as seen in this case (most likely from coyotes) had a postmortem interval of 12 months or more [3]. On the other hand, Willey and Snyder [6] found that five adult wolves in an outdoor enclosure could consume a large deer (55–73 kg) in 4–7 days. This was a controlled feeding study in which the wolves were not given any other food while feeding on the deer. Rossi et al. [10] discuss four case studies of domestic pet consumption of human owners from the UK. The disarticulation sequence by the three dog cases is consistent with that reported by Haglund et al. [3], but the time frame is clearly accelerated in cases of confinement with a body. In one case, a German Shepherd consumed the face, neck and thoracic organs as well as several cervical and thoracic vertebrae, both clavicles, the left scapula, upper ribs, and the right upper arm. The postmortem interval was not more than a few days [10]. Significant trauma of the face, neck and thorax by an Alsatian have been documented in less than 45 min between death, caused by a self-inflicted gunshot wound, and arrival of emergency personnel. Notable in this case, too, was the absence of blood from the scavenging activity despite the very short postmortem interval [11]. There were no case studies found of indoor canine consumption of human remains to the extent seen in the present case.

While several sources postulate that canine scavenging of human remains is motivated only by hunger [10,12,13], the amount of available food in the residence does not necessarily impact when dogs and other confined pets will begin feeding on the body [11]. For instance, the Alsatian had food available in

the dog dish next to the victims' bed and was alone with the victim for less than an hour [11]. In the present case, dog food had been consumed, though it is unknown how much food was in the bags when the victim died. In addition, food such as cereal was accessible on the countertops but was untouched. Thus, it does not appear that consumption of human tissue is necessarily a last resort to starvation for domestic dogs. Attempts by the dog to rouse or "resuscitate" the fallen owner by licking and nipping the face may initiate scavenging activity [11].

Mitigating intrinsic factors, such as clothing, drugs and alcohol, diseases and perimortem trauma may also impact canine scavenging behavior and, hence, the postmortem interval. Clothing did not appear to be a significant deterrent in this case given the complete consumption of the soft tissue and feet as well as severe fragmentation of the leg bones. The victim's heavy, cold-weather clothes were on the floor in the living room and covered with dog hair but were not shredded or otherwise compromised. In another case, a poodle has been documented as causing significant damage to a leg despite the presence of pants [14].

The medical and prescription history of the victim suggests one or more potent prescription drugs could have been in her tissues at the time of her death. No published reports could be found that discuss the impact of human-ingested drugs on dog scavenging behavior. However, Rossi et al. [10] report a case of ten cats that scavenged the remains of a man who had died of a drug overdose. Though the postmortem interval was only three days, all of the cats died, suggesting that the cats were not repelled by the drugs in the tissue and that the transfer of drugs via consumption is a more parsimonious explanation for the feline fatalities than starvation. While it is likely that the homeowner in the current case died of an overdose, suitable tissue to test acute drug levels was not available. The dogs appeared healthy when found and were not tested for drugs.

Perimortem trauma will provide insects an additional portal of entry into the body, altering the normal pattern of initial infestation of the nose, mouth and anus [15]. However, there is little information in the literature on how bodily injuries deter or attract canines to the body or affect their feeding pattern. In the case of the Alsatian described above, the bullet entered the mouth and exited the back of the neck [11]. The dog did scavenge these areas but since the mouth and throat are natural early targets of scavenging, it is unclear if the wound had any real effect. The current case also cannot shed light on this issue as there was no evidence of gross perimortem trauma on the few bones recovered.

The social parameters of this case fit a trend noted elsewhere [10] in which victims of postmortem feeding live alone with one or more pets and are socially isolated. Disability, physical and chemical abuse, and mental illness can contribute to social isolation [16], and a history of mental instability and prescription drug abuse likely contributed to seclusion in this case. In the months leading up to her death, the victim rarely left the house and, if necessary, did so in the evenings. Seasonality may also be a factor in that indoor isolation is common in the winter months and lack of visual contact with neighbors over extended periods of time is not unexpected.

4. Conclusions

This case documents canine scavenging of human remains in an enclosed, confined setting. Unlike open environments, in which scavenged bones can be widely dispersed, scattering of human remains was limited to a specific area of the room in which the victim likely died despite the fact that the dogs clearly had full range of the main floor as evidenced by the scat distribution. The clothing presumably worn by the victim was intact and, though covered with dog hair, was not shredded and did not seem to deter the dogs from feeding. While there are no published case studies of indoor contexts in which consumption progressed to the degree seen in this case (though see [7]), a minimum time period of days or weeks is likely as opposed to months. The impact of intrinsic factors of the human body on canine scavenging behavior requires more in depth study in order to better estimate the postmortem interval.

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