CASE REPORT

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Artefact in Forensic Medicine: Postmortem Rodent Activity

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ABSTRACT: The human body may be attacked by a variety of animals. It is a potential source of confounding marks for forensic practitioners when unmasking criminal activity. A case that posed some problems for the crime scene investigators on discovering a dead body indoors, which had both ears missing is discussed. The suspicion initially was that of homicidal mutilation of the corpse. A general awareness of artefactual postmortem animal activity may avoid their misinterpretation. This short report acknowledges a persistent paucity in the forensic literature on the subject of human remains and postmortem animal activity.

KEYWORDS: pathology and biology, crime scene investigation, forensic pathology, postmortem artefact, soft tissue injury, mutilated corpse, human remains, animal activity, gnawing, scavenging, teeth marks, rodents, carnivores, household pets

Recent guidelines to differentiate soft tissue artefacts caused by rodents and carnivores [*1*] provide useful clues for forensic practitioners when interpreting postmortem rodent destruction of human remains. The telltale gnawing marks of rodents may be distinguished from characteristic bite impressions left in the bones by other carnivores [*2*]. The carnivores have a topographic predilection and produce a constellation of pits, punctures, scoring and furrows that are usually distinct from other bone artefacts [*2*].

The postmortem features that distinguish between soft tissue damage by rodent activity and carnivore scavenging are tabulated elsewhere [*1*]. They are affected by several factors such as the dental structure, mastication power, feeding behavior and nature of the tissue targeted, which may explain the cross similarities observed. It can, however, be a problematic dilemma for forensic pathologists when determining whether something sinister may be masquerading as "end result" of rodent disturbance.

The rodent activity might be secondary to mutilation initiated by household pets or perhaps an adverse modification of a pre-existing injury inflicted by human hands. It has been documented that superficial antemortem skin injuries may be modified by insects

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[3]. A general forensic awareness of artefactual postmortem injuries may avoid their misinterpretation.

Case Report

The body was that of an appropriately clothed, well nourished, elderly, white male who lived alone on the outskirts of London. He had been found dead by neighbors. He was lying supine on a carpeted floor in a rather squalid small bedroom. It was on a warm day in Autumn but there was no entomological predation and no evidence of early putrefaction. The postmortem interval was estimated to be around 36 h. There was no sign of a struggle and the residence was secure.

The ears were missing entirely and there was some damage to the nose (Figure 1). The crime scene investigators initially suspected the ears "cut off" and symbolic of perverse homicidal mutilation. A closer inspection of the damaged soft tissue margin showed characteristic circumscribed crenated edge of a high specificity for rodent activity, although a similar pattern can be created by a domestic cat. There was a hint of laminated soft tissue damage. There were no discernible rodent hairs adherent to the exposed soft tissue. A significant feature was the absence of hemorrhage at the scene. A diagnosis of postmortem destruction of the soft tissue by rodents was consolidated by finding a few rat droppings in the vicinity of the head.

An autopsy confirmed that his sudden death was due to coronary heart disease, for which he attended a cardiology clinic regularly and was receiving hospital medication. The rest of the postmortem examination was essentially unremarkable.

Discussion

The human corpse may be attacked by a variety of animals (such as birds, fish, crustacea, rodents, cats, dogs, foxes or wild carnivores) and insects [3]. The postmortem animal predation is typically on the bare exposed parts of the body and may take place within a short time of death, depending on factors such as seasonal variation and geographical locus [3].

It is quite rare for postmortem injuries to be caused by domestic animals, including large herbivores such as cattle and horses that are able to inflict hoof injuries (the latter may also bite) and other farm animals such as pigs [4]. Fatal mauling of humans by pet dogs have been reported [5,6]. Fatal attacks on humans by large cats, out of the wild, have also been reported [7].

A pet animal such as a cat or dog does not normally eat its dead owner unless it is housebound and starving or needs to get out [3,4]. A predatory dog attack, often involving more than one animal, occurs when an animate human is viewed as a potential prey [6]. The bite marks are said to be easily identifiable by a "garland like" pattern or "saw-edged" shape, together with stabs from the sharp canine teeth [4]. The feline bite has been described as much shorter and more rounded than that of the dog [5]. The big cats cause transverse incised and puncture wounds or parallel abrasions from the incisor teeth and parallel linear abrasions consistent with claw wounds [7].

An observation of what resembled tunnelled punctures from canine teeth, together with a slightly ragged and undermined edge, in the soft tissue at the attachment of the right ear (Fig. 1) raised the possibility of mixed animal activity involving a domestic carnivore. There were no characteristic canid claw marks, often V-shaped [1] beyond the damaged zone. Although the deceased did not keep any pet animals, a possibility of stray cats gaining access to the scene could not be excluded completely.

The typical feeding behavior of rodents and various other animal predators who scavenge human remains has received scant attention in the forensic literature. In an anecdotal

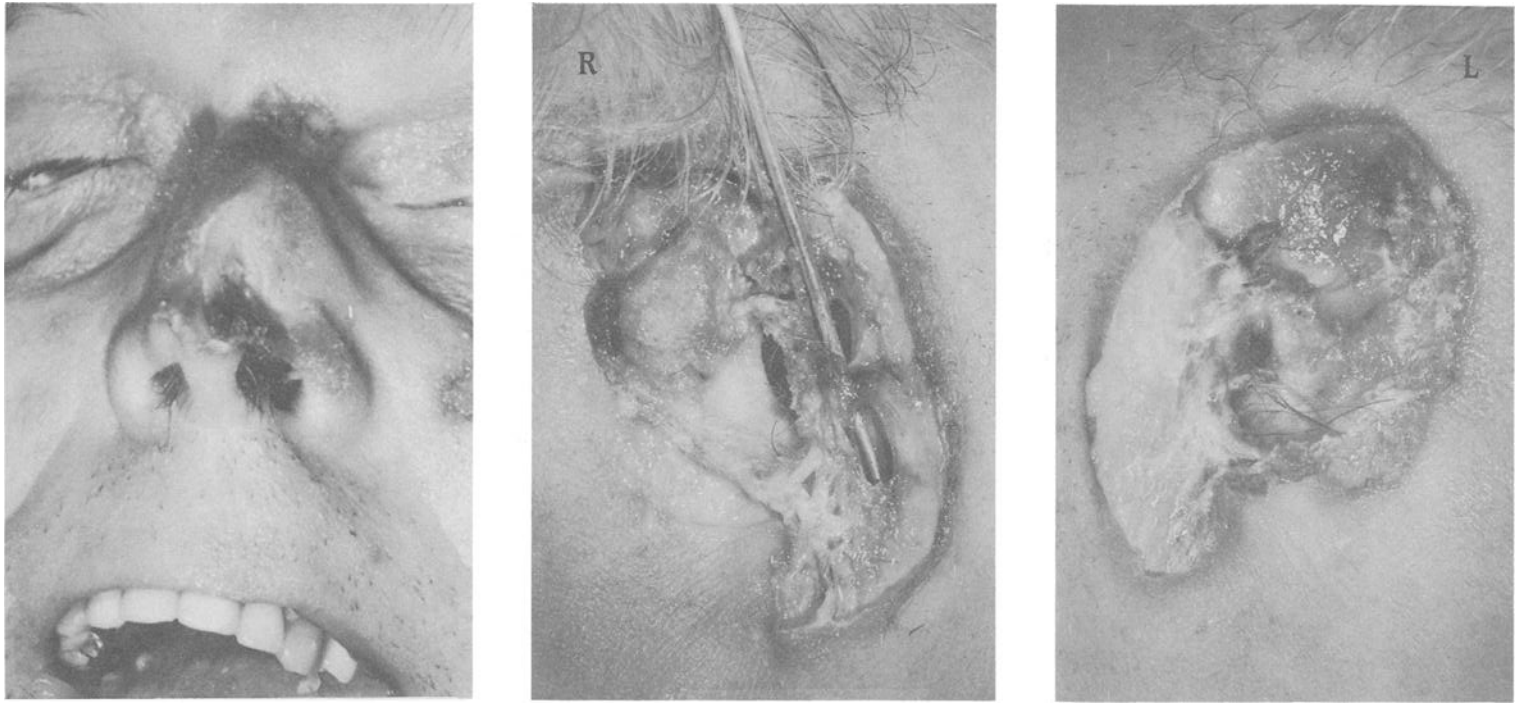

FIG. 1—*Soft tissue destruction of the nose and both ears due to rodent activity. The right ear shows tunnelled soft tissue punctures (probed) resembling canine tooth mark.*

case reported which involved rat activity and a human corpse outdoors, all soft tissue of the face and neck, including both eyes had been eaten away and both forearms completely defleshed or skeletonized within a postmortem interval of approximately three days [*1*]. It is not too difficult to imagine large predators outdoors rapidly devouring a human corpse and causing considerable destruction within a short time. Aquatic animals like fish may well eat up ears or other facial soft parts of a dead body, which on recovery from the water after a fortnight may be found reduced to a mere skeleton [*4*].

The deceased in this case report had expired for not more than 48 hours. A matter of general curiosity is the likely number of feeding rats and the period for onsite gnawing or chewing, of what was relatively fresh soft tissue, that must have occurred in order for both ears to be consumed completely? Because the part of the ears missing were not located, it is not possible to state whether distant soft tissue transportation took place.

It is well known that postmortem animal interference with human remains in forensic cases may modify the scene and hinder other aspects of a medico-legal postmortem examination. It is also a potential source of confounding marks which may be overinterpreted. A mistaken diagnosis of criminal activity, which results in wasting time of the law enforcing officers, can only be detrimental to good practice of forensic medicine.

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