

## **Delayed Post Mortem Predation in Lightning Strike Carcasses: Sense or Nonsense?**

**Ryan Blumenthal**

Senior Specialist: Forensic Pathologist  
Department of Forensic Medicine, University of Pretoria.

E-mail: ryan.blumenthal@up.ac.za

### **Abstract**

An adult giraffe was struck dead by lightning on a game farm outside Phalaborwa, South Africa in March 2014. Interestingly, delayed post-mortem predation occurred on the carcass, which according to the farm owners was an atypical phenomenon for the region. Delayed post-mortem scavenging on lightning strike carcasses has been anecdotally reported from time to time, although no formal studies have confirmed this phenomenon. The purpose of this article is to raise awareness of this phenomenon, with the view of more meticulous and scientific observations in future case studies.

### **Case History**

An adult giraffe was found dead in the South African lowveld (broad-leaved woodland of North Western Limpopo) the day after a severe thunderstorm (Figure 1).

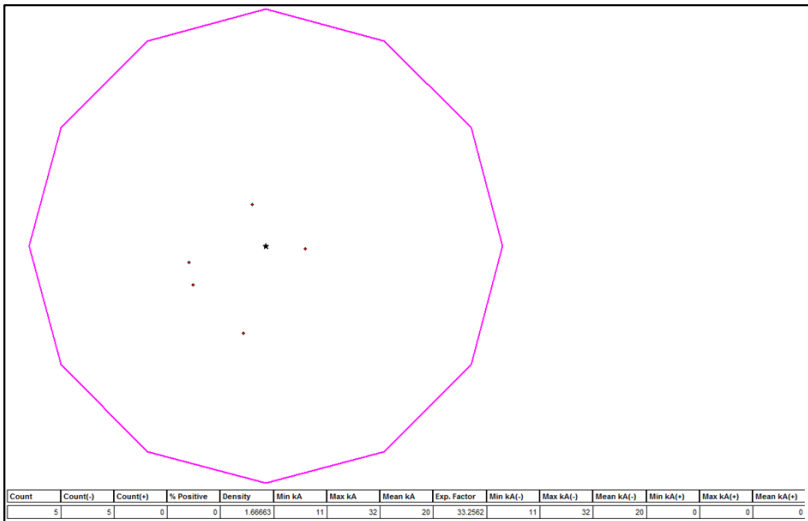
Lightning strike in the area was confirmed by the South African Weather Service. A Small Area Exposure Analysis was performed for

the period 5 March 2014 20:00 SAST – 6 March 2014 04:00 SAST. A 1km radius buffer around the reference point was selected. Five lightning strikes were recorded within a 1km radius around this point in the specified time period (Figure 2). The Small Area Exposure Analysis image was overlaid on Google Earth

showing the location of the five strikes (Figure 3).



**Figure 1** Photograph of the giraffe in early putrefaction (courtesy of K Smith).



Count	Count(-)	Count(+)	% Positive	Density	Min kA	Max kA	Mean kA	Exp. Factor	Min kA(-)	Max kA(-)	Mean kA(-)	Min kA(+)	Max kA(+)	Mean kA(+)
5	0	5	0	1.66663	11	32	20	33.2562	11	32	20	0	0	0

**Figure 2:** Lighting data of alleged strikes – star is the location of the dead giraffe (courtesy South African Weather Service).



**Figure 3:** Lightning data of alleged strike overlaid on Google Earth (courtesy South African Weather Services).

The carcass initially showed blackening of the head and neck; no other external injuries to the body could be identified. An unusual ‘ammonia-like’ smell was present around the carcass. Poisoning as a cause of death could provisionally be excluded, due to the fact that no other poisoned animals were present in the region and there were no signs of vomiting or diarrhoea. However no toxicological analysis was performed. It seemed as though the giraffe had died instantaneously as there were no visible signs of a struggle in the area immediately surrounding the carcass.

Interestingly, vultures and hyenas did not feed on the carcass for five days after the incident.

According to the owners of the farm, the smell from the giraffe carcass was overwhelmingly different from their usual experience when near decaying carcasses. Their dog reacted strangely and would not go close to investigate, which according to them was out of character.

While investigating the carcass (in their estimation about three days after the incident), they witnessed a large group of vultures flying low over the carcass. In their experience, the vultures would descend very quickly onto a carcass, especially one which was so clearly visible to them. The farm owners left the scene of death to allow for the vultures to settle and begin eating. On return to the scene

about five hours later, they were surprised to find the carcass untouched and the vultures had left the area. This, according to the farm owner's experience, was highly unusual.

Approximately one week after the suspected strike, the farm owner returned to the scene and reported that the carcass had been partially consumed by vultures. Although there are hyenas in the area, as well as other scavengers, there was no evidence that anything other than vultures had consumed any part of the carcass.

The owners returned to inspect the carcass again after a few days and the carcass remained unchanged. They did, however, notice that the tree above the carcass showed obvious signs of dead leaves on the higher branches. This finding could have been in keeping with direct or close lightning strike.

Another unusual observation was that the hooves of the giraffe had dislodged from the lower legs. In their experience of other hoofed game, the hooves remain firmly intact on a carcass long after death.

## Discussion

Post-mortem interval in human corpses is not an exact science. The

determination of time since death is thus a very difficult and complex task (Siegel *et al.* 2000).

Generally speaking, initial decay in humans takes place about 36-72 hours after death. The corpse still appears relatively fresh externally but internally it begins to decompose, owing to the combination of enzymatic autolysis and bacterial proliferation from the intestines.

The giraffe is a ruminant, and as such has a rumen which is a large fermentation tank. Fermentation continues unabated after death and bloating occurs extremely rapidly after time of death as the animal can obviously not eructate to remove the gas that is liberated during fermentation. Bloating is visible within 30 minutes after death. The fermentation also produces large amounts of heat that cannot be dissipated, so the carcass temperature rises rapidly, which accelerates decomposition.

Early putrefaction or green putrefaction in humans takes place about one week post mortem. This period often begins with a greenish discoloration, skin blisters, abdominal swelling with gas, oozing of putrefactive fluids from the mouth and nostrils (not to be mistaken for blood!), and the typical odour of decay.

Black putrefaction in humans takes place about a month post mortem. The corpse exhibits a flesh of creamy consistency with exposed parts turning black, especially the head and face. Skin decomposition results in generalized epidermal detachment, and the nails fall off. The abdomen collapses as gases escape. The odour of decay is at its maximum.

Butyric fermentation in humans occurs up to two months post mortem. This stage is marked by progressive drying of the cadaver and the occurrence and proliferation of mould. The odour is less offensive and becomes typically cheesy.

Dry decay and skeletonization in humans generally takes place months to years later. Final drying of the corpse and progressive disappearance of the remaining soft tissues occurs in this stage.

Unfortunately, the chronology of putrefactive events is only indicative of what may occur, as enormous and generally unpredictable inter-subjective variability exists. Ambient temperature obviously influences the rate of putrefaction to a major extent, but many other factors such as body corpulence, ante-mortem disease or circumstances of death (sepsis or oedema during the period preceding death may hasten decomposition).

Animal predation is part of the natural food chain, which returns proteins, fats and carbohydrates of dead bodies to other animals, some of it passing back to the vegetable kingdom through soil nutrition.

The type of predation varies greatly with geography and season. If the corpse or carcass is lying in the countryside, large predators will cause prompt and severe damage, with even complete destruction being possible in a short time (Knight 2004).

Vultures and hyenas are the main scavengers present on the aforementioned farm, which is located close to the Kruger National Park. Other large animals on the farm are usually predated almost immediately. This 'myth' of delayed post mortem predation on lightning strike fatalities has been heard time and time again from farmers around the country, although no formal studies have confirmed this phenomenon.

Some farmers in the nearby Klaserie region report that as many as thirty vultures will sometimes sit around a carcass for three days continuously without coming down to feed, and then flying away. As they are scavengers, they can be extremely cautious about coming down to a carcass. The presence of humans and

a dog could possibly have disturbed the vultures.

The fact that the hooves fell off early may be in keeping with lightning strike. Lightning strike in humans may cause a so-called 'tip-toe' sign where lightning exits the body through the foot (Fahmy *et al.* 1999). This typically presents as a crater on the sole of the foot. This could offer a possible explanation with regards to the hooves of the giraffe falling off or becoming 'loose', early.

If delayed post mortem scavenging were indeed a reality, perhaps it would be due to some sort of lightning-related chemical odour on the carcass. Perhaps singed fur could release a sulphur-like smell. Perhaps various esters or amines are released from a body post lightning

strike. Whatever the cause may be, this anecdotally reported phenomenon requires greater scientific scrutiny.

Cattle killed during a lightning strike in Middleburg were loaded *en masse* by a local predator park owner for feeding to his lions, hyenas, leopards, panthers, tigers, etc. He reported no hesitation on the part of the carnivores to devour the meat, some of which was refrigerated for later use (personal communication).

The purpose of this article is merely to raise awareness of the phenomenon of delayed post mortem predation of lightning strike carcasses, which may or may not exist.

Perhaps more meticulous scientific studies and observation can be performed in future cases?

## Acknowledgements

The author would sincerely like to thank Bill and Kim Smith, on whose farm this incident occurred. The author would also like to thank Morné Gijben, from the South African Weather Service for providing the lightning strike data. The author would also like to thank Dr Zephne Bernitz for her comments that improved this article.

**Key words:** Lightning strike; delayed post mortem predation; vultures; scavengers; hyenas; South Africa.

**References**

- Jay A. Siegel, J. A., Saukko, P. J. & Knupfer, G. C. 2000. *Encyclopedia of Forensic Sciences*, 2nd Edition. Elsevier Academic Press. Pennsylvania State University. Academic, pp. 1357 – 1363.
- Knight, B. 2004. *Knight's Forensic Pathology*, Second Edition, Arnold Publishers, Chapter 2, Animal Predation, pp. 75-76.
- Fahmy, F.S. Brinsden, M.D., Smith, J. & Frame, J.D. 1999. Lightning: the multisystem group injuries. *Journal of Trauma* 46: 937-40.

\*\*\*\*\*