

CASE REPORT

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Post-mortem freshwater animal predation—a case report

Jayanth S. H.^{*} , Geetha K. B., Vidusha Vijay and Manju Prakash

Abstract

Background Post-mortem animal predation affects human corpses in various ways. Lesions are a characteristic of the type of terrestrial or aquatic predators. These lesions can be misinterpreted and may be challenging for the forensic pathologist. Different species in freshwater cause different types of lesions depending on their feeding habits. There is a paucity in the literature about post-mortem lesions caused by freshwater animals.

Case presentation A 24-year-old man had accidentally drowned while fishing in the River Cauvery. His body was recovered after 3 days. Though the cause of death was drowning, post-mortem animal activity was observed during autopsy, and a live juvenile crab was also found along with the body. Distinct post-mortem lesions caused by decapods *Oziotelphusa wagrakarowensis* and small fishes *Hypselobarbus dubius* and *Dawkinsia arulius* are described.

Conclusions Aquatic predators and their activity on the corpse are different from that of terrestrial predators. Knowledge of the local fauna is required to correlate the lesions on the body to the predator.

Keywords Drowning, Freshwaters, Predate, Aquatic organism, Case report

Background

Medico-legal investigation of bodies recovered from large freshwater bodies like rivers is quite challenging. Retrieval of bodies in flowing water is another major hurdle. Bodies are usually recovered 2 to 3 days after a missing complaint is lodged at a nearby police station. Along with post-mortem changes, one would observe significant artifacts and post-mortem injuries during autopsy which would interfere with achieving the objectives of the forensic autopsy.

Though post-mortem injuries and artifacts caused by animal predation are well-known to forensic pathologists, they can sometimes be misinterpreted by investigating authorities. These can be caused by animals on land, in air, or in water. Predation by land animals is more

common; insects, rodents, foxes, dogs, and big cats cause post-mortem injuries over bodies found in open spaces. Each animal leaves behind a characteristic bite mark or wound which is distinctive to the biting action of their teeth. A wide range of aquatic animals like fishes, crustaceans, crocodiles, and sharks predate on submerged bodies. The type of aquatic animal species found in a particular aquatic environment depends on the type of water body like lake, river, or sea. Each one of them causes specific post-mortem lesions on a human corpse. Crustaceans are considered the most effective tissue removers in water, typically leaving oval to round, crater-like dermal lesions of varying size Tsokos and Tsokos (2005). Lesions can sometimes mimic ante-mortem injuries. A rare form of post-mortem freshwater animal predation can sometimes mislead the forensic pathologist. Here, we report a case of post-mortem predation by fishes and decapods on a 24-year-old male whose body was recovered from River Cauvery.

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Case presentation

A 24-year-old male had gone missing, and a complaint regarding the same was registered a day after at a nearby police station. As per an eyewitness, he was last seen fishing in the waters of the nearby River Cauvery. The search party found and retrieved the completely submersed body after 2 days, and the body was found 4 km downstream under the rocks. The body was subjected to a medico-legal autopsy on the same day after 6 h of retrieval.

On examination, the body was of an adult male with only track pants on him. Post-mortem staining could not be appreciated, and rigor mortis had passed off. Marbling of the veins was present over the front of the chest. The skin over both palms and soles was wrinkled, bleached, and sodden. There was a loss of skin and soft tissue on the whole face (Fig. 1). Two circular defects of about 7 cm in diameter were observed on the front of the left side of the chest and over the front of the left side of the abdomen (Figs. 2 and 3). The defects were muscle deep with loss of skin and subcutaneous tissue. The defect on the abdomen was surrounded by a larger area of skin loss. Margins of the defects show scalloping. There was another oval defect measuring 5 × 4 cm with loss of skin and subcutaneous tissue present over the outer aspect



Fig. 1 Aquatic predator activity (freshwater fish)—loss of skin and soft tissue of the whole face



Fig. 2 Aquatic predator activity (freshwater crab)—circular defect on the front of the left side of the chest

of the left arm. Two large defects involving skin and soft tissue exposing the underlying muscles, vessels, and tendons were present over the left upper limb and left foot. Nail beds were bluish-discolored. A juvenile live freshwater crab was also seen on the cloth material in which the body was wrapped and brought to the mortuary.

Internal examination revealed fine froth and gravel in the respiratory tract with voluminous lungs. Froth was observed upon sectioning the lungs. The heart was unremarkable with patent coronary arteries. The stomach contained water and gravel. Other organs were intact and congested.

The skin around the defect was subjected to histopathology and was negative for vital reaction. Toxicology screening did not detect any poisons or alcohol.

The cause of death was attributed to asphyxia as a result of drowning, and the manner was determined to be

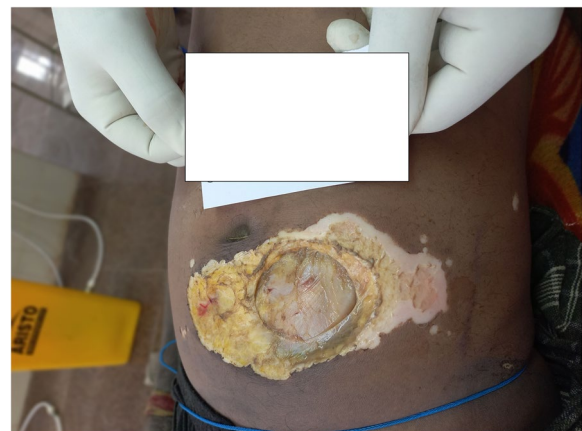


Fig. 3 Aquatic predator activity (freshwater crab)—circular defect on the front of the left side of the abdomen

accidental. Defects present over the body were opined to be of post-mortem in nature and were caused by freshwater animal predation.

Discussion

Drowning is one of the common causes of unnatural death in rural India especially where there are nearby water bodies. Accidental drowning is more common than suicide. Inability to swim, lack of supervision, lack of physical barriers such as fences, failure to wear life-preserving equipment, alcohol impairment, and seizure disorders are certain factors associated with unintentional drowning Armstrong and Erskine (2018).

Young men are more at risk to drown in natural bodies of water. Though they are able to swim, they drown either by swim fatigue or rough/swift waters. Swimming in unsecured or unsupervised locations (i.e., ponds, lakes, rivers) where depth and volume of water cannot be predicted and getting caught in whirlpools are common causes of death in swimmers.

Predators alter ante-mortem injuries; devour skin, soft tissues, and internal organs; create defects which mimic injuries; and feed on the insects and ova on the corpse. These will interfere with medico-legal death investigation and causes difficulty in fulfilling the objectives of the forensic autopsy. Destruction of the face, loss of skin having tattoo marks, and scars make it hard to identify the deceased. Sometimes, it is quite challenging to determine the cause and manner of death and also to estimate the post-mortem interval Erkol and Hösükler (2018).

The type of post-mortem animal activity depends on the location of the body, the type of animal species found in that area, and their eating habits. Animal activity on submersed corpses is different from that of land animals. Knowledge of the type of aquatic animal species is required to interpret the findings on the body during the autopsy. One should investigate and examine carefully if terrestrial predator activity is found on a submersed body.

With the face submerged, the drowned mobile body will often attract aquatic animals including fish, decapods, amphipods, and crocodiles Petrik et al. (2004). Animals will feed on the soft bits of the face including the lips, nose, and ears. Circular and oval lesions were observed in the present case over the trunk, left upper limb, and left foot, and there was loss of skin and subcutaneous tissue over the face. Crustaceans are considered the most effective tissue removers in water, typically leaving oval to round, crater-like dermal lesions of varying size Tsokos and Tsokos (2005). Lunetta and Modell in a comprehensive review of literature have documented crater-like pits of varying size caused by crustaceans and soft tissue destruction of the face by small fishes

Lunetta and Macroscopical (2005). Knight also describes that circular defects in the skin exposing the subcutaneous fat and muscles are made by crustaceans such as crabs Saukko and Knight (2016). Review of literature and knowledge of local aquatic predators were considered in attributing lesions on the body to post-mortem predation by crustaceans like freshwater crabs and that over the face to freshwater fishes.

Loss of tissue with irregular scalloped edges indicates post-mortem animal predation. Bones are not damaged markedly if the bodies are retrieved from deep waters Dumser and Türkay (2008). Larger aquatic animals may amputate the drowned body. Alligators and crocodiles cause a characteristic pattern of punctures. The large punctures are paired and get closer to each other as they approach the snout Drowning et al. (2005). Starfish cause dermal hematomas by their peculiar mechanism of feeding, namely sucking. When inflicted in the early post-mortem interval, these hematomas have been reported to be easily mistaken for vitally sustained hematomas Tsokos and Tsokos (2005).

In the present case, the person had drowned accidentally, and the body was submersed for about 3 days. Cause of death, manner of death, and post-mortem interval were determined without ambiguity. However, identification based on facial recognition was not possible as the skin and soft tissues of the face were eaten away by aquatic animals. The deceased was the only person who had gone missing in that particular locality during that period. Based on this and other morphological features of the body, the deceased was positively identified by the police.

Lesions over the face where there was loss of skin and soft tissues were opined to be caused by post-mortem predation by freshwater fishes. Circular lesions over the trunk, oval lesions over the left arm, and other lesions involving the left upper limb and left foot were opined to be caused by post-mortem predation by freshwater crabs. *Hypselobarbus dubius* and *Dawkinsia arulius* are species of small freshwater fishes, and *Oziotelphusa wagra-karowensis* is a species of crab found in South Indian freshwaters Pati et al. (2020). A juvenile crab of the same species was also recovered from the clothing covering the deceased during autopsy.

Conclusions

Artifacts caused by post-mortem predation can mislead forensic pathologists. Aquatic predators and their activity on the corpse are different from that of terrestrial predators. Knowledge on the local fauna is required to correlate the lesions on the body to the predator. Post-mortem circular defects involving the skin and subcutaneous tissue are because of predation by decapods like crabs.

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Nil

Authors' contributions

JSH and GKB carried out the autopsy. VV took the autopsy pictures and reviewed the literature. JSH wrote the manuscript with support from MP. All authors have read and approved the manuscript.

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Availability of data and materials

The data that support the findings of this study are available from the corresponding author [JSH] upon reasonable request.

Declarations

Ethics approval and consent to participate

Consent to participate is not applicable as the subject had been deceased and was subjected to a forensic autopsy by the police. Ethics approval was taken from the Ethics Committee of CDSIMER.

Consent for publication

Informed written consent was taken from the next of kin of the deceased to publish the paper.

Competing interests

The authors declare that they have no competing interests.

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