Veterinary Today
Vol.1 Issue 6 June,
2023 Pages:75-77

Necropsy: A Brief Introduction

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Introduction

A post-mortem examination, colloquially known as a necropsy, serves as a vital diagnostic tool for ascertaining the underlying cause of diseases. It involves meticulous examination of tissue samples through the means of both macroscopic and microscopic analyses, as well as conducting relevant serological and microbiological investigations. This comprehensive process not only aids in identifying the precise aetiology of ailments but also imparts valuable insights from the deceased to the living, essentially conveying a message of wisdom.

The necropsy procedure encompasses a systematic evaluation of the deceased organism, encompassing a detailed scrutiny of various organ systems. Subsequent to the examination, any notable macroscopic pathological alterations are meticulously documented, followed by their correlation with the medical history to arrive at an accurate diagnosis of the prevailing diseases.

Objectives:

1. To ascertain the underlying etiology of mortality.
2. To validate or negate a clinical diagnosis.
3. To procure specimens for laboratory analyses.
4. To comply with judicial mandates in veterinary-legal cases or for animals covered by insurance.
5. To diagnose a disease outbreak within a herd or flock and subsequently implement appropriate therapeutic interventions for other animals exhibiting similar clinical manifestations.
6. To contribute to the progressive advancement of scientific understanding across diverse realms of research and development.

Postmortem examination should not be performed when:

1. The deceased animal is suspected to have succumbed to anthrax, with the aim of preventing spore formation (following the suspicion of anthrax bacilli presence, blood smears may be prepared from the ear vein or collected unclotted blood).
2. The cadaver is extensively decomposed, characterized by complete organ liquefaction.
3. The remains of the deceased animal are not presented as an intact whole body, but rather in fragmented portions.

Precautions

1. Validate the demise of the animal by observing cessation of respiration, cardiac activity, and ocular motility. Additionally, assess the cooling of the body and onset of rigor mortis.
2. Acquire a formal requisition letter from the authorized entity, particularly essential in veterolegal or insured cases.
3. Refrain from conducting post-mortem examinations during night-time under artificial illumination, as colour changes, which serve as the foundation for lesion identification, may not be discernible. Perform post-mortem procedures exclusively in daylight.
4. Obtain a comprehensive medical history of the animal from the owner, attending veterinarian, or law enforcement personnel.

5. Employ appropriate personal protective equipment such as aprons, gum boots, and gloves. Remove any accessories, including watches and rings, that could impede the postmortem examination process.
6. Identify the animal and record pertinent information, including species, breed, sex, age, and color. Additionally, measure the length of the animal from the point of shoulder to the point of hip, determine the height at the shoulder level, ascertain the girth behind the forelimb, and, in horned or antlered animals, measure the distance between the tips of the horns or antlers.

Time of death

4. Accurately determining the time of death is a critical factor, especially in veterolegal cases. Typically, this information is obtained from the owner or attending clinician. Although challenging, it is possible to approximate the time of death by carefully observing the following parameters:
5. **Rigor Mortis** the postmortem phenomenon characterized by the stiffening of muscles, plays a crucial role in estimating the approximate time of death. The duration of rigor mortis is typically around 24 hours, although it is subject to considerable variability and relies heavily on the ambient temperature at the carcass location. Notably, certain circumstances such as exhaustion or drowning can expedite the resolution of rigor mortis, often occurring within approximately three hours. Conversely, cachectic animals may exhibit delayed onset of rigor mortis.

The progression of rigor mortis follows a discernible pattern, with the jaw muscles being the first to undergo stiffening, followed by the eyelids, tail, digits, distal limb muscles, and ultimately the larger limb muscles. The relaxation of muscles occurs in a similar sequential manner. Importantly, once rigor mortis has been disrupted through body or limb movement, it will not reoccur.

1. **Algor Mortis**- Algor Mortis refers to the postmortem cooling of the carcass following death. While it is a valuable indicator, it is not entirely definitive in determining the precise time of death. Nonetheless, it aids in identifying recently deceased animals.
2. **Corneal clouding** – Algor Mortis, the cooling process that occurs after death, typically initiates around 25 hours after death in carnivores. The presence of closed eyelids plays a crucial role as it prevents the cornea from dehydrating, thereby facilitating more accurate observations during the assessment of algor mortis.
3. Clouding of the lens, rumen mucosal sloughing, blood glucose levels, stomach content digestion, and the presence of fly eggs or larvae are additional parameters that can be utilized in the determination of death. However, it is important to note that these parameters exhibit high variability and should be interpreted with caution.

Techniques Of Postmortem (Necropasy) Examination

Prior to commencing the dissection of the carcass, it is imperative to first exclude the possibility of anthrax. To achieve this, blood smears are obtained by puncturing the ear tips and subsequently subjected to microscopic examination following staining with a mature polychrome methylene blue stain. This method serves the purpose of detecting any potential presence of anthrax bacilli.

1. Position the animal in a left lateral recumbent posture.
2. Perform a midventral incision using a knife, extending from the chin to the anus.
3. Carefully expose and isolate the prepuce, scrotum, or mammary gland region.
4. Proceed to remove the skin in a dorsoventral direction, ensuring the face, neck, thorax, and abdomen are adequately stripped.
5. Dissect the muscles and fascia between the scapula and the body, subsequently removing the forelegs.
6. Elevate the hind legs and sever the coxofemoral ligament.
7. Thoroughly examine the subcutaneous tissue, muscles, and superficial lymph nodes, including prescapular, prefemoral, supramammary, etc.
8. Access the abdominal cavity by incising the muscles and peritoneum.
9. Gain entry into the thoracic cavity by cutting the xiphoid cartilage at the sternum. Elevate the ribs and apply pressure to facilitate their disarticulation from the vertebral column.
10. Systematically examine the visceral organs within both the abdominal and thoracic cavities.

- Thoroughly examine the heart, lungs, trachea, esophagus, mediastinal lymph nodes, and diaphragm.

Abdominal Cavity:

- In ruminants, carefully inspect the rumen, reticulum, omasum, and abomasum.
- In other animals, focus on the stomach.
- In all animals, meticulously examine the liver, pancreas, intestine, mesenteric lymph nodes, spleen, kidney, ureter, and urinary bladder.