

In veterinary medicine the death of an animal patient is often thought of as the end of a medical case. However until a thorough post-mortem examination is completed, the case is **not** closed. In fact, the post-mortem examination (autopsy, necropsy) is a very useful and necessary procedure in the diagnostic process as it often defines the cause of death.

Why do a post-mortem examination? A good post-mortem has five benefits:

1. Benefit to the owner/breeder:

- It may reveal deficiencies in husbandry practices which can be modified or corrected.
- It may reveal hereditary and/or congenital (birth) defects which may influence future breeding decisions.
- By pinpointing the underlying disease process or processes, it allows the initiation of treatment for similarly affected individuals in a litter, household, kennel, etc.
- The results of a post-mortem exam may facilitate the development and implementation of a preventive medicine/ husbandry program in the kennel to avert future deaths if possible.

2. Benefit to the attending veterinarian:

- A specific diagnosis, in many cases, leads to a specific treatment.
- It can reveal individual kennel problems and these can serve as a starting point when future disease problems occur. This avoids time consuming trial-and-error treatments and allows specific treatment and preventive measures to be started earlier.
- It adds to the experience and learning of the veterinarian.

3. Benefit to the breed:

- It may reveal breed-specific problems.
- It will provide useful information to other breeders and veterinarians.
- It allows accumulation of specific information concerning the deaths of individuals in that breed and allows for

statistical analysis and compilation of data.

4. Benefit to humans:

- Since animals live with and amongst humans it may reveal zoonotic diseases which may be transmitted to people. This allows public health personnel to be notified and act to prevent human exposure and disease.
- We now know the close relationship genetically between animals and humans. More and more we are finding the same hereditary and genetic diseases in animals and people. The results of the post-mortem examine may facilitate the development of animal models for human disease which can lead to new treatments for both animals and people.

5. The post-mortem examination often results in "closure" for the owner, the veterinarian and other people involved in the death of an animal.

What constitutes a **thorough** post-mortem examination? The post-mortem examination consists of the following categories:

- Gross pathology
- Histopathology
- Toxicology
- Microbiology
- Parasitology
- Virology
- Clinical pathology

Gross Pathology

This consists of the examination of every organ and system, including the brain and spinal cord. By visual examination, the veterinarian is looking for obvious abnormalities in organ appearance and the relationship between organs. The body is examined for trauma due to vehicles, bite wounds, lacerations, wounds caused by projectiles, burns, chemicals, etc. Many bacterial and infections as well as cancer will often produce characteristic changes in organ appearance – these often determine the direction of the rest of the post-mortem exam. All too often the examination ends here. It must be pointed out that the gross appearance of an organ can be misleading and degenerative

changes following death can be misinterpreted -- it isn't always like a CSI episode. That being said the gross exam is useful in revealing the following broad categories of problems such as neoplastic changes resulting in tumors, potential bacterial and viral diseases, foreign objects, trauma, congenital or hereditary defects.

Histopathology

This microscopic examination of tissues is very important and useful. Many disease problems and processes are not visible to the naked eye and not obvious on the gross exam. Tissue samples are harvested from suspicious areas as well as the liver, spleen, intestinal tract, kidneys, pancreas, lymph nodes and lung. Additional samples might include heart muscle, skeletal muscle, nervous system, the eye and bone. These samples are sent to a veterinary diagnostic laboratory and it may take up to several weeks for the results to be reported. Histopathology will often give the definitive diagnosis so it is a very important procedure to do.

New procedures have entered the field with the advent of immunohistochemistry staining, Congo Red staining, etc.

Toxicology

Although not commonly done, the toxicological examination is done in those cases where poisoning, whether intentional or accidental, may be involved. In these cases blood, stomach/intestinal contents and samples of the ingested material are sent to the laboratory for analysis.

Microbiology

Here samples are taken for bacterial culture. The causative organism is identified and tested against various antibiotics to determine its susceptibility. Most commonly the lungs, trachea, urinary tract and reproductive tract are cultured. Cultures can also be done on intestinal contents, any discharges or abscesses. Time is especially critical in this

phase of the post-mortem exam – upon the death of the animal normal bacteria from the gut invade the tissues and will obscure the results.

Parasitology

This aspect of the post-mortem involves the examination of the lungs, intestinal tract and heart for evidence of internal parasites. Many parasites are only visible under the microscope and not all are picked up on routine fecal exams.

Virology

This phase of the post-mortem examination is perhaps the most difficult and costly. Viral isolation requires special laboratory equipment, special tissue culture media for growing viruses and time. Viral isolation can take 4 weeks or longer. Special transport media is necessary for shipment of samples, although many times a local human hospital can be helpful. Electron microscopy is also used to identify viruses which require special processing. Typical tissues cultured for virus isolation in clued the liver, kidney, lungs and intestines.

Clinical pathology

Included in this category is routine blood testing which can be hampered due to storage conditions of the body, time after death, and many other factors. Newer methodologies include DNA/RNA analysis, PCR techniques, serology, and other testing procedures.

Up to this point we have addressed what goes into a thorough post-mortem examination and why we perform one. I will also say that many veterinary hospitals and veterinarians are not equipped or have the time and staff to do a thorough post-mortem examination. Often the exam is shortened to a rapid dissection of the body with harvesting of samples from appropriate tissues. Now I'd like to address the breeder/owner's responsibility:

- Cost** – as one can imagine, a good post-mortem examination is a costly procedure. It takes time to do a thorough exam, laboratory costs are high and the techniques involved are complex. A rough estimate

would be in the hundreds of dollars.

- Time** – the time to decide to do a post-mortem exam is **before** the animal dies. This allows the veterinarian to obtain fresh samples as soon as possible and optimizes the chances of getting useful results.
- If an animal should die at home and a veterinarian is not available, don't freeze the body.** It is much better to refrigerate the body. This prevents freezing artifacts which confuse the pathologist examining the tissues.

The death of a pet is traumatic both for the owner and the veterinarian. Too often, the post-mortem examination is rushed at the last minute or, worse yet, forgotten. It is important to communicate your wishes to the veterinarian early so the necessary procedures can be scheduled rapidly, samples obtained quickly and the examination performed efficiently.

The Chinese Shar-Pei dog breed has a genetic predisposition to an autoinflammatory disorder known as Familial Shar-Pei (FSF). It is an heredofamilial episodic fever disorder characterized by a high temperature (typically greater than 105° F) lasting 12-36 hours, often with a swollen, painful hock joint (Swollen Hock Syndrome, SHS which can occur in 40% of the FSF dogs) and systemic reactive amyloidosis leading to kidney failure in about 15% of these dogs. There currently are no diagnostic blood or DNA tests available to screen for or diagnose this disorder.

As part of the research into the genetics of FSF the Health Committee of the Chinese Shar-Pei Club of America, Inc. has asked owners whose dogs have died or were euthanized in kidney failure to have a necropsy done and to request Congo Red staining (CRS) of the tissues submitted. Congo Red staining is the "gold standard" for the presence of amyloid. Unfortunately, H & E staining of tissue specimens for the presence of amyloid is not as accurate or reliable as CRS. The Health Committee and the CSPCA, Inc. ask that any veterinarian and/or laboratory receiving a request from a Shar-Pei owner to have CRS done on submitted tissues to please comply with that request. If the laboratory is not equipped to do CRS please inform the owner so that other arrangements can be made. We hope the CRS results can be used by breeders to evaluate and modify their breeding programs until definitive blood screening procedures for FSF can be developed and made available to the fancy.

Post-Mortem Examination in the Chinese Shar-Pei

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