

Necropsy Techniques in Cattle

Sarah Wagner, DVM, PhD, Diplomate ACVCP

Veterinary Technology Program, Department of Animal Sciences, North Dakota State University, Fargo, ND 58105

Abstract

Necropsy is used to diagnose disease in individual animals and to make decisions about the health and management of the herd. Veterinary technicians can and should participate in the performance of necropsy in cattle. Prior to beginning a necropsy, the veterinarian and technician should discuss which systems will be of particular interest during the necropsy examination, based on the history of the animal and the herd. The nearest veterinary diagnostic laboratory can describe which samples should be submitted for diagnosis of particular diseases, and how samples should be shipped to the lab. The most important tools for bovine necropsy are a sharp knife, pruning shears and a good working knowledge of the anatomy of cattle. It is always best to perform the necropsy as soon as possible after death, especially when the weather is warm. In both the chest and the abdomen, internal organs should first be examined as they lay in the body cavity; then they may be removed for further examination. Cattle with neurologic signs that test negative for rabies must be tested for Bovine Spongiform Encephalopathy, which requires submission of the obex area of the brainstem to a veterinary diagnostic laboratory. A thorough examination of an animal by gross necropsy can provide useful information in a relatively short time. Veterinary technicians can make a meaningful contribution to their practices by providing assistance with necropsy procedures.

Résumé

La nécropsie est utilisée pour le diagnostic des maladies chez les animaux et dans le but de faire des choix au niveau de la santé et de la régie du troupeau. Les techniciens vétérinaires peuvent et devraient participer à la nécropsie du bétail. Avant de débiter une nécropsie, le médecin vétérinaire et le technicien devraient discuter afin de déterminer quels systèmes seront plus particulièrement visés durant la nécropsie en se basant sur les antécédents de l'animal et du troupeau. Le laboratoire de diagnostic vétérinaire le plus près peut déterminer quels échantillons devraient être soumis pour le diagnostic de maladies particulières et comment les échantillons devraient être expédiés au laboratoire. Les outils les plus importants pour la nécropsie bovine sont un couteau bien aiguisé, des sécateurs et une bonne connaissance pratique de

l'anatomie bovine. Il est toujours mieux de faire la nécropsie peu de temps après la mort surtout lorsque le temps est chaud. Au niveau de la poitrine et de l'abdomen, les organes internes devraient être examinés en premier étant situés dans la cavité corporelle. Ces organes peuvent être retirés par la suite afin de poursuivre l'examen. Les bovins présentant des signes neurologiques mais testant négatif pour la rage devraient être testés pour l'encéphalopathie spongiforme bovine, ce qui nécessite la soumission de la région de l'obex du tronc cérébral au laboratoire de diagnostic vétérinaire. L'examen approfondi d'un animal par la nécropsie macroscopique peut donner des indices importants dans un laps de temps assez court. Les techniciens vétérinaires peuvent faire une contribution significative dans leur pratique vétérinaire en offrant de l'aide durant la nécropsie.

Introduction

Necropsy is an irreplaceable procedure in bovine practice, where it is useful for diagnosis of disease in the individual animal and decision-making about the health and management of the herd. Veterinary technicians can and should participate in the performance of necropsy in cattle.

Conducting the Necropsy

Several tasks must be done prior to beginning a necropsy. First, the owner must be interviewed regarding the history of the animal and any other affected animals in the herd. If the animal has received any prior treatments, they should be noted. The veterinarian and technician should discuss which body systems are of particular interest during the necropsy examination. It is an excellent idea to telephone the nearest veterinary diagnostic laboratory before beginning the necropsy; the pathologists or staff can offer useful advice regarding what samples should be submitted for diagnosis of particular diseases, and how samples should be shipped to the lab. Finally, permission for the necropsy must be obtained from the owner (generally less of an issue in bovine practice than companion animal practice), and the identity of the animal must be confirmed.

One should wear gloves when performing necropsies to prevent contamination of the carcass, exposure of the technician to zoonotic diseases and the spread of

diseases to others. Potential spread of disease is also controlled by washing clothing worn during a necropsy immediately after the procedure. The most important tools for bovine necropsy are a sharp knife, pruning shears and a good working knowledge of the anatomy of cattle and the normal appearance of tissues. Containers should be ready to receive samples for culture and histopathology if such samples are to be collected.

It is best to perform the necropsy as soon as possible after death, especially when the weather is warm. It should begin with a thorough external examination of the animal. Body condition should be noted, along with the presence of any discharge or other abnormalities. Bovine necropsy is usually performed with the animal lying on its left side, so that rumen is below the other viscera and out of the way. In order to gain access to the abdominal and chest cavities, the right front leg is separated from the body by cutting it under the scapula and reflecting it dorsally. The right rear leg is separated from the body through the hip joint and also reflected dorsally. It is recommended that a stab incision be made through the skin first, then extend the cut by inserting the blade under the skin and pulling it outward in order to cut through less hair and preserve the sharpness of the knife blade.¹ The skin is commonly cut at the midline and reflected dorsally away from the body in order to simplify opening the chest and abdominal cavities and reduce contamination.

The abdominal cavity may be opened using a T-shaped cut up the midline and along the caudal border of the ribs on either side. In both the chest and the abdomen, any fluid or adhesions should be noted when the cavity is opened. Internal organs should first be examined as they lay in the body cavity, then they may be removed for further examination. If the rumen is greatly distended, it may be nicked to release the gas and facilitate examination of other organs. Cutting the duodenum and the root of the mesentery will allow the intestines to be moved up and out of the abdominal cavity and facilitate inspection of other abdominal viscera. Kidneys, bladder, uterus and ovaries, and liver may be examined in place, while stomachs and intestines are generally removed from the abdomen to facilitate a thorough examination. If the rumen is to be cut open, it should be done last to avoid contamination.

The chest is opened by cutting the diaphragm away from the ribs, then cutting the junction between the sternum and ribs and reflecting the ribs dorsally. In smaller animals this may be achieved by breaking the ribs manually as they are pushed away from the midline; in larger animals the ribs can be cut using tree pruning shears or an axe. Again, fluid or adhesions in the chest should be noted. The heart and lungs may be removed by cutting dorsal, ventral and diaphragmatic attachments.

Sometimes examination of other organs is desirable. Joints may be opened if arthropathy is suspected, and fluid from the eyes may be required for some toxicological tests. Removal of the spinal cord from a bovine is an undertaking that may best be left to professionals. Removal of the brain, however, is possible. The author has had good luck with the technique of drilling a hole in the front of the head and using a water hose to push the brain out through the foramen magnum; others have had mixed results with this technique and prefer to cut the head open. Cattle with neurologic signs that test negative for rabies must be tested for Bovine Spongiform Encephalopathy. This requires submission of the obex area of the brainstem. Brain samples sent to the diagnostic laboratory should therefore include several inches of spinal cord caudal to the cerebellum to be sure that the obex is included.

Conclusions

A thorough examination of an animal by gross necropsy following these procedures can provide useful information in a relatively short time. Veterinary Technicians can make a meaningful contribution to their practices by providing assistance with necropsy procedures.

References

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