NECROPSY

Procedures and Basic Diagnostic Methods For Practicing Veterinarians

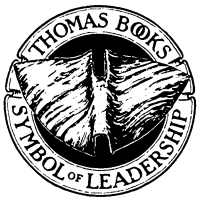
NECROPSY

Procedures and Basic Diagnostic Methods for Practicing Veterinarians

By

ALBERT C. STRAFUSS, D.V.M., M.S., PH.D.

Professor
Department of Veterinary Diagnosis
College of Veterinary Medicine
Kansas State University
Manhattan, Kansas



CHARLES C THOMAS • PUBLISHER
Springfield • Illinois • U.S.A.

Published and Distributed Throughout the World by

CHARLES C THOMAS • PUBLISHER
2600 South First Street
Springfield, Illinois 62794-9265

ISBN 0-398-05375-8

Library of Congress Catalog Card Number: 87-16773

Printed in the United States of America
Q-R-3

Library of Congress Cataloging in Publication Data

Strafuss, Albert C.
Necropsy : simplified procedures and basic diagnostic methods for practicing veterinarians.

Bibliography: p.
Includes index.
1. Veterinary autopsy. 2. Veterinary medicine--Diagnosis. I. Title.
SF69.S77 1987 636.089'607559 87-16773
ISBN 0-398-05375-8

To

The veterinary student and practitioner who will read and find this textbook to have aided their quest in becoming a better diagnostician by improving diagnostic skills through the necropsy and associated "hands on" laboratory supportive techniques.

PREFACE

THIS BOOK on necropsy diagnosis is written to aid veterinary practitioners and students in establishing diagnoses. Information scattered throughout the literature or learned by the author's experience has been collated and presented in a logical sequence. A necropsy procedure for the dog with appropriate modifications for other domestic animals is described, thereby eliminating the necessity of learning a different procedure for each species. Emphasis is placed on gross pathologic diagnoses with simple and quick supportive laboratory techniques, which can be performed during necropsy (impressions or smears, Gram stains, etc.). A common mistake in practice is to omit laboratory procedures or to do difficult tests that are needed infrequently without first perfecting tests that are supportive, simply done, inexpensive, and more rewarding.

In veterinary medicine, teaching and learning revolve around living patients, but in many instances necropsy can result in an intelligent and scientific understanding of disease processes. Before lesions can be studied, an orderly and systematic necropsy must be carried out and visualized by an orderly technique; such a procedure is described in this text.

It is important that necropsies be fully utilized as a means of understanding disease pathogenesis and for distinguishing one disease from another. Pathologic anatomy is one facet only (most likely an end result) of a process involving one or more mechanisms that elucidate etiology and provide a rational basis for prevention and treatment of disease. A skillfully performed necropsy allows laboratory procedures to be performed to yield maximal diagnostic information. A necropsy carelessly done or attempted to improperly trained people is more likely to provide misinformation or no information. The organizational concept of necropsy and associated laboratory procedures stresses a "collect and do" instead of a "collect and send" philosophy.

The text emphasizes quality control in establishing diagnoses. Although quality control in the practice of veterinary medicine is not decreed by law, it behooves the profession to police itself with quality control so that this will not happen. A practitioner can provide some degree of quality control by doing necropsies on animals that die. Secondly, he can send tissues from problem cases to a diagnostic laboratory not to get a diagnosis, but to confirm his diagnosis. Diagnostic laboratories around the country, however, are seldom used for this purpose. Thirdly, attendance at veterinary short-courses in bacteriology, cytology, etc., marks the beginning of individual quality control by adapting and using laboratory supportive procedures during necropsy.

In large animal practice, routine necropsies, particularly in swine and cattle confinement operations, permit monitoring the herd health status and managerial procedures. This, likewise, applies to dog kennels, aviaries, or commercial poultry operations. Veterinary practitioners frequently avoid doing necropsies because they take too much time or are too much trouble, or because the rendering companies will not pick up animals after necropsy. These personal factors arise from a lack of familiarity with efficient necropsy procedures, instruments, and availability of simple and quick laboratory tests to confirm a diagnosis.

Veterinarians are seldom taught the science and art of doing a necropsy examination. In veterinary school, we learn anatomy and surgery, but seldom relate anatomy to necropsies. We learn pathology by studying effects of disease, but usually are not taught how to best detect postmortem change or to distinguish abnormal from the normal in the cadaver, which is really the heart of a competent necropsy. All available laboratory tests are discussed in the classroom, but we really never demonstrate or require students to understand the appropriate samples to be collected from the cadaver at the time the necropsy is being conducted. We always say in our teaching, "Send in the appropriate sample, properly packaged so that it is adequately refrigerated and can be transported." The inconclusive diagnosis is derived from inconclusive evidence, either from the history or necropsy and the negative diagnosis may be directly associated with the fact that we were not thorough enough to make a diagnosis.

Chapters on necropsy of birds and common gross findings of diagnostic significance in poultry (small farm flock and commercial) and cage birds are included to provide basic information for diagnosing many avian diseases. Veterinary contact with small farm flocks, game birds (chukars, pheasants, and quail), pigeons, cage birds, and aviaries

is increasing and, therefore, there is need for veterinarians to grasp the information available in these chapters to develop and sharpen their diagnostic skills by doing necropsies and supportive laboratory tests. Most veterinary practitioners have the facilities and scientific background to diagnose avian diseases. Their reluctance to handle birds stems from a lack of knowledge about how their problems should be approached; such an approach is outlined in the avian chapters. Establishing a diagnosis is really no more difficult in birds than domestic animals once the *modus operandi* is established.

Necropsies are continual educational opportunities offered to veterinary practitioners in their own practices and can seldom be duplicated elsewhere. This type of continuing education is lifelong.

Albert C. Strafuss

ACKNOWLEDGMENTS

A SPECIAL THANKS to Dr. S. A. Jones for doing the illustrations on necropsy procedure which were superbly done with a diligent stroke of perception. Much appreciation to Sherri Kraus for the excellent typing of the manuscript and for organizing a format which projects the various headings throughout to have a better reading style. The interest, encouragement, and many suggestions by Dr. S. M. Dennis were most helpful. The timely editing by Eileen Schofield of the Kansas Agricultural Experiment Station was invaluable. The critique and suggestions of Dr. Loren D. Kintner were appreciated.

CONTENTS

NECROPSY
Procedures and Basic Diagnostic Methods
For Practicing Veterinarians

CHAPTER 1

IMPORTANCE OF NECROPSY

VETERINARIANS who perform necropsies become better diagnosticians who can administer treatment with more precision and success. Necropsies document the incidence of disease in a community and are important in surveillance of diseases transmissible from animal to man. Information from necropsies support and aid programs to monitor herd, kennel, or flock disease status.

Scientific inquiry by necropsy should be regarded as an examination of a body to determine the pathologic processes in relation to "clinical examination," and to acquire information regarding the nature of disease. The more effectively these ends are accomplished, the greater the contribution of the necropsy in determining the cause of illness.

The expression "clinical examination" should not be misunderstood. It has three aspects; animal, history, and environment. Inadequate examination of any of these may lead to error. The future of the veterinary profession essentially rests on the ability to render service based on accurate diagnoses. Clinical examination is an important cog in the diagnostic process. In veterinary medicine, history taking is the most important of the three aspects of a clinical examination, so it must be accurate and complete. The more the veterinarian knows about veterinary medicine, the more proficient he becomes at taking a good history. He has the knowledge to ask the appropriate questions and to meaningfully interpret the owner's answers. A good history, properly taken, remains one of the most valuable diagnostic aids a veterinarian has at his disposal. Many questions pertinent to the history can be asked while performing a physical examination, and the answers the clinician receives should constantly be compared with what he is observing. If the physical findings and the history do not support each other, it is well to review the relevant portion of the history again, perhaps rephrasing the questions so that if

misunderstandings have occurred, they can be clarified. Statements, particularly those concerned with time should be tested for accuracy. Owners, especially herdsmen and hired help, often attempt to disguise their neglect by condensing time or varying the chronology of events. History-taking will vary considerably depending on whether one animal or a group of animals is involved in the disease problem under examination. As a general rule in food animals, any disease should be considered a herd problem until proven otherwise. It is often rewarding to examine the remainder of a herd or flock to find animals in the early stages of the disease.

It is frequently stated that a good history will give the diagnosis without any other data. The veterinarian who has been working with a particular client and a particular animal may not need to ask a litany of questions, since he already may have the history well in mind. Other cases may require a thorough history. It is important that the history be written down. First, the owner realizes the importance of the history and will do his best to answer the questions as accurately as possible. Secondly, it provides the owner with time to collect his thoughts and remember details that might be overlooked in ordinary conversation. By getting the history organized on paper, the veterinarian can pick up leads that need to be pursued.

When doing a necropsy without a history, evaluation of tissue changes in an open carcass may often reveal nothing; everything may look normal. However, when incorporating the history with the necropsy, certain differential diagnoses will suggest looking for the presence of specific lesions. Frequently, lesions otherwise hidden may now become obvious. The business of getting an accurate history along with differential diagnoses in one's mind, is essential for obtaining a diagnosis.

The performance of a necropsy is a science and requires a good knowledge of general and special pathology of organs and organ systems. It requires a standardized necropsy procedure to effectively illuminate all pathological conditions so they may be studied in a thorough and systematic manner. A standardized necropsy procedure allows for precision, neatness, and thoroughness so that definitive diagnoses are made. A familarity with normal color and size of organs and tissues is important for diagnosing disease. Grossly normal-looking organs may have early microscopic changes that can be overlooked. However, direct cytological impressions or smears may easily detect early tissue changes. Histopathologic, bacteriological, and chemical examinations may be indicated to further support cytological interpretations.

Necropsy looks easy when one watches an experienced prosector at work. Repeated practice of a procedure increases proficiency and prevents the useless pulling, cutting, and destruction of lesions. A veterinarian using a definite necropsy protocol will perform uniform, rapid, systematic, and complete necropsies that are the key to consistent interpretation of lesions. Using a standard protocol for a necropsy assures that each organ system will be grossly observed in turn. Shortcuts lead to a lack of thoroughness, resulting in a wrong diagnosis, or no diagnosis at all. Only occasionally will a case require a modification of a standardized protocol. For example, a bloated animal may necessitate relieving the gas pressure and removing organs from the abdomen before the thoracic viscera may be removed.

In cases where lesions are not present and the cause of death cannot be ascertained, the prosector should realize that although a "no diagnosis" is a measure of lack of total knowledge about a case, it is not due to lack of thoroughness. The percentage of correct diagnoses depends largely on one's skill and thoroughness in performing necropsies.

A necropsy is performed for one or more of the following reasons.

1. History, clinical signs, and necropsy aided by laboratory tests often determine the nature of an animal's disease.
2. Apart from diagnosis, necropsies play a vital role in understanding diseases and their pathogenesis. Such an understanding is essential for developing and applying rational therapeutic and control measures.
3. A skillfully conducted and intelligently interpreted necropsy will give the client (especially livestock owners) a surprising amount of satisfaction and confidence in his veterinarian.
4. In disease surveillance, collection of data for statistical analysis of pathological conditions may provide answers to management problems in large livestock operations or uncover a subclinical problem before it becomes economically costly.

Most errors in diagnosis are not the result of ignorance, but of haste, carelessness, or apathy. Pasteur's statement, "In the fields of observation, chance favors only the prepared mind," has withstood the test of time. Powers of observation are markedly enhanced when a *systematic* necropsy becomes routine.

SELECTED REFERENCES

Aitken, W.A.: A Re-evaluation of Postmortem Examination, J.A.V.M.A. 129 (December 1, 1956): 533.