

NECROPSY
Procedures and Basic Diagnostic Methods
For Practicing Veterinarians

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By

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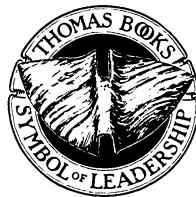
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To

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 post-mortem 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

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CONTENTS

	<i>Page</i>
<i>Preface</i>	
Chapter 1 — Importance of Necropsy	3
Chapter 2 — Necropsy Procedures	7
Introduction	7
Dog and Cat	8
Swine	32
Cattle, Sheep, and Goats	34
Horse	36
Cosmetic Necropsy	40
Chapter 3 — Descriptive Writing of Pathologic Changes	43
Chapter 4 — Postmortem Changes Versus Antemortem Lesions	51
Chapter 5 — Gross Pathologic Evaluation of Tissues	65
Inflammatory and Neoplastic Lesions	65
General Diagnostic Criteria for Differentiating Inflammatory and Neoplastic Lesions	66
Diagnostic Value of Consistency in Gross Pathology	67
Diagnostic Value of Color in Gross Pathology	68
Chapter 6 — Specimen Collection and Submission	71
Choice of Specimens	71
Selected Sites for Specimen Collection	72
Collection and Preservation of Samples	76
Bacteriology	77
Virology	81
Mycology	82
Parasitology	82
Toxicology	82

Electron Microscopy	82
Rabies	83
Blood Smears	83
Blood Samples	84
Transport of Specimens to the Laboratory	84
Chapter 7 — Necropsy and Clinical Bacteriology	87
Collection of Specimens for Bacterial Examination	88
Growth of Organisms	88
Gram-Reaction	89
Primary Isolation	90
Antibiotic Sensitivity Testing	93
Identification of Important Aerobic Bacteria	94
Chapter 8 — Laboratory Procedures at Necropsy	97
Diagnostic Cytology at Necropsy	97
Direct Examination of Tissues	97
Preparation of Cytological Specimens	98
Diagnosis of Neoplasms	100
Diagnosis of Inflammatory Diseases	102
Clinical Laboratory Support at Necropsy	103
Quality Control	104
Hematology	105
Urinalysis	107
Cerebral Spinal Fluid	108
Postmortem Evaluation of Body Fluids	108
Choosing and Obtaining Body Fluids	109
Determining Time-of-Death	111
Diagnosis Using Postmortem Body Fluids	111
Chapter 9 — Selection and Handling of Toxicologic Specimens	115
Choice of Specimens	116
Practical Tests for Field Diagnosis of Toxicoses	118
Chapter 10 — Diagnosis of Parasitism in Domestic Animals	125
Collection and Preservation of Samples	125
Methods of Parasitological Examination	126
Smear Method	127
Sedimentation Method	127
Flotation or Levitation Method	128
Negative Fecal Examination	129

Detection of Other Types of Parasitism in Domestic Animals	130
Examination for Microfilariae in Blood.	131
Gross Examination for Parasites	132
External Parasites	133
Estimation of Time-of-Death by Myiasis	134
Chapter 11 — Diagnostic Evaluation of Bovine Ingesta	
During Necropsy	135
Color of Feces.	135
Odor of Feces	136
Consistency of Feces	137
Particle Size of Ingesta	137
Blood Smearing of Rump and Tail.	138
pH Levels and Protozoan Activity of Ruminal Contents	139
Chapter 12 — Gross Observations of Diagnostic Significance in Animals	141
Diseases Associated with Anemia.	141
Diseases Associated with Edema	142
Diseases Associated with Fibrin	144
Diseases Associated with Hemorrhage.	145
Diseases Associated with Icterus.	146
Diseases Associated with Ulcers	147
Diagnostic Features of Various Types of Fluid Found in Body Cavities	148
Chapter 13 — Diagnosing Abortion Problems	151
Fetal Examination	152
Postmortem Changes Characteristic of Antepartum Death	152
Postmortem Changes Characteristic of Parturient Death	153
Gross Signs Characteristic of Postpartum Death	154
Fetal Lesions.	154
Placental Examination.	156
Specimens to be Submitted	157
Laboratory Procedures	158
Chapter 14 — Necropsy of Birds	161
Collection, Storage and Transport of Specimens	162
Collection of Blood Samples	163
Preparing Blood Samples for Serological Examination	165
Laboratory Procedures	166

Serology	166
Diagnostic Cytology	168
Methods of Euthanasia	169
Necropsy Precautions	171
Necropsy Equipment	171
Necropsy Procedure	171
External Examination	172
Internal Examination	172
Chapter 15 — Management and Common Gross Pathological Findings of Diagnostic Significance in Birds	179
Clinical Examination	179
Management Factors in Commercial Flocks in Health and Disease	179
Management Factors in Small Avian Flocks in Health and Disease	180
Common Gross Pathology Findings of Diagnostic Significance in Birds	183
Poultry	183
Skin and Feathers	183
Feet and Legs	184
Head, Beak, Eyes and Nasal Sinuses	184
Oral Cavity, Esophagus and Crop	185
Trachea, Lungs and Air Sacs	185
Pericardium and Heart	185
Alimentary Tract	185
Liver and Spleen	186
Reproductive Tract	186
Kidneys	187
Brain and Peripheral Nerves	187
Caged Birds	187
Skin	187
Feet and Legs	188
Beak, Eyes, and Nasal Sinuses	189
Oral Cavity, Esophagus and Crop	190
Trachea, Lungs and Air Sacs	190
Pericardium and Heart	191
Alimentary Tract	191
Liver and Spleen	192
Peritoneum	193

Reproductive Tract	193
Kidneys	193
Brain and Peripheral Nerves	194
Chapter 16 — Disposal of Dead Animals and Birds	195
Health Aspects	195
Disposal of Dead Animals	196
Sanitary Land Fills	197
Burning	197
Rendering Plant	198
Burial or Disposal Pit	198
Livestock Waste Disposal Regulations — The Veterinarian’s Role ...	200
Incinerators	201
Bird Carcass Disposal	202
Incineration or Burning	202
Burial	203
Pit or Tank	203
Rendering	203
Chapter 17 — Malpractice in Veterinary Medicine	205
Guidelines for Practitioners	210
Guidelines for Diagnosticians	211
Working with Attorneys	212
Preparing Expert Testimony	212
Presenting Expert Testimony	213
Rules of Evidence for Expert Witnesses	213
<i>Appendix One</i> — Staining Procedure for Routine Hematology and Cytology Stains	215
<i>Appendix Two</i> — Staining Procedure for Special Stains	219
<i>Appendix Three</i> — A Simplified Flow Chart for Isolation of Bacterial Pathogens	225
<i>Appendix Four</i> — Photography and Knife Sharpening	237
<i>Index</i>	241

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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 familiarity 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.

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