Techniques in Necropsy: Pathway to Knowing “Everything”

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NCSU-CVM Class of 2011
Summer Zoo Rounds
June 12, 2008
The Post-Mortem Exam

- Patient history
- Necropsy
- Histopathology
- Microbial culture/isolation
- Toxicity screening
- Gene analysis
Definition

- **Necropsy**
  - “seeing a dead body” (Greek)

Spyglass Entertainment Group, *The Sixth Sense*, 1999
Why do a necropsy?

- Diagnostic
- Prevention
- Evaluate health of a population
- Educational
Why do a necropsy?

http://www.isrvma.org/article/54_3_7.htm

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=1575
Necropsy Facility
Necropsy Facility
Basic Equipment

- Sharp knife and steel
- Scissors
- Tree limb snips
- Handsaw
- Rongeurs
- Ruler
- Tissue containers
Basic Equipment
Basic Equipment
Basic Equipment
Basic Equipment
Goals of Necropsy

- Data collection
- Concise lesion description
- Appropriate tissue sampling
- Correlate findings with in-life data.
Data Collection

- Review history
- Systematic
- Necropsy record
  - Signalment and ID
  - Date/time of death
  - Date of necropsy
  - List of tissues examined
  - Description of lesions
# Necropsy Record

## PART B - ANIMAL IDENTIFICATION AND RELATED DATA

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>ANIMAL I.D. (Name and Tattoo Number)</td>
<td>9.</td>
<td>SPECIES</td>
<td>10.</td>
<td>BREED</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>EUTHANIZED (Specify method and agent used.)</td>
<td></td>
<td>YES</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>18.</td>
<td>CAUSE OF DEATH (Medical reason for death or decision to euthanize.)</td>
<td></td>
<td>YES</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>19.</td>
<td>NAME AND ADDRESS OF UNIT ACCOUNTABLE FOR ANIMAL</td>
<td></td>
<td>YES</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>20.</td>
<td>CONTRIBUTOR'S NECROPSY NUMBER</td>
<td>21.</td>
<td>DATE OF DEATH (YYYYMMDD)</td>
<td>22.</td>
<td>TIME BETWEEN DEATH AND NECROPSY</td>
</tr>
</tbody>
</table>
SECTION IV - TISSUE CHECKLIST

Use this checklist to record all tissues collected for submission. In the "Other" section, list any additional tissues collected that are not on the checklist. Tissues are listed in order of descriptive protocol. See TM M.O. 2103 for an alphabetical list.

<table>
<thead>
<tr>
<th>36. ITEM</th>
<th>37. MWD TATTOO</th>
</tr>
</thead>
<tbody>
<tr>
<td>EYES (LEFT/RIGHT)</td>
<td>SPLEEN</td>
</tr>
<tr>
<td>LACRIMAL GLAND</td>
<td>MESENTERIC LYMPH NODE(S)</td>
</tr>
<tr>
<td>AXILLARY LYMPH NODE(S) (LEFT/RIGHT)</td>
<td>STOMACH</td>
</tr>
<tr>
<td>HAIRY SKIN (SPECIFY SITE IN REMARKS)</td>
<td>DUODENUM</td>
</tr>
<tr>
<td>MAMMARY TISSUE (IF APPLICABLE)</td>
<td>JEJUNUM</td>
</tr>
<tr>
<td>SKELETAL MUSCLE</td>
<td>ILEUM</td>
</tr>
<tr>
<td>BONE MARROW</td>
<td>ILEOCECOCOLIC JUNCTION</td>
</tr>
<tr>
<td>THYROID AND PARATHYROID GLANDS</td>
<td>CECUM</td>
</tr>
<tr>
<td>MANDIBULAR SALIVARY GLANDS</td>
<td>COLON</td>
</tr>
<tr>
<td>ADRENADEL GLANDS (LEFT/RIGHT)</td>
<td>RECTUM</td>
</tr>
<tr>
<td>THYMUS/THYMIC REMNANTS</td>
<td>ANUS/PERIANAL AREA/ANAL SAC</td>
</tr>
<tr>
<td>BONE (RIB, STERNUM/BR; SPECIFY OTHER SITE)</td>
<td>EAR CANAL</td>
</tr>
<tr>
<td>TONSILS (LEFT/RIGHT)</td>
<td>BRAIN (INTACT)</td>
</tr>
<tr>
<td>TONIXIE</td>
<td>PITUITARY GLAND</td>
</tr>
<tr>
<td>ESOPHAGUS</td>
<td>SPINAL CORD (INTACT)</td>
</tr>
<tr>
<td>MEDIAL RETROPHARYNGEAL LYMPH NODE(S)</td>
<td>PERIPHERAL NERVE (SPECIFY)</td>
</tr>
<tr>
<td>DIAPHRAGM</td>
<td>OTHER (SPECIFY)</td>
</tr>
<tr>
<td>KIDNEY(S) (LEFT/RIGHT)</td>
<td></td>
</tr>
<tr>
<td>URETERS</td>
<td></td>
</tr>
<tr>
<td>URINARY BLADDER</td>
<td></td>
</tr>
<tr>
<td>URETHRA</td>
<td></td>
</tr>
<tr>
<td>PROSTATE GLAND</td>
<td></td>
</tr>
<tr>
<td>TESTES/EPIDIDYMIS (LEFT/RIGHT)</td>
<td></td>
</tr>
<tr>
<td>UTERUS; CERVIX; VAGINA</td>
<td></td>
</tr>
<tr>
<td>OVARIES (LEFT/RIGHT)</td>
<td></td>
</tr>
<tr>
<td>ILIAC LYMPH NODE(S) (LEFT/RIGHT)</td>
<td></td>
</tr>
<tr>
<td>AORTA, ABDOMINAL (SPECIFY OTHER SITE)</td>
<td></td>
</tr>
<tr>
<td>HEART (ENTIRE ORGAN, OPENED)</td>
<td></td>
</tr>
<tr>
<td>TRACHEA/LARYNX</td>
<td></td>
</tr>
<tr>
<td>TRACHEOBRONCHIAL LYMPH NODE(S) (L/R)</td>
<td></td>
</tr>
<tr>
<td>LUNG</td>
<td></td>
</tr>
<tr>
<td>PANCREAS</td>
<td></td>
</tr>
<tr>
<td>LIVER</td>
<td></td>
</tr>
<tr>
<td>GALLBLADDER</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS:

* Identify these tissues by placing in labeled, large-size tissue cassettes for either containerial or prior to fixation and staining.

D0 FORM 1626, OCT 2001
Lesion Description

- Tissue
- Location
- Color
- Size
- Shape

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=6708
Lesion Description

- Consistency and texture
- Number and extent
- Surface appearance
- Odor

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=6708
Tissue Sampling

- Cytology
- Light microscopy
- Microbial isolation
- Molecular analysis
- Toxicology
- Electron microscopy
Cytology

- Prior to fixation
- Touch impression
- Smears
- Skin scrape
- Fine needle aspirate (FNA)

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=6292
Light Microscopy

- Formalin fixed
- <1cm thick
- >10:1 fixative:tissue ratio
- Representative samples should include junction between normal and abnormal
- Histochemistry and immunohistochemistry

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=9531
Microbial Isolation

- Fresh tissue
- Transport media
- Frozen tissue (viruses)
Molecular Analysis

- Pathogen identification
- Frozen samples are preferred
Toxicology

- Fresh or frozen tissue
- Liver, kidney, skeletal muscle, fat
Electron Microscopy

- 1% glutaraldehyde
- Tissue perfusion
- Paraffin embedded tissue
Carnivore

Testis

Bladder

Small intestines

Stomach

Pancreas

Gallbladder

Colon

Kidney

Liver

Adrenal gland

Uterus

Ovary

Lung

Heart

Salivary gland

Thyroid

Prostate

= Prostate

(dkhaines|1997 The University of Tennessee College of Veterinary Medicine)
Summary

- Start big; work towards small
- Be consistent
- Return to the animal’s history
- Collect extra tissue if unsure
- Do it as often as you can
Want Necropsy Experience?

- Gross Pathology Rounds
  - Every Wednesday 12:15-1:15

- Saturday Morning Necropsy Volunteers
  - See PathHeads board for available dates
References


References


