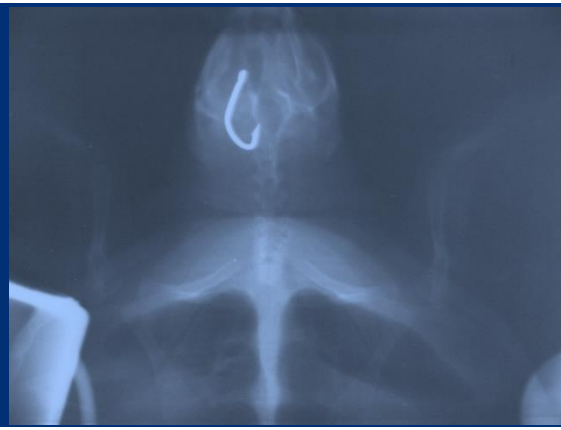
*Biology & Conservation*

# Biologija in varstvo velikih morskih vretenčarjev



*of Large Marine Vertebrates*

## Sea Turtle Lab:

## *Dissection, Anatomy, Sampling*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Faculty of Mathematics, Natural Sciences and Information Technologies
University of Primorska

# Handling alive sea turtles

- nutritional conditions
- muscle tropism and tone
- appearance of the skin and external surfaces of carapace, plastron, and head
- inspection of natural openings and external mucous
- respiratory capacity and mode
- temperature
- sensorium level and reflexes
- strange attitudes
- swimming and floating mode

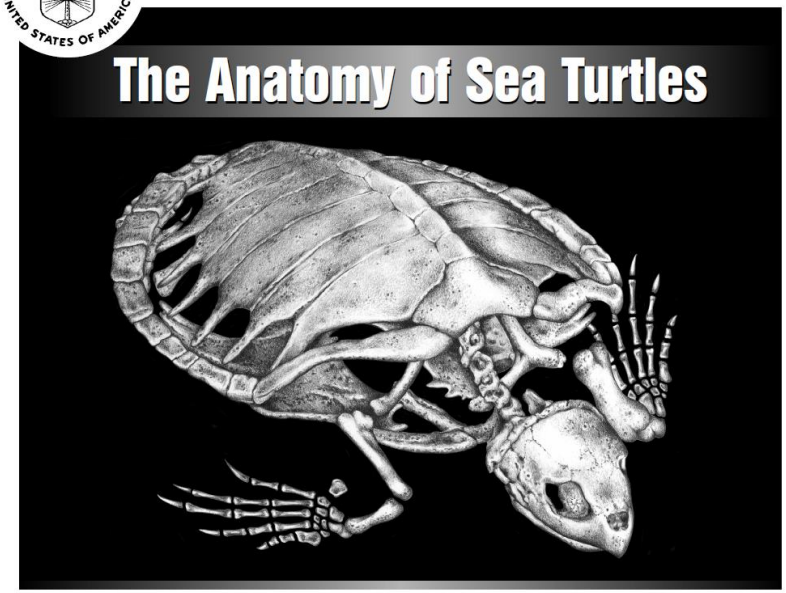
Figure 6: Turtle in a good nutrition status: it is evident abundant fatty tissue under the skin of the neck and axillary region.

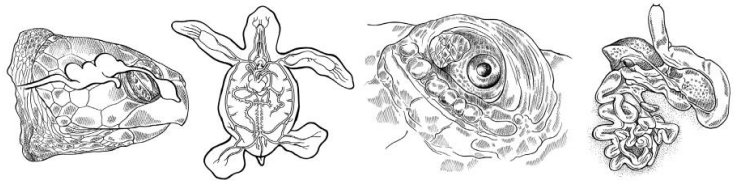

Figure 7: Turtle in a poor state of nutrition.

# Transport of alive turtles

NOAA Technical Memorandum NMFS-SEFSC-470

# The Anatomy of Sea Turtles





**Jeanette Wyneken, Ph.D.**
Illustrated by Dawn Witherington

**December 2001**
U. S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, FL 33149

netcet

# STANDARD PROTOCOL FOR POST-MORTEM EXAMINATION ON SEA TURTLES

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**DVM, PhD**

**Erica Marchiori**
**DVM**

The project is co-funded by the European Union, Instrument for Pre-Accession Assistance.

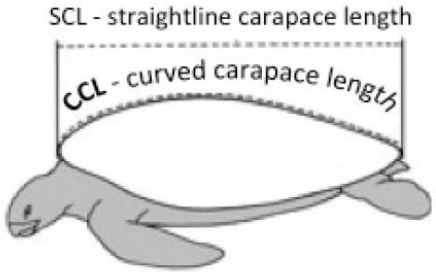
Let's grow up together
Adriatic IPA
Cross Border Cooperation 2007-2013

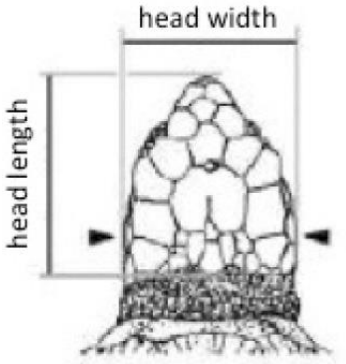
# Equipment

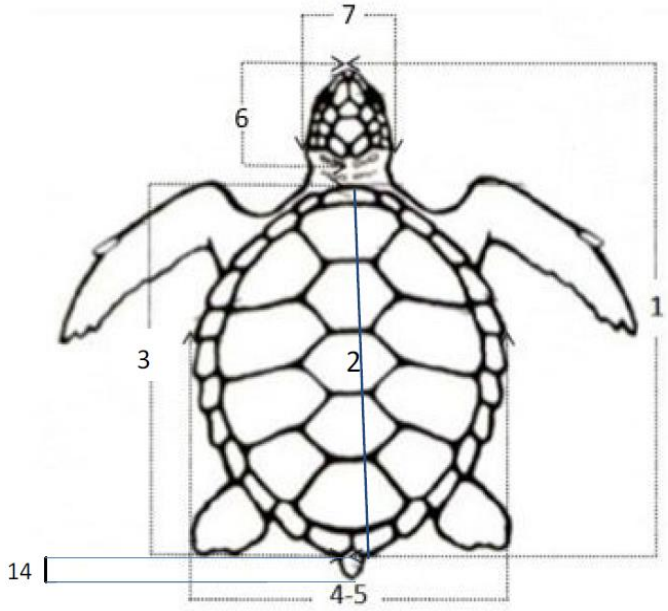
- Measuring tape
- Aluminium foil
- Plastic zip-bags
- Plastic containers
- Eppendorf tubes
- Ethanol / fixative

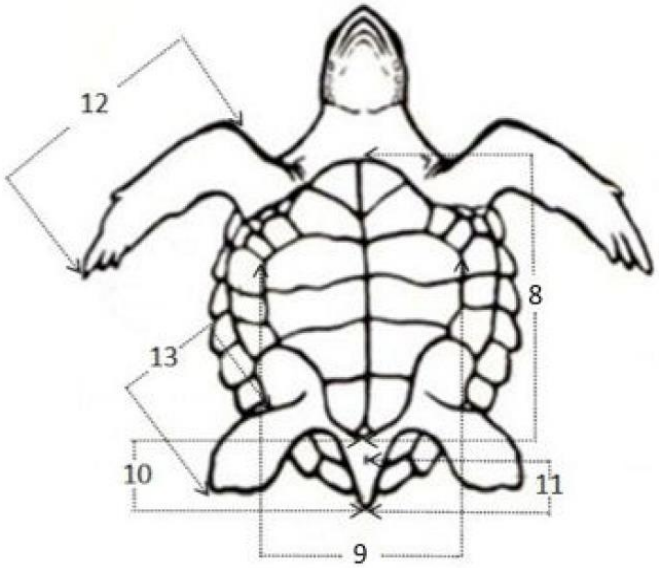
| | Standard Samples | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Life History** | **Genetics** | **Parasites** | **Histo.** | **Contam.** | **EnteroBT** | **HerpesVR** | **Biotox** |
| **Tissue** | (Frozen or fixed) | (Frozen &/or DMSO) | (70% EtOH) | (10% Formalin) | (Foil wrapped and frozen) | (Culture swab) | (Frozen9 | (Frozen) |
| Adrenal | | | | ■ | | | | |
| Blood/Serum | | | | | | | | ■ |
| Brain | | | | ■ | ■ | | ■ | |
| Carapace | ■ | | ■ | | | | | |
| Esophagus | | | ■ | ■ | | | | |
| Fat deposition | ■ | | | | | | | |
| Feces | | | ■ | | | | | ■ |
| Heart | | | ■ | ■ | | ■ | | |
| Humerus | ■ | | | | | | | |
| Intestine | | | ■ | ■ | | ■ | | |
| Kidney (R) | | | | ■ | ■ | ■ | | ■ |
| Kidney (L) | | | | ■ | ■ | ■ | | ■ |
| Liver | | | ■ | ■ | ■ | ■ | | ■ |
| Lung (R) | | | ■ | ■ | | | ■ | |
| Lung (L) | | | ■ | ■ | | | ■ | |
| Muscle | | ■ | | ■ | | | | |
| Oral Mucosa | | | | ■ | | | | |
| Ovary | ■ | | | ■ | ■ | ■ | | |
| Pancreas | | | | ■ | | ■ | | |
| Skin | | ■ | ■ | ■ | ■ | | ■ | |
| Spleen | | | | ■ | | | ■ | |
| Stomach | | | ■ | ■ | | ■ | | |
| Stomach Contents | ■ | | | | | | | ■ |
| Testis | ■ | | | ■ | ■ | | | |
| Thyroid | | | | ■ | | | | |
| Trachea | | | ■ | ■ | | | | |
| Urine | | | | | ■ | | | ■ |

# Morphometry




| BASIC MEASURES | |
|---|---|
| 1 = TL | |
| 2 = CCL | |
| 3 = SCL | |
| 4 = CCW | |
| 5 = SCW | |
| 6 = HL | |
| 7 = HW | |

| COMPLEMENTARY MEASURES | |
|---|---|
| 8 = PL | |
| 9 = PW | |
| 10 = TTL | |
| 11 = VTL | |
| 12 = FoL | |
| 13 = HiL | |
| 14 = CaTT | |

PL: plastron length
PW: plastron width
TTL: total tail length
VTL: vent-tip length
FoL: foreleg length
HiL: hindleg length
CaTT: tip of carapace-tip of tail

TL: total length
CCL: curved carapace length notch to tip
SCL: straightline carapace length notch to notch
CCW: curved carapace width
SCW: straightline carapace width
HL: head length
HW: head width

# Body condition

| Score | Preservation status | Description | Practicable exams |
|---|---|---|---|
| **1** | Fresh carcass | Death occurred in the previous 24 hours | histology, cytology, virology, microbiology, parasitology, pollutants, biotoxins, genetics |
| **2** | Moderate decomposition | Head: integral or with partial loss of skin;<br>Eye: sunken or liquefied;<br>Tail: present or absent;<br>Limbs: integral;<br>Carapace and plastron: integral;<br>Bloated carcass | histology (limited), virology, microbiology, parasitology, pollutants, biotoxins, genetics |
| **3** | Advanced decomposition | Head: complete loss of skin;<br>Eye: liquefied;<br>Tail: absent;<br>Limbs: partially exposed skeleton;<br>Carapace and plastron: partial or total loss of skin;<br>Collapsed carcass | histology (limited), parasitology, pollutants (limited), genetics |
| | | a) internal organs: still distinguishable | |
| | | b) internal organs: liquefied | |
| **4** | Mummified carcass or partial carcass | Incomplete carcass;<br>Skull: visible;<br>Carapace: broken with separation of parts | genetics |

# Body condition

| Score | Preservation status |
|---|---|
| 1 | Fresh carcass |
| 2 | Moderate decomposition |
| 3 | Advanced decomposition |
| 4 | Mummified carcass or partial carcass |

Code 1

Code 2

Code 3

Code 4

# Nutritional condition

| Nutritional status | Description |
|---|---|
| Excellent | Integral or partially liquefied adipose tissue covers entire ventral area. Hepatic lipidosis is also present. |
| Very good | Integral or partially liquefied adipose tissue covers entire ventral area. |
| Fair | Integral or partially liquefied adipose tissue covers peripheral parts of ventral area. |
| Scarce | Integral or partially liquefied adipose tissue is present only in limited peripheral parts of ventral area. |
| Not valuable | Mummified carcasses. |

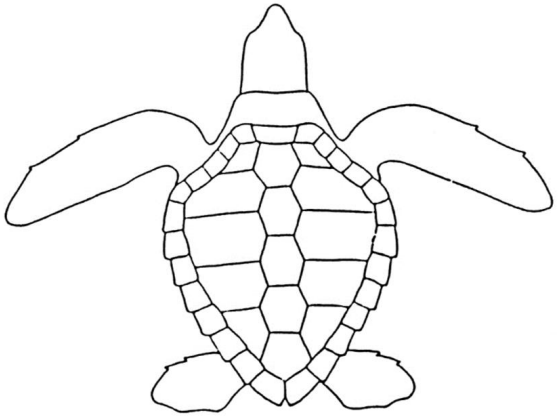
Score 1 (plus hepatic lipidosis)

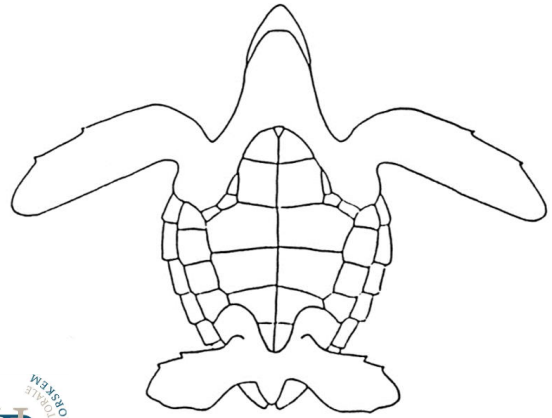
Score 2

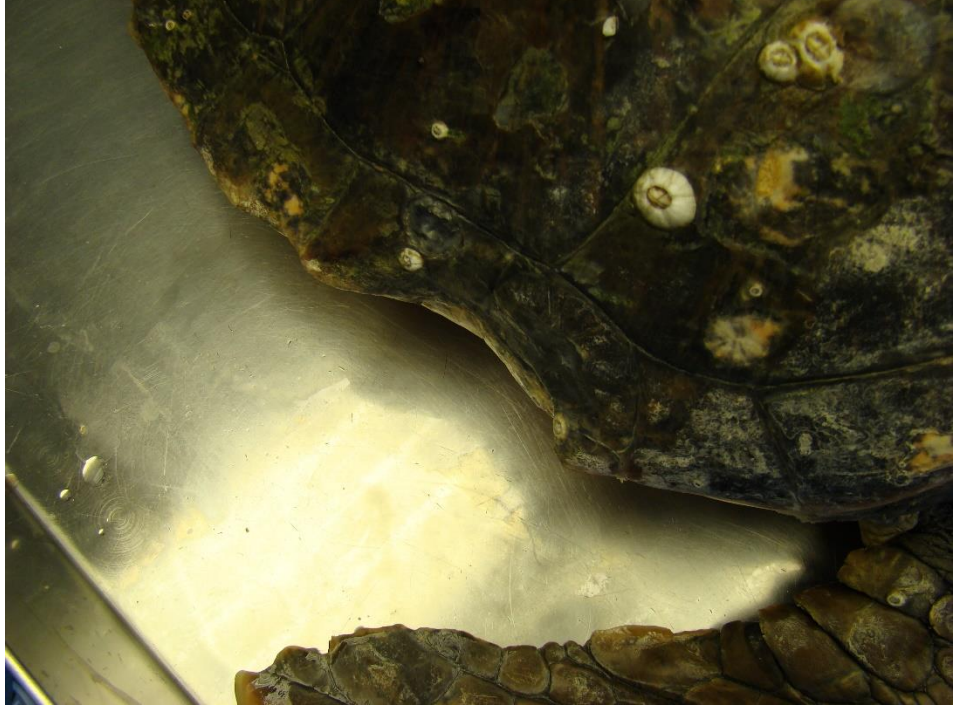
Score 3

Score 4

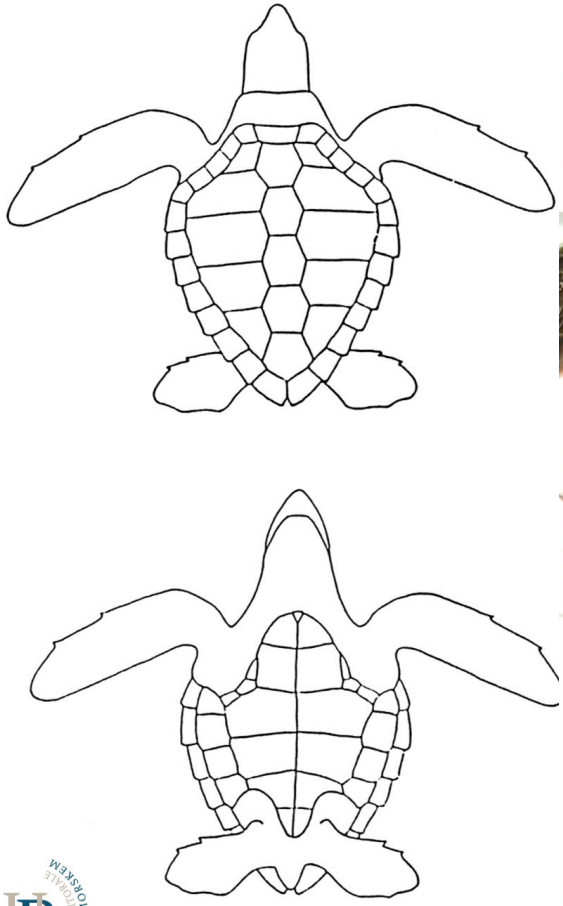
# External lesions, haematomas



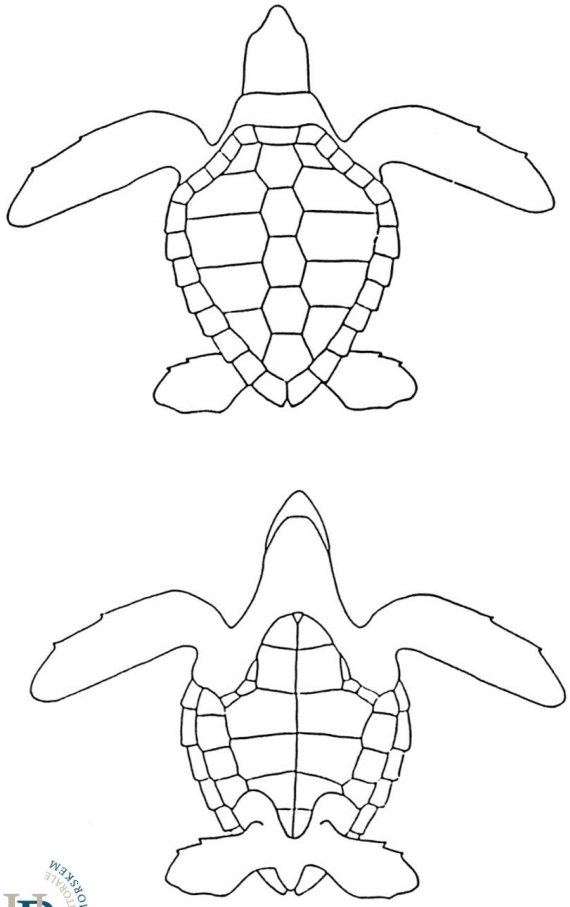




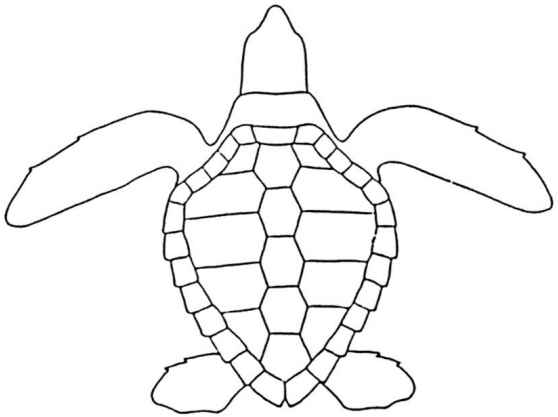
# External lesions, haematomas, epibionts, ectoparasites

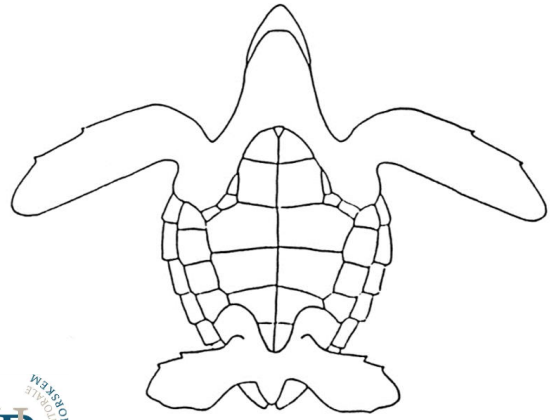


# External lesions, haematomas, epibionts, ectoparasites

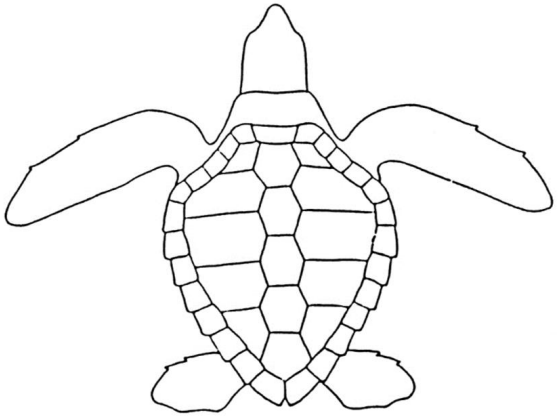


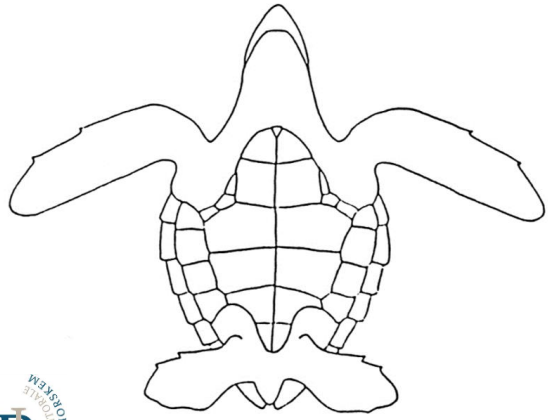
# External lesions, haematomas, epibionts, ectoparasites



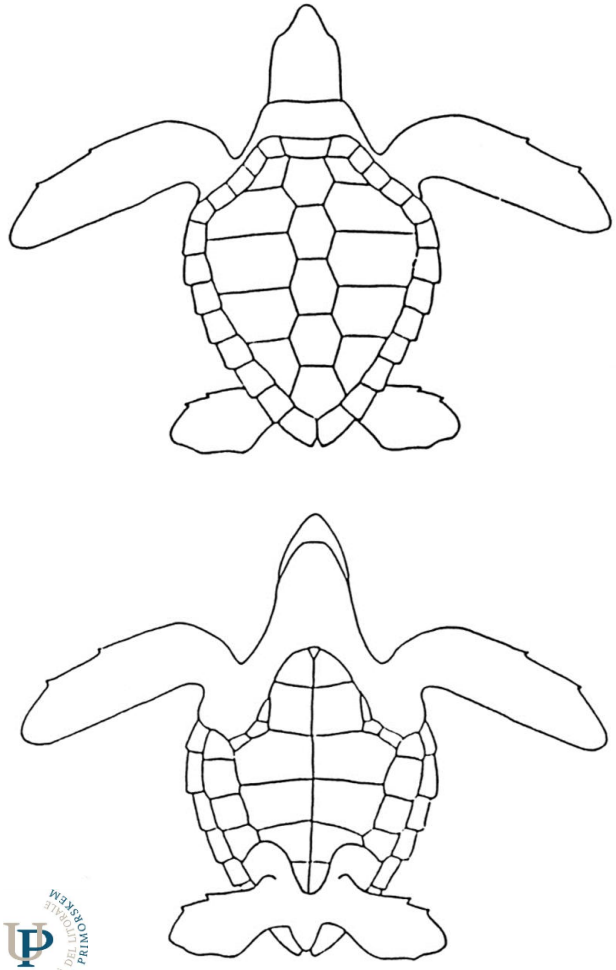


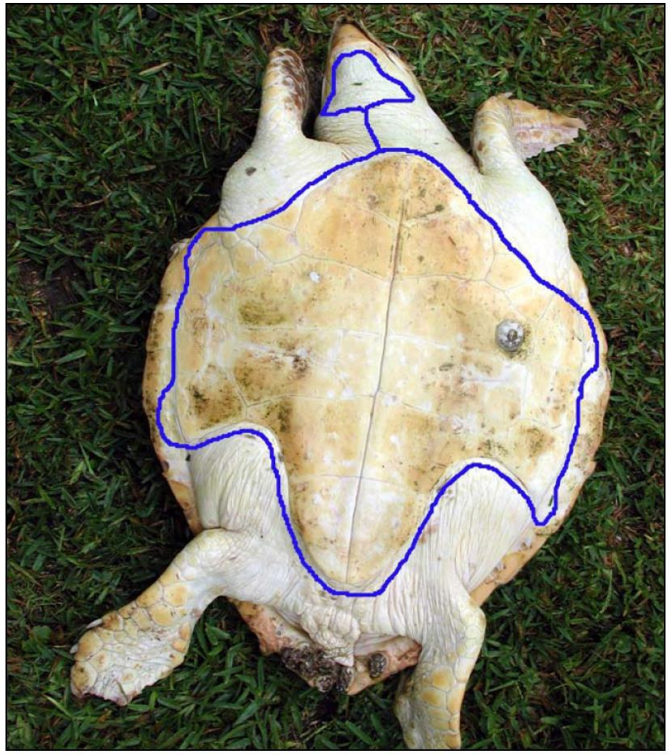
# External lesions, haematomas, epibionts, ectoparasites



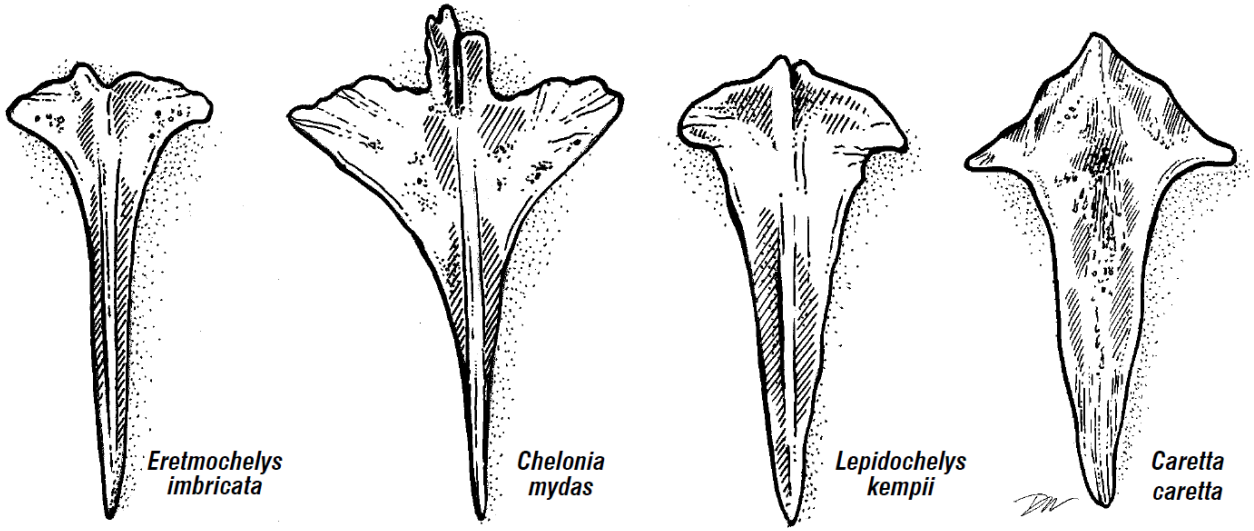


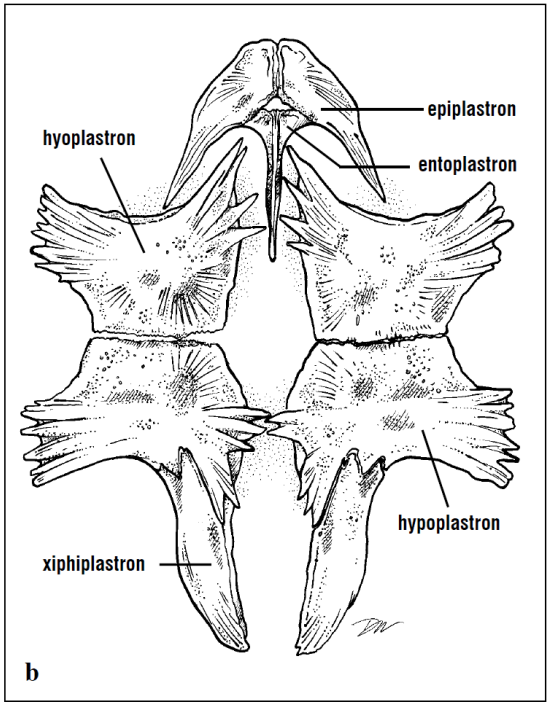
# External lesions, haematomas, epibionts, ectoparasites



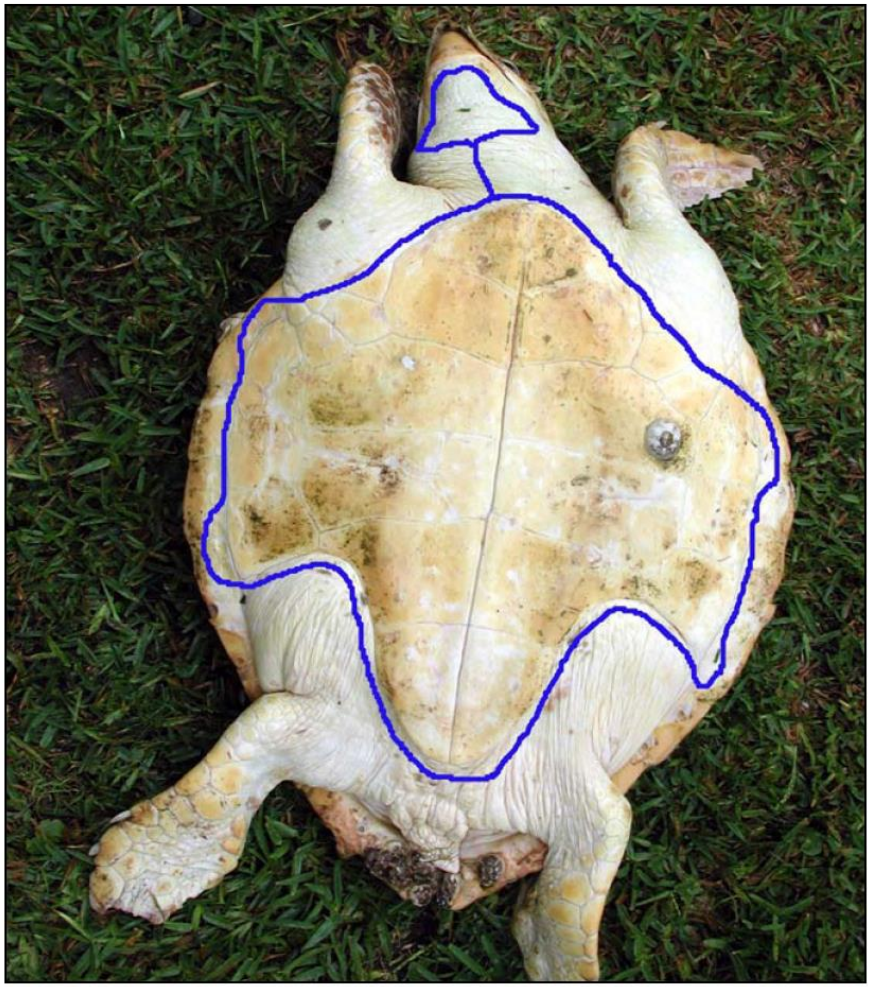


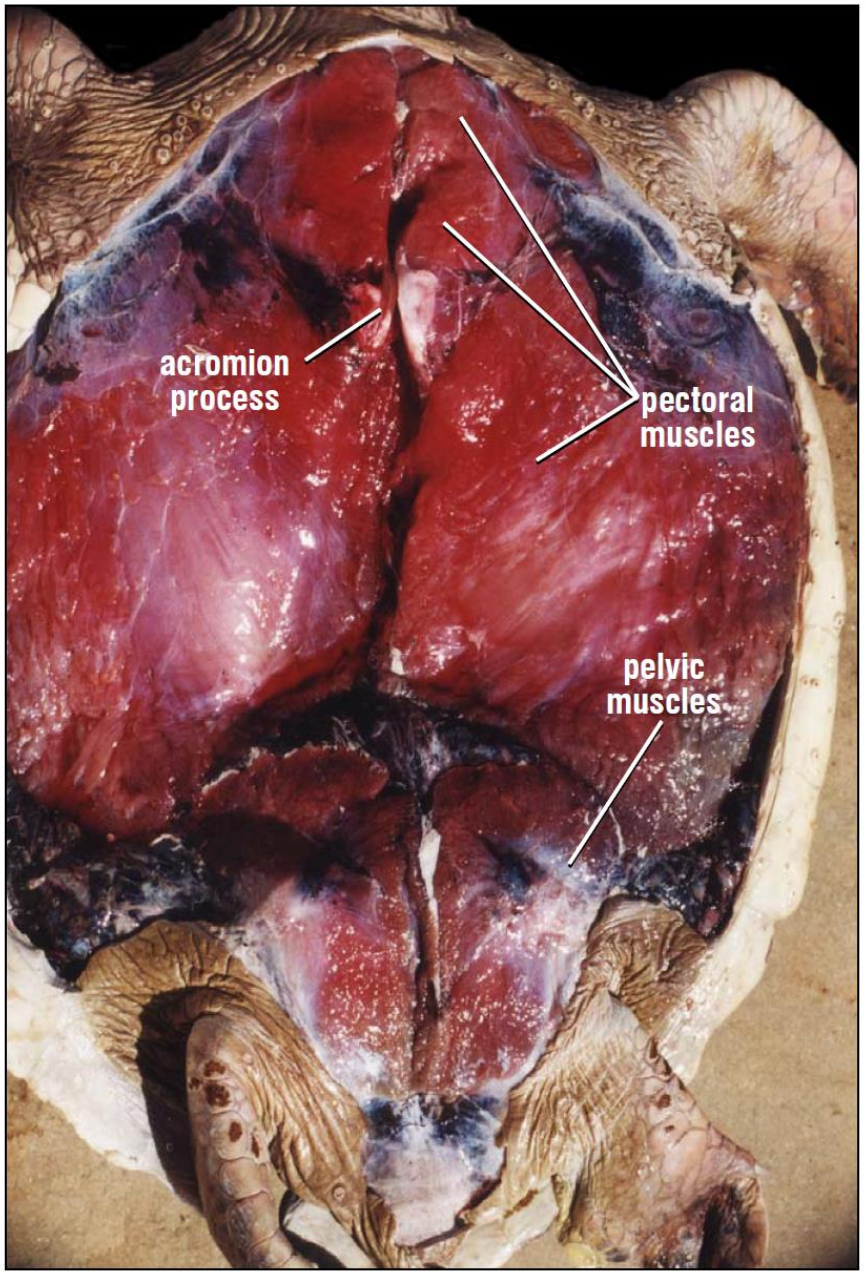

a

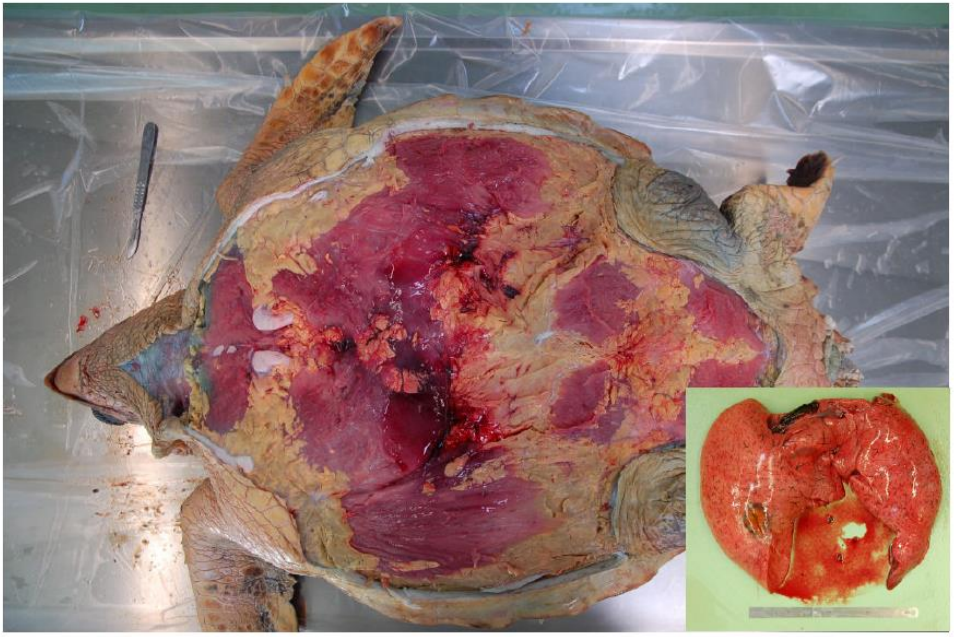

Eretmochelys imbricata
Chelonia mydas
Lepidochelys kempii
Caretta caretta


epiplastron
hyoplastron
entoplastron
hypoplastron
xiphiplastron
b

# Dissection



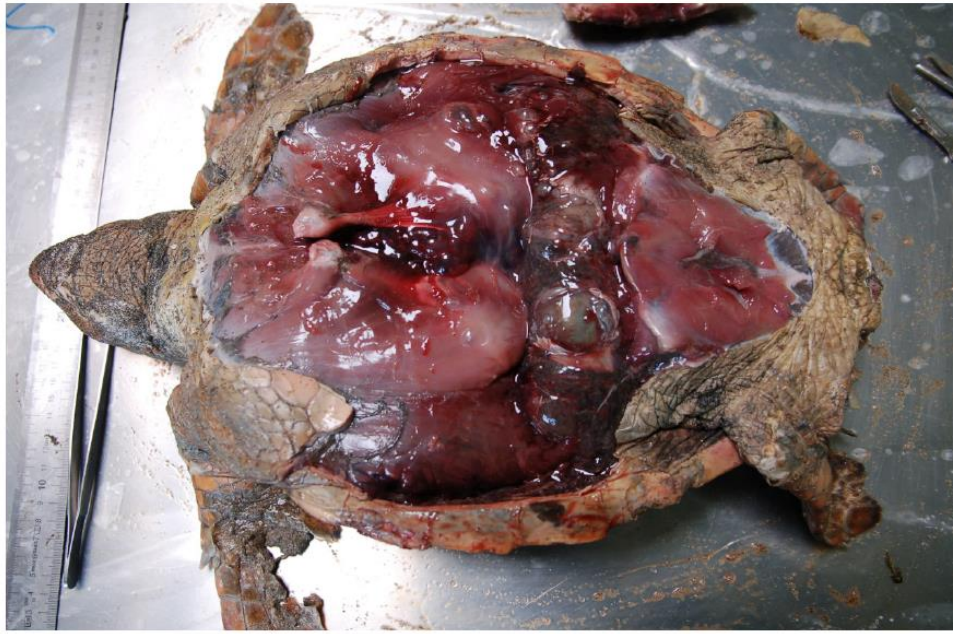




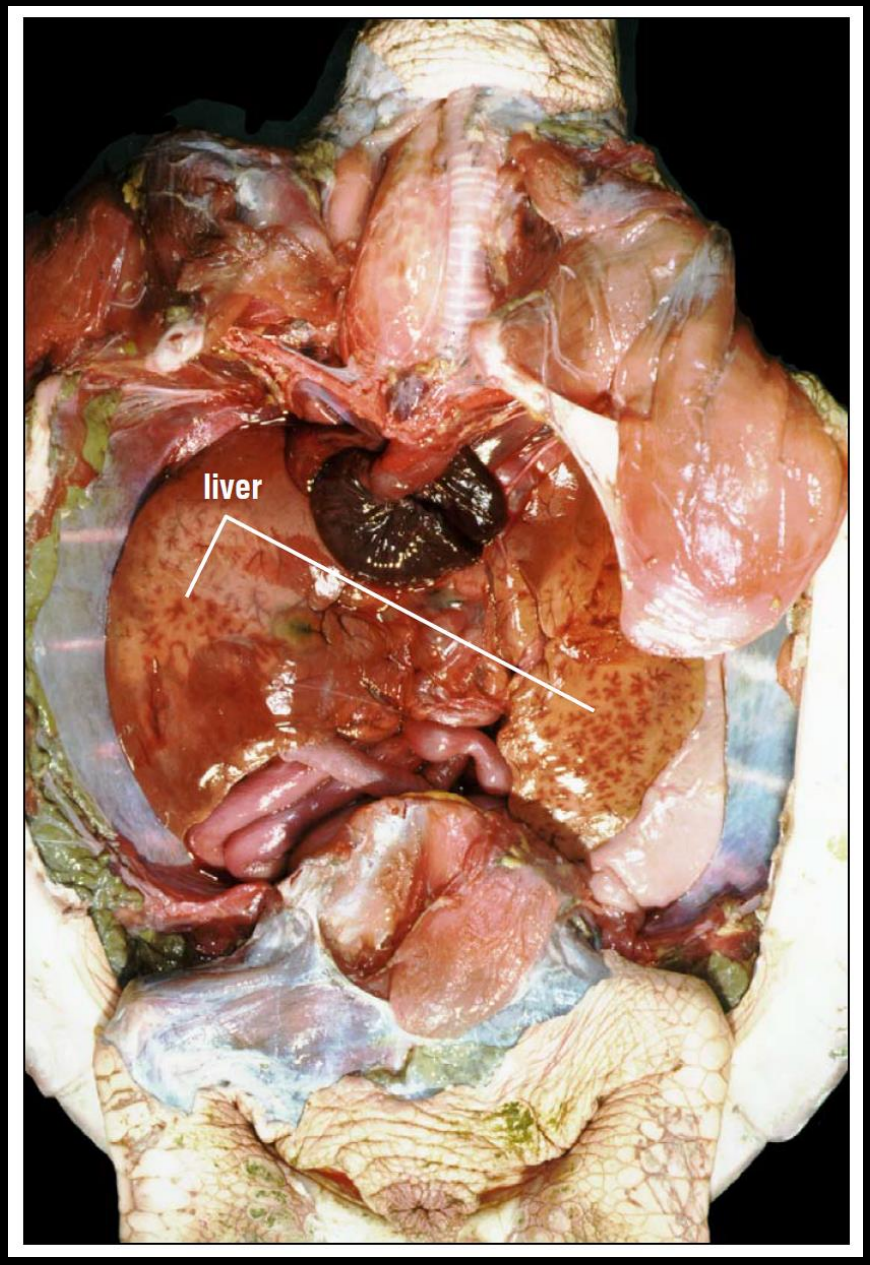
Score 1 (plus hepatic lipidosis)

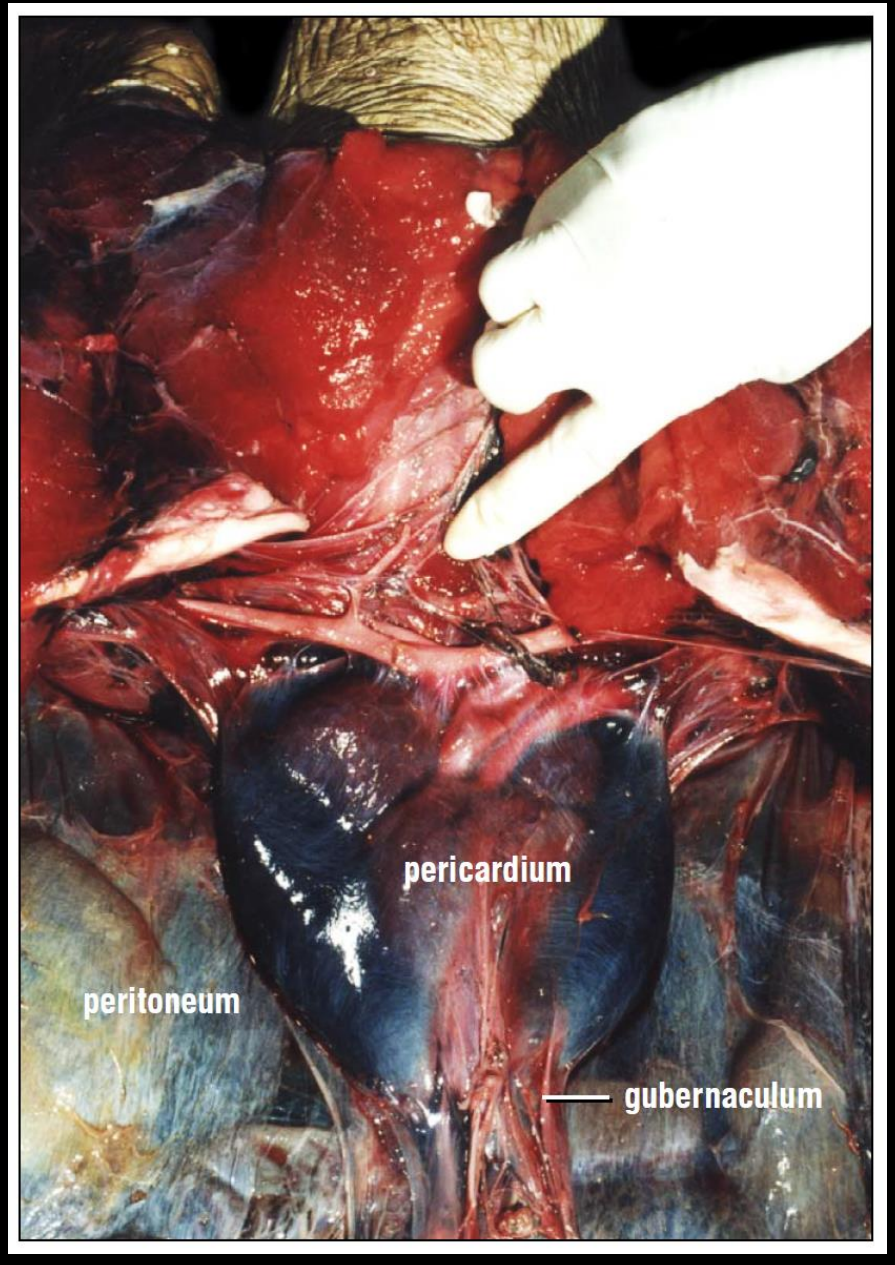
Score 2

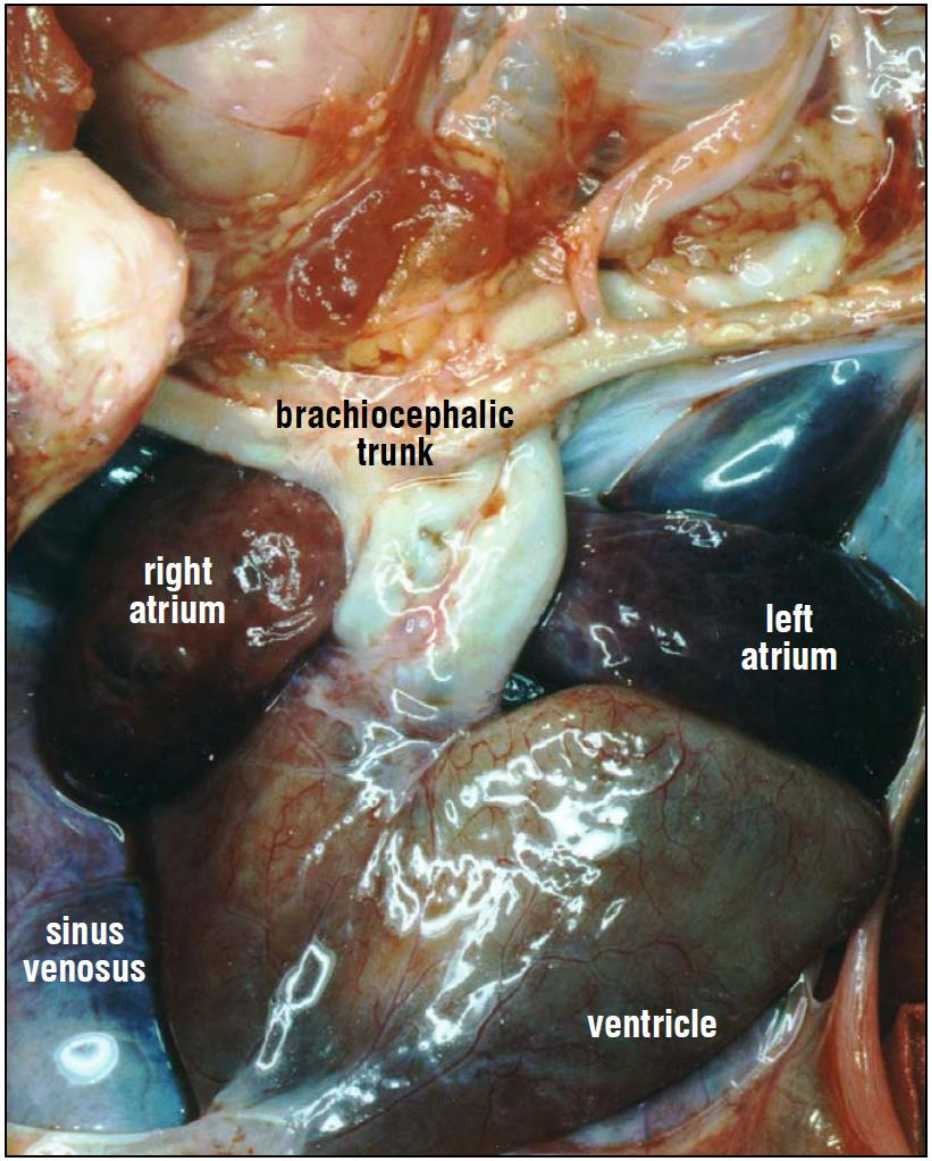
Score 3

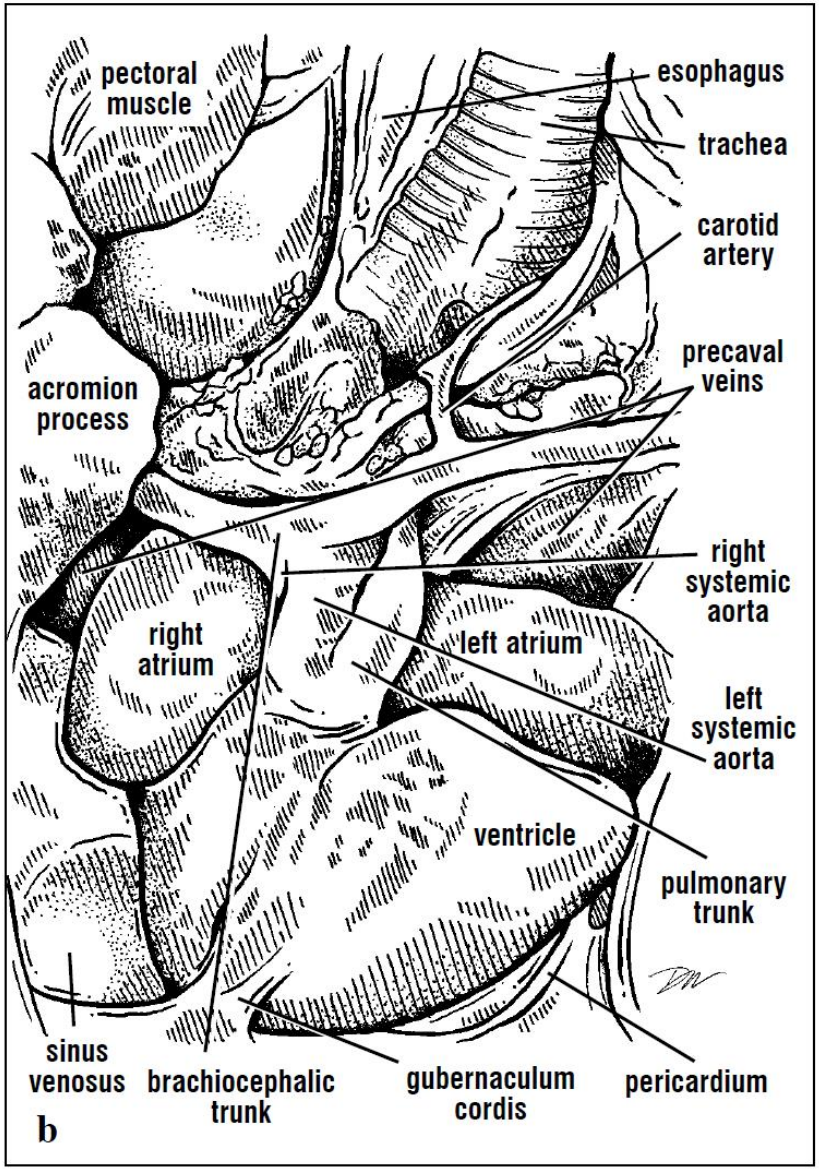


Score 4

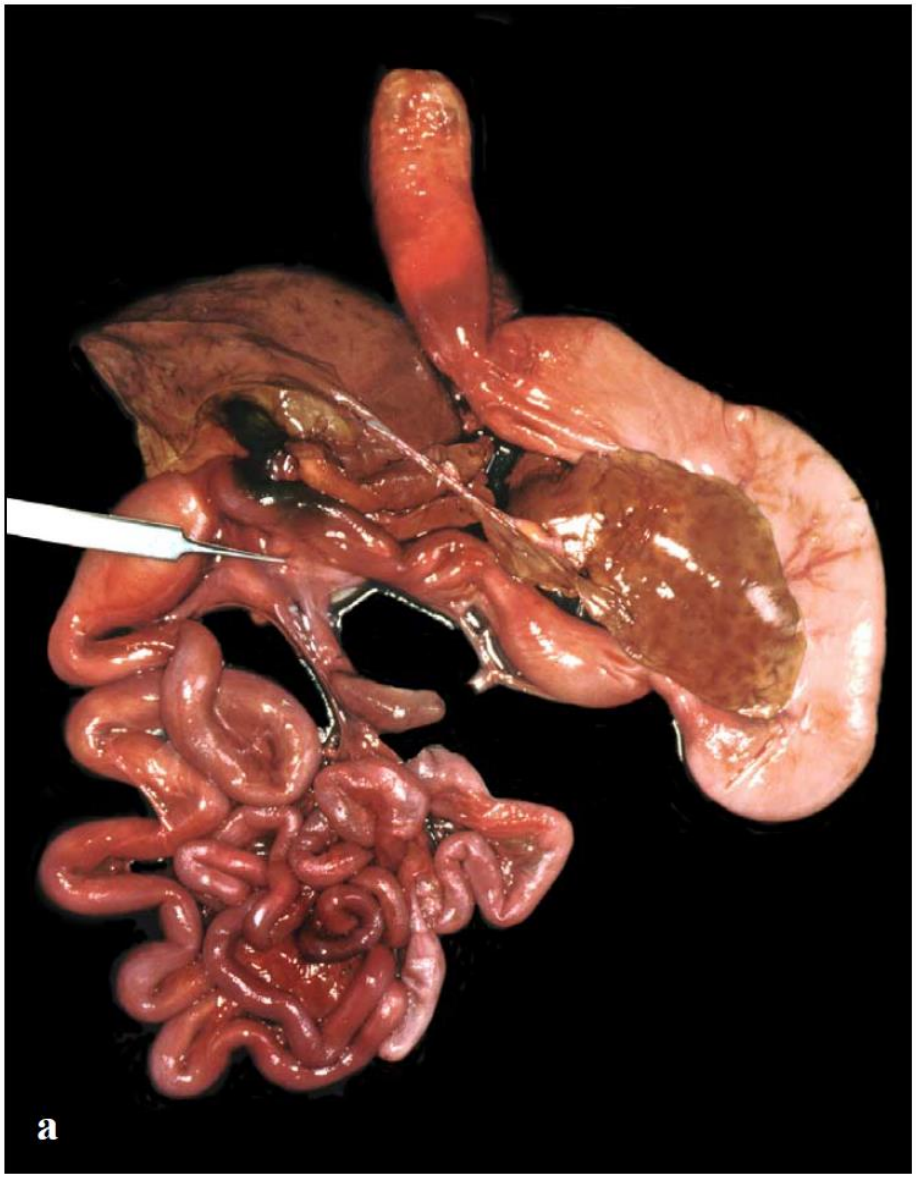

liver


pericardium
peritoneum
gubernaculum

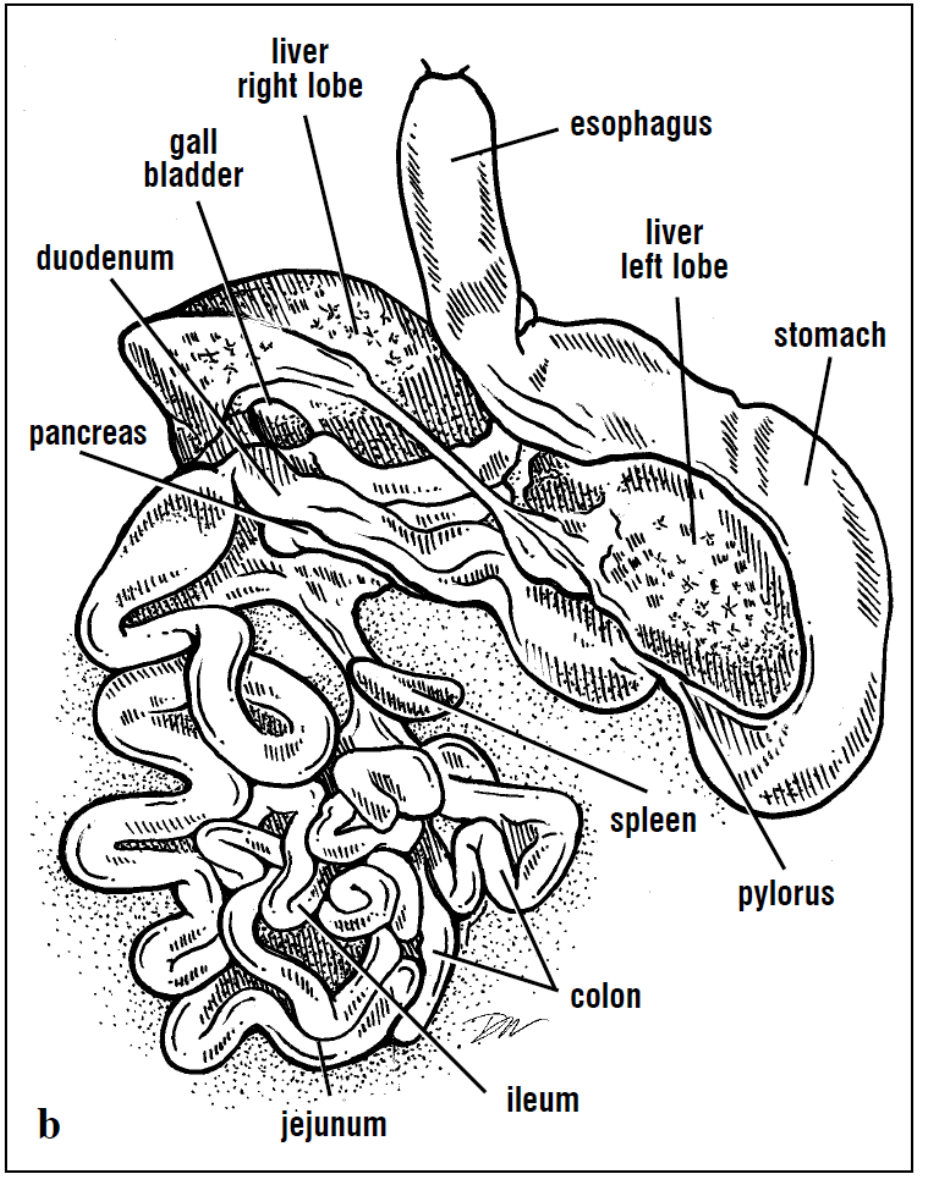


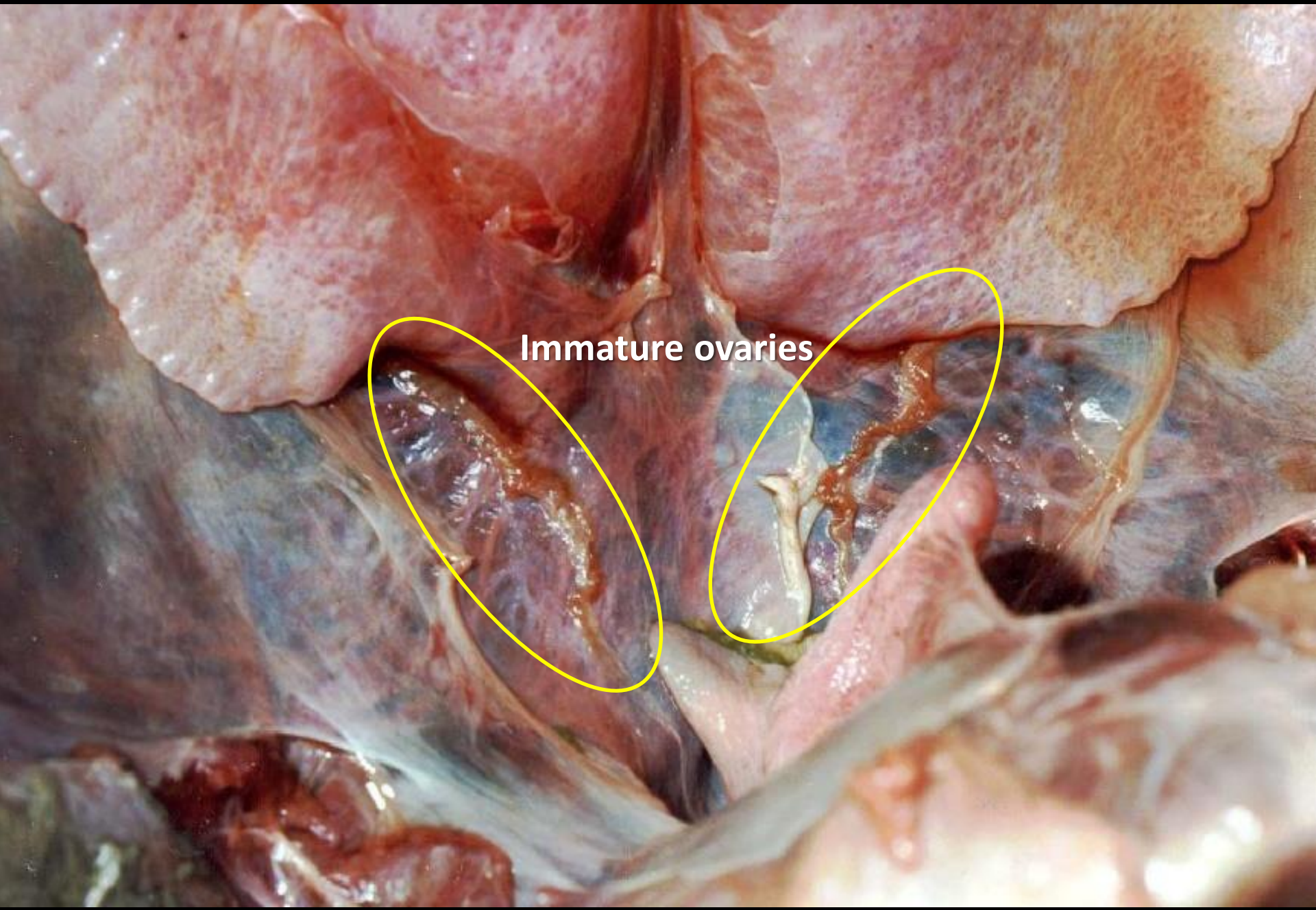

**Figs. 129a and 129b.** *The four chambers of the heart can be identified in this ventral view. The ventral pericardium has been trimmed away to show both the heart and its great vessels. The apex of the ventricle is anchored to the pericardium and peritoneum posteriorly. The venous drainage from the anterior body to the precaval veins can just be seen lateral and anterior to the left atrium.*

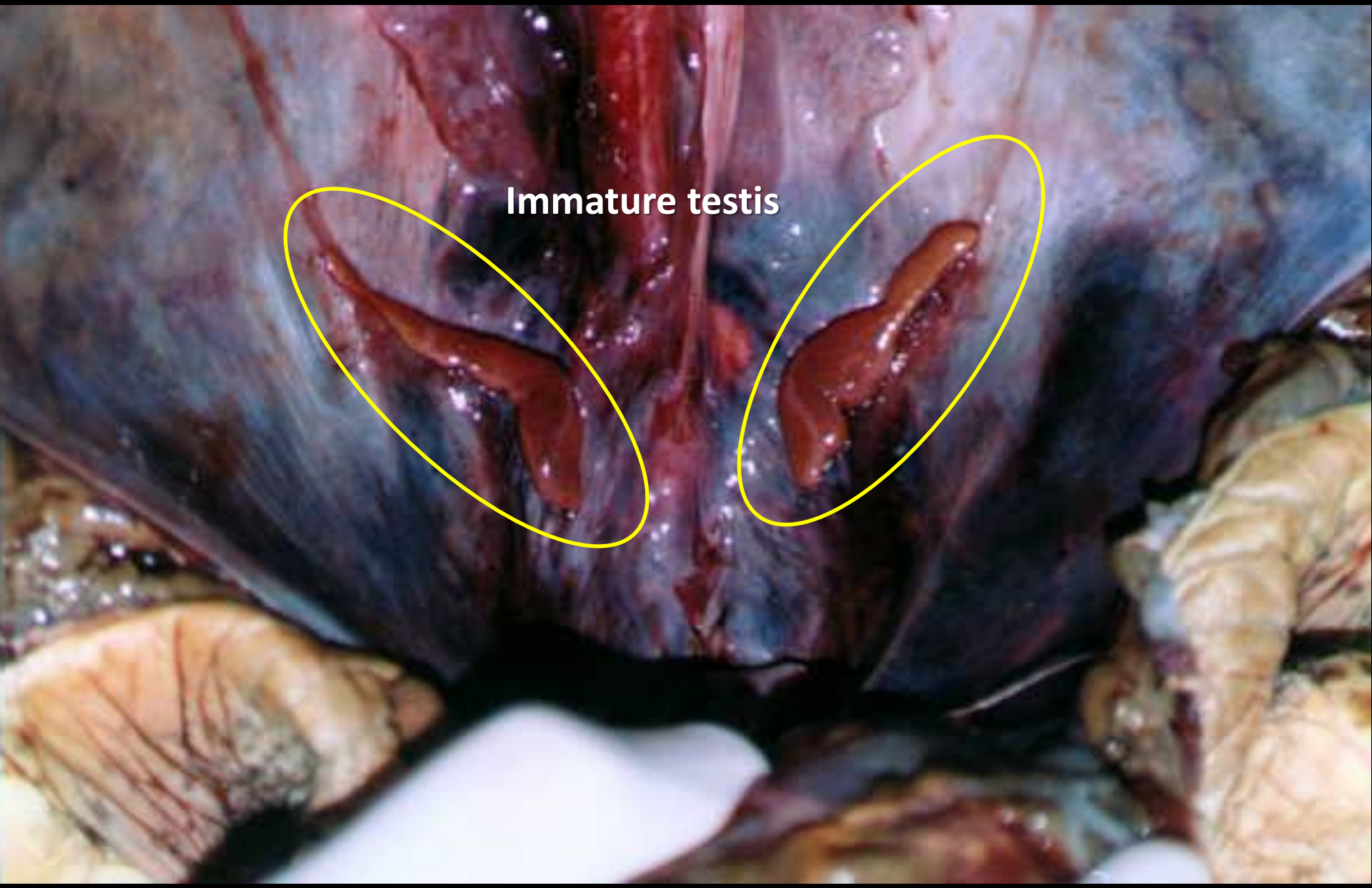


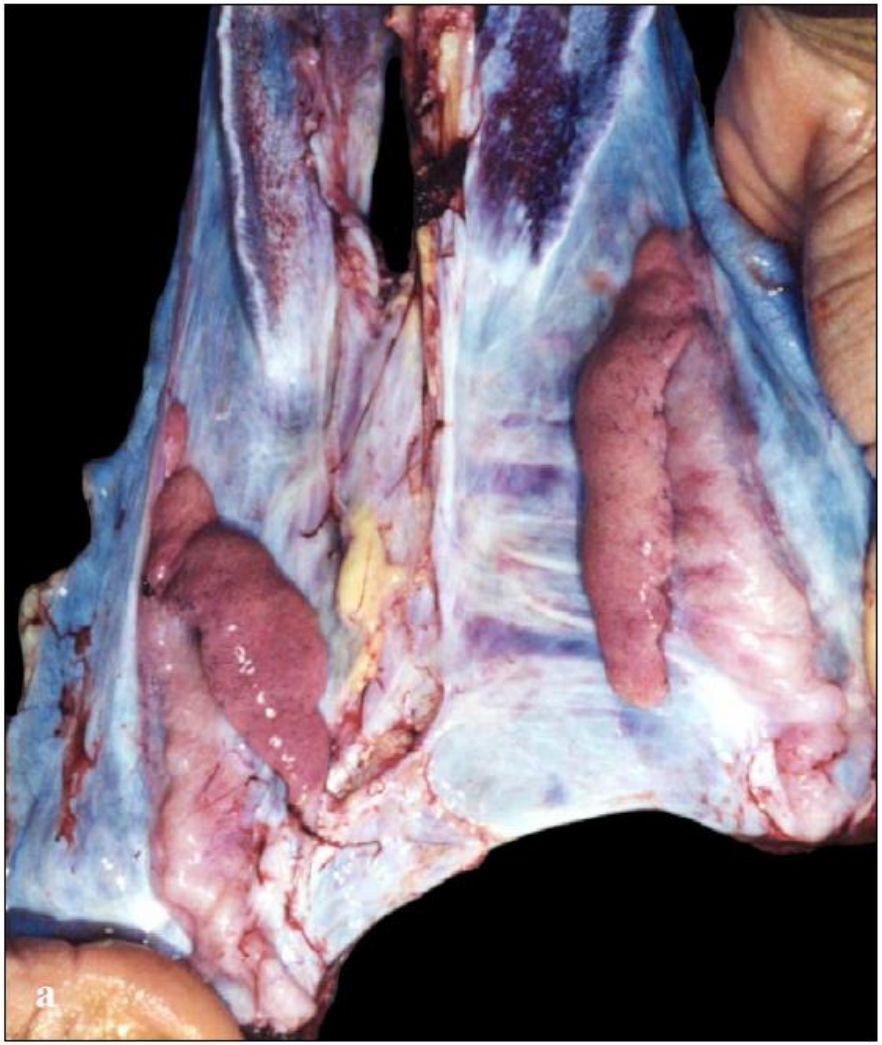
a

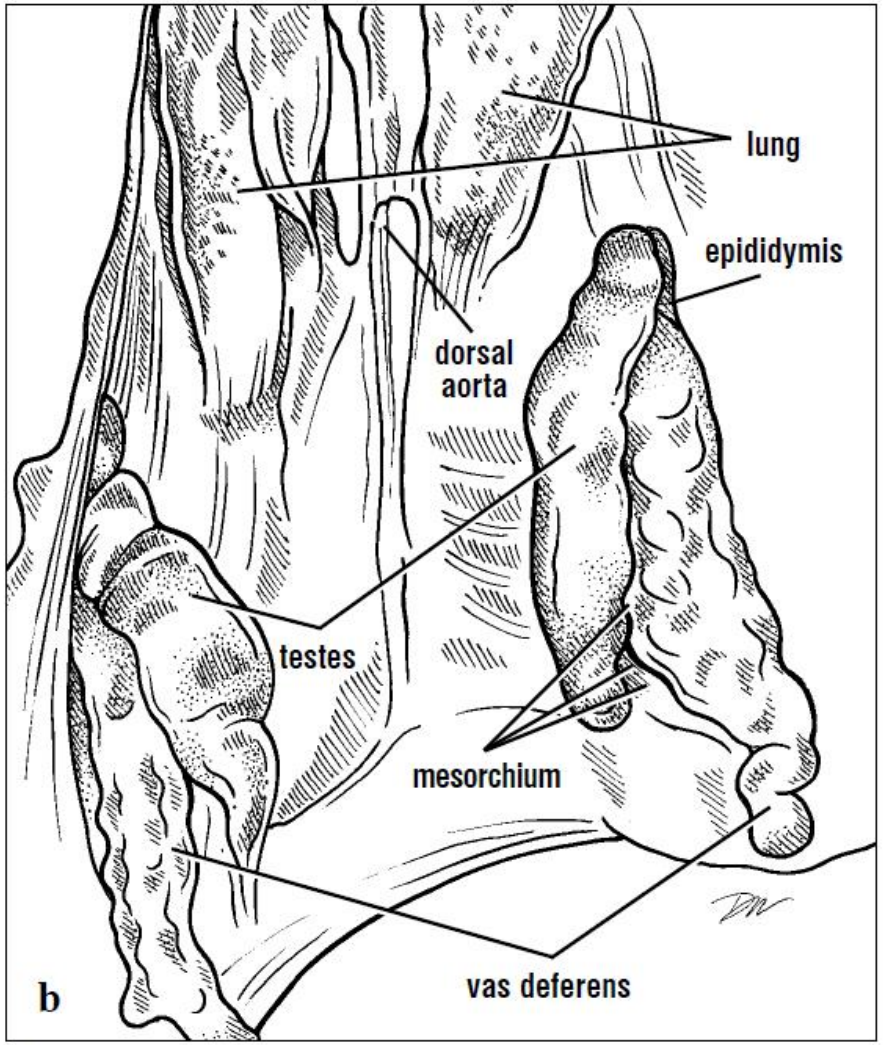

liver
right lobe
esophagus
gall
bladder
liver
left lobe
duodenum
stomach
pancreas
spleen
pylorus
colon
ileum
jejunum

b

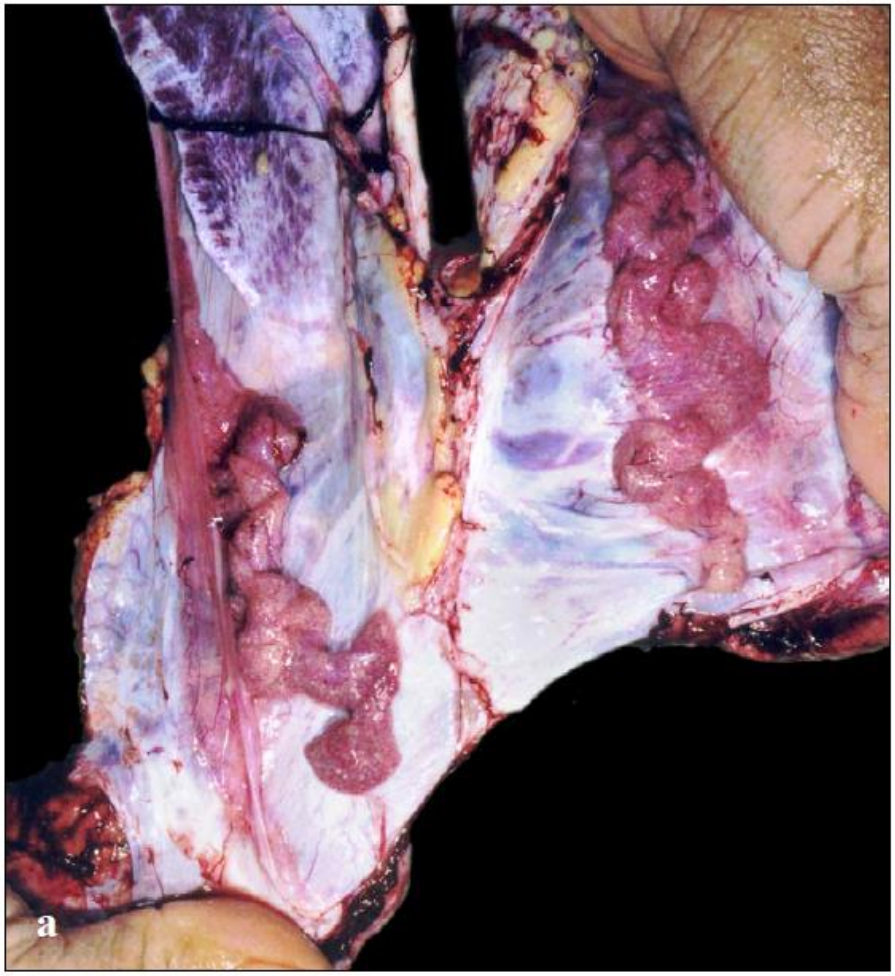

Immature ovaries

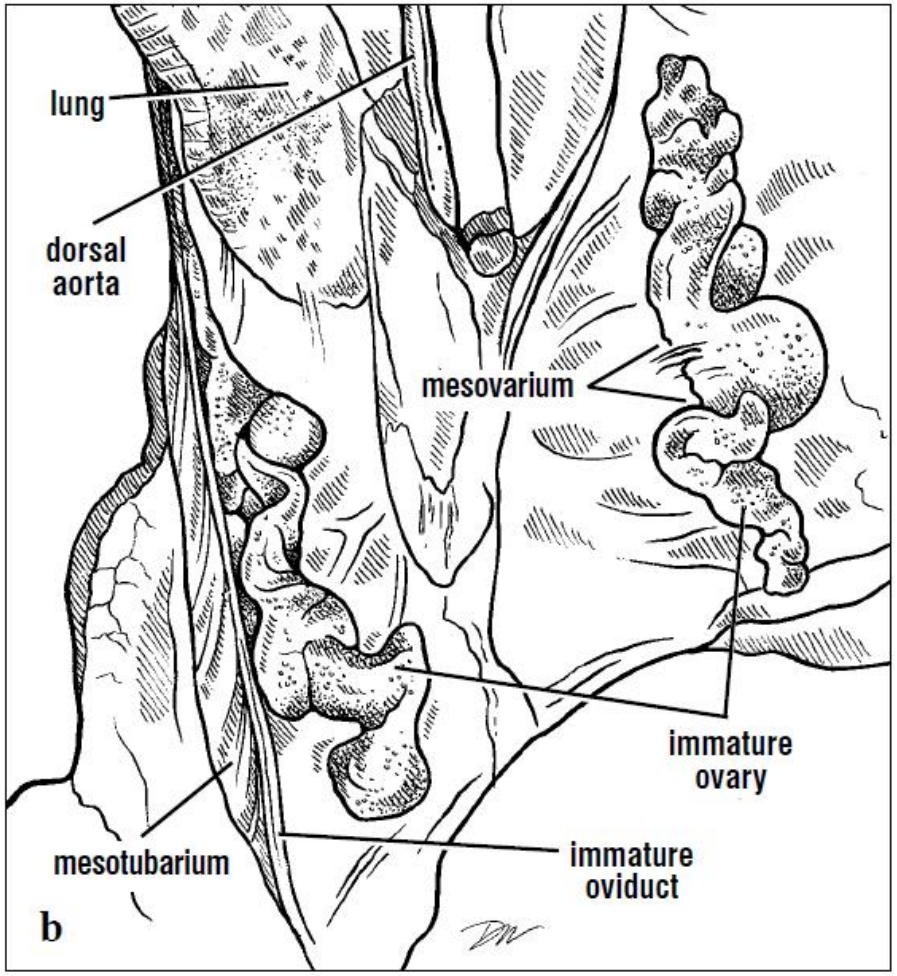

Immature testis



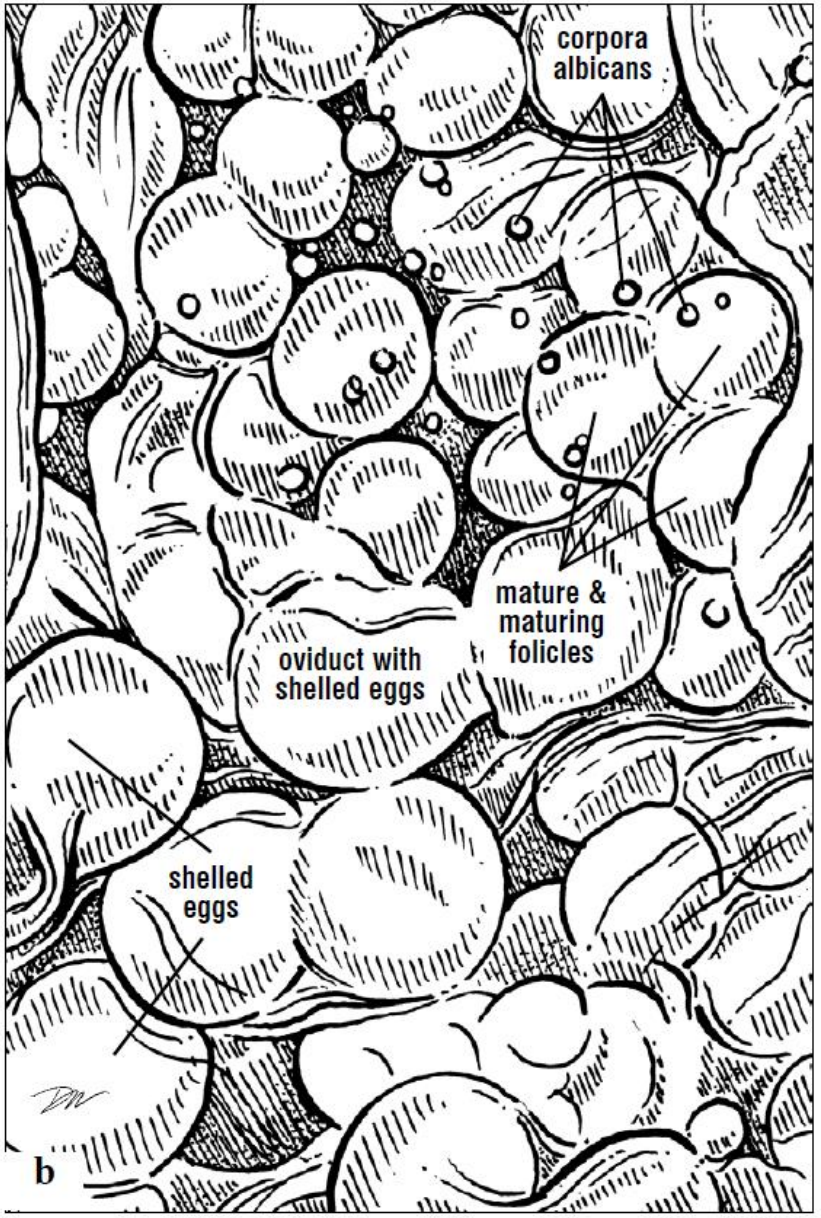




**Figs. 222a and 222b.** *Testes of an immature green turtle. The testes are attached to the peritoneal wall by their flat dorsal surface. Lateral and slightly dorsal to each testes is an epididymis, which leads to a vas deferens. The surface of the testis is smooth in immature turtles.*

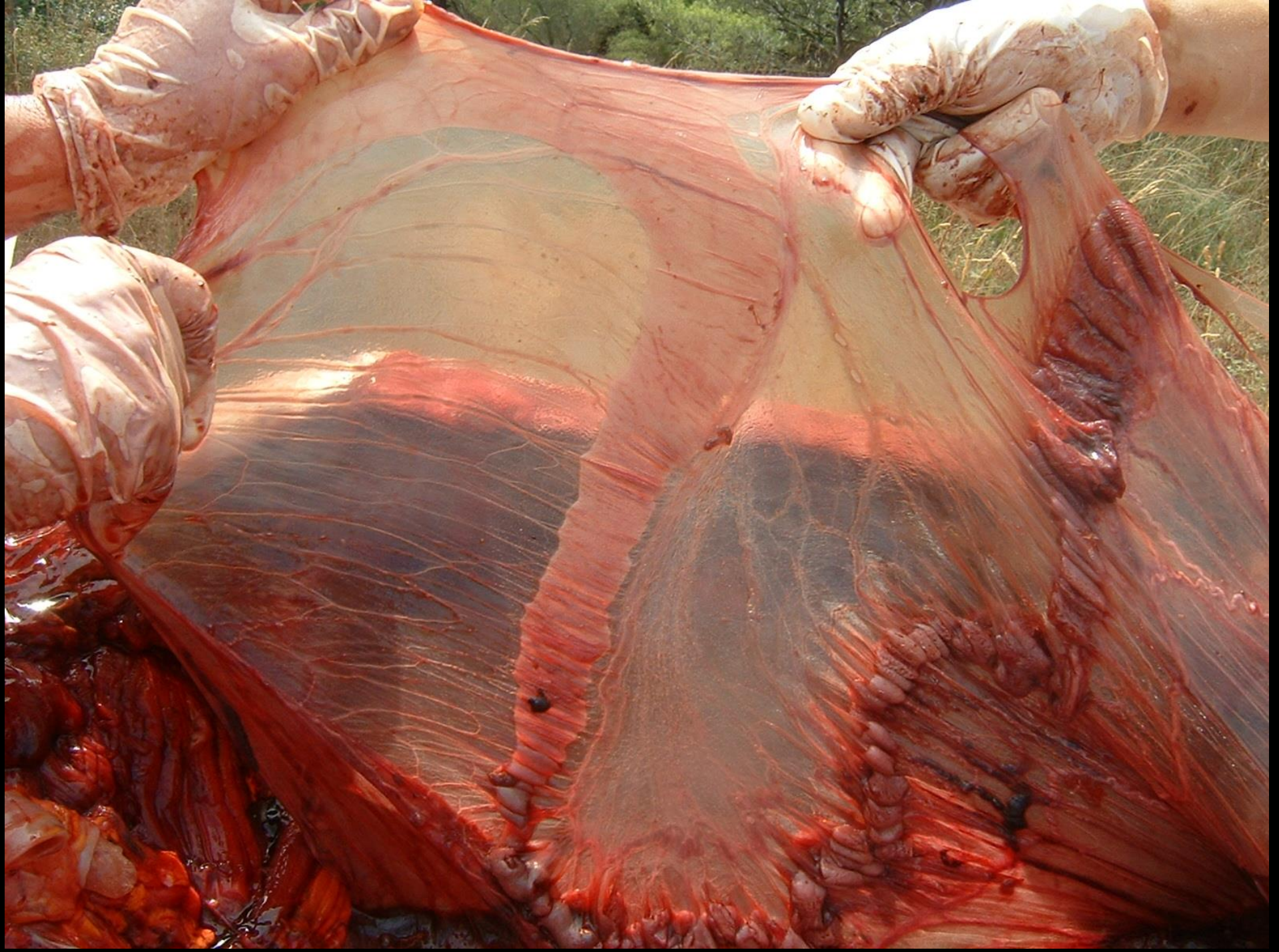


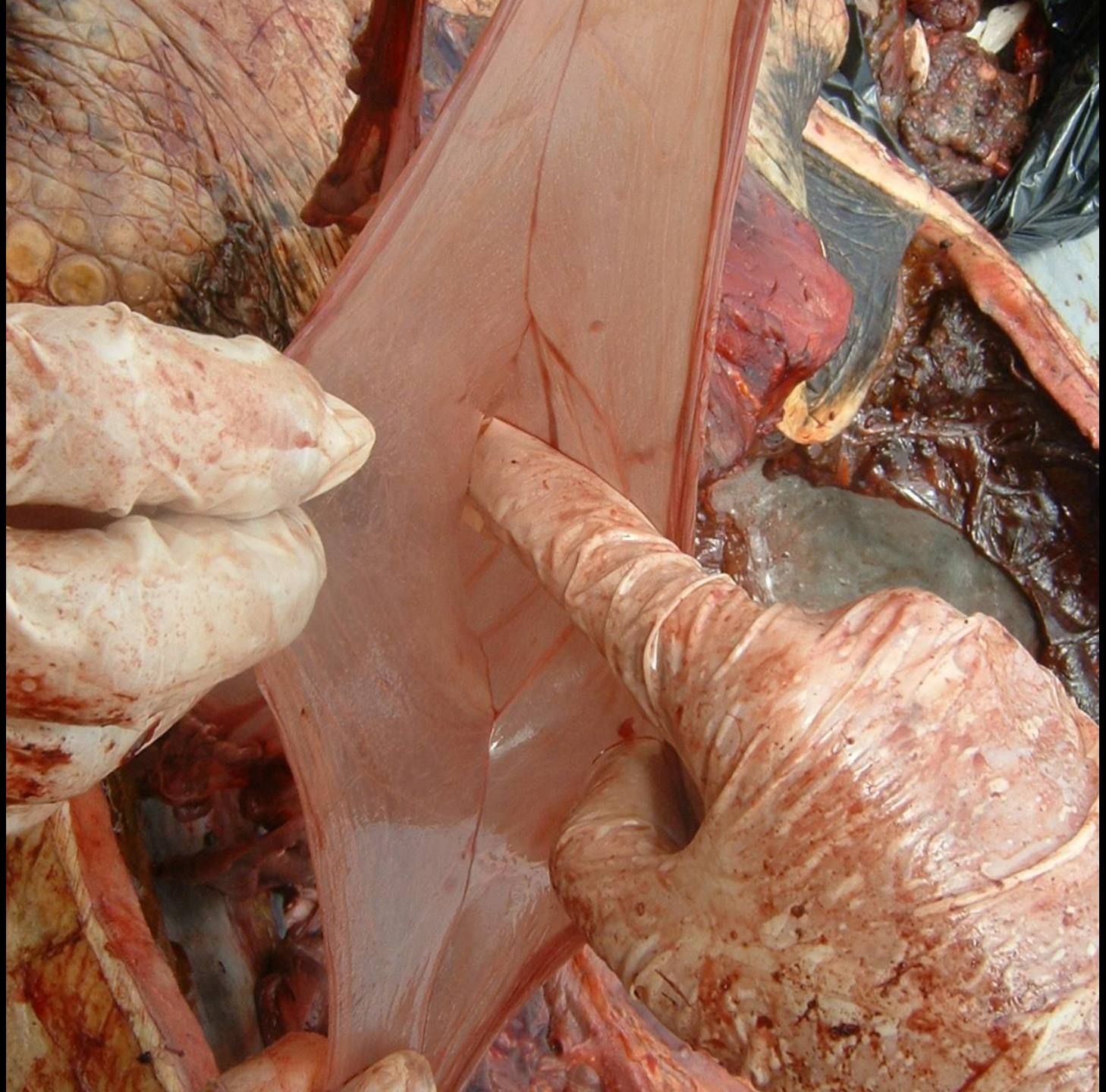



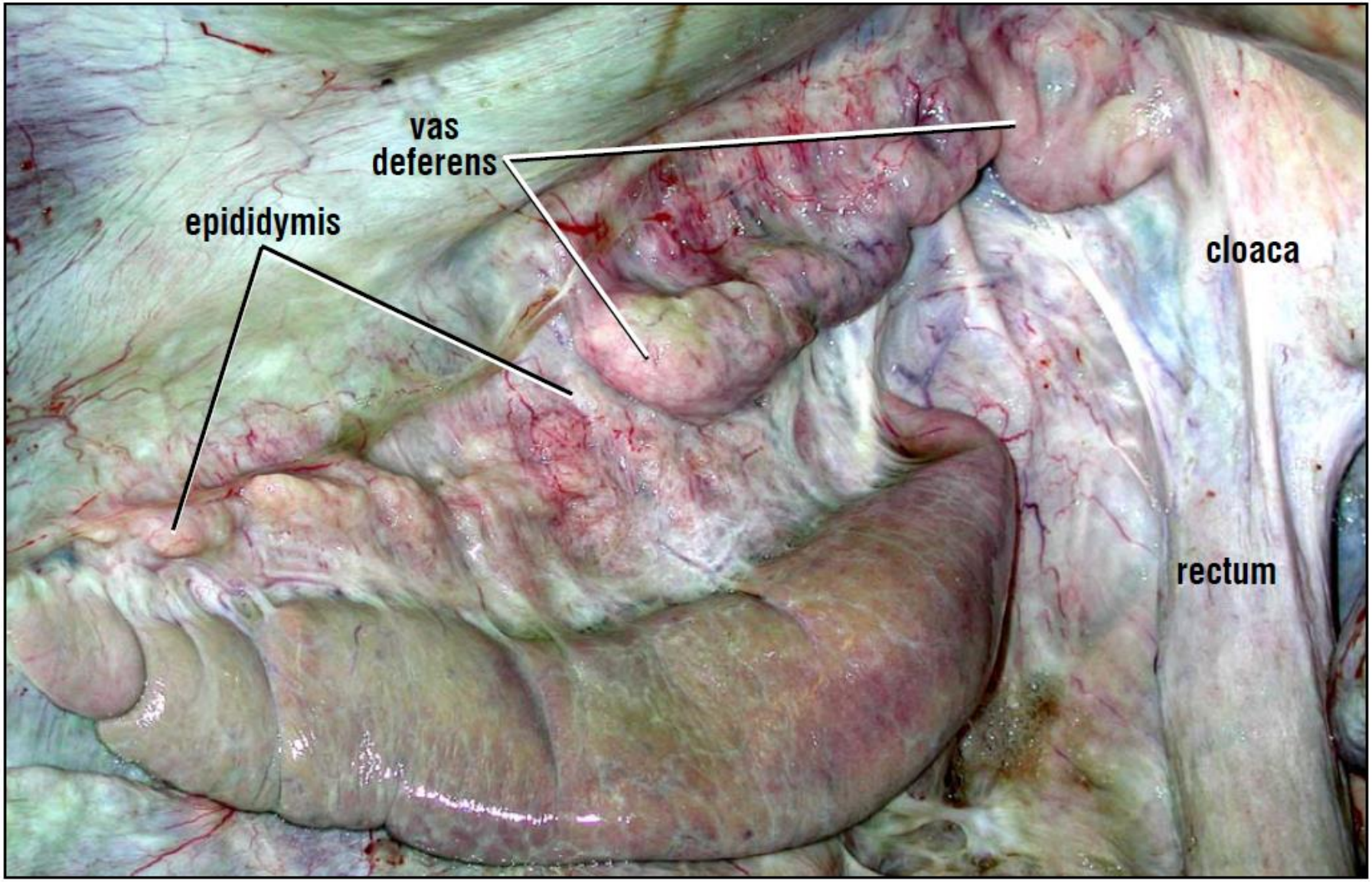

**Figs. 223a and 223b.** *Ovaries of an immature green turtle. The ovaries are attached to the peritoneal wall by their lateral edges. The surface of the ovary is granular. Lateral to the ovary is the immature oviduct, which is suspended by the mesotubarium.*

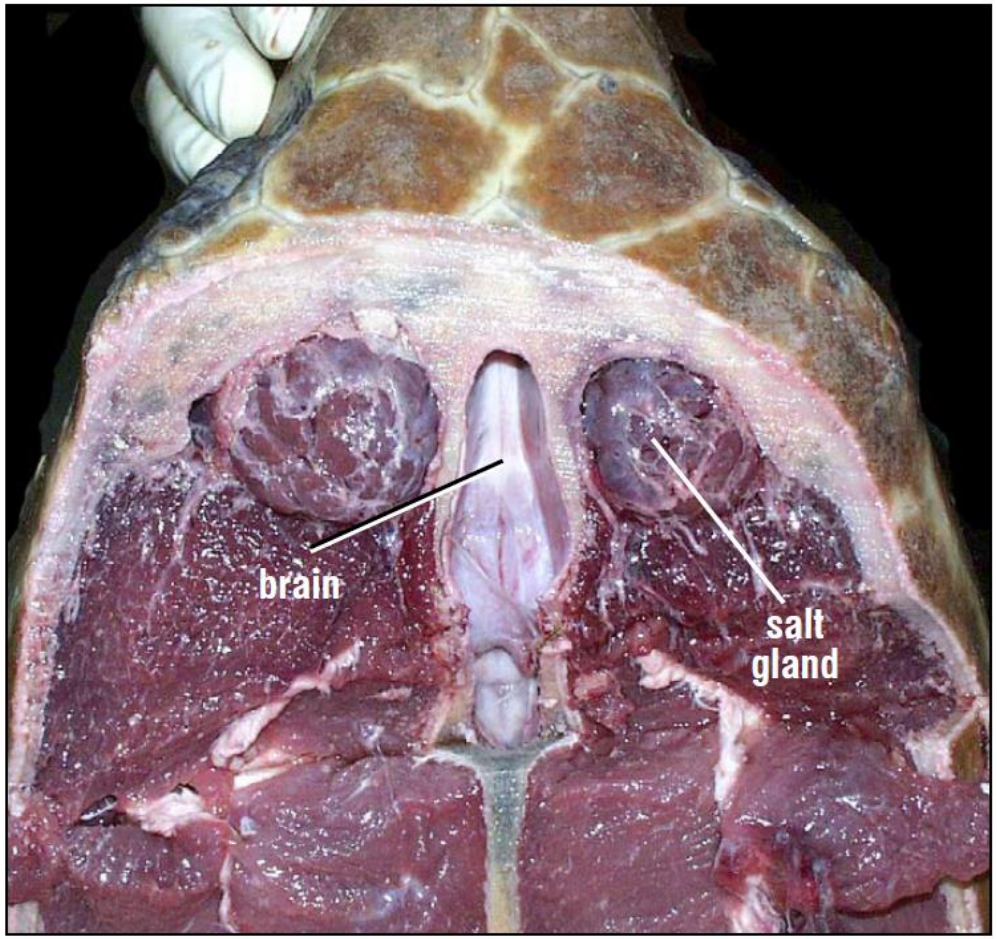



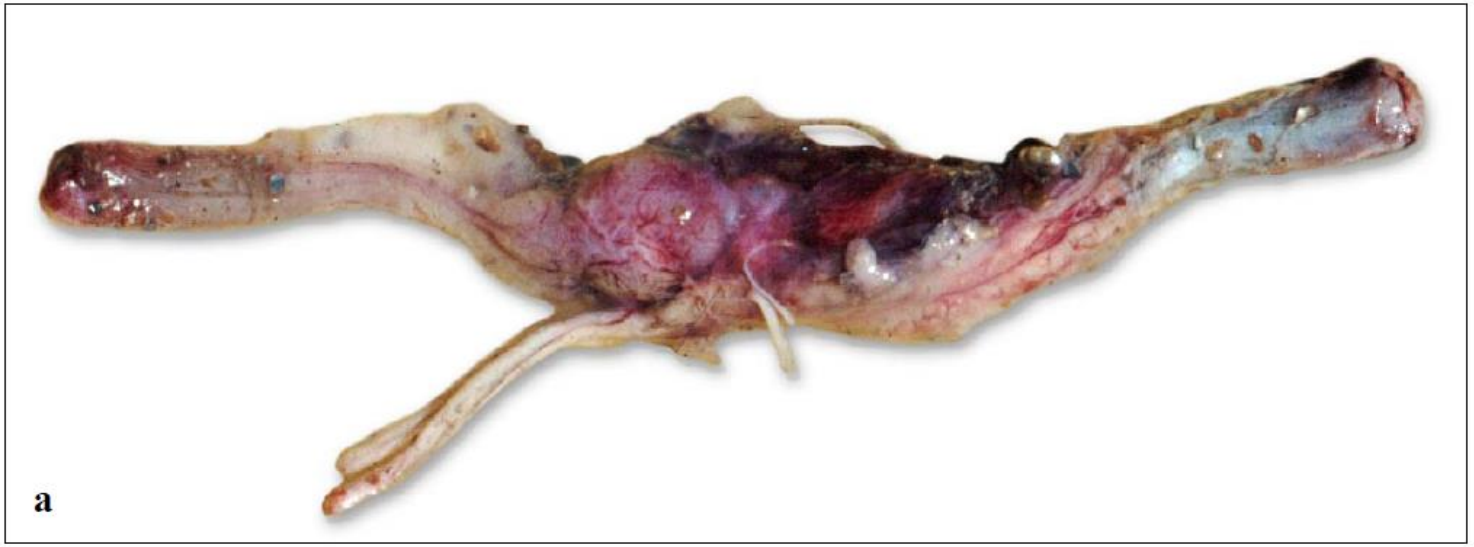

**Figs. 226a and 226b.** *Eggs, follicles, and corpora albicans in a reproductively active loggerhead. This oviduct holds shelled eggs. Above the oviduct are several sizes of maturing follicles and the scars (corpora albicans) remaining from the sites of ovulated follicles.*



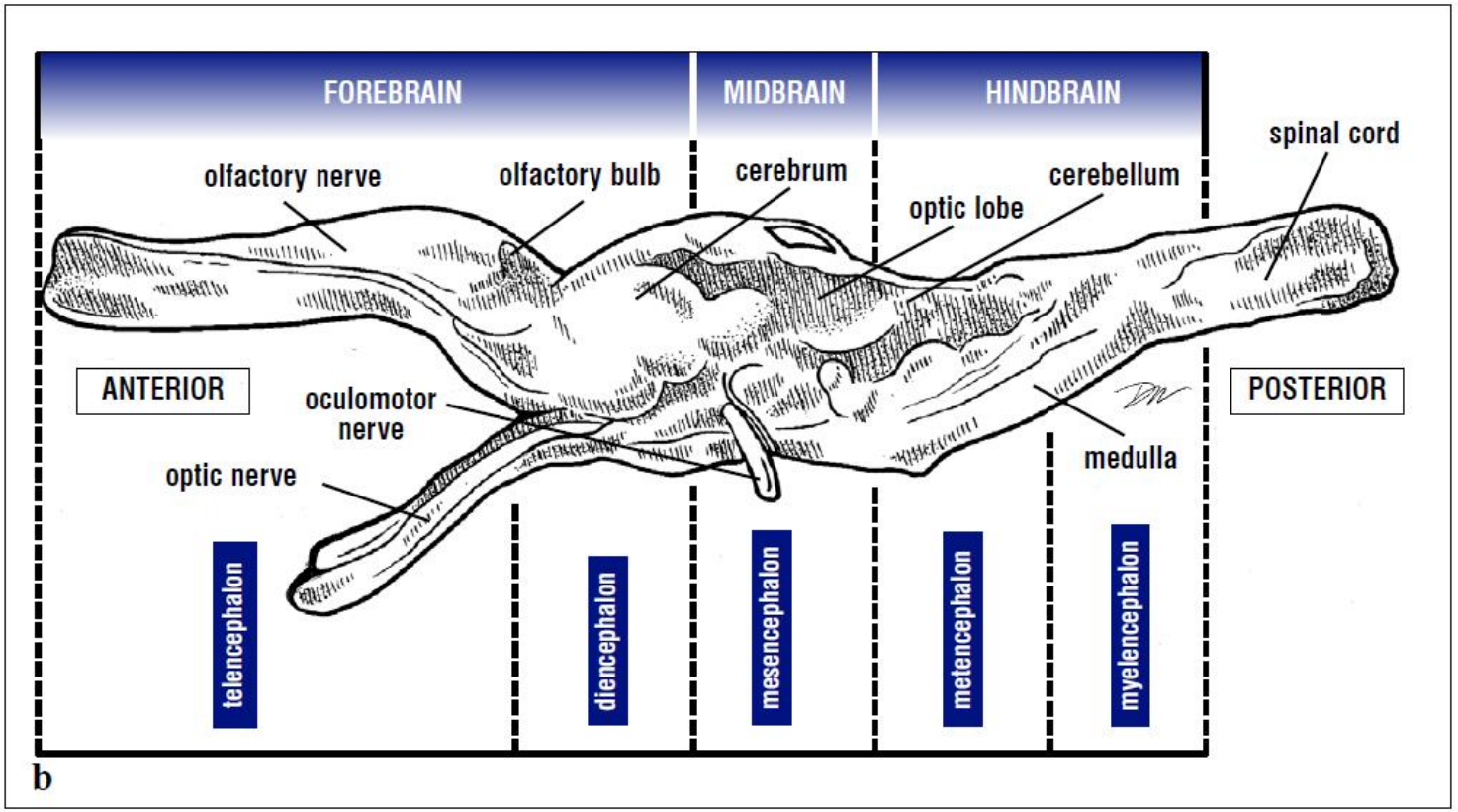



vas
deferens
epididymis
cloaca
rectum


brain
salt
gland



a


FOREBRAIN
MIDBRAIN
HINDBRAIN
olfactory nerve
olfactory bulb
cerebrum
optic lobe
cerebellum
spinal cord
ANTERIOR
POSTERIOR
oculomotor nerve
optic nerve
medulla
telencephalon
diencephalon
mesencephalon
metencephalon
myelencephalon

b