

TECHNIQUE OF NECROPSY IN VETEROLEGAL CASES

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INTRODUCTION

- NECROPSY IS THE MESSAGE OF WISDOM FROM DEAD TO LIVING
- SYSTEMIC EXAMINATION OF ANIMAL, RECORDING OF GROSS LESIONS AND THEIR CORRELATION WITH HISTORY TO MAKE DIAGNOSIS OF DISEASE
- DEAD CELLS EXPLORE TRUTH OF IT'S OWN DEATH.....

VETEROLEGAL NECROPSY

- Veterolegal necropsy is scientific and systematic examination of cadaver in cases where crime is involved
- The purpose of examination is to find out time and cause of death
- Technique of necropsy examination of veterolegal cases is almost similar to usual necropsy examination

LEGAL DUTIES OF VETERINARIANS

- Conducting thorough postmortem examination of **vetero-legal cases**
- Determining the **cause of death**
- Investigating and reporting of animal **cruelty**
- Investigations in case of malicious & accidental **poisoning**
- Crime scene investigation for **insurance companies**
- Investigations in case of frauds in the sale of livestock and livestock products

RULES FOR VETEROLEGAL NECROPSY

- Request letter from Police Officer (**Inspector/Magistrate**)
- Collect maximum information on history, date & time of death and treatment given
- Animal identification (**sp, breed, age, sex, no. or mark specially for insured animals as well as in religiously disputed cases**)
- Conduct in broad day light/natural light
- **Dispute over still birth and calf born alive:** Piece of lung (sink in atelectasis neonatum/float if born alive)

- Lesions on skin surface (laceration, wound, trauma, incision, erosion, vesicle, ulcer, bullet injury: depth and width/diameter)
- Mention the side on which the animal is lying down
- Poisoning/toxicity (type of poison)
- Wild animals: DFO/ Higher officer

(Viscera including skin, bone, teeth etc. are returned to the person requested for the necropsy & no item should be left behind)

- At the time of necropsy outsiders should not be allowed (**closed premise**)
- Avoid necropsy if carcass is suspected to have died of Anthrax
- Avoid necropsy if carcass is completely putrefied with liquefaction of all organs
- Avoid necropsy if carcass is not presented as whole body but in parts

IMPORTANCE OF PHOTOGRAPH

- They should be close enough to identify the animal and the lesions
- A ruler should be in the photograph to show the size of the wounds
- All photographs should include a label marker with the name of the owner or number of the case, the date, and any other pertinent information
- Videotapes can be helpful if there are musculoskeletal injuries or neurological deficits

POSSIBILITY OF CAUSE OF DEATH

- Death due to mechanical trauma
- Death due to intentional poisoning
- Death due to accidental/ intentional electrocution
- Death due to feed toxicity- Mycotoxicosis, Organophosphorus and Organochlorin toxicity
- Death due to environmental pollution with toxic chemicals/ effluent etc. in industrial areas
- Unauthorized killing of wild animals and birds by chemical poison, bullet, arrows and traps

IF NO IDENTIFICATION MARKS

MEASURE

- LENGTH- POINT OF SHOULDER TO POINT OF HIP
- HEIGHT- AT SHOULDER
- GIRTH- BEHIND FORE LIMBS

IF HORNED

- LENGTH
- COLOUR
- COAT COLOUR

IF NO INFORMATION ON AGE

- In cattle-by **horns**-If estimated mention in the report
- Estimate by **teeth**- for all animals

AGE OF CATTLE

RINGS IN THE HORNS

- Cows: 1ST ring at the age of 3 years
- Buffaloes: 1ST ring at the age of 4 years
- AGE= 2+number of rings

BY TEETH

INCISORS- 4 PAIRS

- Deciduous teeth appear by : 1-3 weeks
- First pair : 1 1/2 -2 Years
- 2nd pair : 2 1/2 Years
- 3rd pair : 3 1/2 -4 Years
- 4th pair : 4-4 1/2 Years
- Full adult dentition is present by : > 5 YEARS
- WEARING ON LINGUAL SURFACE : 7 YEARS

AGE OF SHEEP AND GOAT

LAMBS AND KIDS

- Deciduous teeth fully erupted : few weeks

INCISORS- 4 PAIRS

- First pair : 1-1 ½ Years
- 2nd pair : 2 Years
- 3rd pair : 3 Years
- 4th pair : 4 Years
- Full adult dentition is present by : > 5 YEARS
- WEARING ON LINGUAL SURFACE : 7 YEARS

AGE OF HORSE BY TEETH

INCISORS- 3 PAIRS:

- Central pair : 2 ½ Years
- 2nd pair : 3 ½ Years
- Corners : 4 ½ Years
- 3rd incisors in wear : 6 Years

CUPS ON LOWER INCISORS:

- No cup on the 1st incisor with a hook on upper 3rd incisor : 7 Years
- No cup on 2nd incisor : 8 Years
- No cup on 3rd incisor : 9 Years

AGE OF HORSE BEYOND 10 YEARS

GALVENEY'S GROOVE:

(a dark vertical groove occurs on outer surface of the upper corner incisor)

- More prominent and moves down the tooth
:10-20 years
- disappears in upper half :above 29 years
- disappears completely :30 years

AGE OF WILDLIFE (DEER, WOLVES)

FAWNS

- Deciduous teeth are present soon after birth
- Permanent tooth begin to erupt by 1-2 years

ADULTS

- Age is typically estimated by tooth wear, particularly on the molars which show distinct patterns of wear over time
- In older animals, teeth may be heavily worn, broken or missing.

EXTERNAL EXAMINATION

- **SIGNS OF DEATH:** Cessation of respiration, heart beat and eye movement, Algor mortis and initiation of Rigor mortis
- POSITION OF THE ANIMAL
- GENERAL CONDITION
- **EVIDENCE:**
 - FRACTURE
 - DISCOLOURATION
 - PUTREFACTION

EXTERNAL EXAMINATION

- Rigor mortis
- Autolytic changes
- Congestion
- Bleeding
- Putrefaction
- Gun shot wound
- Ectoparasites

TIME OF DEATH

- FROM THE OWNER / CLINICAL SHEET BUT
IN VETEROLEGAL CASES- To be determined by
- RIGOR MORTIS
- HYPOSTATIC CONGESTION
- SIGNS OF DECOMPOSITION

APPROXIMATE TIME OF DEATH

- BODY FRESH WITH NO POSTMORTEM CHANGES WITH CLOTTED BLOOD OF RECENT ORIGIN- 2-4 HOURS
- RIGOR MORTIS IN
 - HEAD :2-8 Hours (Winter)
 - :1 - 3 Hours (Summer)
 - HEAD, NECK & FORELIMBS :12 HOURS
 - WHOLE BODY :15 HOURS
 - HIND LIMBS ALONE :20 HOURS
 - DISAPPEARED :24 HOURS
- DECOMPOSED/BODY LOOSE, PUTRID SMELL & BLOATED :> 30 HOURS

FORENSIC ENTOMOLOGY

Insect analysis is also a good method for determining time of death:

- Eggs To Maggots :24 hours
- Maggots to Pupae :4-5 days
- Pupae to adults :3-5 days

RIGOR MORTIS

HASTENED/ENHANCED BY

- ⊙ EXTERNAL TEMPERATURE

- ⊙ VIOLENT EXERCISE

 - RACING

 - FIGHTING

 - STRUGGLING

- ⊙ VIOLENT MUSCULAR CONTRACTION

 - (STRYCHNINE POISONING)

- DISAPPEARANCE OF RIGOR MORTIS DEPENDS ON RAPIDITY OF COMMENCEMENT OF DECOMPOSITION

PUTREFACTION/DECOMPOSITION

BEGINS FROM 6 TO 36 HOURS DEPENDING ON

FASTER

- CONDITION OF ANIMAL (QUICK IN FATTY ANIMAL)
- TEMPERATURE AND MOISTURE
- DIED OF ABDOMINAL DISEASES

DELAYED

- DIED OF POISONING WITH ANTIMONY, ARSENIC, STRYCHNINE AND CHLOROFORM, CARCASSES BURIED IN DRY SOIL AND SUBMERGED IN WATER

CLASSIFICATION OF VETEROLEGAL CASES



NATURAL CAUSE

LIGHTNING

FLOOD AND
DROWNING

MAN MADE CAUSE

ELECTROCUTION

DROWNING

PHYSICAL INJURY

1. BRUISES (CONTUSIONS)
2. ABRASIONS
3. INCISED WOUNDS
4. PUNCTURED WOUNDS
5. GUNSHOT WOUNDS

POSONING

PLANT AND CHEMICAL

DROWNING

- Submersion of the body in water or other fluid medium



LESIONS IN DROWNING

- Water soaked appearance (**corrugated skin**)
- External injuries over the body due to struggling
- **Air passage and stomach filled with plant and algae and debris**
- **Lung becomes edematous** distended with fluid
- **Whitish frothy exudates in trachea and larynx**

ELECTROCUTION

- Exposure of body to electric shock either to alternate current or direct current.
- **Alternate current is more danger than direct current**
- Shock depends upon :
 - Resistance of the body
 - Voltage and duration of contact

ELECTROCUTION

- **Severe:** animal may fall **dead** without any struggle
- **Less severe:** animal becomes **unconscious** and after a few minutes may **recover completely**.
- Nervous symptoms: **paraplegia**. (may persist or disappear gradually)
- **Singeing and burning marks** occur in about 90% of cases of lightning, mostly on the medial side of the limbs, but the **hairs have a brownish discoloration and abnormal kinking**.
- **Half chewed food in the mouth** is a significant finding in the case of a lightning stroke

LESIONS IN ELECTROCUTION

- **Burning or singeing marks** at the point of entry and exit
- **Dilated pupil**
- **Congested viscera**
- **Edematous lungs**
- **petechiae over serous membranes, heart and meninges**
- **Longitudinal fractures of the long bones**
- **Distended rumen and swollen carcass**
- **Rigor mortis develops and disappears quickly**

LIGHTNING

- Exposure of the body to discharge of **atmospheric** electricity in the open field, under large trees or poles during thunderstorms.
- Death due to **fatal syncope, coma and due to burn injuries**
- Lightning temperature: **50,000°F** and **300 million volts** And **30,000 Amps** in combination.

LESIONS IN LIGHTNING

- Rigor mortis develops and passes quickly
- Early purification of the carcass
- Bloody discharge from all natural orifices and blood is dark and tends to clot slowly
- Distended rumen and swollen carcass
- Petechiae throughout the body including endocardium, meninges and central nervous system
- Congested upper respiratory tract mucosae

LESIONS IN LIGHTNING

- Extravasation of blood in the muscles and superficial lymphnodes
- Longitudinal fractures of long bones
- Singeing or burning marks on the feet or muzzle
- The veterinarian investigating insurance claims for lightning stroke should insist on the presence of both the owner and the insurance representative at the time of necropsy

Dead cattle due to lightning hit

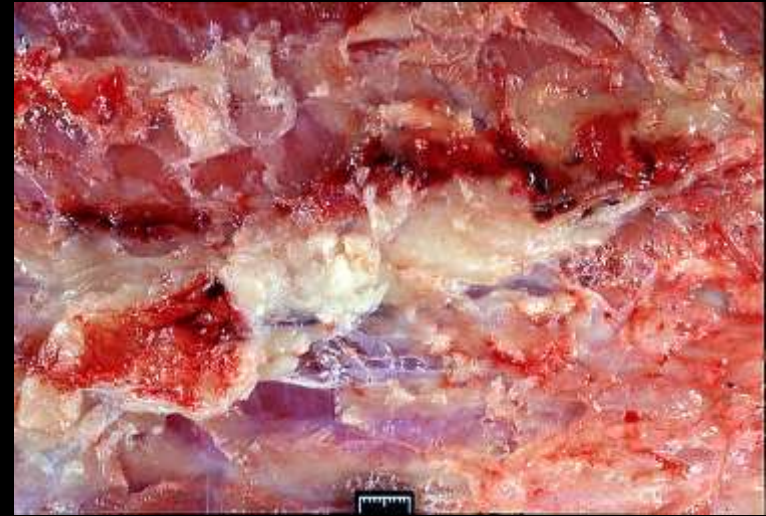


Acute vertebral fractures and hemorrhage in pleura



**LOCALLY EXTENSIVE HEMORRHAGE
AND EDEMA AND COOKED APPEARANCE**

Vertebral Fracture



SKIN OF LIGHTNING



BURNS

- DAMAGE TO THE SUPERFICIAL SKIN AND DEEPER STRUCTURES
- DEATH OCCURS DUE TO SUFFOCATION
- SOOTY PARTICLES IN LARYNX, TRACHEA AND BRONCHI
- ABSENCE OF SOOT : INDICATES DEATH BEFORE BURNS OR FIRE

BURNS

ANTEMORTEM BURNS	POSTMORTEM BURN
LINE OF REDNESS: involves whole true skin or around injured part, separates living from dead	NO LINE OF REDNESS
VESICATION: contains serous fluid- albumin and chloride, inflammed base, surrounding skin copper coloured	FALSE VESICATION- CONTAINS AIR ONLY BASE: HARD, DRY & YELLOW
SIGNS OF INFLAMMATION	NO SIGNS OF REPAIR INTERNAL ORGANS: ROASTED, FOUL SMELLING OFFENSIVE ODOUR

TIME OF BURNS

REDNESS	Immediate
VESICLES	2 – 3 Hours
PUS	2 – 3 Days (Not before 36 hours)
SEPARATION OF DEAD TISSUE	4 – 6 Days
DEEP TISSUE REPARATIVE	15 Days
GRANULATION TISSUE COVER	Beyond 15 days
CICATRIX SCAR	After several weeks or months

BURNS ON THE SKIN



WOUND

- ❖ Incised wound
- ❖ Lacerated wound
- ❖ Punctured wound
- ❖ Gun shot / fire arm wound
- ❖ Contused wound

AGE OF WOUND

ENDS COVERED WITH LYMPH	36-48 Hours
JOINING EDGES	72 Hours
HEAL BY FIRST INTENSION	7-8 DAYS

AGE OF OPEN WOUND

BLOOD AND LYMPH ON WOUND, RED MARGINS, SLIGHTLY SWOLLEN WITH INFILTRATION OF LEUKOCYTES	First 12 Hours
PROLIFERATION OF VASCULAR TISSUE	24 Hours
NETWORK OF NEW CAPILLARIES	36-48 Hours
PUS IN THE SEPTIC WOUND	36-48 Hours
GRANULATION TISSUE	48-56 Hours
FIBRILS OF CONNECTIVE TISSUE	3-6 Days
DENSE SCAR	3-4 Weeks

AGE-BONE FRACTURE

HAEMORRHAGIC EXUDATION	1-3 Days
SOFT TISSUE CALLUS	4-15 Days
OSSIFICATION	15 Days-5 Weeks
HARD CALLUS	6-8 Weeks

GUN SHOT WOUND

The appearance of the wound depends upon the following conditions of the individual case under examination:

1. THE KIND OF WEAPON EMPLOYED
2. THE NATURE OF THE PROJECTILE
3. THE VELOCITY OF THE PROJECTILE
4. THE NATURE OF THE POWDER USED
5. THE RANGE AT WHICH THE WEAPON WAS FIRED
6. THE DIRECTION OF FIRE

ENTRANCE BULLET WOUND

- It is smaller than exit wounds
- It will be more or less circular if the weapon is fired from a close range and the area will be blackened by smoke and flooded with burnt grains of gun powder
- No blackening is found if the weapon is fired from a distance of more than four feet
- When the velocity of the bullet is very low the entrance wound will be a slit like hole

EXIT BULLET WOUND

- Exit bullet wounds are always free from sign of burning and blackening of the burnt powder
- They are torn within and pushed in the outward direction and the hole should be bigger than the bullet
- If the bullet passes through a bone, it shows a clear cut hole at the entrance and an excavated cone shaped hole at the exit and some time the bullet is lodged in the body
- The recovered bullet must be send to the police officer in sealed envelope as legal evidence

TYPES OF HAND WEAPONS

Revolver



AK 47 Gun



Single shoot pistol



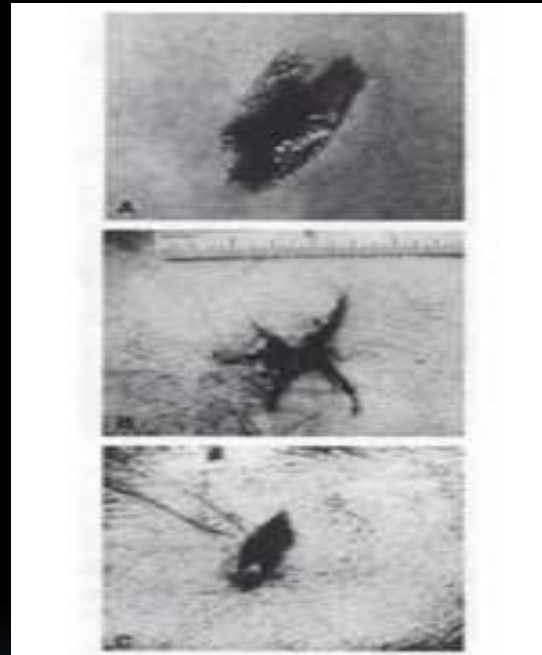
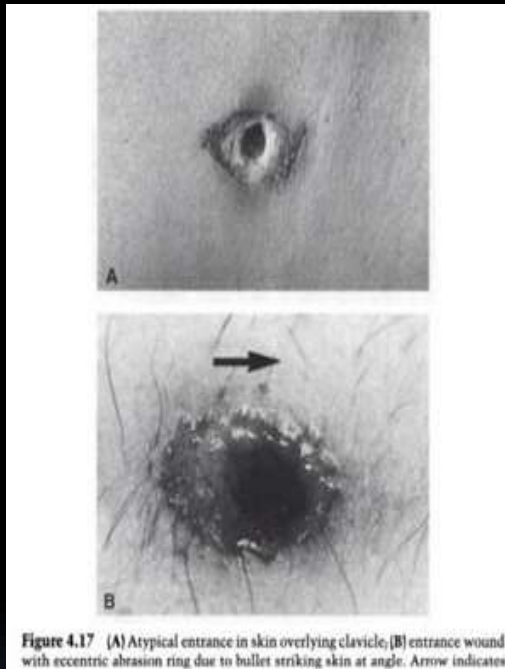
Hand rifle



Hand pistol



COMPARE THE SKIN ENDS TEXTURE



Entrance

Exit

Distance gun shoot wound

GUN SHOOT IN AND AROUND SCAPULA

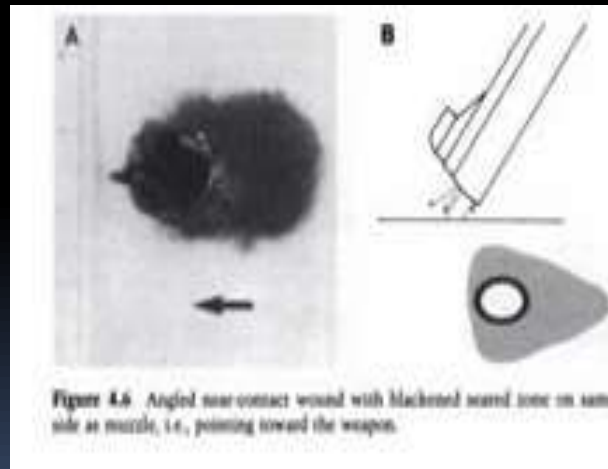


Figure 4.4 Angled near-contact wound with blackened soiled zone on same side as muzzle, i.e., pointing toward the weapon.

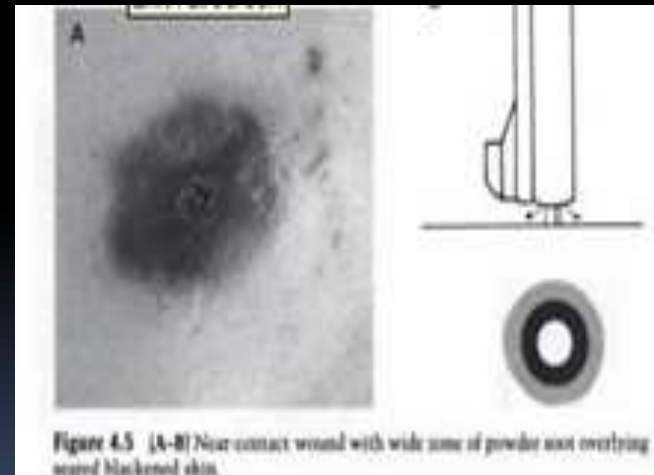


Figure 4.5 (A-B) Near-contact wound with wide zone of powder soot overlying soiled blackened skin.

Close contact shoot with angle and without angle

COMMON POISONING

- Abrus precatorious (rathi)
- Datura seed
- Aconite root
- Linseed
- Urea
- Insecticide and pesticide

LESIONS

- **PETECHIEAL AND ECCHYMOTIC HAEMORRHAGES ON HEART AND OTHER VISCERAL ORGANS**
- **OEDEMA AND CONGESTION OF LUNGS**
- **HEPATITIS**
- **TUBULAR NECROSIS OF KIDNEYS**

MALACIOUS POISONING



INSTRUMENTS

- BUTCHER'S KNIFE
- SCALPELS
- DISSECTING FORCES
- SURGICAL SCISSORS
- BOWEL SCISSORS
- HACK SAW/ELECTRIC SAW
- IRON FOOT RULE
- MAGNIFYING GLASS
- CHISEL
- HAMMER
- SPATULA
- BONE CUTTER
- GLOVES AND MASK

POSTMORTEM CHANGES

- Autolysis: Digestion of tissues by its own enzymes
- Putrefaction: Decomposition by saprophytes
- Pseudomelanosis: Greenish/bluish/blackish discolouration
- Algor mortis: Cooling of body
- Rigor mortis: Contraction and shortening of muscles
- Livor mortis: Staining of tissues with Hb
- Hypostatic congestion: Blood accumulation in ventral part
- Postmortem emphysema
- Postmortem clot: Excessive release of thrombokinase from leucocytes
- Displacement of organ
- Imbibitions of bile
- Adipocere: Death due to drowning

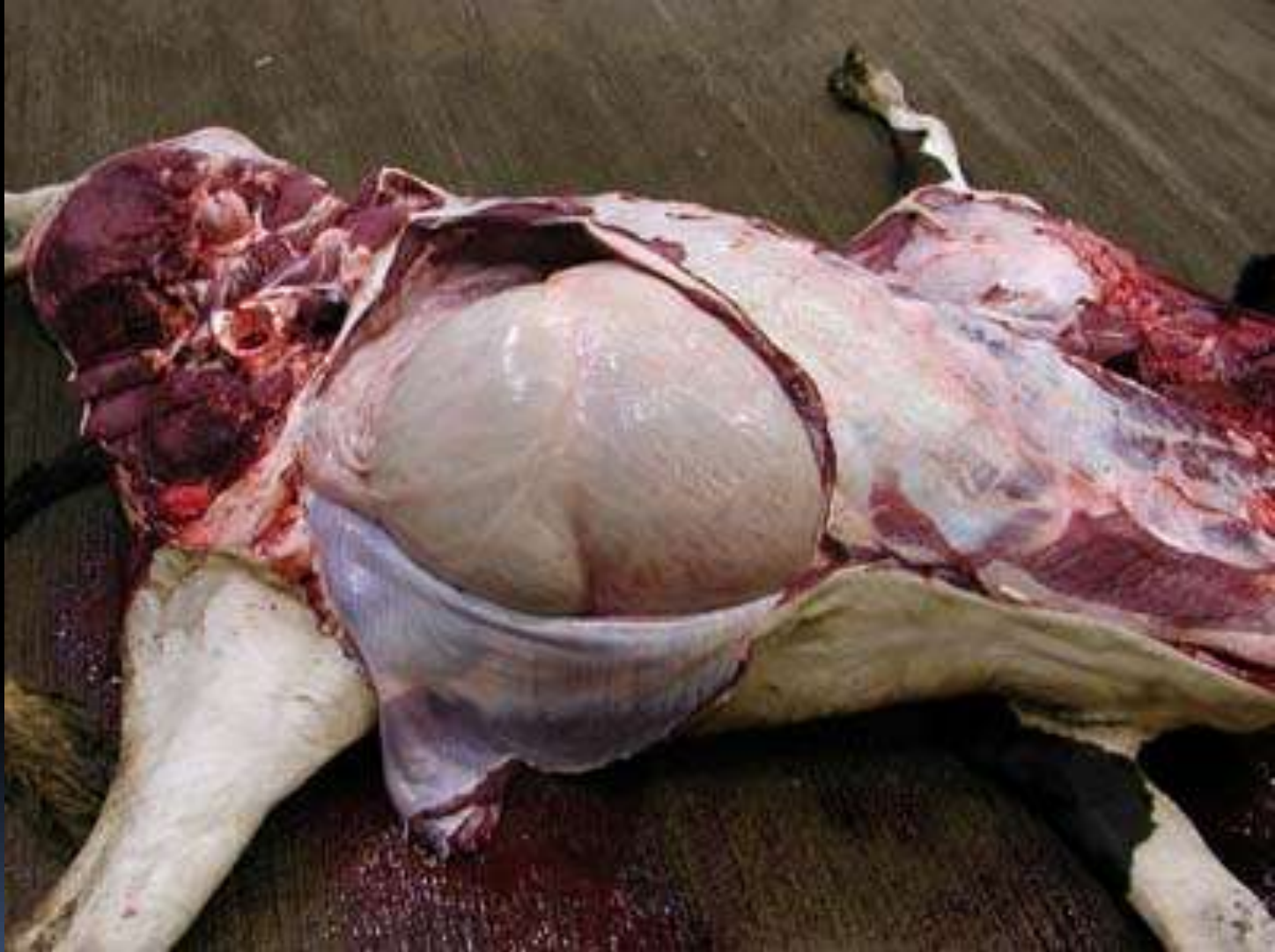


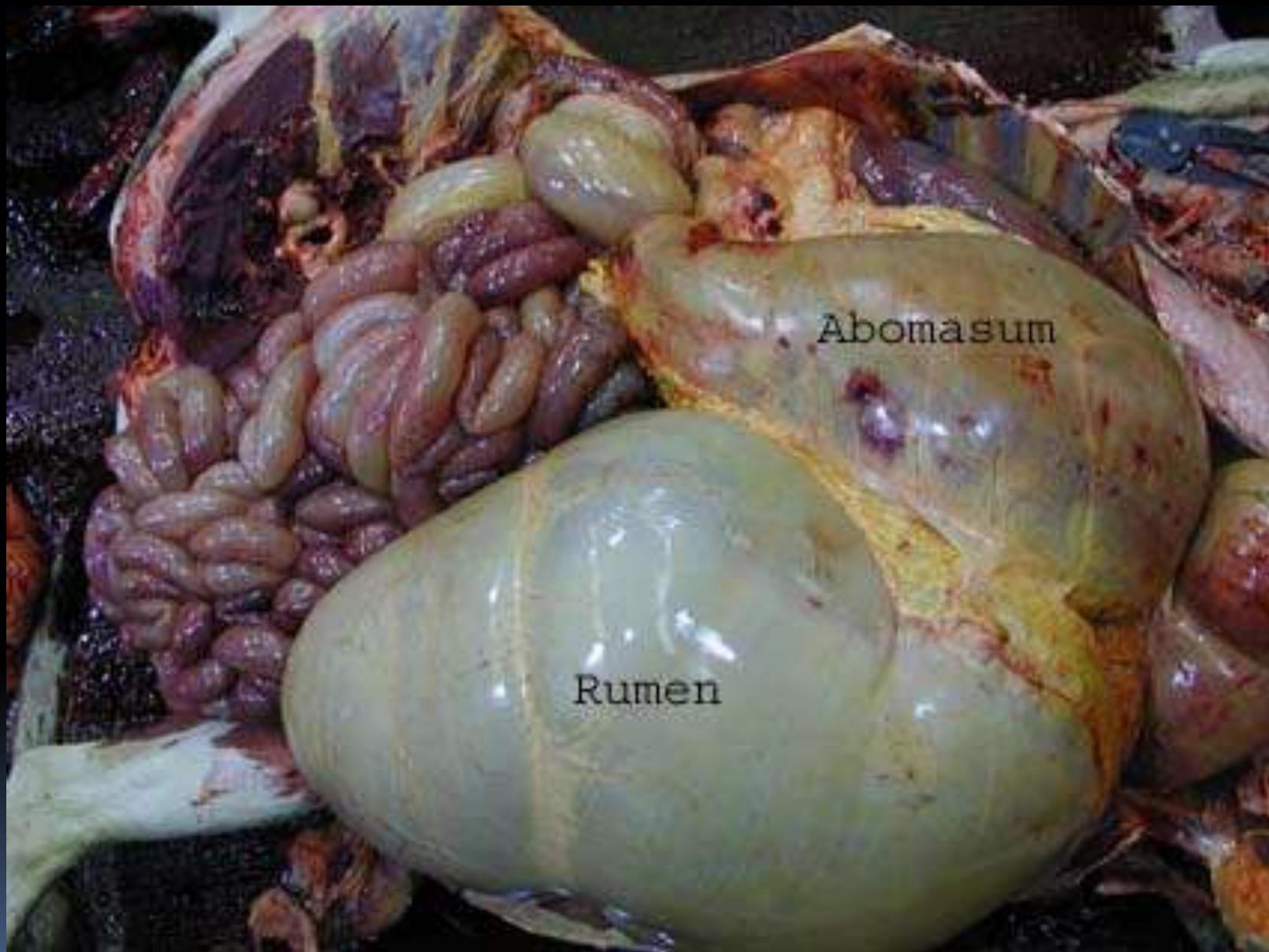
Body Cut



Leg Reflection





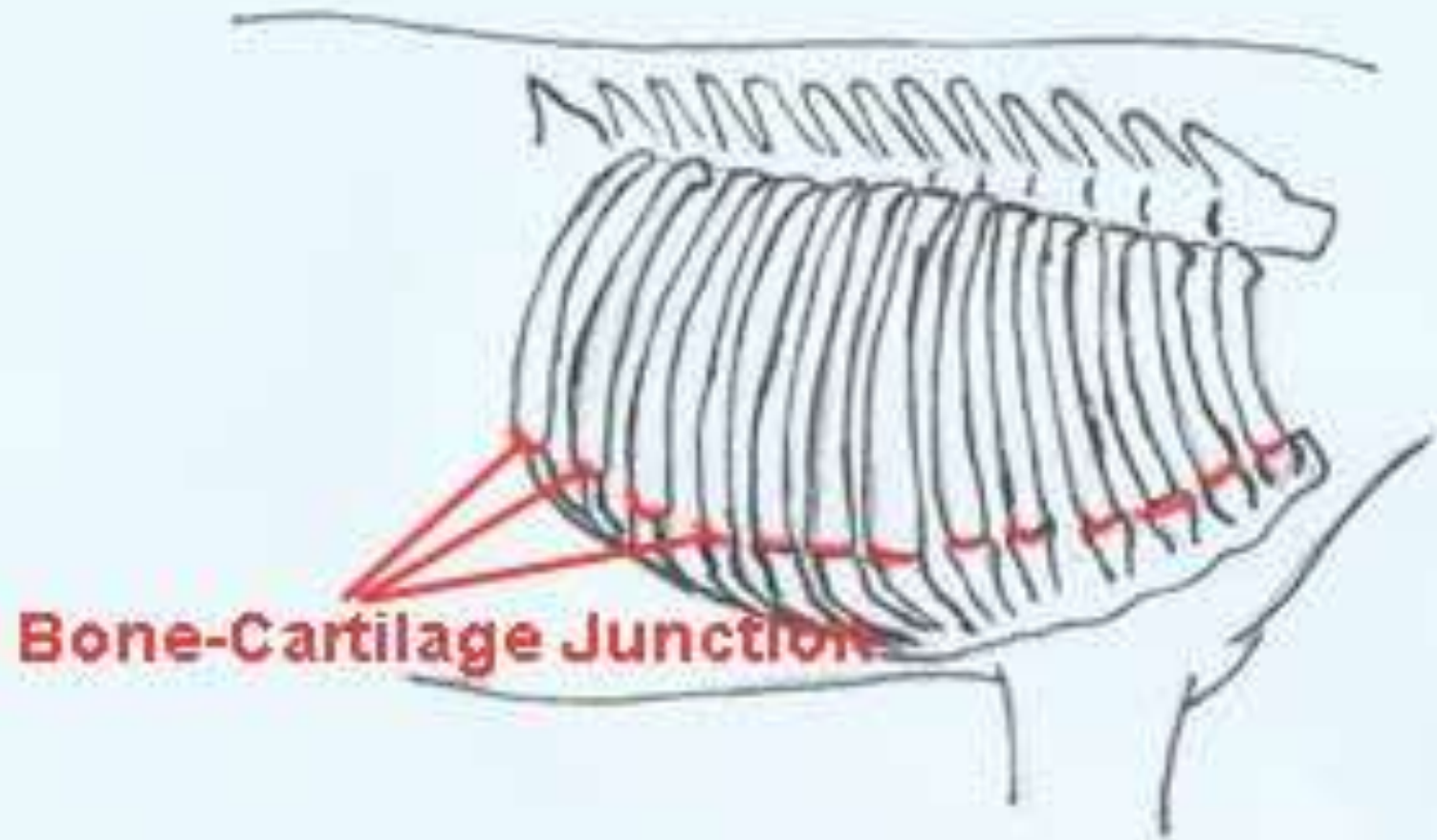


Abomasum

Rumen



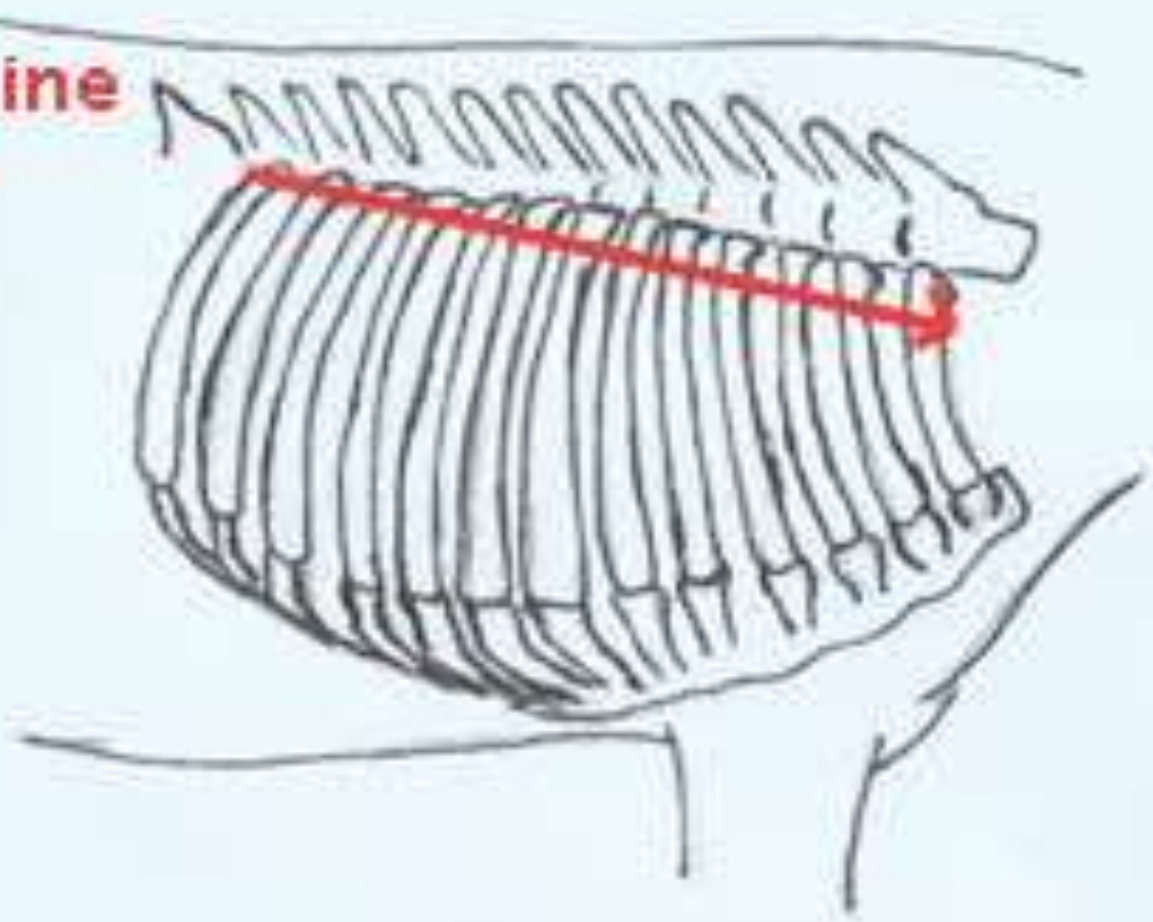
Cutting of Diaphragm



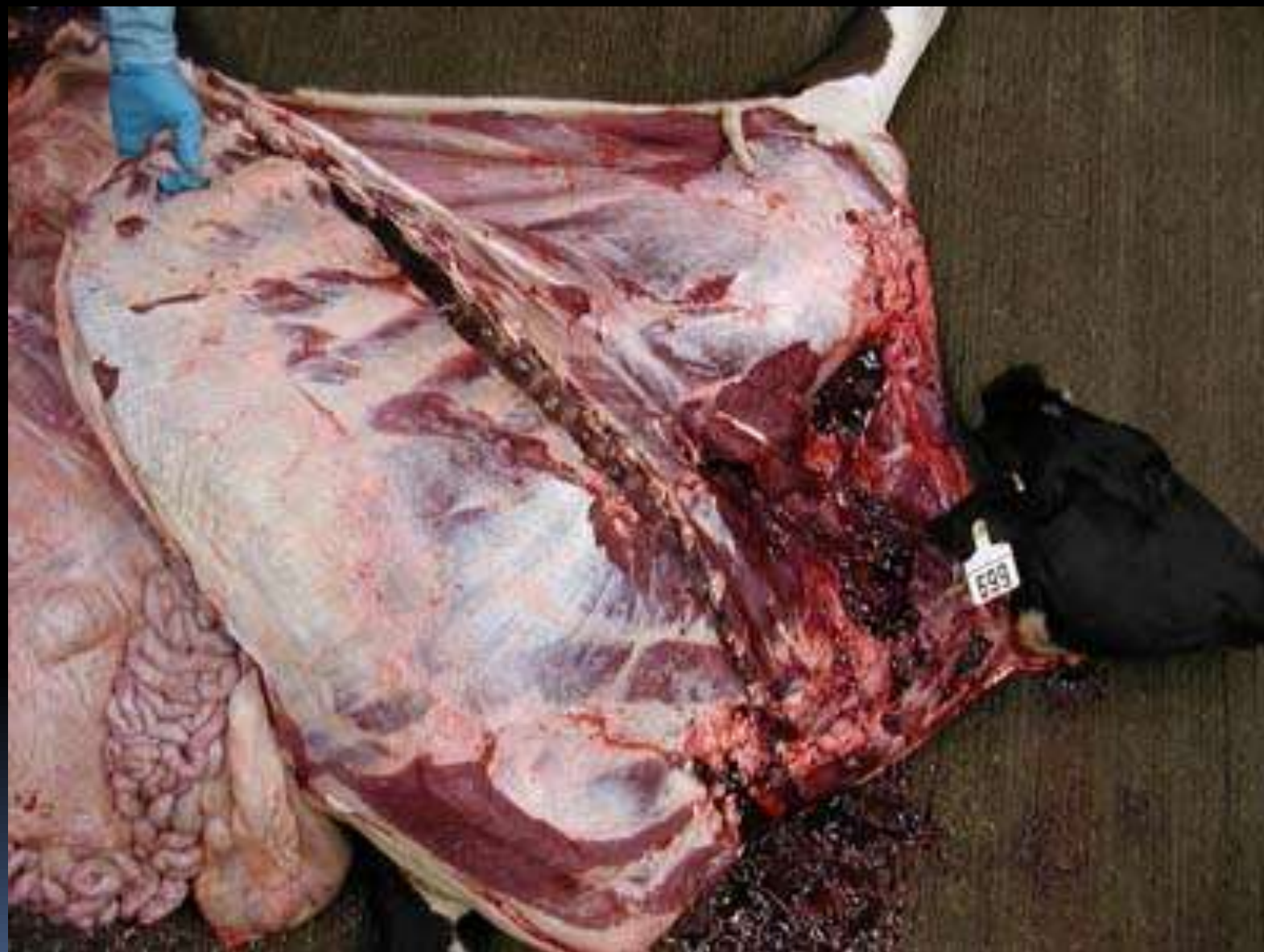
Bone-Cartilage Junction

Rib Cage

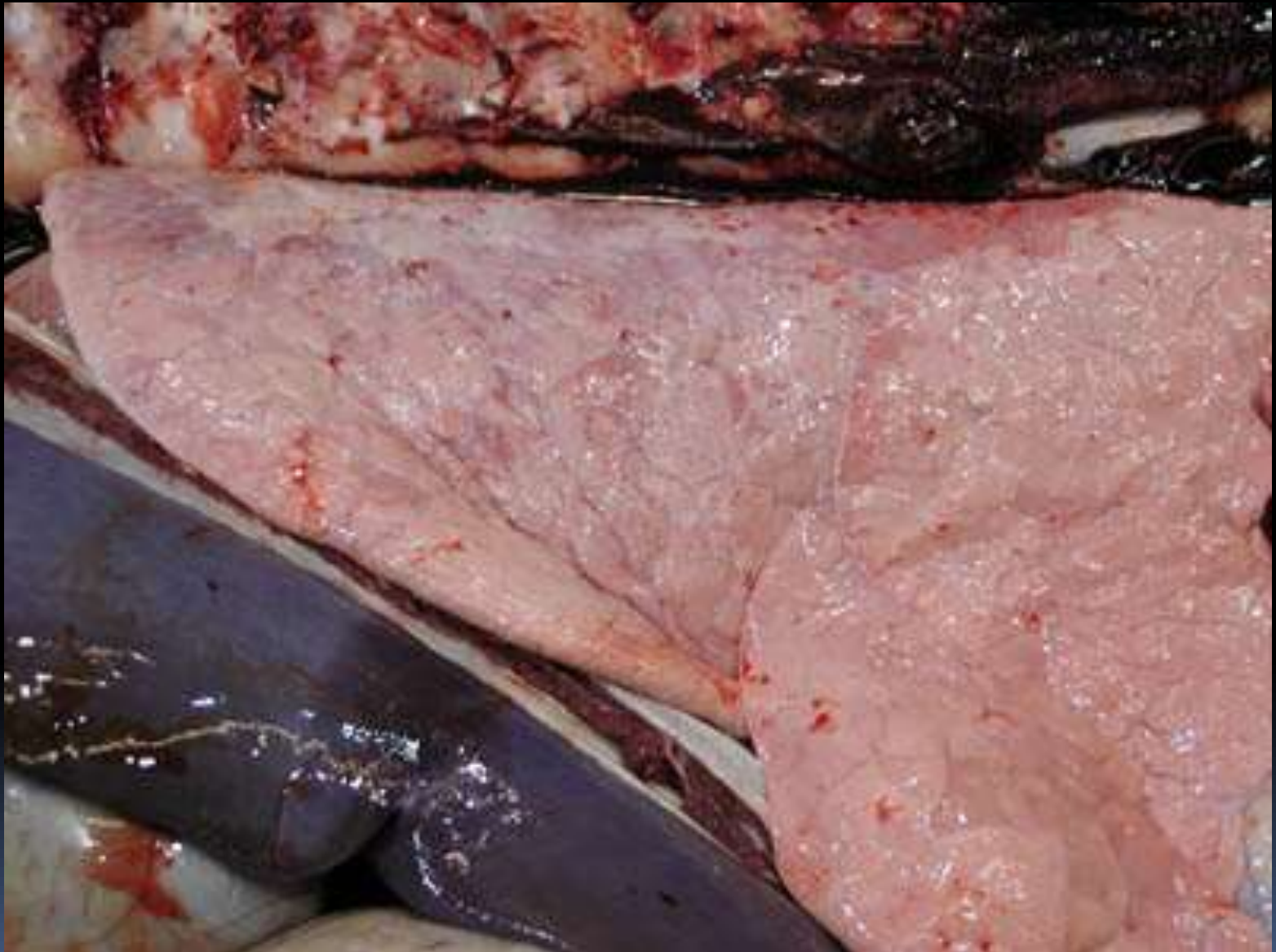
Incision Line



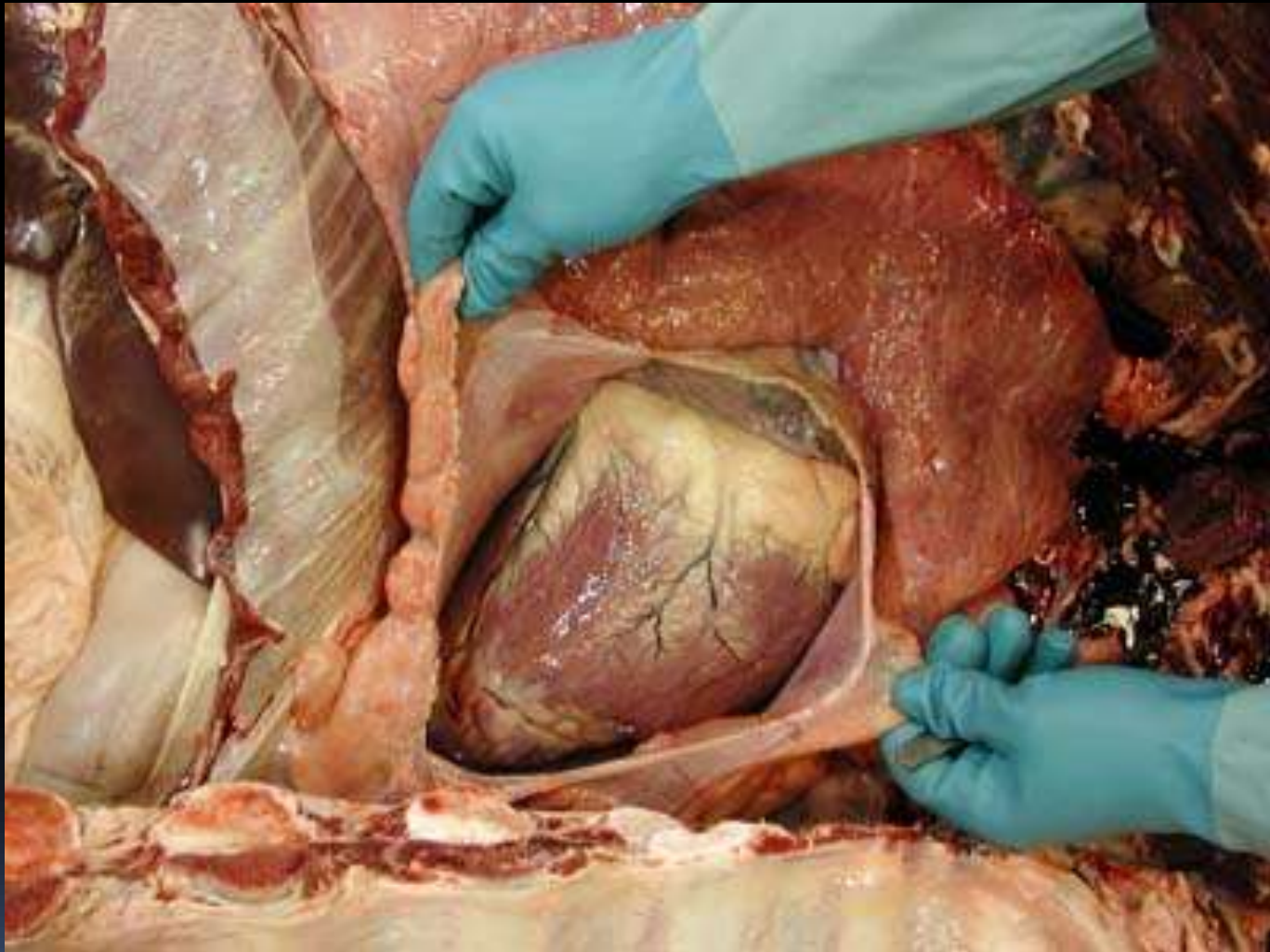
Rib Cage



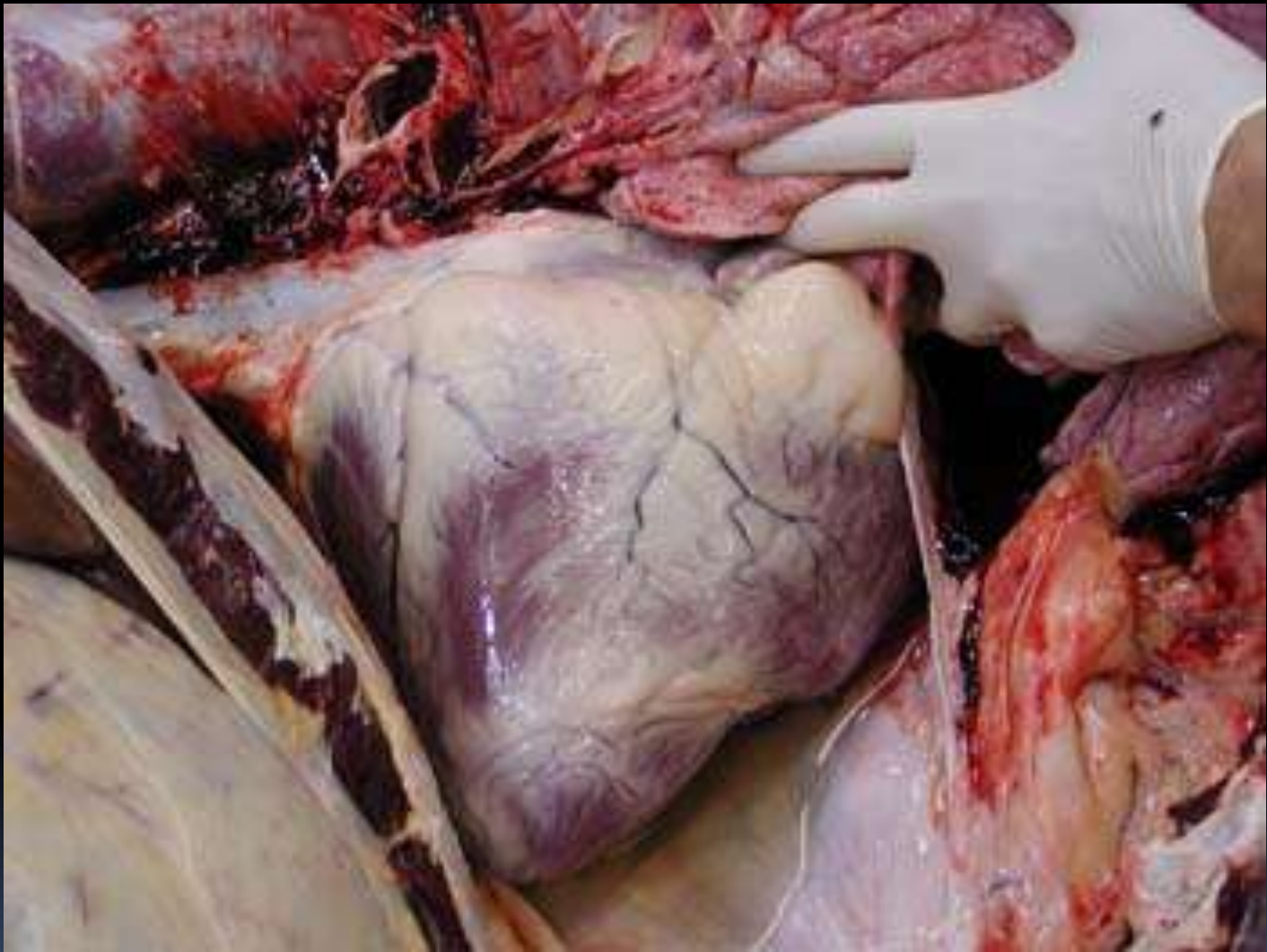
Rib cut



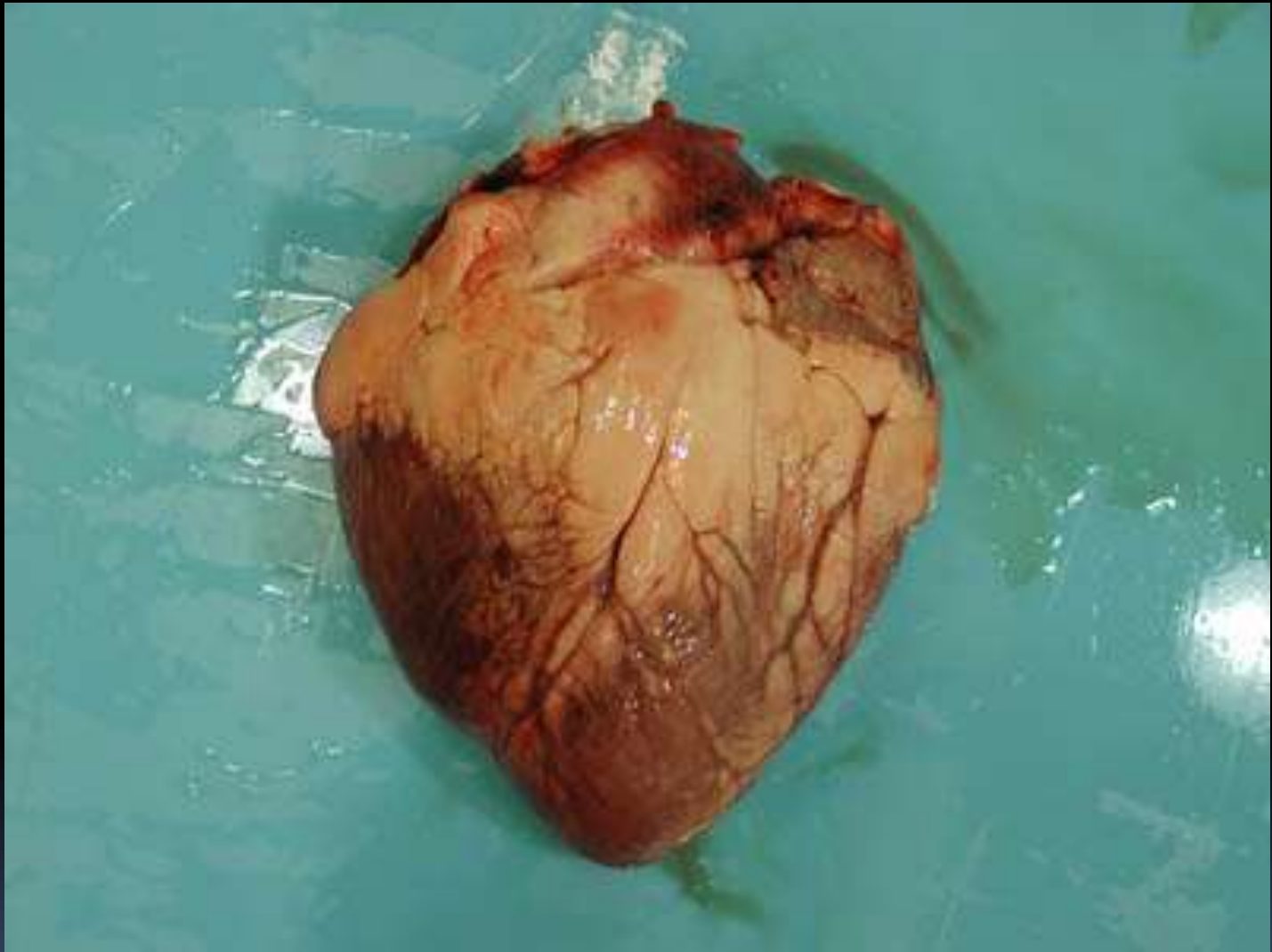
Normal Lung



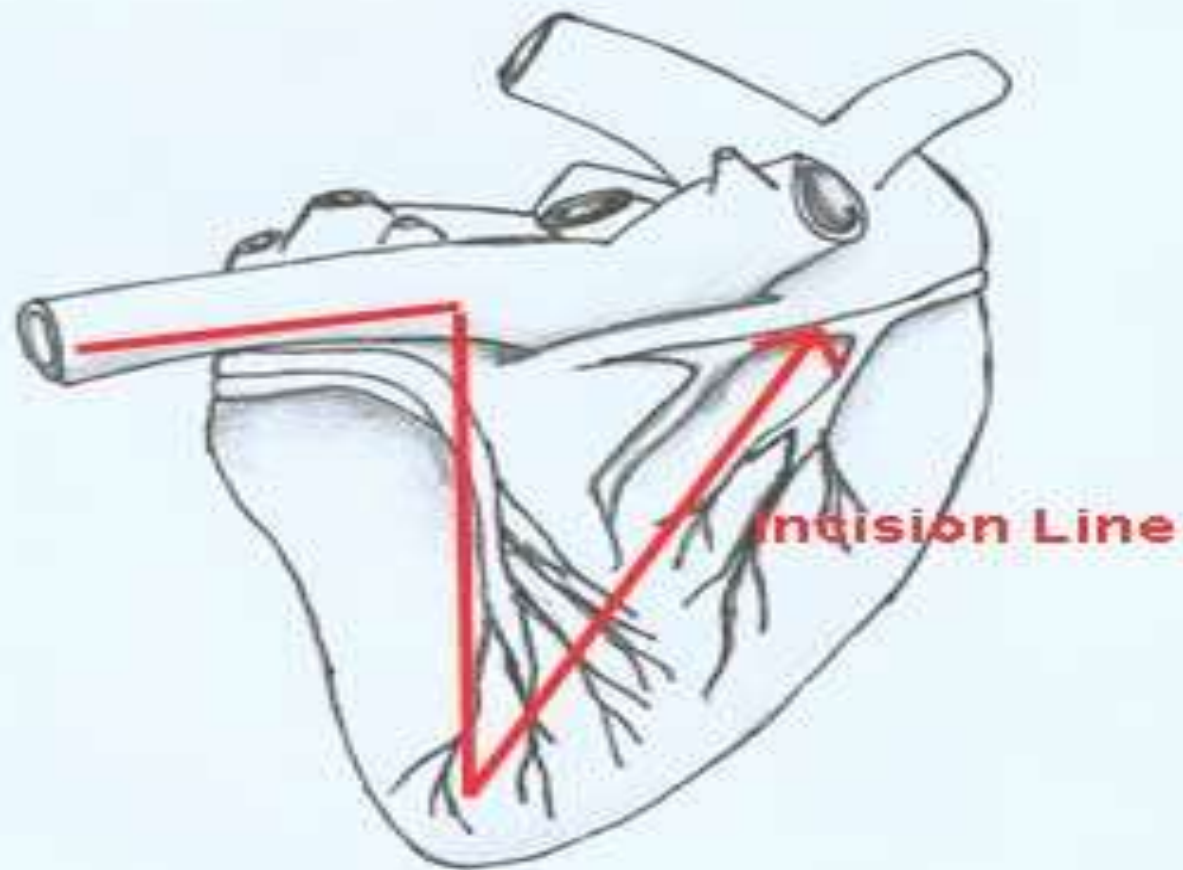
Pericardium



Opening of Pericardium

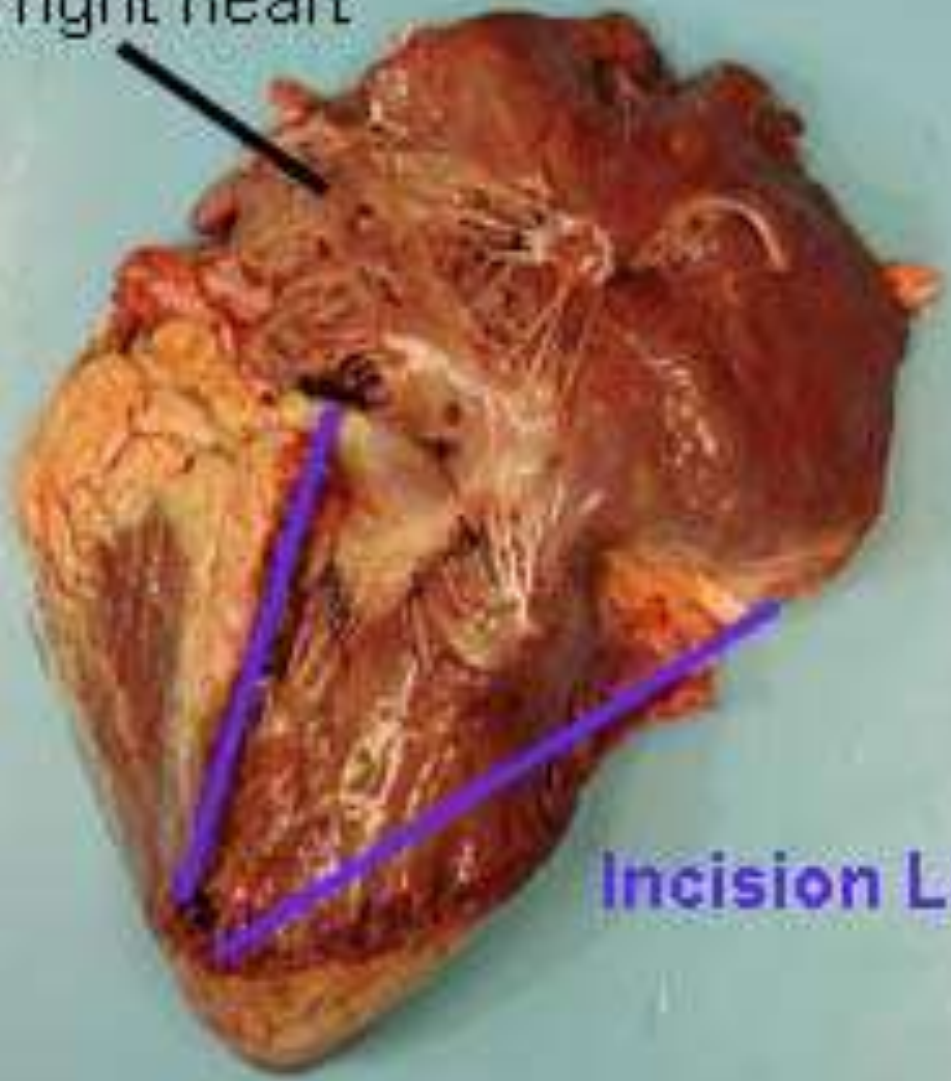


Normal Heart



Right Side of Heart

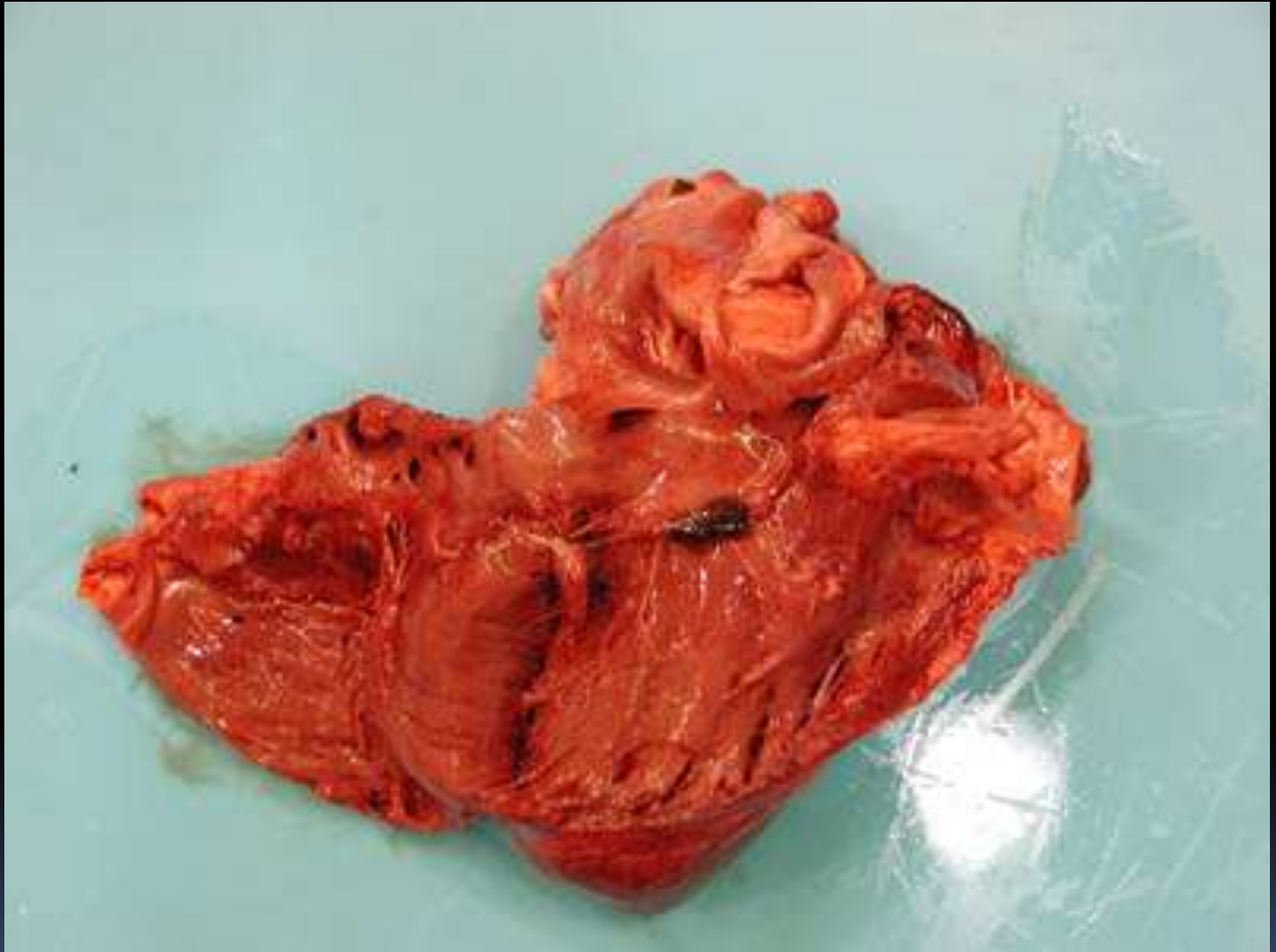
Flap of right heart



Incision Line

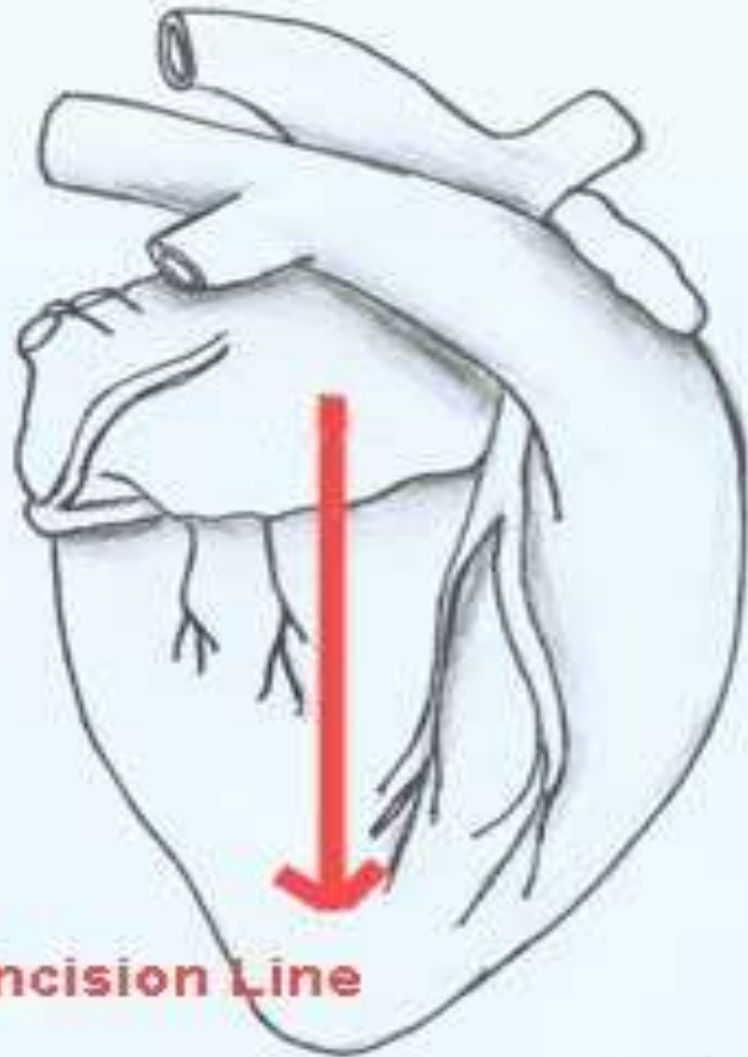


Opening of Right Atrium

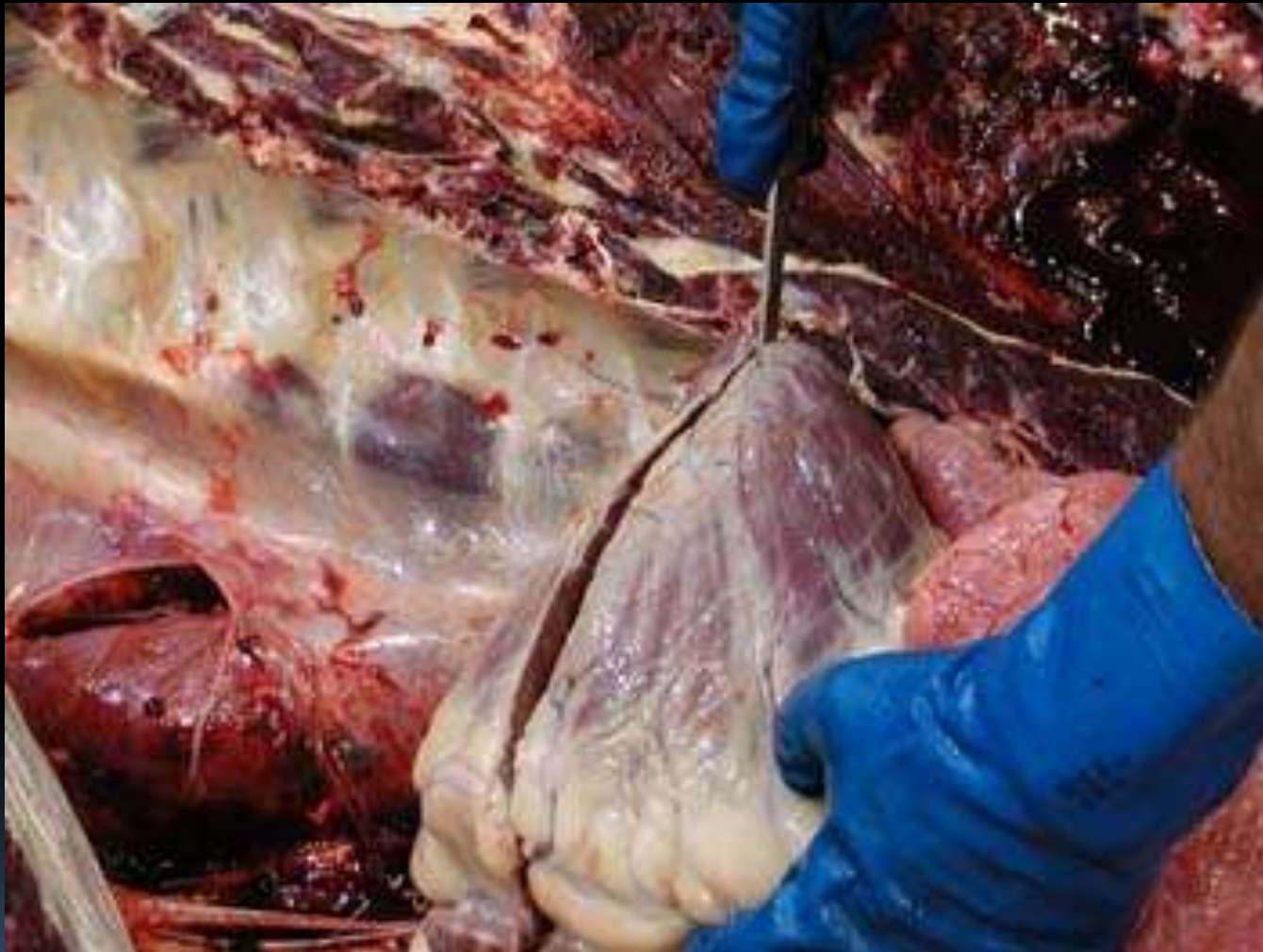


Opening of Heart

Left Side of Heart



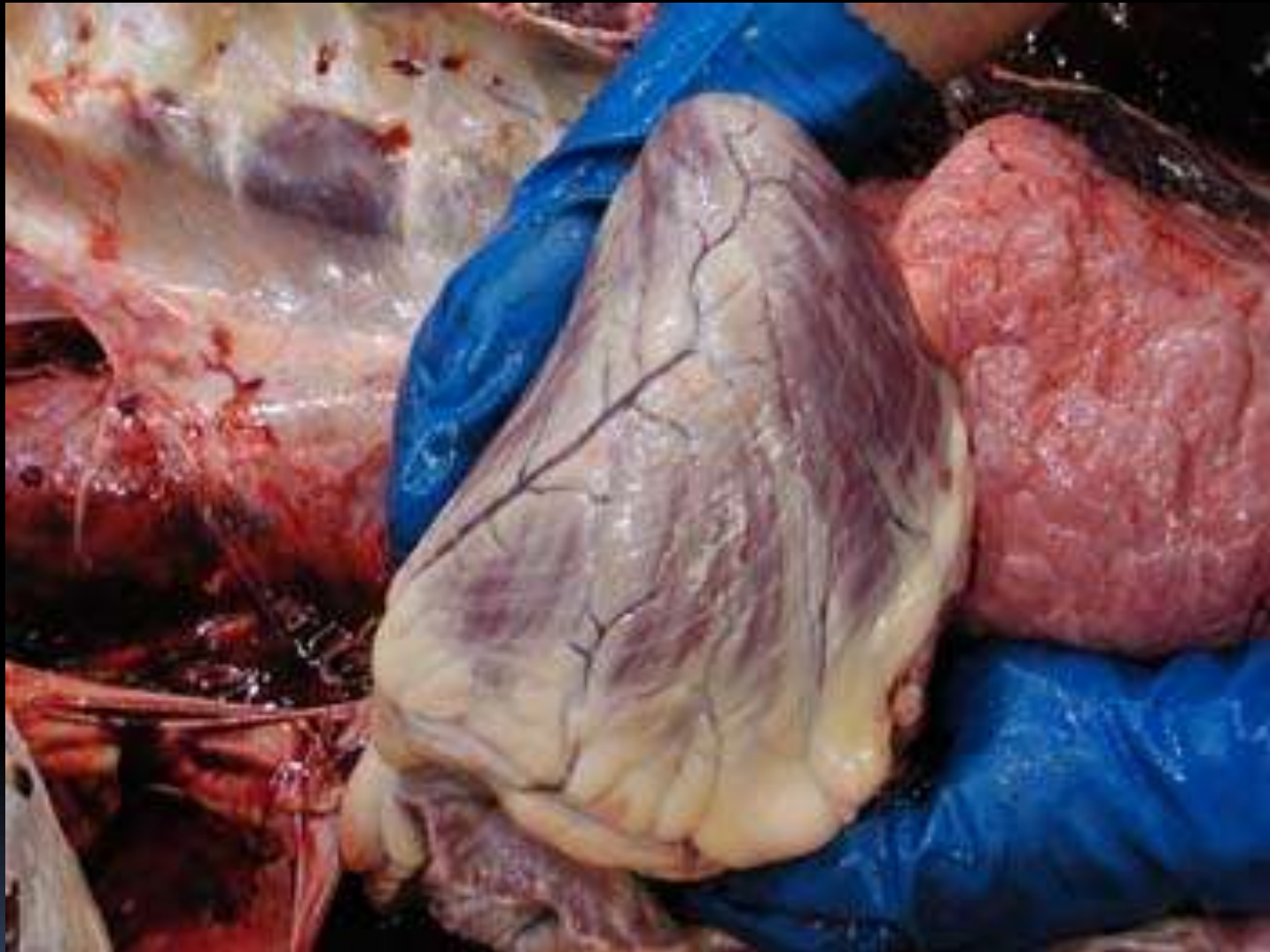
Incision Line



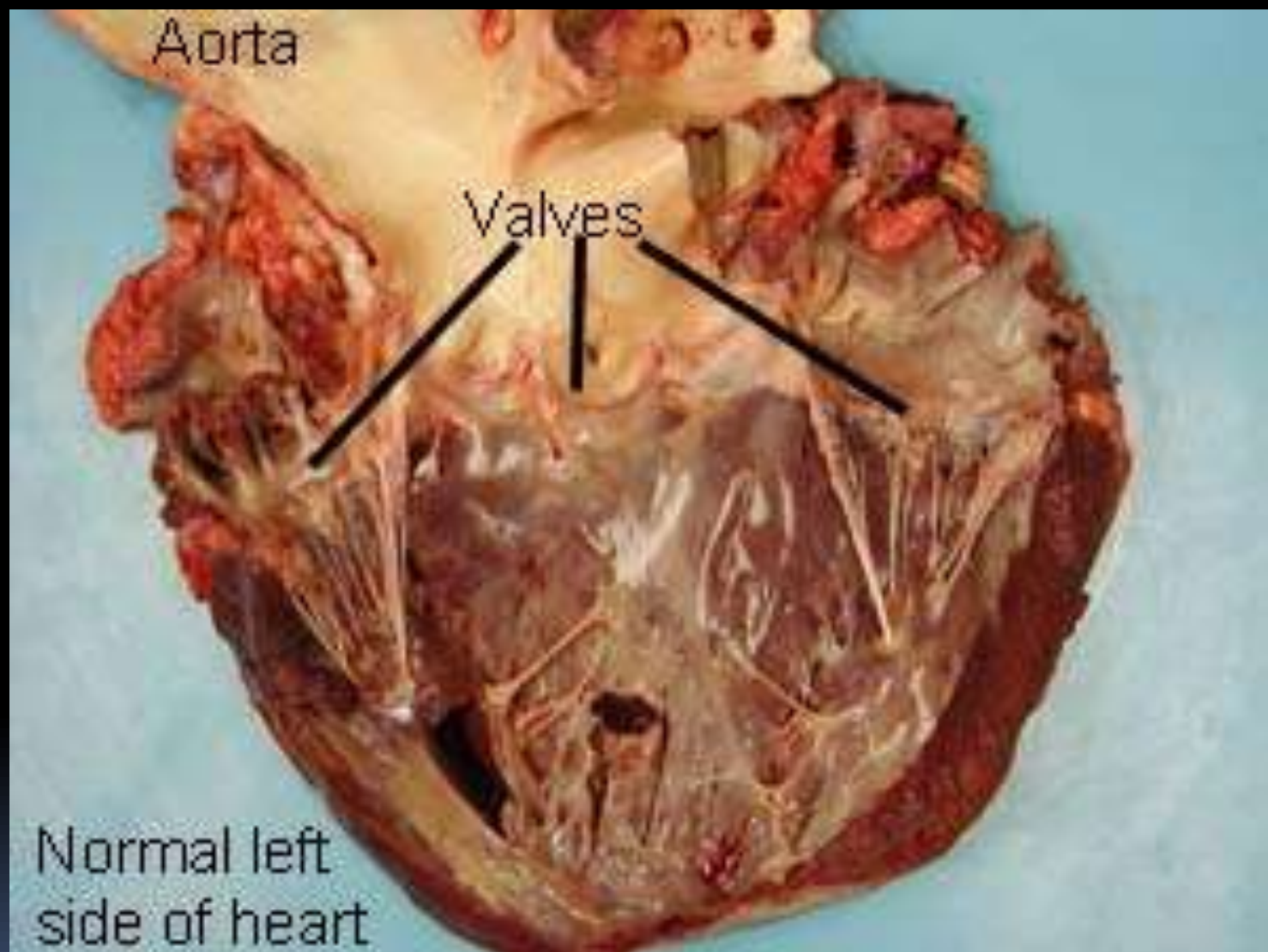
Opening of left heart



Opening of left Heart

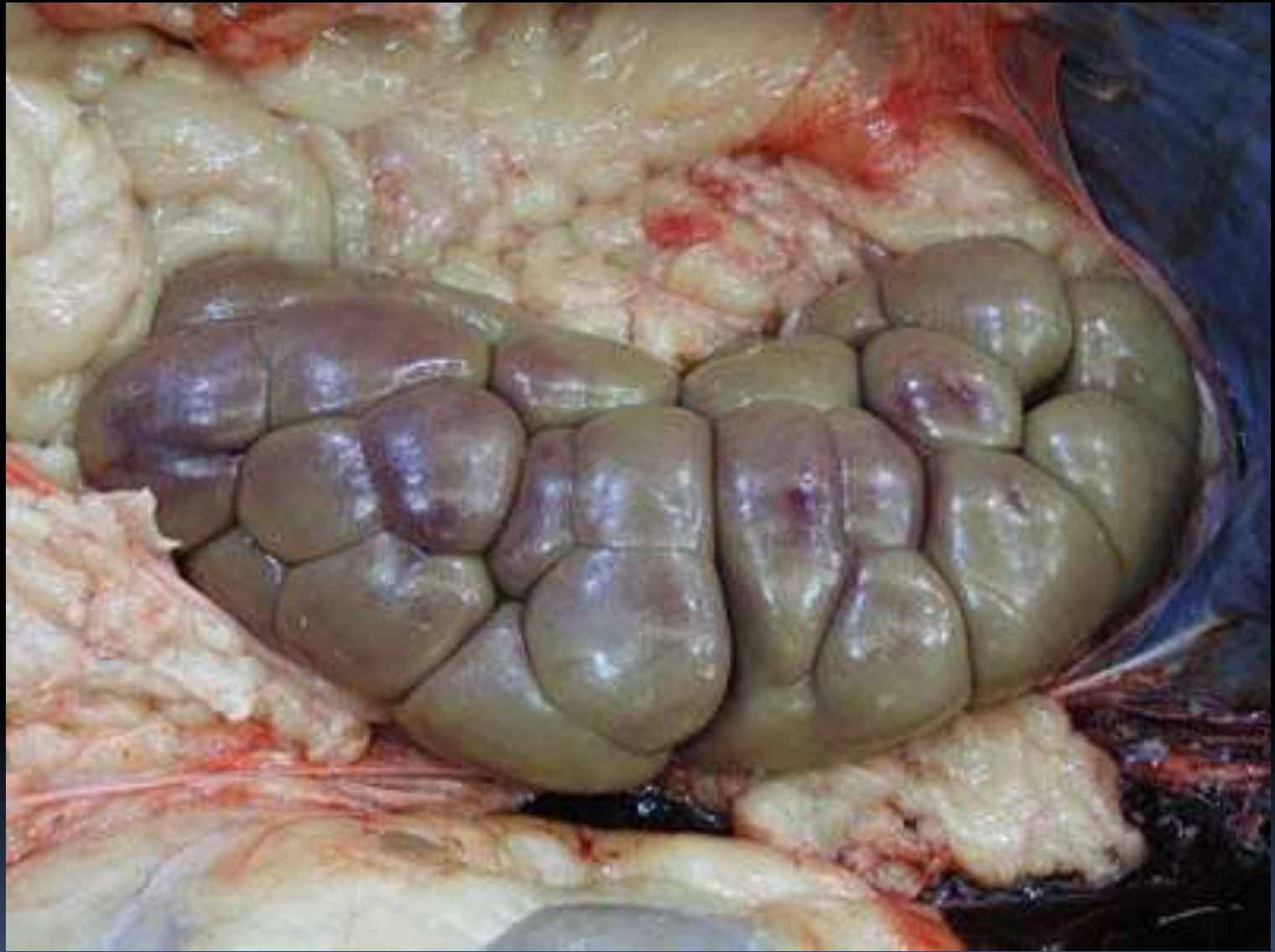


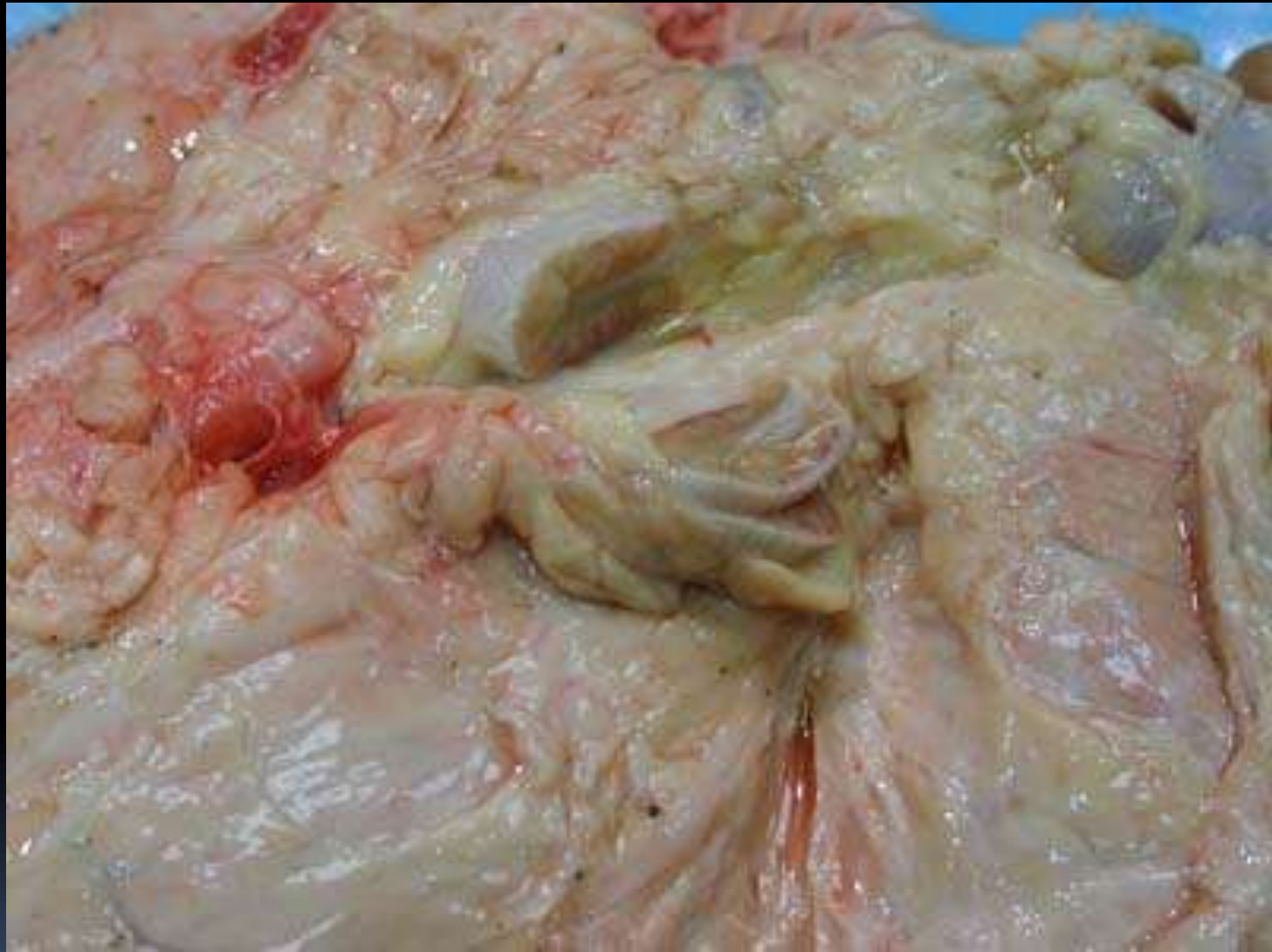
Left side heart



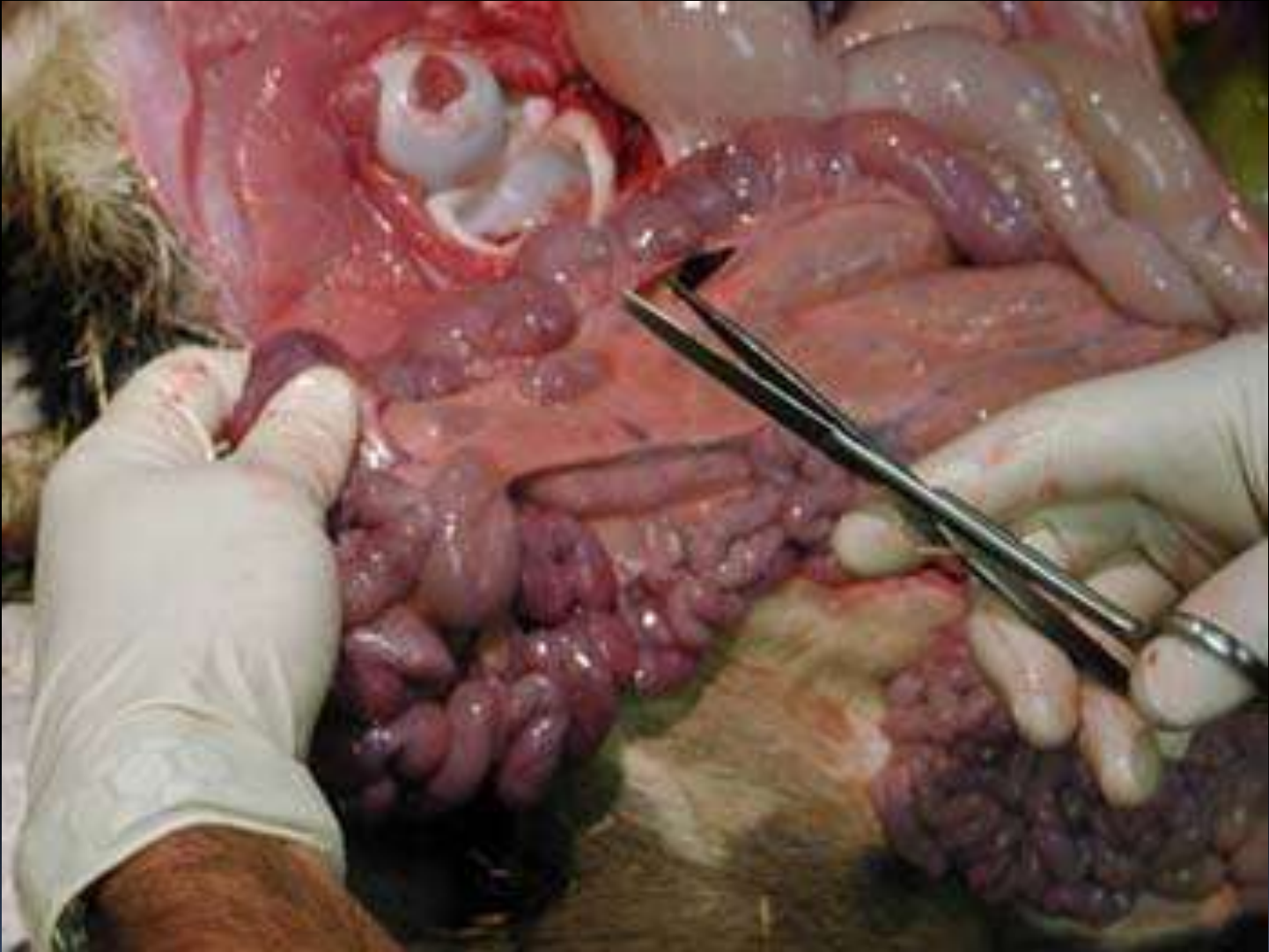


Kidney

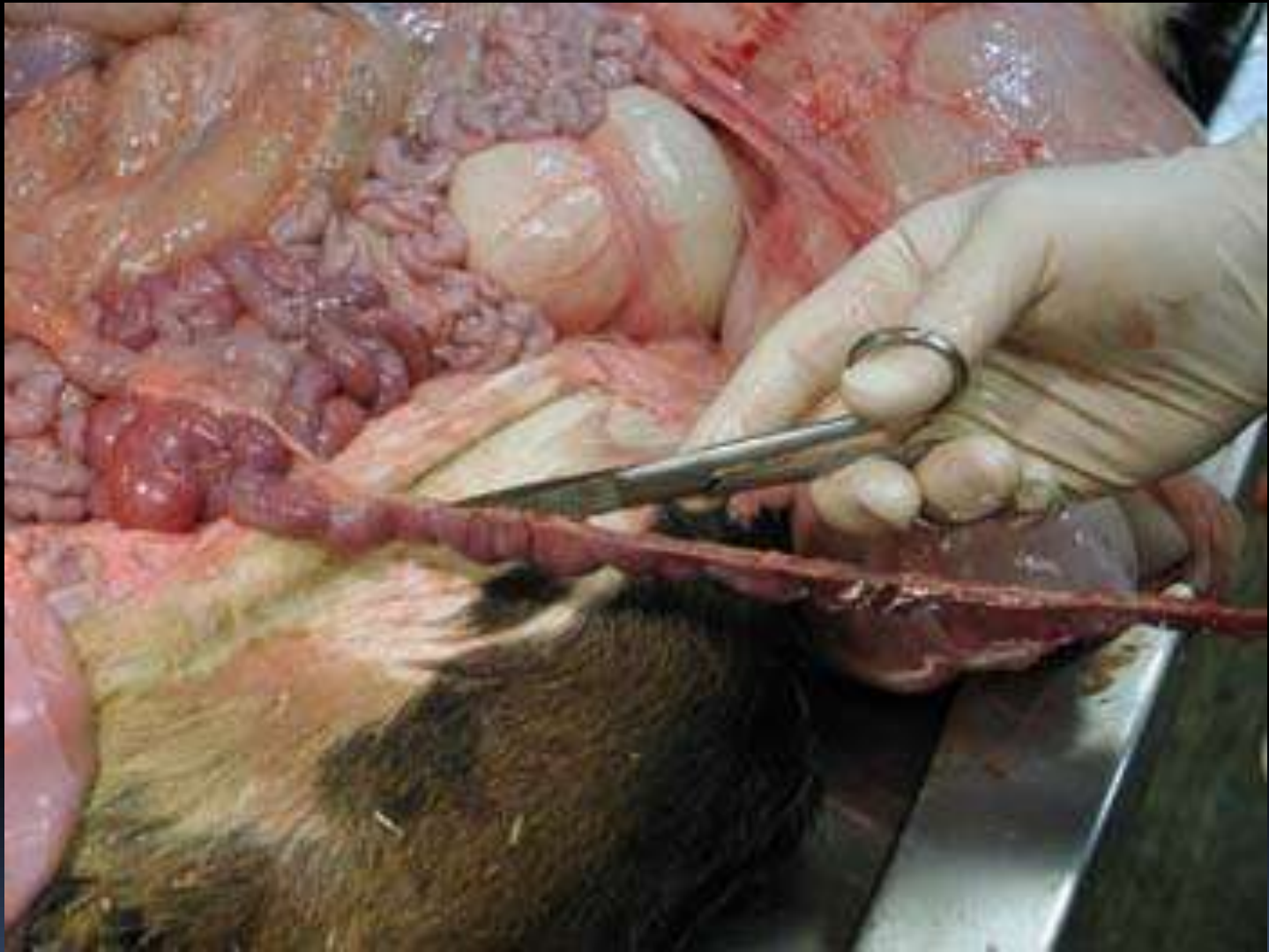




MESENTERIC LYMPHNODE



Bowel



OPENING OF BOWEL





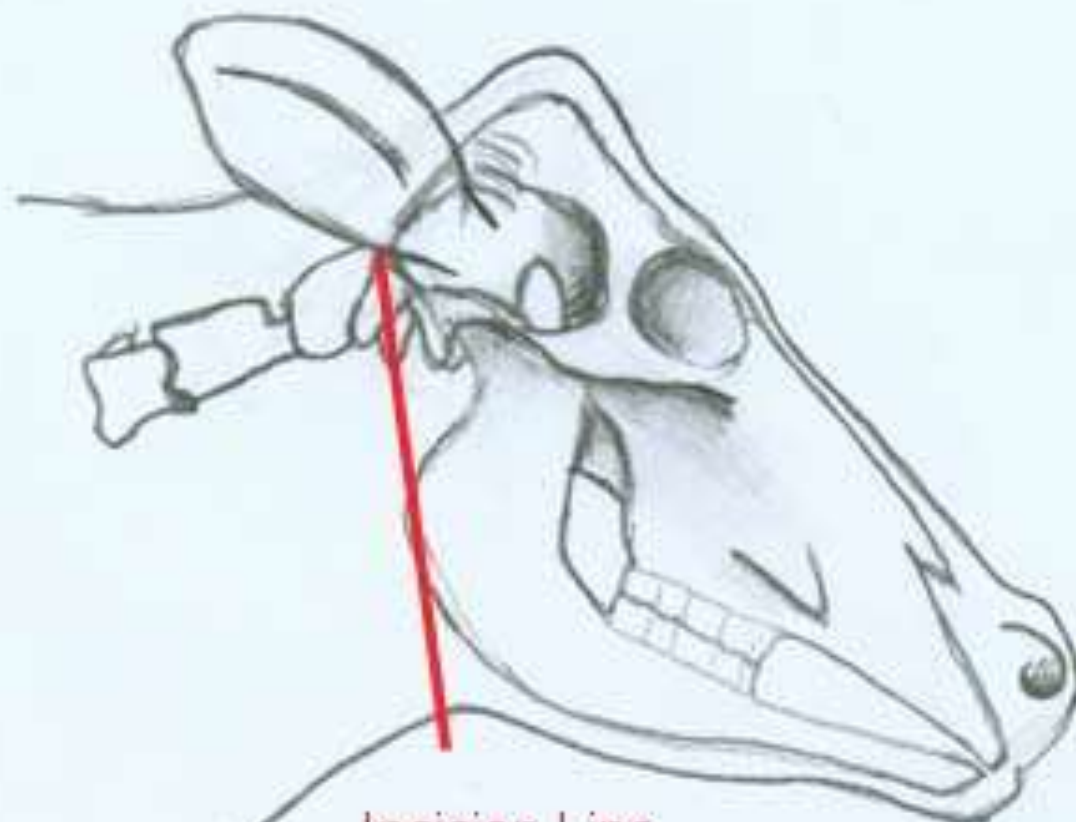
OPENING OF GALL BLADDER



EXAMINATION OF GALL BLADDER



EXAMINATION OF LIVER



Incision Line



Head Removal

COLLECTION AND DISPATCH

- ❖ **Collect suitable organ of choice**
- ❖ **Collect the sample in preservative**
- ❖ **Make proper label and legal letter for sending the sample**
- ❖ **Make proper arrangement for covering the sample and proper seal in front of officer**
- ❖ **Send the letter to higher official , judge and chemical examiner**
- ❖ **Always keep one original form of letter with you for your future reference and verification**

AT FINAL REPORT

- The final report should classify the injury or death as accidental, non accidental, natural or undetermined
- Your curriculum vitae/Qualification
- Brief statement outlining the purpose of the report
- Your finding facts and assumptions
- Your opinion about the investigated case
- Some Appendices like:
 - Photographs which taken around the animal
 - Result of your examination
 - Any recommendations for future investigation

Probable questions in the court

- Have you considered the postmortem examination
- What was the species, colour and age of the dead animal
- When and where postmortem examination was done
- Have you mentioned the time and date of death in postmortem report
- Have you mentioned age, size and location of the wound if any
- Probable weapons used for this injury
- Whether injury was done before or after death
- What was the lesion you had observed during postmortem examination
- Fate of the case in the court depends on the postmortem report and cross examination to the autopsist

Recognition of meat of different animals

- When police authority sends the meat for recognition you may refer to **forensic laboratory**
- However physical examination of the meat can be done

BEEF

- Reddish with brownish muscle mixed with fat
- Fat is yellow in color
- Calf meat (veal)-Fine fibre
- Bone marrow is white to reddish yellow
- Calf bone marrow- Deep pink/ red color

- **Mutton**- dark red with odour of ammonia. Fat is white not intermixed with muscle
- **Chevon**- Red but paler than mutton. Peculiar "goaty" smell
- **Dog meat**- Dark red & fat is intermixed with muscles
- **Pork**- Mild red in colour. Soft with odour of ammonia. Fat is white in colour
- **Horse meat**- Dark red to brown red. Blackish when exposed to air. Fat is gold colour to dark yellow colour and bone marrow is greasy in nature

VETS BEWARE OF IPC SECTIONS

Offence	IPC section	Punishment
Punishment for false evidence	196	Imprisonment for 3 years, fine, both
Issuing or signing false certificate	197	Imprisonment for 3 years, fine, both
Destruction of document to prevent evidence	204	Imprisonment for 2 years, fine, both
Beastility	377	Imprisonment for life or 10 years, fine, both
Killing or maiming	428,429	Imprisonment for life or 5 years, fine, both

- **Section 196: Punishment for false evidence**
- whoever corruptly uses or attempts to use as true or genuine evidence any evidence which he knows to be false or fabricated, shall be punished in the same manner as if he gave or fabricated false evidence
- **Section 197: Issuing or signing false certificate**
- Whoever issues or signs any certificate required by law to be given or signed, or relating to any fact of which such certificate is by law admissible in evidence, knowing or believing that such certificate is false in any material point, shall be punished in the same manner as if he gave false evidence

- **SECTION 204. DESTRUCTION OF DOCUMENT OR ELECTRONIC RECORD TO PREVENT ITS PRODUCTION AS EVIDENCE**
- Whoever secretes or destroys any 1[document or Electronic Record] which he may be lawfully compelled to produce as evidence in a Court of Justice, or in any proceeding lawfully held before a public servant as such, or obligates or renders illegible the whole or any part of such 1[document or Electronic Record] with the intention of prevention the same from being produced or used as evidence before such Court or public servant as aforesaid, or after he shall have been lawfully summoned or required to produce the same for that purpose, shall be punishable with imprisonment of either description for a term which may extend to two years, or with fine, or with both.

Section 377. Unnatural offences

Whoever voluntarily has carnal intercourse against the order of nature with any man, woman or animal, shall be punished with 1[imprisonment for life], or with imprisonment of either description for term which may extend to ten years, and shall also be liable to fine

Explanation. -Penetration is sufficient to constitute the carnal intercourse necessary to the offence described in this section

Section 428. Mischief by killing or maiming animal of the value of ten rupees

Whoever commits mischief by killing, poisoning, maiming or rendering useless any animal or animals of the value of ten rupees or upwards, shall be punished with imprisonment of either description for a term which may extend to two years, or with fine, or with both

Section 429. Mischief by killing or maiming cattle, etc., of any value or any animal of the value of fifty rupees

Whoever commits mischief by killing, poisoning, maiming or rendering useless, any elephant, camel, horse, mule, buffalo, bull, cow or ox, whatever may be the value thereof, or any other animal of the value of fifty rupees or upwards, shall be punished with imprisonment of either description for a term which may extend to five years, or with fine, or with both

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