FULL ARTICLE
ARTIGO COMPLETO
ARTÍCULO COMPLETO

ENVIRONMENTAL SMOKE
(www.environmentalsmoke.com.br)
ISSN 2595-5527
v. 3, n. 2, p. 31-45, 2020

NECROPSY OF AN OLIVE TURTLE: *Lepidochelys olivacea* (Eschscholtz, 1829)

Gil Dutra FURTADO[1*]; Rute Cavalcante da SILVA[2]; Patrícia Aguiar de OLIVEIRA[3]

[1]Veterinary Medicine student/Maurício de Nassau University Center (UNINASSAU), João Pessoa; Agronomist/Federal University of Paraíba (UFPB); Ph.D. in Psychobiology/Federal University of Rio Grande do Norte (UFRN); Socio-partner of the Agribusiness Cooperative (COOPAGRO), Natal, Rio Grande do Norte, Brazil.

[2]Veterinary Medicine student/UNINASSAU, João Pessoa, Paraíba, Brazil.

[3]PhD in Development and Environment/Federal University of Paraíba (UFPB); Professor of Veterinary Medicine/UNINASSAU, João Pessoa, Paraíba, Brazil.

*Corresponding author. E-mail: gdfurtado@hotmail.com

Abstract. The necropsy is an action composed of several stages carefully organized and performed on a corpse, aiming to elucidate or confirm what happened to the animal, so that it would die. The autopsy performed on a turtle by the team of academics from the Veterinary Medicine course at UNINASSAU, was of great value in making it possible to better understand its cause of death. Many convalescent turtles are sent to specialized environments in order to have their health restored, but some unfortunately end up dying, due to the seriousness of their case. The necropsy is then performed to clarify, refute, confirm or even modify a diagnosis previously established. Each necropsy stage is performed with great responsibility, where the qualification of veterinary medicine students is of paramount importance for this specific purpose. The necropsy performed on this chelonian *Lepidochelys olivacea*, aimed to provide an active practice and present a range of scientific knowledge, which academics will deal with now or in their professional lives. The conclusion regarding the autopsy performed, revealed that the cause of death was due to a cranial laceration probably caused by a propeller of a motor boat.

Keywords: Cavity opening; Veterinary Medicine; Procedures.

NECROPSIA DE UMA TARTARUGA OLIVA: *Lepidochelys olivacea* (Eschscholtz, 1829)

Resumo. A necropsia é uma ação composta por várias etapas minunciosamente organizadas e realizadas em um cadáver, objetivando elucidar ou confirmar o que aconteceu ao animal, para que ele chegasse a óbito. A necropsia realizada em uma tartaruga pela equipe de acadêmicos do curso de Medicina Veterinária da UNINASSAU, foi de grande valia para que fosse possível compreender melhor, a sua causa mortis. Muitos quelônios convalescentes são encaminhados para ambientes especializados com o objetivo de terem sua saúde restaurada, mas alguns infelizmente acabam vindo a óbito, devido à gravidade de seu caso. É realizada então a necropsia para esclarecer, refutar, confirmar ou mesmo

Submitted on: 30 Jul. 2020; Accepted on: 15 Aug. 2020; Published on: 31 Aug. 2020
DOI: 10.32435/envsmoke.20203231-45

modificar um diagnóstico antes estabelecido. Cada etapa da necropsia é realizada com grande responsabilidade, onde a qualificação dos acadêmicos de medicina veterinária é de suma importância para este fim específico. A necropsia realizada neste quelônio *Lepidochelys olivacea*, teve por objetivo proporcionar uma prática ativa e apresentar uma gama de conhecimentos científicos, dos quais os acadêmicos lidarão ora ou outra em suas vidas profissionais. A conclusão quanto a necropsia realizada, revelou que a causa da morte se deu devido a uma laceração craniana provocada provavelmente por uma hélice de um barco a motor.

Palavras chave: Necropsia; Quelônio; Medicina Veterinária; Procedimentos.

NECROPSIA DE UNA TORTUGA DE OLIVO: *Lepidochelys olivacea* (Eschscholtz, 1829)

Resumen. La necropsia es una acción compuesta de varias etapas cuidadosamente organizadas y realizadas en un cadáver, con el objetivo de dilucidar o confirmar lo que le sucedió al animal, para que muera. La autopsia realizada en una tortuga por el equipo académico del curso de Medicina Veterinaria en UNINASSAU fue de gran valor para comprender mejor su causa de muerte. Muchas tortugas convalecientes son enviadas a entornos especializados para recuperar su salud, pero algunas lamentablemente terminan muriendo, debido a la gravedad de su caso. Luego se realiza la necropsia para aclarar, refutar, confirmar o incluso modificar un diagnóstico previamente establecido. Cada etapa de necropsia se realiza con gran responsabilidad, donde la calificación de los estudiantes de medicina veterinaria es de suma importancia para este propósito específico. La necropsia realizada en esta *Lepidochelys olivacea* queloniana, tenía como objetivo proporcionar una práctica activa y presentar una gama de conocimientos científicos, que los académicos abordarán ahora o en su vida profesional. La conclusión sobre la autopsia realizada reveló que la causa de la muerte se debió a una laceración craneal probablemente causada por una hélice de un bote a motor.

Palabras clave: Apertura de la cavidade; Medicina Veterinaria; Procedimientos.

INTRODUCTION

Necropsy is a careful examination performed on an animal corpse by qualified professionals, these being called veterinary medical experts. It is practically the only way to arrive at a correct diagnosis, avoiding errors or correcting them when performing it. Through necropsy, they seek to identify the possible cause of death by observing anomalies or lesions that they visualize in the constituent parts of the exposed animal, both by analyzing its internal regions and its external regions. It is important to know that, in order to be successful in performing this procedure, professional veterinary medical experts must promote as much as possible the good

quality of their actions during necropsy, actions that aim to elucidate the reason, the time and the cause of death of an animal (FURTADO et al., 2019; FRANCE, 2015).

The practice of necropsy, whether for expert reporting or even for scientific purposes, provides crucial information so that professionals can understand how the interaction of the animal occurred with certain circumstances and/or pathologies that led to death. Based on the results obtained in the necropsy, it is possible to better understand the facts and circumstances that contributed to this situation (FURTADO et al., 2019; FRANCE, 2015; BARROS, 1988).

Studying the cause of death of an animal by performing the autopsy, becomes possible not only to try to find out what caused the animal's death, but also serves to help other animals, such as discovering that the death was from poisoning and how it was, thus making preventive measures applied to avoid further fatal incidents. Therefore, necropsy is the best technique for comparing the clinical signs observed in the individual (WOLKE; GEORGE, 1981).

The research shows that olive turtles *(Lepidochelys olivacea),* perform their spawns mainly on the Sergipe's coast and in the extreme north of Bahia (SILVA et al., 2007).

As a rule, females of this species have an average weight of 41.3 kg (CASTILHOS and TIWARI, 2006) and a size of approximately 72 cm in curvilinear hull length (CCC), and may spawn on, an average hundreds of eggs in each nest (SILVA et al., 2007).

These chelonians usually present coastal displacements, traveling along the northeastern coast and moving to equatorial oceanic zones (SILVA et al., 2011). It was also observed that these chelonians present great fidelity to their reproductive site (MATOS et al., 2012).

Regarding the examination performed on a chelonian carcass, this procedure should always be performed by a qualified specialist, such as a veterinarian, with training for this purpose, thus aiming to determine the time and the death's cause of the animal studied. However, in order to determine the cause of death of a stranded chelonian, it becomes a big challenge, because the circumstances in which it passed until it was found could lead to a high degree of decomposition, which happens with much of the carcasses that reach the beach.

Carcasses may undergo natural changes, such as decomposition by enzymatic and biotic elements; the presence of these will influence the characteristics of each levels of decomposition the chelonian if found (MARCOVALDI et al., 2016).

Carcass decomposition is influenced by factors such as temperature, environmental humidity, animal size, nutrition, body condition, cause of death, among other factors. For these reasons, the process of evaluating a carcass requires a good view to be attentive to cadaveric changes and make a comparison to differentiate from changes produced still in life (MARCOVALDI et al., 2016).

The guidelines contained in the technical manuals for necropsy, provide several methodologies that can be applied in the laboratory, such as Virchow's, where organs are removed one by one and examined later; Ghon, where evisceration is performed by monoblocks of anato-functionally related organs; that of M. Letulle, where the contents of the thoracic and abdominal cavities are removed in a single monoblock and that of Rokitansky, where the organs are removed in isolation after they have been opened and examined "in situ" the cadaver, and all of them always having the same objective, which is the elucidation of the cause of death and the study of the factors involved in these (VIRCHOW, 1875; TWEEL; TAYLOR, 2013; BONEL et al., 2018).

Veterinary Medicine students, when performing and/or monitoring necropsies, achieve a desired professional quality, expanding their knowledge and experience with this technique and professional action (FURTADO et al., 2019).

MATERIALS AND METHODS

The necropsy was performed on the premises of the Maurício de Nassau university center University Center (UNINASSAU - PB), in the Laboratory of Animal Anatomy of the Veterinary Medicine course and conducted by the participants of the project "VETERINARY EXPERIENCE IN THE PARAIBA AQUARIUM. Veterinary actions, necropsy of *Chelonioidea* and community extension", under the guidance of Doc Patricia Aguiar de Oliveira, Veterinary Physician and professor at Uninassau.

All those involved in this activity, before entering the laboratory, were paraded with the necessary PPE, such as latex gloves, lab coat, closed shoe, mask, glasses and cap (ANDRADE et al., 2002; FURTADO et al., 2019).

The equipment used were blades and scalpel cable, blunt-romba straight scissors, rat tooth tweezers, anatomical tweezers, hemostatic tweezers, tape and saw.

During the necropsy, organ-by-organ was investigated, following the script predetermined in the methodology of "Virchow", until the completion of the activity (VIRCHOW, 1875; WORK, 2000).

RESULTS

Necropsy was performed to determine the cause of death of the quelonian. The animal was identified as an olive turtle *(Lepidochelys olivacea),* classified as being the smallest of the marine turtle species found on the Brazilian coast. This olive turtle, rescued by the Paraíba

Aquarium Company, was found stranded on the beach and could not resist her injuries, and died.

STEP BY STEP DESCRIPTION

The turtle was packed in the refrigerator and thawed for 36 hours, so that it was possible to perform the necropsy activity. Initially, the group of students explained how the action and steps to be followed would be, also performing the exposition of a sequence of information that would be properly observed and annotated.

Notes were made regarding abnormalities and external curiosities found in the animal. The measurement began in the dorsal part (carapace) ending in the ventral part (plastron). Barnacles were recorded in the carapace, a breakage located in the edge of the hoof and a fracture observed in the skull of the animal.

Then, the chelonian was placed in the dorsum-ventral position where the carapace plastron was separated, cutting the insertions of the skeletal muscles, the clavicle and the pelvis. After exposure of the internal organs, the following structures were observed: the existence of adipose tissue, of the cellomatic membrane, pectoral and ventral muscles, hepatic lobe, gallbladder, pericardial sac, heart, spleen, pancreas, thyroid, intestines, oral cavity, trachea, esophagus, lungs, stomach, urinary bladder, gonads, kidneys, the salt gland and the brain.

DISCUSSION

The necropsy began with the identification of the chelonian species, which proved to be an olive turtle *(Lepidochelys olivacea)*, whose identification was performed based on the numbers of the coastal shields presented by the animal, in which it had seven pairs of lateral plates (Figure 1) and two pairs of prefrontal plates with "dark gray green" color, which identifies it as an adult animal.

Continuing the external investigation, it was found that the animal was female, with the presence of a fracture at the edge of the hoof on the right side (Figure 2) and in the skull, a severe fracture in both hemispheres in the parietal region, in the postorbital region, in the frontal region (Figure 3), in addition to the presence of barnacle on the ventral side of the carapace (Figure 4).

Figure 1. Chelonian's carapace.

Source: Authors.

Figure 2 - Fracture at the edge of the hull.

Source: Authors.

Figure 3 - Fracture in the skull of the turtle.

Source: Authors.

Figure 4 - Barnacle in the ventral part of the carapace.

Source: Authors.

The turtle weighed approximately 50 kg, its size measured with a tape was 63cm in rectilinear carapace length, 66cm in curvilinear carapace length, 59cm long plastron and 67cm in curvy carapace width.

When moving on to the next stage of necropsy, the professor mentioned the importance of observing the size, shape, color and texture of the internal organs, as they would be relevant indicative of the animal's health status.

The plastron was then removed, with the chelonian in supine position, using a scalpel (Figure 5). The cut, initiated by the edges of the plastron, continued through the cartilage line throughout the cartilage line, and through constant traction, the cuts of the ventral pectoral muscles, ventral pelvic muscles and adipose tissue were performed.

Once the plastron was removed, all recommended observations were made. Subsequently, the front and rear limbs were disjointed and removed for better exposure of the internal organs (Figure 6). The carcass itself did not present excess of fat.

The removal was continued, with the help of scalpels, the pectoral and ventral muscles, easily identified. The heart was located in the mediastinum, with its three cardiac chambers (one ventricle and two atria) and, on examination, it was firm, homogeneous and of red-pink standard color.

Near the heart we find the thyroid, a spherical and translucent organ; and the liver, with firm, smooth texture, with rounded edges and homogeneous shading, purplish brown.

Figure 5 - Removal of the plastrão.

Source: Authors.

Figure 6 - Removal of the forelimbs.

Source: Authors.

After the localization and observation of the heart and liver, they were removed, continuing with the cutting of the skin in the midline of the ventral neck, aiming to expose the esophagus and the trachea, which appeared tanned and with a soft lumen on the cutted surface, presenting a two-way bifurcation, going to the bronchi (Figure 7).

The esophagus, a soft tubular organ that is next to the trachea, has the lumen with a mucosa full of numerous large spines (Figure 8). The lungs had a spongy, soft consistency and homogeneous pink color. The stomach and Intestines were filled with undigested food that the animal consumed before it died. The complete gastrointestinal tract is composed of the glottis, which is the opening to the trachea, esophagus, stomach, small intestine, large intestine and rectum.

Figure 7 - Trachea

Source: Authors.

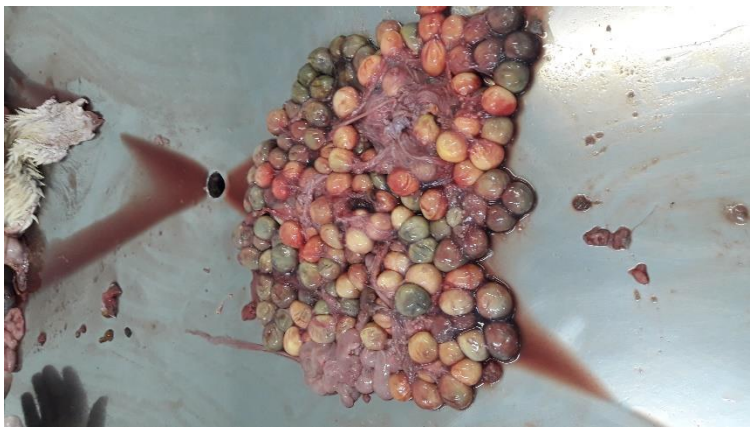
Figure 8 - Particularity of the esophagus.

Source: Authors.

The spleen, a round organ that is part of the turtles' immune system, presented firm, soft and rosy consistency, is closely associated with the pancreas and found near the small intestine.

The bladder, a bag-shaped organ with thick walls that retains urine, was located above the large intestine and under the pelvis. The kidneys were lodged under the shell, just behind the lungs and under the pelvis, exhibiting firm and homogeneous consistency with a rough nodular surface. The gonads were just above the kidneys. The female turtle in question was in the reproductive period, and eggs were found in its reproductive system (Figure 9).

Figure 9 - Turtle eggs.



Source: Authors.

The last stage of necropsy was observation of the brain and saline gland. The brain, which is small, was damaged due to the fracture in the skull, a condition that made it difficult to observe the salt glands.

By the end of necropsy, all information was duly recorded in the "necropsy data sheet" (appendix). All materials used were properly discarded or properly sanitized, as recommended in the safe use of the Animal Anatomy laboratory of UNINASSAU.

CONCLUSIONS

After the end of this necropsy, it can be affirmed that the cause of death of this chelonian was a physical collision of the animal with a motor vessel.

It can also be highlighted that the technical, scientific and pedagogical gain was of great value, having increased the knowledge of the importance of the action of the Veterinarian, exposed a methodology of opening of chelonians that was not known to the students, encouraging them to continue in the studies of Veterinary Medicine, besides condensing important information to be shared with the community in general.

ACKNOWLEDGMENTS

The authors thank the participation of veterinary medicine students Adrya Hybia De Lima Quirino, Ana Luiza Madruga, Gabriella Menezes Freitas Silva, Lucas Maroja de Vasconcelos, Bianca Miranda Amorim and Ernani Rodrigues da Costa Filho, for their contribution to the realization of this activity. We thank the company “Aquarius Paraíba” for the contribution and partnership, aiming at scientific technical development, as well as actions for environmental education and the preservation of the marine environment.

REFERENCES

ANDRADE, A.; PINTO, S.C.; OLIVEIRA, R.S. Orgs. **Animais de Laboratório: criação e experimentação.** Rio de Janeiro: Editora FIOCRUZ, 388 p., 2002.

BONEL, J.; RAFFI, M.B.; SALLIS, E.S.V.; VARGAS, G.D. **Manual de Técnicas de Necropsias em Animeis Domésticos.** CRV. Pg. 88. 2018

CASTILHOS, J.C.; TIWARI, M. Preliminary data and observation from an increasing olive ridley population in Sergipe, Brazil. **Marine Turtle Newsletter**, Durham, n. 113, p. 6-7, 2006.

MATOS, L.; SILVA, A.C.C.D.; CASTILHOS, J.C.; WEBER, M.I.; SOARES, L.S.; VICENTE, L. Strong site fidelity and longer interesting interval for solitary nesting olive ridley sea turtles in Brazil. **Marine Biology**, New York, v. 159, n. 5, p. 1011- 1019, 2012.

MARCOVALDI, M.A.; THOMÉ, J.C.A.; BELLINI, C.; SILVA, A.C.C.D.; SANTOS, A.J.B.; LIMA, E.H.S.M.; FEITOSA, R.S.C.; GOLDBERG, D.; LOPEZ, G.G.; MARCOVALDI, G. A Conservação e Pesquisa das Tartarugas Marinhas no Nordeste Brasileiro pelo Projeto Tamar. In: **Conservação de Tartarugas Marinhas no Nordeste do Brasil: Pesquisas, Desafios e Perspectivas.** Pernambuco: Editora Universitária da UFRPE, 2016, p. 15-50, 2016.

SILVA, A.C.C.D.; CASTILHOS, J.C.; LOPEZ, G.G.; BARATA, P.C.R. Nesting biology and conservation of the olive ridley sea turtle (*Lepidochelys olivacea*) in Brazil, 1991/1992 to 2002/2003. **Journal of Marine Biological Association**, United Kingdom, v. 87, p. 1047-1056, 2007.

SILVA, A.C.C.D.; SANTOS, E.A.P.; OLIVEIRA, F.L.C.; WEBER, M.I.; BATISTA, J.A.F.; SERAFINI, T.Z.; CASTILHO, J.C. Satellite-tracking Reveals Multiple Foraging Strategies and Threats for Olive ridley Turtles in Brazil. **Marine Ecology Progress Series**, Oldendorf/Luhe, v. 443, p. 237-247, 2011.

TWEEL, J.G.; TAYLOR, C.R. The rise and fall of the autopsy. **Virchows Archiv**. 462: 371–380, 2013.

VIRCHOW, R. **Die Sektions Technik im Leichenhause des Charité-Krankenhauses**. August Hirschwald, Berlin, 1875.

WOLKE, R.E.; GEORGE, A. Sea turtle necropsy manual. **NOAA Tech**. Memo. NMFS-SEFC-: 1– 24. 1981.

WOLKE, R.E.; GEORGE, A. **Manual de necropsia de tartarugas marinhas.** Memorando Técnico NOAA NMFS SEFC-24, Departamento de Comércio dos EUA, Cidade do Panamá, Flórida. 1981.

WORK, T.M. Sea turtle necropsy manual for biologists in remote refuges. **United States Geological Survey**, National Wildlife Health Center, Hawaii Field Station. 2000.

APPENDIX

FACULDADE UNINASSAU
CURSO DE GRADUAÇÃO EM MED. VETERINÁRIA

AUTORIZAÇÃO

Declaro para os devidos fins legais que eu, **Felipe Eduardo da Silva Sobral**, médico veterinário e professor responsável pelas disciplinas: *anatomia veterinária descritiva dos animais domésticos* e *anatomia veterinária topográfica dos animais domésticos*, sob registro interno nesta instituição de número 030102978, autorizo a professora **Patrícia Aguiar de Oliveira**, também docente desta casa a realizar atividade técnica de necropsia em uma tartaruga da espécie *Chelonia mydas* nas dependências do laboratório de anatomia veterinária da Faculdade UniNassau JP.

Esta atividade será realizada com os discentes regularmente matriculados no 4º período do curso de graduação em medicina veterinária da instituição supracitada e fará parte do conteúdo ministrado junto a disciplina de *patologia geral e necropsia*.

Desde já agradeço a disponibilidade e apoio do corpo de técnicos da faculdade em todas as ações do curso de medicina veterinária e me disponho para maiores esclarecimentos.

João Pessoa, 25/09/2019

Felipe Eduardo da S. Sobral
Médico Veterinário
CRMV 01082-PB

FOLHA DE DADOS DE NECROPSIA

Espécie *Lepidochelys olivacea* Identificação *Tartaruga Oliva*

Data da coleta _____ da Necropsia *10/ Outubro/2019*

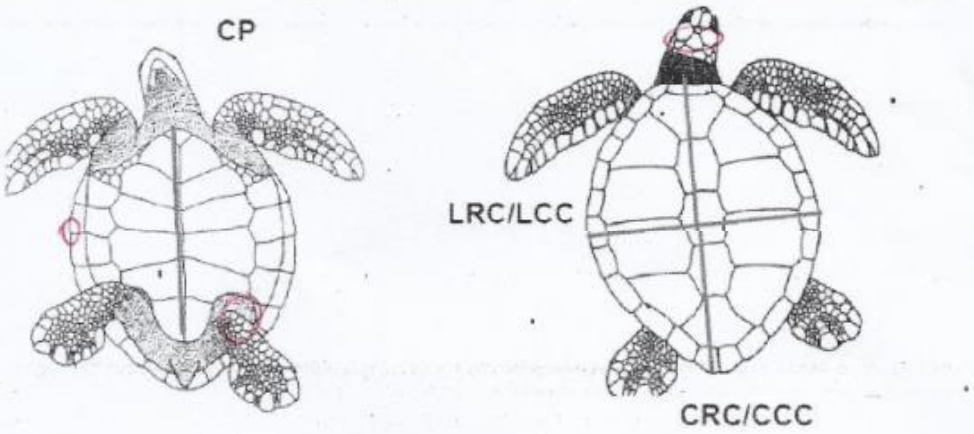
Local *Faculdade Uninassau*

História *Animal doado pelo Aquário Paraíba após suposto acidente com hélice de barco.*

SEXO M ____ F *X* I ____ IDADE ____ Peso(kg) *≅ 50kg*

CRC *63* CCC *66* CP *48* LRC *59* LCC *67*

Comprimento retilíneo de carapaça (CRC); Comprimento curvilíneo de carapaça (CCC); Largura retilínea de carapaça (LRC); Largura curvilínea de carapaça (LCC); Comprimento do Plastrão (CP)



Plastrão, carapaça e pele: Se estão caindo as escamas? Têm feridas fresca ou velhas? Sanguessugas (quantas)? Algas (porcentagem coberta)? Qualquer outro epibiônte crescendo na carapaça? Há algum crescimento anormal na pele? *Apenas a presença de craca*

Condição do corpo: a tartaruga em boas condições tem um bonito Plastrão redondo. Nas tartarugas severamente emaciadas, o Plastrão afunda para dentro da cavidade e fica côncavo.

Medidas

Cloaca: Há alguma protuberância? Está gotejando sangue ou muco? *Não*

Fossas nasais: Há gotejamento de sangue ou muco? *Não*

Boca: a mucosa oral deveria ter uma coloração rosada. Uma coloração vermelha ou azul acinzentada não é normal. Anote qualquer úlcera, lesões, placas, crescimento, manchas ou sangue na cavidade oral. Também anote a presença de algas na boca

Olhos: Os olhos estão colapsados, opacos ou lacrimejando? Existe crescimento pequeno ou pústulas ao redor dos olhos? *Não apresentava globo ocular em ambos os olhos.*

Nadadeiras: Há crescimento anormal como verrugas ou pústulas na pele? Estão intactas? As nadadeiras estão enroscadas em redes de pesca ou anzóis? *Não.*

Circule o(s) termo(s) mais apropriado(s). Agregue suas próprias notas quando necessário.

CONDIÇÃO CORPORAL: (Bom, regular, ruim) Boa

CONDIÇÃO POST MORTEM: (Morte recente, ~ 1 dia, > 2 dias) > 2 dias

EXAME EXTERNO (Pele, olhos, fossas nasais, cloaca) NDN*

MÚSCULO ESQUELETAL: (Atrofia do músculo peitoral – Nenhuma, moderada, severa; Gordura: firme, suave, gelatinosa; cavidade corporal: muitos fluidos, poucos fluidos, seco)

FÍGADO: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

CORAÇÃO: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

PULMÃO: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

TRAQUEIA: Lúmen: liso, áspero; Cor: homogêneo/manchado, bronzeado, branco, vermelho, café, verde, rosado).

BAÇO: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

RIM: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

GÔNADAS: (Superfície: lisa, áspera, granular, enrugada; Consistência: firme, friável; Cor: homogêneo/manchado, vermelho, negro, café, roxo, bronzeado, amarelo).

TIREOIDES: (Superfície: liso, áspero; Consistência: firme, friável; Cor: translúcido / manchado, alaranjado, bronzeado, vermelho, amarelo) Não identificadas

ORAL: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? Não

ESÔFAGO: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? foi encontrado areia.

BUCHO: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? Sim. Não identificada

ESTÔMAGO: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? Sim. Não identificado

INTESTINO DELGADO: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo?

INTESTINO GROSSO: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? Presença de fezes

BEXIGA URINARIA: (Mucosa: lisa, áspera, granular; Cor: homogêneo/manchado, rosado, bronzeado, amarelo, cinza, vermelho, café) Algum conteúdo? Não

CEREBRO: (Superfície: lisa, áspera; Consistência: firme, friável: Cor: homogêneo/manchado, bronzeado, vermelho)

GLÂNDULA DE SAL: (Superfície: lisa, áspera; Consistência: firma, friável: Cor: homogêneo/manchado, café, rosado, bronzeado, alaranjado) Degradada por conta da pancada.

* Nada digno de nota