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POSTMORTEM CHANGES IN TROPICAL ENVIROMENTS

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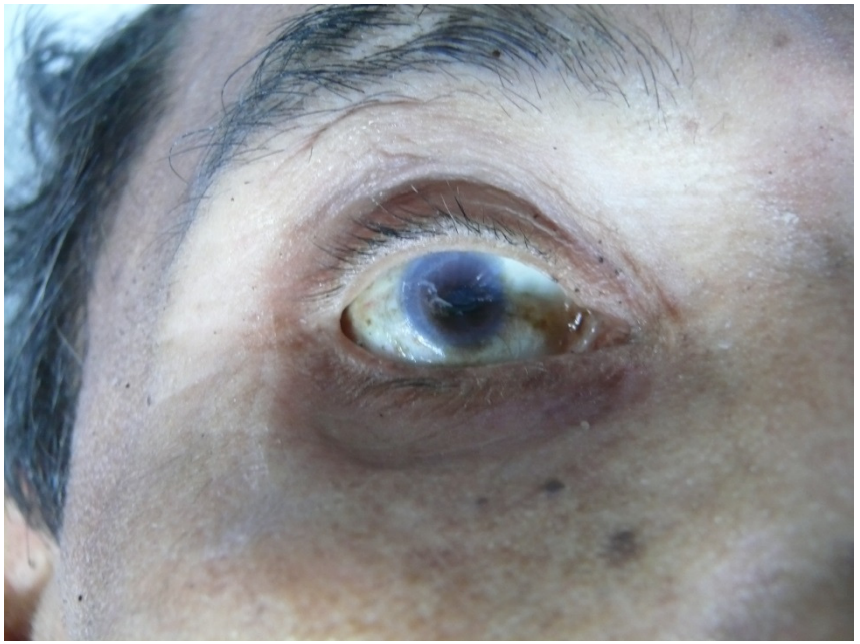
3rd International Conference on
Forensic Research and Technology
October 06-08, 2014 San Antonio, USA

INTRODUCTION

- After death, the morphology and appearance of the corpse are modified and deteriorate progressively until the emergence and development of the cadaveric phenomena and by artifacts resulting from the action of internal and external factors: enviromental conditions, damage peri and post mortem.

INTRODUCTION

- Post mortem changes are progressive
- Critical importance in estimating the post mortem interval in conjuntion with the history, terminal events and scene findings.



INTRODUCTION

THE REPUBLIC OF PANAMA

CIUDAD DE PANAMÁ

- 1.5 million inhabitants
- On the shores of the Pacific Ocean
- Tropical climate
- Average temperatures 21 – 34.5 ℃
- Extensive rain regime
- Relative humidity > 80%

CIUDAD DE PANAMA

FORENSIC PATHOLOGY

- Forensic Sciences and Medico Legal Institute of Panamá
- Forensic Pathology Department
- 1.200 autopsies per year
- 10% decomposed bodies

DECOMPOSITION STUDIES

- Most of the available studies refer to decomposition in temperate enviroments or with marked seasonal variations.
- Important to consider specific local factors in conditions of high temperature and humidity
- Other factors: animal activity, dificulties and handling and transportation and preservation of the body

AUTOR	COUNTRY	INCIPIENT CHANGES	MODERATE CHANGES
Di Maio	**USA**	**Horas**	**< 72 horas**
Pachar	Panamá	Horas	< 72 Horas
Dolinack	Estados Unidos	Horas	<72 horas
Perper	Estados Unidos	Horas	< 72 Horas
Basile	Argentina	Horas	Días
Quai	Rumania	Horas	< 72 Horas
Carrera	Perú	Ø 24 horas	Meses
Grandini	México	Ø 24 horas	< 72 horas
Griest	Estados Unidos	1-72Horas	Ø 1 Semana
Gisbert Calabuig	España	Ø 24 horas	Meses
Shkrum – Ramsay	Canada	24-48 horas	Ø 1 Semana
Vargas Alvarado	Costa Rica	Ø 24 horas	Días
Pounder	Reino Unido	36-72 horas	Ø 1 Semana
Sheperd	Reino Unido	Días	Semanas
Quiróz Cuaron	México	Días	Semanas
Prokop	Alemania	Días	Semanas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DECOMPOSITION STUDIES

- Evaluation of cadaveric phenomena and perimortem artifacts must be made by medical experts and researchers who know the climatic and enviromental conditions of the geographic area in which is located the body.
- High temperature and humidity affect the rapid deterioration of the corpse increasing the possibility of the emergence of artifacts that complicate the interpretation of the lesions.
- The optimum temperature: 21-38 ºc

POST MORTEM CHANGES

- Postmortem changes, specially those related to putrefaction appear and evolve sooner than described in other climatic conditions.
- Green abdominal discoloration over the cecum may appear in matter of hours.

POSTMORTEM CHANGES

- Moderate to advance putrefaction (chromatic – enphysematosus changes) occur in up to 72 hours.
- High temperature, humidity, exposure to the sun

POSTMORTEM CHANGES

Case example 1

Cae example 2

Case example 3





Case example 4

Case example 5

Case example 5

Case example 5

Case example 6

Case example 6

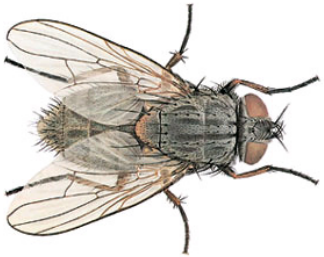
POST MORTEM CHANGES

Spontaneous mummification

Complete skeletal reduction

Postmortem mutilation

Animal activity



Tropical animal activity

Example 1

Example 2

Example 3

Example 4

Charried bodies

Charried bodies

Mutilated bodies

Mutilated bodies

Mutilated bodies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Research proyect

The American forensic anthropologist ***Arpad Vass*** proposes the use of universal formulas for estimating the time of death in decomposed human bodies.

His proposal summarizes 20 years of studies in the "farm bodies" Research Center of Anthropology, University of Tennessee, United States.

Vass recommends the application of these formulas in different conditions to its geographical environment.

Research proyect

Information from the inspection and removal of the corpse was analyzed, autopsies were performed and two universal formulas were applied to estimate the time of death in days: one for a body exposed outdoors (aerobic) and one for a body buried (anaerobic conditions).

Research proyect

For the objective evaluation of the degree of cadaverous decomposition amendment proposed by the author, the combined ratio calculation soft tissues and viscera Aufderheide was applied.

This index measures, in percentages, the degree of deterioration of bone, soft tissue and viscera of the body.

The average values of temperature and humidity used were published in the Bulletin Hydrometeorological ETESA Panama.

Results

CASE 1: Unknown Elder found in an advanced state of putrefaction. Last seen **8** days ago.

In aerobic conditions:

$$\frac{1285 \times (\text{decomposition}/100)}{0.0103 \times \text{temperature} \times \text{humidity}} \qquad \frac{1285 \times 0.75}{0.0103 \times 32 \times 90}$$

32.48 days

In anaerobic conditions:

CASE 2: Female 28 years old, killed and buried in moist clay soil within one meter deep 6 days before the discovery

$$\frac{1285 \times 0.75 \times 4.6 \times 1}{0.0103 \times 32 \times 100} \qquad \frac{4.433.25}{32}$$

134.5 days

Research proyect conclusion

As they are structured, the formulas proposed by Vass not applied in tropical environments with high temperature and humidity, as in the case of Panama. To be applicable in our environment modifications should consider factors specific to our geographic area, to develop research project at the Institute of Legal Medicine and Forensic Sciences.

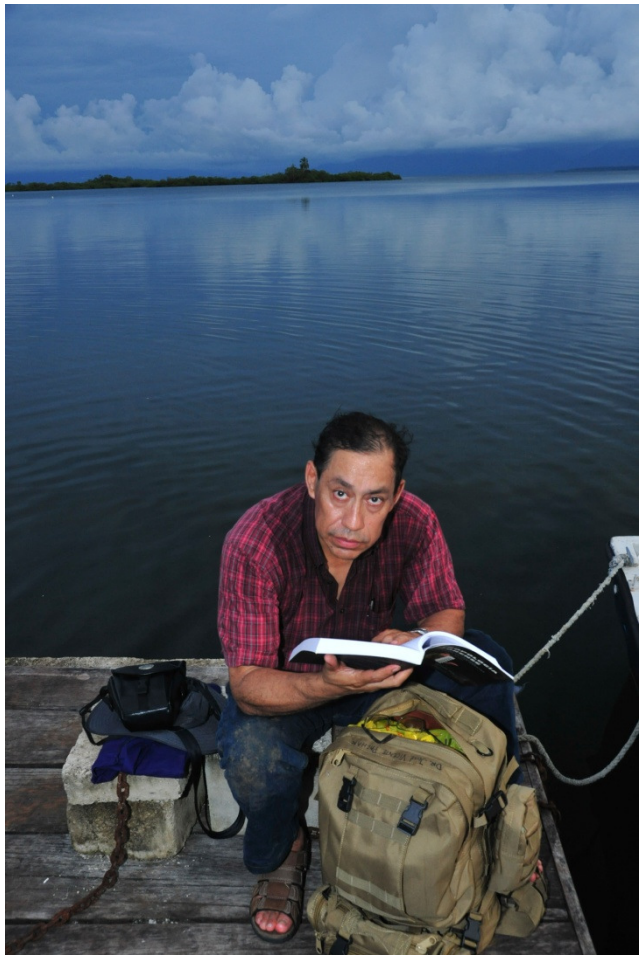
REFERENCES

- 1. Vass Arpad A. The elusive universal post-mortem interval formula. For Sci Int 2011 (204): 34-40.
- 2. Aufderheide AC. The Scientific Study of Mummies. Cambridge University Press, Cambridge UK, 2003.
- 3. Panamá. Contraloría General de la República. Recuperado el 04-04-2013 de: http://www.contraloria.gob.pa
- 4. Dolinack, D., Matshes, E. & Lew, E. (2005). Postmortem Changes. In “Forensic Pathology”. USA: Elsevier.
- 5. Luna, A. (2010). La data de la muerte, un desafío no resuelto. Rev Esp Med Legal, 36(2), 47-48
- 6. Saukko, P. & Knigth, B. Knigth’s Forensic Pathology. (3º ed). London: Oxford University Press, 20
- 7. Byard, R.W., Farrell, E. & Simpson, E. (2008). Diagnostic yield and characteristic features in a series of decomposed bodies subject to coronial autopsy. Forensic Science, Medicine, and Pathology, 4, 1, 9-14
- 8. Pachar, J.V. (2012). Tanatología Forense. Panamá, ARTICSA.
- 9. Garamendi, et al. (2008). Lesiones post mortales por fauna cadavérica. La acción de las hormigas sobre el cadáver. Cuad Med Forense, 14(52), 155-159
- 10. Byard, R.W., James, R.A. & Gilbert, J.D. (2002). Diagnostic problems associated with cadaveric trauma from animal activity. Am J Forensic Med Pathol. 23(3), 238-244.
- 11. Harding, B.E. & Wolf, B.C. (2006). Alligator attacks in southwest Florida. J Forensic Sci 51, 674-677
- 12. Mendieta, C. y Duarte, A. (2009). Ataque por animales acuáticos (tiburón y cocodrilo). A propósito de dos casos fatales en la provincia de Bocas del Toro (Panamá). Cuad Med Forense, 15(58), 309-315.
- 13. Powers, R..H. (2005). The decomposition of Human Remains. In Forensic Medicine of the lower Extremity. Ed Rich J., Dean D.E., Powers R.H.. New Jersey, USA: Human Press.
- 14. scan, M.Y. & McCabe, B.Q. (2000). Animal Effects on Human Remains. In: “Encyclopedia of Forensic Sciences”. USA: Elsevier.
- 15. Di Maio, J.M. & Dana, S.E. (2007). Time of Death – Decomposition. In “Handbook of Forensic Pathology”. USA: CRC.
- 16. Perper, J.A. (1993). Time of Death and Changes After Death. Anatomical Considerations. In “Medico Legal Investigation of Death”. (3º ed). Springfield, USA: Spitz.

REFERENCES

- 17- Basile, A. y Waisman, D. (1989). Agonología Tanatología en “Fundamentos de Medicina Legal”. Buenos
- Aires, Argentina: El Ateneo.
- 18. Quai, I., Terbancea, M. y Margineanu, V. (1978). Tanatología Médico Legala. In “Introducere in Teoria
- si Practica Medico – Legala”, Rumania: Dacia Cluj Napoca,.
- 19. Carrera, R. (2009). Medicina Legal. Perú: AFA.
- 20. Grandini, J. (2004). Tanatología en “Medicina Forense”. México: McGraw-Hill Interamericana.
- 21. Griest, K.J. (2010). Timing of Death and Injuries in Infants and Young Children. In “Pediatric Homicide
- medical Investigation”Griest KJ. USA, CRC.
- 22. Calabuig, J.A. (2004). Fenómenos cadavéricos. En “Medicina Legal y Toxicología”. (6º ed.)
- España: Masson.
- 23. Shkrum, M.J. y Ramsay, D.A. (2008). Postmortem Changes. The “Great Pretenders”. In “Forensic
- Pathology of Trauma: Common Problems for the Pathologist”. USA: Humana Press.
- 24. Shepherd, R. (2003). Changes after Death. In “Simpsom s Forensic Medicine”. (12º ed). London: Arnold Pub
- 25. Dix, J. & Graham, M. (2000). Time of Death, Decomposition and Identification. USA: CRC.
- 26. Pounder, D.J. (2000). Postmortem Interval. In “Encyclopedia of Forensic Sciences”, USA: Elsevier
- 27. Gunn, A. y Ch, L. (2009). The decay, discovery and recovery of human bodies. In “Essential Forensic
- Biology” (2º ed). USA: Wiley.
- 28. Prokop, O., Reimann, W. y Hinderer, H. (1987). Signos de muerte y fenómenos cadavéricos.
- En “Vademecum de Medicina Legal”, Cuba: Científico Técnica.
- 29. Vargas, E. (1996). Cadáver. En “Medicina Legal”. México: Trillas.
- 30. Quiroz, A. (1986). Tanatología Forense. En “Medicina Forense”. (5º ed). México: Porrúa.
- 31. Patitó, J.A. (2000). Tanatología. En “Medicina Legal”. Buenos Aires, Argentina: Centro Norte.
- 32. Chawla, H., Lal, B. & Paliwal, P.K.(2011, Abril-June). Meticulous Examination of Body Pays. J Indian
- Acad Forensic Med., 33, 2.
- 33. LeMoyne, S. (1991). Estimación de la época de la muerte. En “Investigación de Hoomicidios”.
- México: Limusa.
- 34. Raffo, H. O. (1993). Examen del lugar del hecho. En “La Muerte Violenta”. Buenos Aires,
- Argentina: Universidad.

Muchas gracias



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