Evaluation of age-related changes in dentition of terrier dogs

Kaveh khazaeel^{1*}, Farzin Mohandespour², Bahman Mosallanejad³ and Mahdi Pourmahdi Borujeni⁴

¹ Assistant Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

²DVM, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran
³ Professor, Department of Clinical Sciences, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

⁴ Associate Professor, Department of Food Hygiene, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

Received: 16.08.2020 Accepted: 27.12.2020

Abstract

Teeth eruption and wearing, especially incisors and canines, are the most practical parameters used in the clinical and physical examination of the animals. This study aimed to evaluate age-related changes in the dentition of domestic dogs in Ahvaz, Iran, to determine a relationship between arrangement of teeth and age of dogs. The present study was conducted on 173 Terrier dogs referred to the Veterinary Hospital of Shahid Chamran University of Ahvaz, which had a birth certificate. The animals were divided into 7 age groups of 1: 0 - 2, 2: 2 - 8, 3: 8 - 18, 4: 18 - 36, 5:36 - 60, 6:60 - 120 and 7: more than 120 months. The age estimation was presented based on dental profile and compared with the ancestral age. The crown length of incisors and canines were measured in the left maxillary hemi arch using a digital caliper, followed by imaging. In this study, computer and statistical studies were performed on the dental profile, correlation between crown length and age, as well as teeth wearing rate, and dental morphology. A comparison of crown length of incisors in each group showed that teeth I1, I2, and I3 had the minimum to maximum crown lengths, respectively. The correlation of estimated age with ancestral age in the studied dogs was very significant. This study showed that age assessment using teeth is one of the most important practical and true methods for age estimation in dogs.

Key words: Age estimation, Tooth, Teeth arrangement, Teeth wearing, Terrier dogs

^{*} Corresponding Author: Kaveh khazaeel, Assistant Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran, E-mail: k.khazaeil@scu.ac.ir



^{© 2020} by the authors. Licensee SCU, Ahvaz, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0 license) (http://creativecommons.org/licenses/by-nc/4.0/).

Refrences

- Barton, Abe. 1939. Age Determination in Dogs. Iowa State University Veterinarian, 2(1), 6.
- Bellows, J., Colitz, C. M., Daristotle, L., Ingram, D. K., Lepine, A., Marks, S. L., Sanderson, S. L., Tomlinson, J., & Zhang, J. (2015). Common physical and functional changes associated with aging in dogs. *Journal of the American Veterinary Medical Association*, 246(1), 67-75.
- Bosmans, N., Ann, P., Aly, M., & Willems, G. (2005). The application of Kvaal's dental age calculation technique on panoramic dental radiographs. *Forensic science international*, 153(2-3), 208-212.
- Boy, S., Crossley, D., & Steenkamp, G. (2016). Developmental structural tooth defects in dogs–experience from veterinary dental referral practice and review of the literature. *Frontiers in veterinary science*, 3, 9.
- Carney, H. C., Ward, C. R., Bailey, S. J., Bruyette, D., Dennis, S., Ferguson, D., Hinc, A., & Rucinsky, A. R. (2016). 2016 AAFP guidelines for the management of feline hyperthyroidism. *Journal of feline medicine and surgery*, 18(5), 400-416.
- Chyan, Phie. 2018. Decision Support System for Selection of Dog Breeds. In 2018 International Seminar on Research of Information Technology and Intelligent Systems (ISRITI), 343-46. IEEE.
- Ettinger, S. J., Feldman, E. C., & Cote, E. (2017). *Textbook of Veterinary Internal Medicine-eBook* (Elsevier health sciences).
- Gonçalves, P., Risco, D., Fernández-Llario, P., Barquero-Pérez, O., Serrano, E., Hermoso-de-Mendoza, J., & Mateos, C. (2016). A new method for ageing wild boar using dental measures. *Ecological Indicators*, 62, 328-332.
- Gorrel, C. (2013). Veterinary dentistry for the general practitioner (Elsevier Health Sciences).
- Harris, S. (1978). Age determination in the red fox (Vulpes vulpes)—an evaluation of technique efficiency as applied to a sample of suburban foxes. *Journal of Zoology*, 184: 91-117.
- Hermanson, J. W., & Lahunta, A. D. (2020). Miller's anatomy of the dog. Miller's anatomy of the dog: 5th Edition.
- Jean, Y., Bergeron, J. M., Bisson, S., & Larocque, B. (1986). Relative age determination of coyotes, Canis latrans, from southern Quebec. *Canadian field-naturalist. Ottawa ON*, 100: 483-87.
- Kershaw, K., Allen, L., Lisle, A., & Withers, K. (2005). Determining the age of adult wild dogs (Canis lupus dingo, C. l. domesticus and their hybrids). I. Pulp cavity: tooth width ratios. *Wildlife Research*, 32: 581-85.
- Kim, Y. K., Kho, H. S., & Lee, K. H. (2000). Age estimation by occlusal tooth wear. *Journal of Forensic Science*, 45: 303-09.
- Kouki, M. I., Papadimitriou, S. A., Kazakos, G. M., Savas, I., & Bitchava, D. (2013). Periodontal disease as a potential factor for systemic inflammatory response in the dog. *Journal of veterinary dentistry*, 30: 26-29.
- Krause-Parello, C. A. (2008). The mediating effect of pet attachment support between loneliness and general health in older females living in the community. *Journal of Community Health Nursing*, 25: 1-14.
- Lahunta, A. D., & Habel, R. E. (1986). Applied veterinary anatomy (WB Saunders).
- Landon, D. B., Waite, C. A., Peterson, R. O., & Mech, L. D. (1998). Evaluation of age determination techniques for gray wolves. *The Journal of wildlife management*,674-82.
- McFarlin, S. C., Galbany, J., Vakiener, M. M., Abavandimwe, D., Cranfield, M. R., Eckardt, W., Mudakikwa, A., Ndagijimana, F., & Stoinski, T. S. (2018). Dental emergence in wild Virunga mountain gorillas (Gorilla Beringei Beringei) from Rwanda. *American journal of primatology*, 80: 57-65.
- Morgan, J. P., & Miyabayashi, T. (1991). Dental radiology: ageing changes in permanent teeth of beagle dogs. *Journal of Small Animal Practice*, 32: 11-18.
- Nickel, R., Schummer, A., Seiferle, E., & Sack, W. O. (1979). *The viscera of the domestic mammals* (Vol. 2). P. Parey.
- Rashed, F. (2015). A Comparative Study of the Dentition and Temporomandibular Joint Anatomy and Histology Adult Dogs. *Biol syst Open Access*, 4: 2.
- Shabestari, L., Taylor, G. N., & Angus, W. (1967). Dental eruption pattern of the beagle. *Journal of dental research*, 46: 276-78.

Shimoinaba, S., & Oi, T. (2015). Relationship between tooth wear and age in the Japanese black bear in Hiroshima Prefecture, Japan. *Mammal Study*, 40: 53-60.

Smuts, G. L., Anderson, J. L., & Austin, J. C. (1978). Age determination of the African lion (Panthera leo). *Journal of Zoology*, 185: 115-46.