

Dental hypodontia in dogs

Hipodontia dentária em cães

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ABSTRACT

Hypodontia is a type of dental anomaly that can affect dogs, characterized by the congenital absence of up to six deciduous or permanent teeth. According to reports in the literature, the absence of a dental element is an incidental finding and the absence of the first premolar teeth is observed more frequently. It is believed that there is a genetic component and viral factors that predispose to the non-development of dental elements. However, an interruption in the development of these same

dental elements can cause tooth failure. It is not possible to discern whether there is a dental element or not just through the macroscopic examination of the oral cavity. In this sense, it is necessary to carry out an intraoral radiographic examination for diagnostic elucidation, which will lead to an appropriate treatment. According to the literature, non-eruption of teeth can generate a dentigerous cyst, whose treatment is based on the extraction of any remaining tooth tissue.

Keywords: hypodontia, dogs, dental abnormalities, radiology

RESUMO

A Hipodontia é um tipo de anomalia dentária de número que pode acometer os cães, caracterizada pela ausência dentária congênita de até seis dentes decíduos ou permanentes. Segundo relatos da literatura, a ausência de um elemento dentário é um achado incidental e observa-se com maior frequência a ausência dos primeiros dentes pré-molares. Acredita-se que haja um componente genético e fatores virais que predisponham ao não desenvolvimento dos elementos dentários. Porém uma interrupção no desenvolvimento desses mesmos elementos dentários pode provocar a não erupção dentária. Não é possível discernir se existe elemento dentário ou não apenas por meio do exame macroscópico da cavidade oral. Nesse sentido, se faz necessário a realização de exame radiográfico intra-oral para a elucidação diagnóstica, que conduzirá a um tratamento apropriado. Segundo a literatura, a não erupção dentária pode gerar cisto dentífero, cujo tratamento se baseia na extração de qualquer tecido dentário remanescente.

Palavras-chave: hipodontia, cães, anormalidades dentárias, radiologia

1 INTRODUCTION

Dogs are difiodonts, as they have two forms of dentition: deciduous and permanent teeth. Deciduous teeth are formed at the beginning of development and, after birth, are replaced by permanent teeth at defined time intervals, with a total of 28 deciduous teeth and 42 permanent teeth (OURO et al. 2022). The dental formula for dogs is: 2 deciduous teeth (3/3 I, 1/1 C, 3/3 PM), totaling 28, and 2 × permanent teeth (3/3 I, 1/1 C, 4/4 PM, 2/3 M), totaling 42 (THRALL, 2019).

Morphogenic and inductive processes in mammalian tooth development follow similar general developmental stages, regardless of tooth type or animal species. Tooth development begins after the interaction between the sheet of ectoderm and the underlying mesenchyme derived from the neural crest. Ectodermal proliferations along the dental lamina will originate the dental buds that project into the mesenchyme. These buds represent the ectodermal primordia of teeth and their number corresponds to the number of deciduous teeth for a given species. So, a failure in the interaction between the ectoderm layer and the mesoderm is the reason for the non-development of the dental elements (MCGEADY et al., 2006).

Congenital dental anomalies in dogs are not common (VENTURINI, FERRO, GIOSO, 2003). They can be classified as alterations in the size of the tooth, in the number of teeth, in the direction and tooth eruption (SAN ROMAN, 1999). Hypodontia or oligodontia happens due to failure in tooth development, generating a reduction in the number of teeth normally present

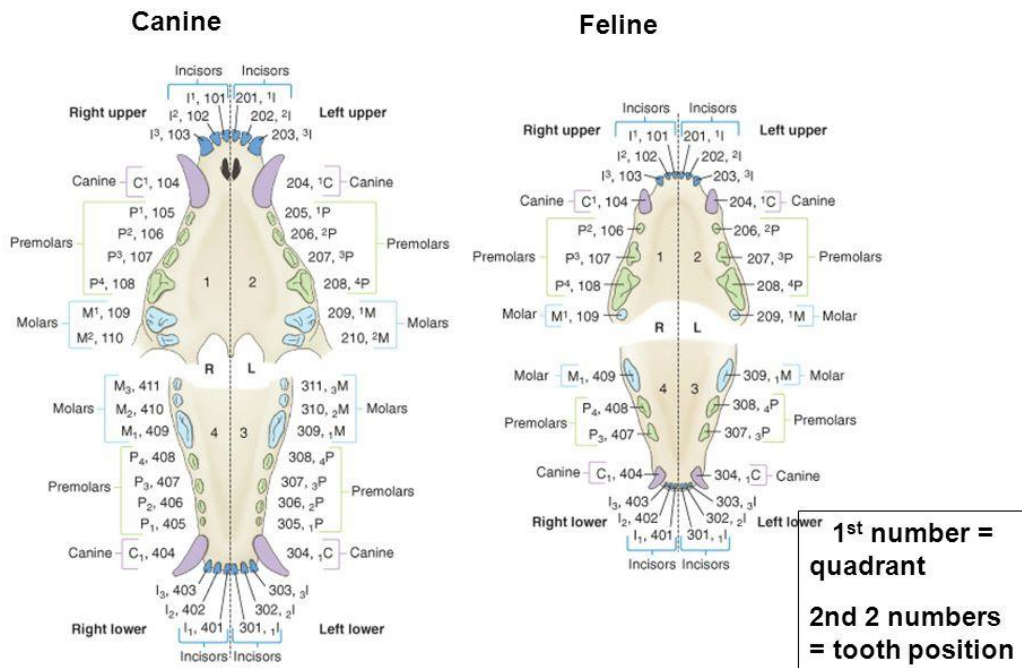
(ASSUNÇÃO, 2020). Dental impaction, partial eruption, enamel hypoplasia or hypocalcification, dentin hypoplasia, dens in dente and root hypoplasia are also types of dental anomalies described in dogs. These conditions can affect both the deciduous and permanent teeth in dogs (VENTURINI, FERRO, GIOSO, 2003). Dentigerous cysts are dental alterations that may arise due to some dental abnormalities, as they contain all or part of a malformed tooth. These cysts can cause distortion of the maxilla or mandible (MCGEADY et al. 2006).

The intraoral radiographic examination is an indispensable tool for detecting dental malformations, lacerations or root fractures, retained roots after tooth fracture or extraction, missing teeth (which may be related to agenesis or presence of impacted teeth), supernumerary teeth or roots, periapical abscesses, dentigerous cysts, oral neoplasms, tooth resorption lesion (very common in cats, but also becoming frequent in dogs), pulpal death (NIEMIEC, 2009), alteration in dental dimensions (macrodontia/microdontia) or bone dimensions (craniomandibular osteopathy, periosteal reactions), intrapulpal calcifications, dental ankylosis, greater bone detailing in cases of mandibular fractures (KUNTSI et al., 2018). Intraoral radiographs are oriented such that the crowns of the maxillary teeth point ventrally and the crowns of the mandibular teeth point dorsally. With the patient facing you, if the distal teeth are on the left, then the dental radiograph is on the right side of the arch; while if the distal teeth are on the right, the radiograph is on the left side (THRALL, 2019). Dental nomenclature follows the configuration of the Modified Triadan System (Figure 1). This system employs a three-digit numerical code to identify each tooth in the animal's mouth. The first number indicates the quadrant in which the tooth is located and the other two numbers indicate the location of the tooth within the quadrant, always starting with the central incisor in a distal direction. Through this system, the permanent dentition is indicated with the numbers 100 in the right maxilla, 200 in the left maxilla, 300 in the left mandibular and 400 in the right mandibular. The deciduous dentition can be designated with the digits 500 in the right maxilla, digit 600 in the left maxilla, digit 700 in the left mandibular and digit 800 in the right mandibular (GORREL, 2010).

Figure 1: Modified Triadan System.



Triadan Numbering System



This article aimed to make a brief review of odontogenesis in dogs and report the occurrence of dental abnormalities in a mesocephalic dog, based on the report of a clinical case.

2 CASE REPORT

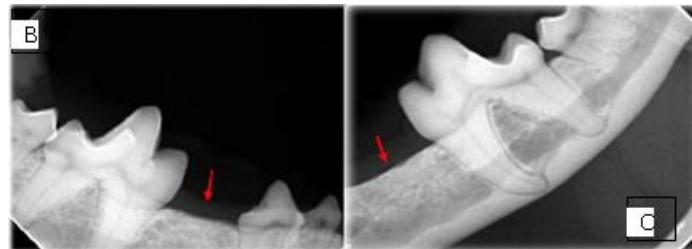
A Maltese female dog, approximately 2 years old, was seen by a veterinarian at a private clinic in the city of João Pessoa, Paraíba state, Brazil on August 10, 2022, for dental evaluation. Upon dental inspection, with the patient anesthetized, the presence of all dental elements in the rostral region was observed, with the exception of tooth #203. All teeth had gingival recession, mobility grade II in tooth #202, periodontal pocket of 4mm and presence of calculus in tooth #402. Malocclusion by linguoversion of teeth #302 and #402 and left mandibular canine tooth #304 not fully erupted. In the right mandible, the absence of the 4th premolar #408 was visualized and likewise in the left mandible, the absence of the 4th inferior premolar #308 was observed. Decrease in the interdental space between #203 and #204 (yellow arrow), being the probable cause of the total non-eruption of lower left canine #304(Figure 2).

Figure 2. A: Presence of all elements in the rostral region #101, #102, #103, #104, #201, #202, #203, #204, #301, #302, #303, #304, #401, #402, #403 and #404. Gingival retraction, malocclusion due to linguoversion of teeth #302 and #402, red arrows. Non-complete eruption of tooth #304, yellow arrow. B: Missing tooth #308, red arrow. C: Decreased interdental space between #203 and #204, yellow arrow. Missing tooth #408, red arrow..



Absence of teeth #308 and #408 (Figure 3).

Figure 3.B: Absence of dental elements of tooth #308, red arrow. C: Absence of dental elements of tooth #408, red arrow.



The treatment consisted of calculus removal and ultrasonic scaling of the crown, subgingival plaque, polishing and irrigation of the gingival sulcus with chlorhexidine solution of all dental elements and tooth extraction (extraction) of teeth #202 and #402. The tutor was instructed to brush properly to maintain the dog's oral health (Figure 4).

Figure 4. A: Appearance of the teeth in the rostral region after periodontal treatment. Extraction of teeth #202 and #402, red arrows. B: Aspect of the dental elements, in the right lateral view, after periodontal treatment. C: Aspect of the teeth, in the left side view, after periodontal treatment.



3 FINAL CONSIDERATIONS

With the closer relationship between humans and animals, there is a significant increase in attention to general health and in particular to oral health. Dental evaluations supported by radiographic imaging exams is still not the reality experienced in many Brazilian states. But that is changing. In this sense, it is expected that the occurrence of dental anomalies in dogs and cats will be increasingly reported, enriching evidence-based veterinary dentistry with scientific support.

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