PERIODONTAL MANDIBULAR OSTEOMYELITIS IN TWO NEW ZEALAND RABBITS

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ABSTRACT

Mandibular osteomyelitis is an inflammation of all structures of the jawbone caused by microorganisms that enter through the tooth decay (odontogenic) or the periodontal tissues. The odontogenic form is more common in humans and originates from decayed teeth where infection can reach the bone and cause osteomyelitis. Periodontic mandibular osteomyelitis originates from the tissues that surround and support the teeth: gingiva, periodontal ligament and alveolar bone, due to the accumulation of plaque and tartar that may form a dental abscess. In rabbits, mandibular odontogenic osteomyelitis is rare and may be related to the diet of pet rabbits. However, periodontal osteomyelitis is common and develops due to the weakness of the periodontal ligament in rodents that allows continuous tooth growth. We did not find reports in scientific journals of this condition, but it has been clinically described in some books. The descriptions in these documents refer purulent osteomyelitis associated to other microorganisms. The aim of this paper is to present and discuss the pathologic findings, etiology and nomenclature of these cases. Two New Zealand rabbits were submitted to the CIESA-FMVZ-UAEMex due to the presence of bilateral submandibular nodes. These cases were characterized by a granulomatous osteomyelitis with a high number of epithelioid cells and lymphocytes in the bone marrow in the lower jaw which agents were involved *Pasteurella multocida* and *Bordetella bronchiseptica*. In all cases of osteomyelitis, it should be inspected the dental injuries to determine the origin of this disease and so diagnose it properly. Else, the term periodontal or odontogenic as the case must be added to the name of this disease.

KEYWORDS: periodontal mandibular osteomyelitis, rabbits, *Pasteurella multocida*, *Bordetella bronchiseptica.*

INTRODUCTION

Mandibular osteomyelitis is an inflammation of all structures of the jawbone caused by microorganisms that enter through tooth decay or periodontal tissues. The mandibular osteomyelitis can be classified according to pathogenesis in periodontal and odontogenic (6). The odontogenic form is more common in humans and originates from decayed teeth where infection can reach the bone and cause osteomyelitis. Periodontal type, originates from the periodontal tissues, including tissues that surround and support the teeth: gingiva, periodontal ligament and alveolar bone, due to the accumulation of plaque and tartar that may form a dental abscess (6). In veterinary, oral and dental diseases have been studied in small animals such as dogs and cats, periodontal disease is very common and associated factors is the accumulation of plaque on the tooth surface, among the predisposing factors are age, nutrition and genetic predisposition (3). In rabbits, mandibular odontogenic osteomyelitis is rare and may be related to the diet of pet rabbits. However, periodontal osteomyelitis is common and develops due to the weakness of the periodontal ligament in rodents that allows continuous tooth growth (1, 5, 7). Normal rabbit dental anatomy and ethological behavior are essential for the development of this pathology. The permanent dentition has the feature to continue to grow throughout the lifetime. However, progressive growth is not very evident due to continuous tooth wear in the feed, which may favor the development of peridontals disease (1, 5, 7). In this study, the etiology and pathological findings of two cases of periodontal bilateral granulomatous osteomyelitis in rabbits from the same farm are reported. The terminology is also discussed, and it is proposed that the term of periodontal disease be used in this disease of rabbits, because in the few reports of osteomyelitis in rabbits, this disease has not been well described.

MATERIALS AND METHODS

Two New Zealand rabbits about 2.5 months old, weighing approximately 1,500 kg, from a family backyard rabbit farm in the State of Mexico. The animals were sent to CIESA, FMVZ, UAEMex, for diagnosis by the appearance of the submandibular nodes. Necropsy was performed on both

rabbits and samples for histopathology, and bacteriology was collected. For histopathology, craneal and caudal cuts of the injury from the lower jaw bones were performed in order to include the full node of each rabbit. Nodes were fixed for 48hrs in 10% buffered formalin, subsequently. They were washed under tap water and decalcified with EDTA for 48hrs, included in paraffin, cut at 6 µm thick and stained with H&E. For bacteriology, samples were taken from the exudate using a sterile swab and bacteriological loop, from the left mandible of the rabbits. Samples were seed in blood agar with 5% sheep blood and in MacConkey agar, incubated at 37 °C for 24 hrs. The isolates were passed on blood agar for purification. The identification and differentiation were determined by biochemical tests as catalase, oxidase, nitrite reduction, Indole, TSI, SIM, MIO, urea and confirmation of the isolates was performed by the API 20NE system.

RESULTS

During the necropsy, at the external inspection showed a rabbits moderate body condition. Internal inspections of the oral cavity were found two nodules in both lower jaws, located just below the molars without evidence of caries, tartar or plaque. Palpation consistency was hard as stone and immobile, approximately 2 cm in diameter (Figure 1). At-cut, yellowish-white nodules of firm consistency containing cheesy material was found. Samples for bacteriology and histopathology were collected for. The histopathology reveled a severe gingivitis as peridontals gingival epithelial ulcerations and intense granulomatous osteomyelitis in the bone marrow of the lower jaw; characterized by the presence of a large amount of epithelioid cells and lymphocytes. Plates were reviewed to verify and identify bacterial colony's growth; in blood agar, two types of colonies morphologically different were identified, in MacConkey agar, there was not bacterial growth. From the exudate, a combination of *Pasteurella multocida* and *Bordetella bronchiseptica* was isolated. The final diagnosis was severe periodontal mandibular granulomatous osteomyelitis associated to *Pasteurella multocida* and *Bordetella bronchiseptica*.

DISCUSSION

Most reports of mandibular osteomyelitis in rabbits are clinical studies describing the injury as

purulent osteomyelitis, associated with various etiologic agents such as *Staphylococcus aureus*, Bacteroides, Pseudomonas, Proteus, *Fusobacterium nucleatum*, *Prevotella heparinolytica*, *Prevotella spp*., *Peptostreptococcus micros*, *Streptococcus milleri* group, *Actinomyces israelii* and *Arcanobacterium haemolyticum* (4, 8). However, this case was characterized by a granulomatous osteomyelitis, a lot of epithelioid cells and lymphocytes in the bone marrow of the lower jaw bone in which, the agents involved were *Pasteurella multocida* and *Bordetella bronchiseptica*. The combined presence of these bacteria is so common in the respiratory tract of healthy rabbits and ill (2). However, there are no reports in which these agents are involved in the development of osteomyelitis in rabbits. This injury could have been caused by a chronic infection due to the type of diet and dentition of rabbits that favored infection.

CONCLUSIONS

The oral and dental diseases are one of the most studied in humans, but in animals has been little studied. In the naming task as accurately and clearly, it must use a nomenclature describing oral diseases in animals, in this case in rabbits. As in all cases of mandibular osteomyelitis should inspect dental injuries, performed histopathological and bacteriological examination to make a good diagnosis.

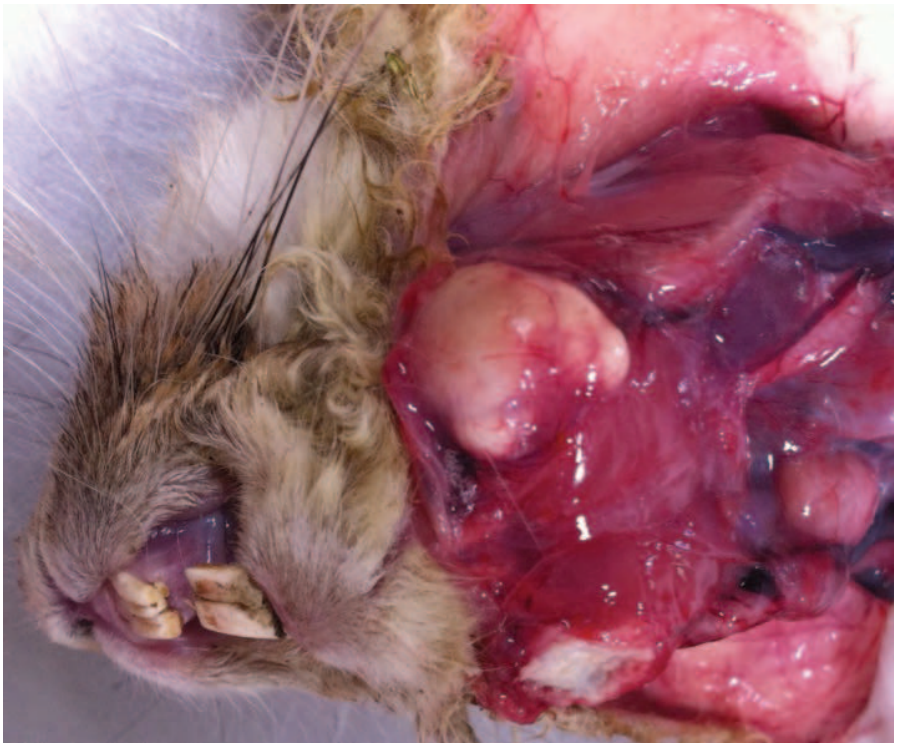

Figure1. Rabbit lower jaw showing whitish nodules.

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