



A Case of Congenital Supernumerary Teeth in an Ovine Dental Pad

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Journal of Veterinary Dentistry
2017, Vol. 34(4) 279-281
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DOI: 10.1177/0898756417734378
journals.sagepub.com/home/jov



Abstract

A rare case of congenital supernumerary teeth, also known as hyperdontia, observed in a healthy 8-month-old female ewe is presented. The congenital defect consisted of the presence of 2 incisor teeth embedded in the lateral areas of the dental pad. The anomaly was found during a routine physical examination and no other congenital abnormalities were found in the patient. No prior congenital abnormalities had been seen in the herd and the study of possible associated teratogenic factors was inconclusive. To the authors' knowledge, this ovine odontogenic abnormality has not been described in the literature and appears to be an extraordinarily rare condition.

Keywords

supernumerary teeth, hyperdontia, congenital abnormality, sheep, ruminant, veterinary dentistry

Complete History and Signalment

In a routine clinical examination carried out at a sheep farm, an 8-month-old female ewe (Canary sheep breed) was found to have teeth in the upper dental pad. The animal was referred to the University of Las Palmas de Gran Canaria for further examination. The animal was bright, alert, responsive, and within normal body condition (score 3/5). After careful examination, the abnormal presence of 2 teeth positioned laterally at the dental pad was observed (Figure 1). General physical examination revealed an apparently healthy animal without other detectable congenital defects.

Radiographic Findings

Radiographic examination of the head revealed 2 small teeth located in lateral areas of the dental pad, and their positions corresponded to fourth incisor teeth in the maxilla (Figures 2 and 3). The teeth were normal in shape but reduced in size and were therefore classified as focal microdontia.

Discussion

Dental abnormalities are not commonly described in ruminant species. All bovid ungulates lack first premolar teeth, maxillary incisors, and canine teeth. Most of the dental congenital defects found in the available literature are focused on defects in form, absent or supernumerary teeth, but always close to species-specific pattern of dentition (I0/4, P3/3, M3/3 = 32). Supernumerary teeth are developed inside the alveolar regions,

which could be described as “normotopic.” Heterotopic teeth, or teeth that develop outside the alveolar region, are extraordinarily rare in ruminants.

The ewe belonged to an extensively managed farm composed of approximately 300 dairy sheep. No previous cases of congenital abnormalities had been observed in the herd. Genetic, toxic, infectious, or environmental factors related to congenital abnormalities could not be demonstrated. No changes had recently been introduced into the breeding stock's diet and there was no history of vaccination or deworming the weeks before and after mating. The ewe lamb was the only offspring, and it was the first parturition for the dam. Based on the owner's information, parents were not affected. Thus, the associated factors in this case could not be determined.

It is believed that the dental pad has been developed in ruminants to gather large quantities of grass and other vegetation, thus, no incisors or canines arise in this rostral area. The existence of supernumerary teeth developing in the dental pad

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Figure 1. Presence of supernumerary tooth in the lateral dental pad.



Figure 2. Lateral oblique radiograph of supernumerary maxillary incisors. Note the presence of dental alveoli.

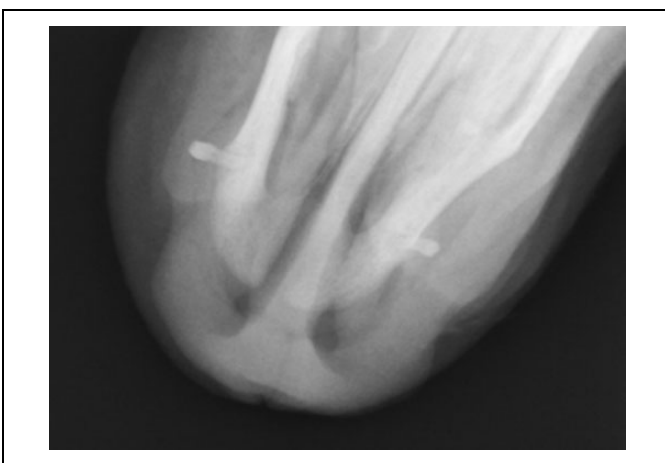


Figure 3. Intraoral radiograph shows the presence of bilateral supernumerary maxillary incisors.

of a lamb has not been found in the available literature, although other nondocumented cases may have occurred in the field. According to the classification of supernumerary teeth,^{1,2}

both were considered as “normotopic” due to the presence of dental alveoli observed in radiographs. The dental alveoli were located in corresponding positions of fourth incisor teeth. Determinant causes could not be established.

The formation of dental tissues is a highly delicate and complex phenomenon. Mammalian teeth form from oral ectoderm and cranial neural crest-derived mesenchyme in a multi-stage process, which includes initiation, morphogenesis, cytodifferentiation, and matrix secretion, resulting in tooth eruption. The genetic basis of odontogenic competence is not known either for the dental epithelium or for the mesenchyme though the expression patterns of multiple genes correlate with the competence.³

The etiology of the supernumerary teeth is uncertain, but various causes have been proposed, such as atavism (reappearance of traits that were lost in generations prior), dichotomy of the tooth germ, excessive growth of the dental lamina, hereditary factors, and other diseases.² Nevertheless, both environmental and genetic factors have been implied as the main causes to explain these anomalies in isolation. Differentiation of neural crest cells and interactions between epithelial and mesenchymal cells during the initiation of odontogenesis, disturbances in migration, and proliferation have been suggested to give rise to this condition. It is inconclusive whether a specific gene or an enzyme defect plays a significant role.⁴

In veterinary medicine, a few reports have been published describing supernumerary teeth. Kuiper et al reported 47 dogs with polydontia, with the boxer being the most prevalent breed.⁵ Dole and Spurgeon determined the frequency of supernumerary teeth in greyhounds (36.4%),⁶ whereas a prevalence of 4.5% of captured Japanese raccoon dogs (*Nyctereutes Procyonoides Viverrinus T*) from the Northern part of Kyushu (Japan) had supernumerary teeth.⁷

In horses, several references of supernumerary teeth have been documented in the literature. A 2005 review of equine dental disorders described supernumerary permanent incisor teeth and supernumerary cheek teeth.⁸ Quinn et al described the clinical features, diagnosis, treatment, and outcome of supernumerary cheek teeth (n = 24) in 15 horses.⁹

In ruminants, a fourth pair of mandibular molars has been described in a white-tailed deer (*Odocoileus virginianus*).¹⁰ Moreover, a supplemental premolar as a postpermanent fourth premolar was described in a moose bull (*Alces alces*).¹¹ In another study of 755 Japanese serow (*Naemorhedus crispus*), supernumerary teeth were found in 1.3% of animals.¹² In sheep (*Ovis spp.*), supernumerary teeth were found among mandibular incisors, maxillary and mandibular premolars, and mandibular molars.¹³ No reports of supernumerary maxillary incisors have been found by the authors.

Clinical consequences of supernumerary teeth in animals are variable and these teeth typically do not cause impairment of mastication. However, facial swelling in a dog was associated with a supernumerary premolar tooth, although a causal association was not established.¹⁴ In horses, supernumerary cheek teeth should be extracted if deep periodontal food pocketing or apical infections are present.⁸ However, conservative

treatment including the management of diastema and reduction in overgrowths is often effective because of mild clinical signs in horses.⁹

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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