Equine Dental Developmental Abnormalities

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Take Home Message

Abnormalities of dental development occur quite commonly in the horse. They can present with a wide range of clinical signs. Detailed oral and radiographic examinations are often needed to diagnose a developmental dental abnormality. Therapy can vary from removal of offending dental overgrowths to aggressive periodontal therapy and/or surgical tooth extraction.

Introduction

Abnormalities of dental development and eruption occur quite commonly in the horse and result in a wide range of clinical conditions. A congenital/developmental problem present at the time of tooth eruption often leads to acquired dental problems as the teeth continue to erupt and wear. Consequently, several different dental abnormalities whose pathogenesis may be inter-related, are often present at the time of clinical presentation.

Supernumerary Teeth

Supernumerary teeth are teeth in excess of the normal expected number in any of the dental arcades. This disorder has been referred to as polydontia or hyperdentition. Supernumerary teeth (polydontia) are uncommonly diagnosed in the horse and the exact prevalence of the condition is unknown.

Supernumerary teeth can be loosely categorized morphologically in two categories: 1) Supplemental teeth that resemble teeth of the normal series in crown and root morphology although not always in size (Fig 1). If a horse has more than the usual number of teeth in an arcade, it may be impossible to be sure which tooth is supernumerary. 2) Rudimentary or dysmorphic teeth that are abnormally shaped and smaller in size than normal teeth.

The term “connate” describes a tooth anomaly that can arise from the fusion of a number of tooth germs or arising from partial splitting of a tooth primordium. Connate teeth are not necessarily supernumerary teeth, but some equine cheek teeth are connated (Fig. 2). Supernumerary teeth may develop in a normal direction of eruption or in an inverted, transverse, ectopic or other abnormal direction (Fig. 3). They may occur singly, multiply, unilaterally or bilaterally and in one or both jaws.
In general, the prevalence of equine supernumerary cheek teeth is greatest at the peripheries of the tooth class fields. The evidence is strongest with respect to the caudal aspects of the molar teeth but supernumerary teeth can also occur lingually, buccally or rostrally to the normal arcades. Clinical signs most commonly associated with supernumerary cheek teeth are dental overgrowths and diastemata, which cause secondary periodontal disease. Examination of a radiograph that encompasses the entire affected dental arcade is often necessary to diagnose this condition.

Supernumerary canine and wolf teeth seldom occur but can be supplemental or connate. Supernumerary incisors of horses always belong to the permanent dentition and are reported more commonly in horses than are supernumerary cheek teeth. The main differential diagnosis for supernumerary incisors or cheek teeth is retained deciduous teeth. In some cases it may be clinically difficult to determine whether an extra tooth is a retained deciduous tooth or a supernumerary tooth. Radiographic examination of the
affected jaw may be indicated to determine the identity of an extra tooth. A retained deciduous tooth has a more mature root and shorter reserve crown than the adjacent permanent teeth, and these distinguishing characteristics are seen during radiographic examination (Fig. 4).

Management of horses with supernumerary teeth is generally limited to regular assessment of the dentition coupled with aggressive dental floating to minimize the opportunity for soft tissue damage by unopposed tooth elongations or sharp enamel points. If complications such as severe periodontal disease or maxillary sinusitis occur, the supernumerary tooth or displaced adjacent tooth should be extracted and appropriate therapy undertaken to manage associated pathology.

Figure 4. A 5-year-old miniature horse mare with a history of packing food in the buccal spaces. Oral examination revealed bilateral double rows of upper premolar teeth. Radiographic examination revealed that the reserve crowns of the buccal rows of premolars had short, mature apical ends. These were compatible with partially retained, worn, buccally displaced deciduous premolars. A dental elevator was used to displace the retained deciduous teeth buccally. The loose teeth were then easily extracted. The horse began to eat better within several days. Retained deciduous teeth can be easily confused with supernumerary dentition during a clinical examination.

Oligodontia

Oligodontia is the congenital absence of a tooth germ or retention and inclusion of a tooth within the jaw. It is difficult to differentiate developmental oligodontia from acquired tooth loss caused by damage to or displacement of a dental bud from injury. It is possible for permanent tooth germs of a young horse to be damaged, displaced or removed when deciduous teeth or jaw bones are injured. Absence of a tooth in the dental arcade leads to mesial drift or tipping of neighboring teeth. Lack of wear of the antagonist to the missing
tooth can lead to dental elongations and abnormal mastication (Fig. 5). Radiographic examination is often necessary to confirm a diagnosis of true oligodontia. Oligodontia may be associated with other epidermal defects such as poor development of hair and hooves.

**Dental Dysplasia**

Dental dysplasia (i.e., abnormal growth and/or development of a tooth) may result in an irregularly shaped tooth that does not fit well into a dental row. The poor fit may lead to food “pocketing” and periodontal disease (Figs. 6 and 7). Enamel hypoplasia has been associated with certain drugs or chemicals administered to the dam during gestation or it may be idiopathic in origin. Abnormal enamel morphology has been observed with branched pulp horns or abnormally shaped teeth. Enamel acts as the scaffolding and template for deposition of dentin and cementum. These tissues follow the abnormal enamel pattern and consequently all three calcified tissues are dysplastic. Dental dysplasia can involve the abnormal formation of the entire tooth structure or only a single tissue type.

Dental dysplasia and oligodontia were reported in a Thoroughbred colt that was monitored from birth to 28 months of age. Serial radiographic examinations revealed the absence of several deciduous and permanent teeth as well as abnormally shaped and positioned teeth in the molar arcades. Cemental hypoplasia usually involves the infundibular portion of the tooth but can be seen as a defect of the peripheral, coronal or reserve crown or root cement.
Abnormal Dental Eruption

Abnormal dental eruption, or maleruption, is often seen following trauma to developing teeth or surrounding bones but has also been reported to be congenital or idiopathic in origin. Cheek teeth can become vertically impacted when dental buds are developing in abnormal or crowded areas in the dental arcades. Teeth may become rotated or otherwise displaced due to developmental malpositioning of tooth buds or overcrowding before, during or after eruption.

Dixon, et al reported that 70% of cheek tooth displacements were developmental in origin due to overcrowding of the cheek tooth row at the time of eruption. This research team frequently found that if a cheek tooth was displaced in one arcade, the same tooth in the contralateral arcade was also displaced. The remaining 30% of displacements were felt to be due to abnormal tooth positioning which may result in non-eruption of the displaced teeth if they are sufficiently horizontal to the adjacent teeth.
Developmental diastemata are often due to insufficient angulation of teeth to achieve good compression between adjacent teeth. Another cause for diastemata is embryonic teeth developing too far apart (Fig 8).

**Conclusion**

Equine dental developmental abnormalities can involve tooth number, morphology or position in the dental arcades. The horse has vertically successional teeth and developmental defects can involve either deciduous or permanent dentition. The horse has hypsodont teeth which erupt continuously throughout the horse’s life. Some developmental abnormalities of the teeth of a very young horse may not cause the horse to exhibit clinical signs until the horse reaches middle age. For example, a horse with a developmental dental abnormality often develops periodontal pockets, abnormal wear patterns and other signs associated with these abnormalities as the horse ages.

A detailed oral examination should include checking teeth for proper number and position. Only the exposed crown of the equine tooth can be visualized in the oral cavity. Therefore, because many developmental defects may not be recognized simply by oral examination, the dentition should be examined radiographically to further delineate abnormalities.

Congenital dentofacial deformities that lead to dental malocclusions such as mandibular brachygnathia (parrot mouth), prognathia (sow mouth), and campylorrhinus lateralis (wry nose) are also developmental abnormalities but are reserved for another discussion.
References


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