

Occlusal fissures in the equine cheek tooth: first μ -CT and histological findings

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Introduction

Fissures in equine cheek teeth are commonly encountered during oral examination and have been reported in several papers¹⁻⁷. A classification of fissure types was proposed in a previous study based on their orientation and the involvement of different tooth substances⁸. Their clinical impact on pulp disease however is still unknown.

The objective of this study was to determine the variation in fissure depth, and the involvement of enamel, dentine and/or cementum in relation to fissure type and the possible communication with pulp horn tips. Secondly, to determine the presence of food particles/bacteria within fissures and to examine pulp morphology of pulp horns adjacent to occlusal fissures.

Material and methods

Teeth extracted for dental pathology and a control group of sound teeth having occlusal fissures were collected and stored in formalin. Teeth (n=27) were scanned using high-resolution x-ray computer tomography (μ CT) imaging to analyse fissure characteristics and extent. Histological examination (n=7) of a subset of teeth was performed to identify fissures and examine their topographical relation to the pulp horn (location).

Results

Diseased (extracted) teeth showed fissures in 23/77 teeth and 20/24 sound teeth showed fissures. High-resolution x-ray computer tomography analysis on 27 teeth identified 43 type 1 fissures (35 type 1a, 8 type 1b). The mean length of the fissure of type 1a and type 1b on the occlusal surface was 3.47 ± 1.60 mm and 13.64 ± 7.40 mm respectively. Their mean depth was 13.22 ± 10.76 mm and 7.42 ± 6.42 mm respectively. Fissures were significantly deeper on the buccal side of the teeth and at teeth 09. Fissures could be identified on histological sections with the presence of organic material inside the fissure, the presence of micro-organisms in the continuation of the fissure protruding within the dentinal tubules and the presence of tertiary dentine.

Conclusion

Our results suggest that fissures may develop following a mechanical insult. They potentially provide a pathway for microorganisms to enter the dentinal tubules which can result in a local inflammatory reaction of the pulp. It is assumed that in healthy teeth, vital odontoblasts react by producing tertiary dentin which lacks patent tubules and thus provides a proper seal against further bacterial invasion.

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Surgical treatment of sinus mucocele in miniature horse breeds: long-term follow-up of 7 cases

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Introduction

Diagnostic procedures, treatment options and long-term follow-up of different sinonasal pathology in horses such as primary and secondary sinusitis¹⁻³, sinonasaal cysts⁴, progressive ethmoid haematoma⁵⁻⁶ and sinus neoplasia⁷⁻⁸ have been described in veterinary literature. Equine reports focused on sinus mucocele are rare. Mucoceles are believed to develop following obstruction of the aperture between sinus and the nasal cavity. Progressive deformation of the surrounding structures is the result of continuous mucus production and accumulation in the isolated sinus compartments. The most common causes of occlusion of the drainage towards the nose in humans are chronic infection, allergic sinonasaal disease, trauma, previous surgery⁹⁻¹⁰. In equine literature this pathology has not been reported in some larger cohort retrospective studies^{1,11}. An older case-report briefly discusses mucocele sinusitis in a thoroughbred filly resolved by simple trephination, flushing and antimicrobial treatment¹². A more recent case-report describes the use of a caudally based frontonasal bone flap to successfully resolve bilateral sinus mucocele in an American Miniature Horse¹³. We describe the long-term follow-up of 7 cases of sinus mucocele treated by bone flap surgery and re-establishing drainage towards the nasal cavity.

Material and methods

A retrospective study was conducted of all sinus pathology cases referred to the equine services of the Faculty of Veterinary Medicine at Ghent University between January 2015 and January 2018. Inclusion criterion was uni/bilateral accumulation of fluid within the different sinus compartments in the absence of other sinus pathology such as sinusitis, sinus cyst, PEH or neoplasia. In January 2018, a call was distributed to EVDC Eq specialists to contribute comparable cases from their case load.