A Study to Determine the Diagnostic Advantages of Oral Endoscopy for the Detection of Dental Pathology in the Standing Horse

Charlotte Goff

Author's address: Elmham Lodge, North Elmham, Dereham, Norfolk NR20 5JG; E-mail: cgoff@rvc.ac.uk.

Introduction

Equine dentistry is a rapidly evolving field that is attracting significant interest from both veterinary surgeons and lay equine dental practitioners. There will continue to be an increased demand for veterinary dental services because of performance demands on younger horses before they have completely developed permanent dentition, an increasing use of middle-aged performance horses, horses being kept in production because of improved reproductive technology, older horses being retired rather than euthanased and because of feed savings from good dental care.[1]

There is also an increasing need for advanced diagnostic imaging of oral and dental structures to enable well-informed decisions to be made regarding treatment in cases of dental disease. Equine dental surgery is a relatively under-developed discipline due to factors including the physical difficulty of visually examining or gaining oral access to equine cheek teeth, the large size and complex structure of the hypsodont equine teeth, limited knowledge on the pathophysiology of equine dental disorders, and the paucity of evidence-based evaluations of equine dental disorders.[2] Novel equipment and treatments have therefore been developed and there has been improved recognition of some types of oral pathology that previously received little attention.

Accurate diagnosis of dental disease frequently requires the use of a wide range of diagnostic aids. These include radiography, gamma scintigraphy, computed tomography, nasal endoscopy and sinoscopy, alongside traditional manual and visual examination techniques. Manual and visual examination of the oral cavity in the standing horse has been greatly improved by the use of chemical restraint, a full mouth speculum, a strong light source and long handled mirrors. However, even the use of these methods have been associated with under-recognition of dental abnormalities such as peripheral and infundibular caries, periodontal disease, gingival pocketing, and diastemata. Due to the long and narrow anatomic configuration of the equine mouth relative to the size of the oral cleft, the visualisation of the intra-oral *soft tissues* structures remains difficult.[3]

Inra-oral endoscopy has been suggested as a more sensitive and specific diagnostic aid than conventional examination methods, particularly for disorders of the caudal oral cavity. There has been some anecdotal evidence to support the use of intra-oral endoscopy, but it remains an area of equine dentistry which has undergone limited investigation.

In this study, the value of diagnostic use of an intraoral videoendoscope is investigated. This technique is currently being used in clinical practice where it has been felt to offer greatly enhanced visualisation of dental structures and thus detection of abnormalities, as compared to traditional examination techniques. This study is intended as a pilot study to determine if there are diagnostic advantages in using oral endoscopy, over and above conventional manual and visual examinations, for the detection of dental disorders in the standing horse.

Method

The study population was comprised of thirty horses between 3-23 years old, which presented to the Rossdale's Equine Hospital, Newmarket over the 4-month study period. Cases varied between those referred for evaluation and treatment of known dental disorders, and those simply requiring routine dental examination and prophylactic treatment. Only horses requiring sedation for dental examination were used in this study and only cases where a full visual, manual and endoscopic examination were successfully undertaken were included.

Examinations were performed with the horse standing in stocks with the head raised by use of an overhead mounted head sling. Sedation was by an intravenous combination of detomidine and butorphanol, and the dose administered varied with individual weight and temperament. In all cases, a full manual and visual oral examination, with the aid of a strong headlight and a long handled equine dental mirror, was carried out and a dental chart completed. With the owner's permission, a subsequent endoscopic examination using a sideviewing videoendoscope, protected by a rigid metal sheath was performed and recorded onto an analogue videotape and a second dental chart was completed from this video recording noting all observable endoscopic abnormalities. To ensure the study was blinded, the videotapes were played in a random order, and were only observed and charted at the end of the 4-month period once all the study horses had been examined.

Results

Of the 30 horses examined, the total numbers of teeth showing abnormalities detected by each diagnostic method are shown in Table 1.

Table 1.

Abnormality	Diagnostic Method	
	Clinical	Endoscopic
Soft Tissue changes	25	34
Dental Overgrowths	194	44
Dental Fracture	12	21
Infundibular Caries	21	63
Peripheral Cemental Caries	31	72
Diastemata	39	60
Abnormalities of Eruption	14	17

Endoscopic examination detected a higher number of dental abnormalities than did clinical examination for every abnormality except dental overgrowths. The use of endoscopy also allowed detection of a higher number of abnormalities of the caudal three cheek teeth than clinical examination.

Discussion

This study has indicated that endoscopy enhances the detection of dental disease and therefore is a useful aid for clinical examination of the equine oral cavity. This finding is in agreement with the work of Tremaine.[4] Studies in human dentistry have shown that endoscopic methods of caries diagnosis are practical and that they may prove to be a valuable additional diagnostic method for the detection and preventive management of dental caries.[5]

References

1. Easley J. (1996) Equine Dental Development and Anatomy. *American Association of Equine Practitioners* 42: 1-10.
2. Dixon P.M. (1997) Dental Extraction in Horses: Indications and Preoperative Evaluation. *The Compendium* 19(3):366-375.
3. Collier M.A., Balch O.K., Alberts M.K., and Reiners, S. (1998) Use of an Intraoral Camera for Identifying and Documenting Equine Oral Disease. *American Association of Equine Practitioners* 44: 304-305.
4. Tremaine H. (2005) Dental Endoscopy in the Horse. *Clinical Techniques in Equine Practice* 4(2):181-187.
5. Longbottom C., & Pitts N.B. (1990) An initial comparison between endoscopic and conventional methods of caries diagnosis. *Quintessence International* 21(7):531-540.