Standing Equine Dental Surgery

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KEYWORDS

• Equine dentistry • Endodontic therapy • Tooth extraction • Buccotomy
• Mandibular fracture • External fixator • Minimally invasive surgery

KEY POINTS

- Equine endodontic therapy is a particularly challenging area of equine dentistry. An orthograde technique that has good long-term success is overviewed.
- Instrumentation and tool adaptation for tooth extraction where conventional techniques by mouth have failed are problematic. An overview of a minimally invasive buccotomy technique that allows straight-line access to a molariform tooth or fragment is presented along with a transbuccal screw extraction technique.
- Stabilization of fractures of the mandibular body are complicated by the presence of important dental structures and often contamination of the fracture site. The application of an Arbeitsgemeinschaft für Osteosynthesefragen (Association for the Study of Internal Fixation [AO]) pinless external fixator has considerable merit, particularly if combined with interdental wiring. An overview of fracture stabilization using the AO pinless external fixator is given.

INTRODUCTION

Dental surgeries in equids are procedures performed that affect the dental tissues and their supporting structures. They have been performed through the ages, and, depending on the degree of invasiveness and technologies available, with patients in a variety of positions and states of mental awareness. For many years, more-invasive diagnostic procedures and surgeries have been performed with equids under general anesthesia. Only 20 years ago, standing oral and dental procedures were limited to oral examination (with or without an oral speculum), dental floating, minor lip and gum laceration repair, wire fixation of fractures to the incisive area, and oral extraction of loose deciduous teeth, wolf teeth or loose periodontally infected incisor, premolar and molar teeth in older horses.[1] However, with a better understanding of the risks associated with general anesthesia, the availability of improved sedatives, the

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use of multimodal analgesia, and the continued development of equipment and surgical techniques, there are considerable advantages to performing many advanced dental diagnostic techniques and surgeries in standing sedated equids compared with recumbency under general anesthesia (see the article by Vigani and Garcia elsewhere in this issue for techniques on sedation and analgesia).

Surgery in the standing sedated patient reduces the inherent risks of general anesthesia. Anatomic orientation is made easier with the head presented in a more familiar position. Procedures typically associated with considerable hemorrhage (surgeries involving the oral mucosa, nasal passages or sinuses) are likely to bleed less with the horse in the standing position due to the head positioned above the height of the heart. The head position in a standing equid may be positioned more ergonomically for both clinician and animal and allows equal access to both sides of the head without having to move the patient. Access to the oral cavity is also optimized by not sharing the space with an endotracheal tube. However, with the presence of fluids in the oral cavity, clinicians need to be mindful of a reduced gag reflex and possible aspiration. General anesthesia may be indicated where the temperament of an equid, the invasiveness of the procedure, or inability to provide good analgesia is not conducive to a procedure performed under standing sedation.

Standing sedation in equids facilitates essential diagnostic procedures, such as a thorough oral examination and radiographic studies.[2] Equipment needed for physical restraint and examination of the head and oral cavity usually involves a set of stocks, head support, a full-mouth speculum, good intraoral lighting, soft tissue retractors, various dental picks, probes and explorers, a long-shafted dental mirror, and/or an oroscope.[3] Radiographic studies may comprise intraoral and extraoral views and be performed with and without contrast media. More-advanced diagnostics may also be undertaken in a sedated standing equid and include computed tomography (CT), scintigraphy, ultrasonography, and sinoscopy. The collection of samples for histopathologic, microbiological, viral, and parasitic analysis is also possible.

The majority of dental surgeries can be performed in a sedated standing equid. They include various odontoplastic procedures, periodontal procedures, endodontic procedures, orthodontic procedures, exodontia, orthopedic procedures, and soft tissue surgeries. The procedures have been extensively reviewed in the current veterinary literature.[4–6] This article focuses on several new and innovative techniques that have not been well disseminated in popular veterinary publications. These include (1) orthograde endodontic treatment of molariform teeth, (2) exodontia facilitated by a minimally invasive buccotomy technique and combined with a possible transbuccal screw extraction technique, and (3) minimally invasive stabilization of fractures of the mandibular body, which may involve dental or periodontal structures.

ORTHOGRADE ENDODONTIC THERAPY OF MOLARIFORM TEETH

Introduction: Nature of the Problem

Endodontic disease of the premolar and molar teeth of equids is not common in primary practice or the general equid population; however, it can make up a significant portion of cases for a dental referral practice and, when it occurs, treatment can be problematic.[7–15] Traditionally, the course of treatment has involved extraction of the affected tooth. However, exodontia is less than ideal. The treatment itself is grossly traumatic to the periodontal tissues, can be technically challenging, and has many potential complications, some of which may result in extended periods of hospitalization and further surgeries.[16–18] Long-term consequences of exodontia are inevitable and include mesial drift, malocclusion, and areas of reduced attrition.[19] Such changes