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Oral and Dental Examination

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Take Home Message

With proper patient restraint and specific equipment, a thorough dental examination can be performed with minimal stress and risk to the horse and examining veterinarian. A thorough oral and dental examination is the basis of dental diagnoses, which are prerequisite to dental treatments. A dental record system is important in documenting findings and monitoring case follow-up.

Introduction

Oral and dental diseases are common occurrences in the equine species as evidenced by the results of incidence studies of dental disease performed on abattoir specimens. Casual oral or dental examination is part of a complete physical examination but is not sufficient to detect most oral or dental problems. This has been demonstrated by the reported high incidence and the comparatively low clinical diagnosis of dental disease. Signs of dental disease are often not apparent to the owner until the disease is well advanced. Clinical signs of dental disease are often not specific and may be reflected in other body systems. Presenting complaint in the owner’s or trainer’s own words should be taken into consideration when examining the horse and properly addressed in planning treatment.

While a comprehensive history and physical examination of every patient seen when performing routine dental evaluations and occlusal adjustment/equilibration is a valuable service to clients, this is not practical nor performed in most cases. However, one must establish the presence of medical problems through client history and clinical signs that may impact safe delivery of dental care. Minimal dental examination must be thorough enough to detect pathology in an early stage of development to prevent the progression of a pathological process to the point where correction is difficult if not impossible. Minimal dental examination includes observing and feeling both hard and soft tissues of the mouth for pathology. The hard tissues consist of the teeth and osseous structures. Soft tissues consist of the lips, cheeks, tongue, palate, gingiva, oral mucosa, lymph nodes and salivary glands. The extent of the examination increases if the history and physical findings warrant further inspection. Documentation of variations and/or abnormalities is the standard of care. Use of a standard dental record form leads to good examination habits. Computerized dental records make information more available for retrieval and case follow-up.

Equipment
Equipment utilized to properly examine the equine oral cavity is minimal, but certain items are necessary. The technique for restraint and size of equipment will both vary for different ages and sizes of patients. Very large (1000 Kg+) draft breeds require more restraint with heavier constructed equipment than the typical (500 Kg) riding horse. On the other extreme, small (100 Kg) ponies and/or miniature breeds require downsized equipment. Oral examination of small horses is best accomplished by positioning the animal on an elevated platform where the oral cavity is visualized at a more comfortable height. Equipment includes but is not limited to a halter and lead, a metal framed dental halter or head stand, a mouth speculum and a good light source (such as a clip-on speculum light or head lamp) mirror, explorer and probe.

Supplemental equipment can also be helpful. Various types of cheek retractors allow better visualization in the buccal spaces. A long-handled, rigid shaft equine dental mirror (2-5cm diameter) is suggested for viewing interproximal spaces and occlusal surfaces of the cheek teeth. The strong rigid handle is easy to retract the soft tissues and visualize hard-to-reach areas. An endoscope with a 30 to 75 degree angled lens can be used to further examine these areas. Attaching a video or still digital camera to the scope allows for relaxed viewing which can be an excellent tool for client education.

Other useful tools include long dental picks, probes, explorers and right angle alligator forceps. These instruments are especially useful in older horses for evaluating pockets between and around teeth as well as open pulp horns and other defects in the occlusal surface.

The exam will also require a bucket, clean equipment, and diluted disinfectant (chlorhexidine) solution to rinse the mouth. A 400 cc dose syringe with a blunt tip works well to rinse the mouth before the oral examination and during dental procedures. High pressure water irrigation can be used to remove debris from deep periodontal pockets. Irrigation aids evaluation of pocket depth and tooth stability. Lastly, disposable examination gloves protect the hands and make cleanup more efficient.

**Oral Examination**

A typical examination starts by taking a brief medical history while screening the animal from a distance. This gives the veterinarian a general idea of the type, thriftiness, general use and overall physical condition of the horse. View and ask about the animal’s feed and water sources, noting the amount and type of feed being consumed. Inspection of the horse’s manure will gain an idea of how well feed is being processed and digested. Survey the head for shape, symmetry and obvious abnormalities. Inspect and palpate the submandibular lymph nodes, submandibular and parotid salivary glands, masseter and temporalis muscles, TMJ and the ventral border of the mandibles. Digitally palpate for irregularities or tender areas especially along the upper dental arcade. Part the lips, inspect the incisors and estimate age before proceeding with examination of the oral mucous membranes, intermandibular space, and tongue. Perform range of motion of the jaw and lateral excursion to molar contact (EMC) maneuvers while noting grinding sounds and vibration with these movements.18
The oral examination continues with the interdental space and adjacent structures. This area often reveals the performance horse’s bitting history. Evaluate the lip commissures, bars of the lower jaw, tongue and palate. In male horses over 4 years of age evaluate the canine teeth. Young adult stallions and geldings between the ages of 4 and 6 years of age may have canine teeth in various stages of eruption. Eruption cysts or tenting of the mucosa with ulceration over these teeth can cause oral pain and bitting problems. Keep in mind that long sharp canine teeth can be a danger to the examiner and care should be exercised to avoid injury. About 25% of all mares have one to four rudimentary canine teeth. In older horses dental plaque or tartar can often accumulate around the canines leading to gingivitis. This calculus can also cover and mask cavities, resorptive lesions and fractures involving the canine teeth.

The upper and lower interdental spaces are examined by firmly running a thumb over the mucosa. Feel for protuberances above or below the gum line and observe the horse’s response to pressure. Check the lower bars for sharpness, bony irregularities, mucosal ulcers or thickening of the tissues. Feel rostral to the lower first cheek teeth for the presence of first premolars. The upper edge of the diastema is palpated for bony abnormalities and the presence of the upper first premolars. These caniniform teeth referred to as ‘wolf teeth’ erupt between 6 and 18 months of age. If present, they are located anywhere along the edge of the maxillary and palatine bones from the palatal side of each upper PM 2 and up to 2 to 3 cms rostral to this location. Wolf teeth usually erupt through the oral mucosa but can migrate under the mucosa and remain as palpable bumps. Unerupted or impacted wolf teeth, referred to as ‘blind wolf teeth’, can cause oral discomfort and training problems in bitted horses. Wolf teeth come in a vast array of shapes and sizes, and the visible crown shape has no relation to the size or shape of the root.

The tongue should be examined for function and anatomical abnormalities. Tongues are frequently injured from harsh bits or neglected tongue ties. Observe and palpate the hard palate. The hand can be introduced into the interdental space and a thumb pressed on the hard palate to make the horse open its mouth. The oral soft tissues should be observed with special attention paid to the palate, tongue and buccal mucosa. Calluses or ulcerations in the mouth are most likely the result of chronic trauma from sharp teeth and are self limiting. Lampas, or physiologic thickening of the palatal mucosa just behind the upper incisors, is common in young horses that are erupting permanent dentition and are not of clinical concern.

The entire oral cavity can only be fully and safely examined with use of a full mouth speculum. To place the McPherson-type speculum in the mouth, the examiner stands to the left side of the horse. With the left hand holding the mouthpiece and the right hand holding the poll strap, the mouthpiece is introduced between the incisors in the same manner as a bit. Use the left thumb and forefinger to open the mouth and guide the mouthpiece into place between the incisors while applying steady tension to the halter strap from behind the horse’s poll. When the speculum is properly positioned, adjust the strap length until the speculum strap is snug. Adjust the mouthpiece from the front to square it with the incisors. Open the jaws of the speculum one notch at a time until the jaws are opened wide enough to accommodate a hand and forearm. If the horse resists having its mouth opened with the speculum in place, the temporomandibular joints and bony structures of the jaw should be carefully evaluated before excessive force is placed on the jaw. At this point the oral cavity is ready for visualization and palpation. A head support stand or metal frame dental halter can be used to elevate the head of a sedated horse to a comfortable height for visualization and palpation.
The teeth should be evaluated for conformation, position and number. In the normal horse, the mean occlusal angle of the mandibular cheek teeth ranged from 19 degrees at the Triadan 06 position to 30 degrees at the 11 position. The maxillary cheek teeth have similar angulations at the 06 position but the occlusal angle decreases as you move caudally in the mouth. Common premolar findings include hooks, ramps, erupting teeth or loose caps (deciduous tooth remnants) and cap slivers. In the center of the molar table, one may observe long teeth, a wave, cupped out or decayed infundibula, missing teeth, fractured teeth or misplaced crowns. In cases of occlusal malocclusions, the overlong tooth is usually the nonpathological tooth and the opposite occlusal tooth should be thoroughly examined for causes of over-attrition. The caudal oral cavity should be inspected for the presence of buccal ulcers, sharp enamel points or hooks, supernumerary or missing teeth, diastema and periodontal pockets or ramped dental arcades. Enamel points that normally form on the buccal and lingual enamel folds or cingula usually do not protrude beyond the level of occlusal surface of the cheek teeth. Regular transverse ridging of the occlusal surface is normal and are associated with taller areas of increased enamel located between enamel outfoldings or cingula where the enamel points form. These should be differentiated from abnormal isolated or irregular transverse ridges that are wedge shaped elongations usually located opposite diastema or malaligned teeth. The acute angle between the vertical edge of the tooth and the occlusal surface can cause sharp enamel points to look and feel quite prominent. Inspect the mesial and distal dental margins for abnormal tooth contact, abnormally interproximal space width (diastema), and feed packed into gingival pockets. Most abnormal wear patterns are associated with some type of malocclusion. Recent use of the term class 1 malocclusion to describe common abnormal wear patterns seems justified and can help with planning corrective odontoplasty procedures.

Palpate the buccal, occlusal and lingual surfaces of all four arcades. The gingival margins of the cheek teeth should be uniform with no feed packing. The crown height should be the same on the mesial and distal aspect of each tooth. The crown height should be longer on the buccal aspect of the uppers and the lingual aspect of the lowers. This represents the normal slope of the molar arcade. Note any deviation or asymmetry in the molar table height or angle. Keep in mind that any defect in one arcade will usually be reflected in a wear abnormality or defect in the opposite occlusal arcade. Grasp each exposed tooth crown between the thumb and forefinger and check for stability. Digitally unstable teeth should be evaluated with the aid of an extraction forceps and assigned a mobility index.

A periodontal examination should be a standard component of the complete oral examination. Periodontal disease may be a manifestation of a variety of infectious and metabolic disorders, and it is not limited to dental pathology. Periodontal disease is painful. In some specific cases, patient anxiety levels may escalate on instrumentation of the oral cavity. Deeper sedation and local infiltration or regional anesthesia may be necessary under these circumstances. The gingival sulcus is checked for depth with a periodontal probe and examined for the tendency to bleed. If present, food material must be removed from periodontal pockets with dental picks, irrigation, and/or long-handled alligator forceps before pockets can be evaluated for pocket type (suprabony or infrabony) and pocket depth. Periodontal pockets are measured for depth, mesial to distal length, and width. Supra and subgingival surfaces of the teeth are evaluated for cemental abnormalities using dental explorers and mirrors: evidence of decay, calculus, fractures, and hypo or hyperplasia may be seen. If evidence of periodontal disease is found during the oral
examination, radiographic evaluation is indicated. A more detailed description for assessing the periodontium can be found in the literature.\textsuperscript{21}

Evaluation of cavities or defects in the surface of teeth from any cause is one component in a complete dental examination. A cavity is usually detected during dental examination by visualization with a mirror or endoscope and tactile exploration of the teeth. Any suspicious areas of the crown should be explored with a dental explorer. The point of the explorer is pulled across the surface of the tooth. On normal dental tissue, the explorer will slide across the tissue surface and make a ringing sound. When pulled across diseased dental tissue, the explorer will drag across or stick into the surface of the tooth and make a dull sound. When pressed into diseased dental tissue, the explorer must be forcefully withdrawn. As the lesion progresses, the diseased tissue will show a brown discoloration, which must be differentiated from normally stained cementum or dentin. Further progression of the lesion usually produces surface cavitation filled with plaque, calculus (tartar), exudates, or necrotic black debris. Calculus should be scaled from the clinical crown of the tooth (especially canine teeth) to facilitate examination. After a lesion has been identified during the oral examination, it should be classified using standard AVDC approved system.\textsuperscript{22}

**Ancillary Diagnostic Tests**

If the initial dental examination reveals signs of dental disease, further diagnostic techniques should be employed to make a more definitive diagnosis. A sedated and restrained or anesthetized horse will allow a more thorough examination. Endoscopy of the nasal passages, larynx and oral cavity is often indicated.\textsuperscript{23,24} Skull radiographs, both plain and contrast studies, give added information regarding dental, osseous and sinus structures. Standing skull films with the mouth propped open, provide a more complete assessment of the occlusal pattern of the dental arcade. Intraoral films provide the best detail of the reserve crown and marginal bone.\textsuperscript{25} Other imaging modalities such as ultrasonography, computerized tomography, nuclear scintigraphy or fluoroscopy may reveal a more accurate picture of certain dental pathology.\textsuperscript{26}

**Dental Records, Charting, and Treatment Planning**

Charting is the process of recording the state of health or disease of the teeth and the oral cavity. To properly chart the mouth, the dental formula and anatomical locations in the mouth must be standardized to make documentation consistent. Use of standard abbreviations for dental terms to describe anatomical boundaries, pathology, diagnostics and therapeutic procedures have made communication possible between colleagues in both the veterinary and human dental professions.\textsuperscript{27} The American Veterinary Dental College Nomenclature and Classification Committee have endorsed the use of the Triadan tooth numbering system.
Note in the dental record: the horse’s signalment, use, management, presenting complaint and any pertinent history with special emphasis on the digestive system and any performance problems. Assign a numbered body score indicating the horse’s general condition. Formulate a treatment plan for each problem based on the history, clinical findings and oral examination before proceeding with any dental work. This problem-orientated approach is important and informs the owner and/or trainer of abnormalities, the treatment plan and a cost estimate of any corrective procedures. An owner consent statement is often included in record forms and can minimize problems should a legal claim be filed against the veterinarian or a bill come into dispute for collection. An in-depth review of dental charting can be found in the 2010 AAEP proceedings.27

References and Suggested Reading Materials


