



Dental care in the older horse

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Today, horses have been placed in environments quite different from their natural ones. Even modern housing environments can vary from pasture to a stall and run with some turnout, a stall without turnout, or a dry lot. These variations in environment provide each discipline in equine veterinary care with different challenges, including equine dental care.

Because of modern housing and care, it is more common today to see horses surviving comfortably to 25, 30, 35, and more than 40 years of age. Along with other advances in equine care, equine dentistry has played a major role in prolonging the length and quality of life of our equine partners. With higher quality dental instruments, better diagnostic imaging techniques, and more effective chemical restraint, the quality of the dental care provided by equine veterinarians has improved tremendously in recent years.

In 1998, the second issue of *Veterinary Clinics of North America Equine Practice* was dedicated to equine dentistry. Other excellent texts have been published addressing equine dental care [1,2]. It is the author's goal in this short article to address equine dentistry as it pertains to geriatric patients. Anatomy, instrumentation, diagnostic techniques, and chemical restraint are briefly discussed. Most of the article is a discussion of dental problems frequently encountered in geriatric patients and how to treat or manage these problems.

Equine teeth

There are two major kinds of teeth found in mammals: brachyodont and hypsodont. Brachyodont teeth are teeth that erupt fully before maturity and are normally long and hard enough to last the lifespan of the individual because they are not usually subjected to the abrasive nature of a grazing

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diet [3]. Brachyodont teeth are found in many mammals, including dogs, cats, and humans. Horses, however, have hypsodont teeth. These teeth have a long reserve crown and erupt over most of a horse's life at a rate of 2 to 3 mm/y [3]. This is a rate similar to that of the wearing of the occlusal surface of the teeth of horses fed primarily forage diets. When horses are fed this type of diet, the lateral excursion of the arcades is greater than when they are fed a high-concentrate diet, and a larger amount of occlusal surface comes in contact with the opposite tooth, providing normal wear.

Horses fed a diet high in concentrates have reduced occlusal wear and therefore a restricted range of lateral chewing actions [3]. The motion of the arcades is more of an "up and down" or "chopping" motion. This leads to abnormal dental growth and tooth alignments. Many older horses are placed on complete-concentrate diets that are designed to be more palatable and digestible. Because these feeds require less lateral excursion, the teeth do not wear normally, and tooth abnormalities that may have been less significant earlier in life now become more of a problem.

Trauma, infection, neoplasia, poor conformation, and behavior abnormalities can also contribute to dental problems. Incomplete or malaligned healing of a fractured tooth or alveolus can lead to tooth problems in the area of the affected tooth or may involve other teeth elsewhere along the arcade. Abnormal wear of the incisors (eg, cribbing) can severely affect the wear pattern of the cheek teeth. Because the end results of these incidents are often not detected until later in life, many of them are problems that must be dealt with in older horses.

Chemical restraint

Today, with access to sedation that makes dental care easier for horses and veterinarians, twitching a nose or a shoulder is no longer the only option. The α -2 agonists (xylazine, detomidine) and opioids (butorphanol, nalbuphine) are frequently combined to provide analgesia as well as sedation [4]. Acepromazine, a phenothiazine derivative, may be used in mares to provide mild tranquilization but should not be used in geldings and stallions because of its ability to cause penile prolapse on rare occasions [5].

Along with sedation, regional nerve blocks provide significant anesthesia that can be helpful with some dental procedures (eg, tooth extraction). Nerves that can be blocked to produce effective anesthesia for most dental work are the mandibular branch of the trigeminal nerve and the infraorbital nerve.

When attempting to desensitize the lower incisors, the anesthetic should be deposited near the mental foramen, where the mandibular branch of the trigeminal nerve (the mental nerve) exits [6]. The foramen is usually palpable just ventral to the level of the commissure of the lips underneath the tendon of the depressor labii inferioris muscle [7]. A 20-gauge 3.5-cm needle is used

to inject 5 to 8 mL of local anesthetic through the foramen and 2 to 4 cm into the mandibular canal [7]. This desensitizes the mandibular incisors, mandibular canines, oral mucosa, and skin covering the rostral mandible on the ipsilateral side [7]. To desensitize the lower premolars and molars, the mandibular nerve must be anesthetized more caudally as it enters the mandibular foramen on the medial aspect of the vertical ramus of the mandible [7]. The mandibular foramen is located by drawing an imaginary horizontal line parallel with the occlusal surface of the lower teeth extending caudally past the vertical ramus of the mandible [7]. A second line is drawn perpendicular to the first from the lateral canthus of the eye to the ventral aspect of the mandible [7]. Where these two lines intersect is the approximate location of the foramen [7]. A 20-gauge 18-cm needle is inserted on the axial surface of the ventromedial border of the horizontal ramus of the mandible and directed to the approximate location of the foramen [7]. Injection of 15 to 20 mL of local anesthetic at this site is usually sufficient [7].

To desensitize the maxillary teeth, the infraorbital nerve must be anesthetized within the infraorbital canal [7]. The canal can be sometimes palpated under the levator labii maxillaris muscle [7]. An easy way to approximate the location of the canal is to place one's middle finger in the nasomaxillary notch and the thumb on the anterior end of the facial crest [8]. The index finger falls halfway between, near the infraorbital canal [8]. By depositing local anesthetic near the nerve as it exits the infraorbital canal, only the upper lip and nares are effectively blocked [7]. To desensitize the incisors, maxillary canines, and first through third premolars, local anesthetic (3–5 mL) must be placed 2 cm within the infraorbital canal using a 22-gauge 3.5-cm needle [7]. It is a good idea to perform this block with the horse sedated, because entering the nerve with a needle can sometimes produce a vigorous head toss by the horse [7].

Many procedures can be accomplished using the medications and techniques described here. Because of the difficulty of some tooth extractions or repairs, however, some of these tasks are better accomplished under general anesthesia [9].

Dental instrumentation

There is a wide variety of equipment available today that improves the quality of dental care and shortens the time it takes to do the job. Chemical restraint and regional anesthesia also makes dental care less of a struggle and less traumatic for the horse. By using the most efficient instruments possible, the amount of sedation is decreased, as is the need for repeated nerve blocks.

After the horse is sedated, a dental halter and rope allow the veterinarian to keep the horse's head at a comfortable level while working on the teeth. Dental stands designed for horses are available, but less expensive

alternatives (eg, human crutch) may also be used. This minimizes the amount of support the assistant or owner has to provide to the horse's head while floating is being done. Without some kind of support, veterinarians have to crouch down to start and then get up as the horse is stimulated by floating, or they have to stay down while floating if the horse is more sensitive to the sedation than anticipated.

A good full-mouth speculum is required to perform a thorough oral examination and dental care. Several styles are available. Ratchet or screw style specula provide good access to the cheek teeth. Keep in mind that the speculum may need to be loosened slightly to gain access to the maxillary third molars, because a widely opened mouth pulls the cheeks tightly against the buccal edge of the caudal maxillary teeth.

Most full-mouth specula come with interchangeable incisor plates. Flat rubber-padded plates that rest nicely in the interdental space provide excellent access to the incisors. In older horses, where the angle between the upper and lower incisors has become acute, padding the incisor plates with a towel or rubber tubing keeps the incisor plates from applying painful pressure or causing lacerations to the hard palate.

Mouth gag specula are also available. This type of speculum provides good access to the incisors but can potentially damage the cheek teeth resting on it if the horse tries to chew on the speculum while under sedation. Even if a horse does not chew, if it puts a lot of pressure on the speculum, this may cause one or more teeth to fracture. This may be of particular importance in older horses with shorter tooth roots. If a mouth gag speculum is to be used, a wedge type properly padded speculum redistributes the pressure over more teeth than does a spool or a coil type speculum and is thus less likely to cause injury to the teeth.

There are a variety of float blades, shaft lengths, angles, and grips available. Grit carbide blades cut in both directions and are less expensive than the tungsten carbide blades. The grit carbide blades become dull more quickly, however. It is possible to have these floats regritted. Tungsten carbide blades stay sharper longer, and most cut in only one direction. Many veterinarians position the blade so that it cuts when pushing the float along the maxillary arcade. For the mandibular arcade, cutting by pushing or pulling the float is left to personal preference, although one straight float should be set to cut by pulling the float to correct caudal mandibular third molar hooks.

Straight float shafts can be used on the mandibular and maxillary cheek teeth. The offset straight float is useful for mandibular cheek teeth. The obtuse angled float is useful for maxillary cheek teeth. Because the maxillary second and third molars are positioned slightly higher than the rest of the maxillary arcade, a float with an upward curvature is useful for reaching these caudal teeth.

Wood or rubber grips are available for floats. A straight grip or a pistol grip is also available. It is up to the veterinarian's personal preference when

it comes to deciding which combination provides more comfort while performing dental work.

Molar cutters are useful when having to remove a large amount of tooth such as may be encountered in older horses that have had poor dental upkeep. These instruments come with simple and compound handles. The space between the jaws of the molar cutter varies from no space to approximately 0.5 in [7]. To minimize the risk of fracturing a tooth below the gingiva, it is important that the molar cutter be positioned parallel to the occlusal surface and that a molar cutter with jaws that provide maximal contact with the tooth be used. Owners should be warned of potential complications, such as fracturing of teeth or lacerating the tongue [7].

The Equi-Chip (Alberts Equine Dental Supply, Loudonville, NY) is a captive bolt percussion tool designed to remove hooks or ramps on the upper rostral or lower caudal aspects of the arcade [7]. After using the Equi-Chip, the tooth should be smoothed with a dental float.

Electric and air-driven dental instruments are now available for working on incisors, canines, premolars, and molars. When working on incisors, it is a good idea to use a marker to indicate the amount of tooth to be removed. When working on the cheek teeth, pausing frequently to check one's progress until one is comfortable using the power equipment can be helpful. For the veterinarian who performs a moderate to large amount of dental work, these instruments are ideal.

Dental imaging

Teeth and their related structures can be imaged in a variety of ways. CT and MRI are valuable techniques but are not readily available to practitioners and are quite expensive to obtain [10]. Nuclear scintigraphy can also be useful in certain cases [11]. Radiography still provides valuable diagnostic information and is available in most veterinary practices [10]. Radiographs are helpful in evaluating teeth, mandible, maxilla, sinuses, and other related structures.

Dental diseases

The mandible is 30% narrower than the maxilla, and the maxillary arcade also sits slightly rostral to the mandibular arcade [12]. Because of this positioning of the teeth as well as the normal side-to-side motion of the mandible, horses develop sharp enamel points on the buccal surface of the maxillary teeth and on the lingual surface of the mandibular teeth. Hooks can often be identified on the rostral aspect of the upper second premolars and the caudal aspect of the lower third molars. Managing these wear patterns is part of routine dental care in the horse. The following sections

address the management of equine dentition when affected by other forces. Problems resulting in abnormalities involving the teeth include trauma, infection, foreign bodies, neoplasia, and conformational deficits. Because it is not often known what has led to the condition of the older horse's teeth, the remainder of this article focuses on certain clinical presentations.

Incisor teeth

The incisors of the horse can be susceptible to injury. Horses depend greatly on the prehensile nature of the lips and use the incisors to bite and tear the grass when they graze, unlike cows, which depend more on the prehensile nature of the tongue to tear the grass and deliver it to the cheek teeth. Abnormalities to the incisors involving size, shape, and apposition to the opposite tooth greatly affect the ability to maintain normal caloric intake and thus normal body condition.

There are four categories in which an abnormal incisor occlusal surface can be placed: "smile, frown, step, or tilt" malalignment (Fig. 1) [13,14]. To correct these malalignments, the longer teeth responsible for maintaining the malalignment must be corrected. For example, in the smile malalignment, the length must be reduced in the upper first and sometimes the second incisors on each side. Of the mandibular teeth, the third and sometimes the second incisors on each side must be shortened. Because the teeth of a horse are continuously erupting until the horse reaches approximately 20 years of age [15], the shorter opposite teeth erupt further once the interference from the abnormally long teeth is corrected. This same principle is applied to the correction of the frown, tilt, and step malalignments (Figs. 2–4).

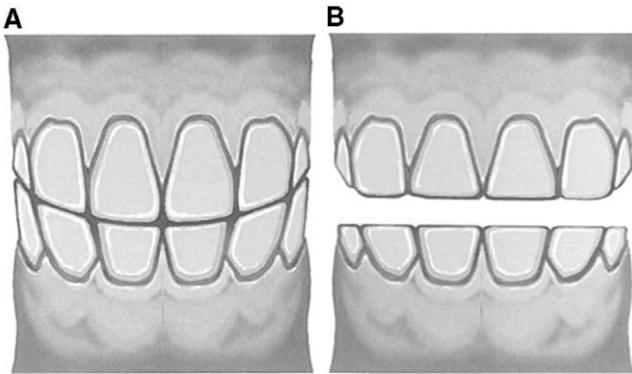


Fig. 1. (A) Smile malalignment. (B) Reduction of the lengths of the first and second upper incisors and the second and third lower incisors corrects this malalignment as depicted in the right illustration. (From Lowder MQ, Mueller POE. Dental disease in geriatric horses. *Vet Clin North Am Equine Pract* 1998;14:365–80; with permission.)

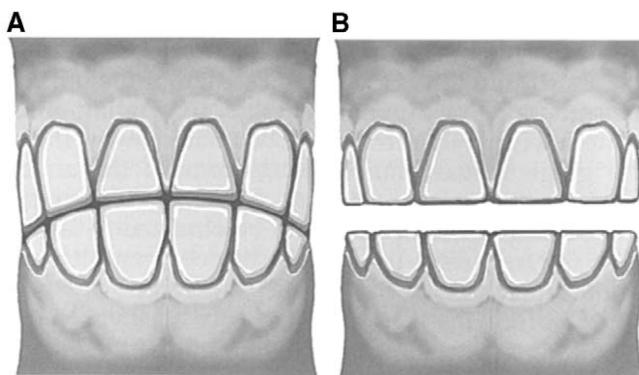


Fig. 2. (A) Frown malalignment. (B) Reduction of the lengths of the second and third upper incisors and the lower first and second incisors corrects this malalignment as depicted in the right illustration. (From Lowder MQ, Mueller POE. Dental disease in geriatric horses. *Vet Clin North Am Equine Pract* 1998;14:365–80; with permission.)

To gain full access to the incisors, the mouth can be held open with one of the veterinarian's hands placed in the interdental space, a full-mouth speculum with special adapted incisor plates, or a mouth gag. A variety of instruments are available for working on incisors. Special handles with tungsten carbide blades, nippers, or an electric dremel tool all effectively remove excess tooth. It is often useful to use a marking pen to draw a line indicating exactly how much tooth is to be removed so as to avoid overcorrecting. There is sometimes a gap between teeth that results during these corrections. When this happens, it is important to supplement the horse's diet with hay; a significant gap would keep the horse from being able to forage adequately in a pasture, because the horse depends on its incisors for this activity.

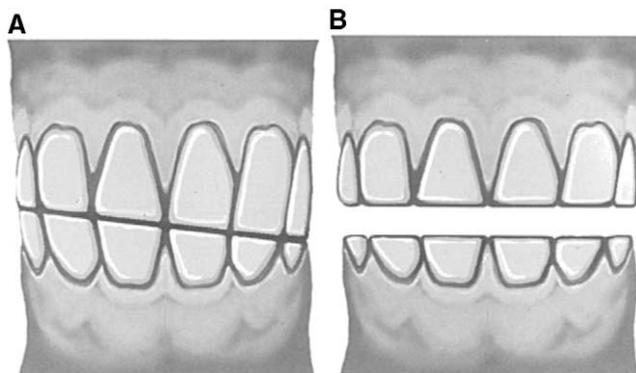


Fig. 3. (A) Tilt malalignment. (B) Reduction of the elongated teeth on the upper and lower arcades corrects this malalignment as depicted in the right illustration. (From Lowder MQ, Mueller POE. Dental disease in geriatric horses. *Vet Clin North Am Equine Pract* 1998;14:365–80; with permission.)

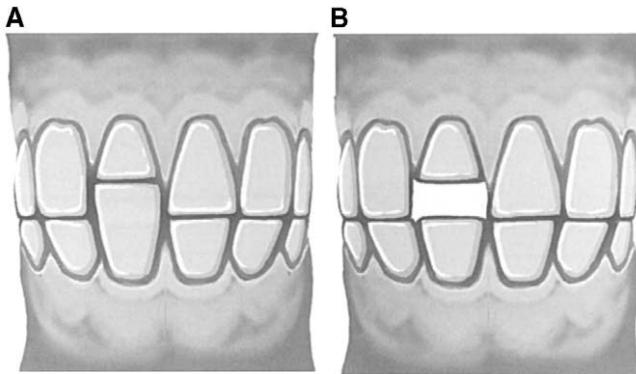


Fig. 4. (A) Step malalignment. (B) Reduction of the one elongated tooth allows the short tooth on the opposite arcade to erupt to the occlusal level. (From Lowder MQ, Mueller POE. Dental disease in geriatric horses. *Vet Clin North Am Equine Pract* 1998;14:365–80; with permission.)

Misplaced incisor teeth are often the result of trauma and rarely need to be removed [7]. These teeth need to be floated frequently to minimize interference with other teeth, the hard palate, or the buccal surface of the oral cavity. Other cases of misplaced incisor teeth include supernumerary teeth, prognathia (monkey mouth), brachygnathia (parrot mouth), and campylo-rhinnus lateralis (wry-nose). Aggressive attempts at correction sometimes involving surgery are best attempted in young horses. When these abnormalities are encountered in the geriatric horse, surgical correction is usually not a viable option, and the teeth are managed to optimize use by the horse and to maintain comfort.

Fractures involving the incisor teeth occur in varying degrees of severity [7]. Fractures involving the crown usually only require smoothing of the surface of the fractured tooth and monitoring of the opposite tooth for overgrowth and floating when necessary. If the fracture extends below the level of the gingiva, diagnostic imaging, such as radiographs, should be considered to evaluate the extent of damage to the tooth and surrounding bone.

In geriatric horses, as the incisors continue to erupt and more tooth becomes exposed, a diastema may become apparent between the incisor teeth [7]. The spaces may need to be managed by keeping them free of feed material so as to prevent discomfort and decay of the teeth.

Behavior problems like cribbing and wind-sucking can lead to abnormal wear of the incisors. Although it is best to try and discourage the behavior of the horse to minimize damage to the incisors, this is often not possible. Care must be taken of the premolars and molars. If the incisors are not meeting normally, the premolars and molars are subjected to more wear than normal, resulting in the need for more frequent dental care. If the behavior can be corrected, depending on the age of the horse, the incisors may erupt back to their normal position. If not, hay supplementation is necessary, because a gap between the incisors makes biting the grass in a pasture difficult.

Canine teeth

Canine teeth in geriatric horses can become quite long and sharp. This can be a hazard to the horse, causing tongue lacerations and biting problems [7]. This can also be a hazard to other horses, leading to fighting injuries and injuries to the owner or veterinarian during the oral examination.

Access to the canines can be gained in the same way that access to the incisors is established—by means of the practitioner's hand, an adapted full-mouth speculum, or a mouth gag. The canine tooth can either be rasped or cut with nippers or with a dremmel tool equipped with a diamond cutoff wheel. When nippers or a dremmel tool is used, the tooth should be cut above the desired length and then smoothed with a dental rasp [7].

In the case of a fractured canine tooth that extends below the level of the gingiva, radiographs should be taken to determine the extent of damage before the decision is made to remove the tooth [7].

Premolar and molar teeth

Irregularities in the dental wear pattern leading to abnormal height and shape of the premolars and molars usually can be assigned to one of three categories: wave mouth, step mouth, or sheer mouth. Dental rasps, dremmel tools, and molar cutters can all be used to realign the occlusal surface of the arcade.

It is important to keep in mind that the cheek teeth of horses have length added to the tooth until the horse is approximately 12 to 14 years of age [16,17]. Teeth continue to erupt until the horse is approximately 20 years of age or until the teeth erupt entirely from the jaw [15]. Abnormalities to the occlusal surface of the cheek teeth are best corrected before a horse is 12 to 14 years of age so as not to shorten the lifespan of the affected teeth.

When attempting to correct a cheek tooth abnormality in older horses, a gap is potentially created between a tooth that has been cut down and its opposite shorter counterpart. By shortening one or more teeth, the contact surface between teeth is reduced. This reduction may be more of a detriment to the horse than leaving the abnormal teeth longer than normal. Judgment must be used when choosing to correct a cheek tooth irregularity in an older horse versus simply managing the abnormality by keeping sharp enamel points from causing discomfort.

A wave mouth describes the uneven height associated with more than one tooth in an arcade. Normal attrition of the first molar (the first cheek tooth to erupt; therefore, the first to wear out) or the fourth premolar, missing teeth, tooth defects, and fractures of teeth or jaws can lead to a wave mouth [7]. When one or more teeth are not positioned normally at the occlusal surface, the opposite teeth are affected, and the teeth wear abnormally because of changes in mastication.

A step mouth describes a defect within an arcade where one tooth is higher than the adjacent teeth [18]. This condition, like the wave mouth, also interferes with normal mastication and lateral excursion of the jaws [7]. A mild to moderate step mouth can be corrected with floating [7]. A moderate to severe step mouth can be corrected with a Gigli wire, a motorized float, or a dremmel tool [7]. Molar cutters can also be used, followed by floating to smooth the tooth [7]. One should be careful to use a molar cutter that fits well around the tooth and to be careful of one's knuckles as the molar cutters are closed. The action of the molar cutter is fast. The compound molar cutters are a little heavier than the simple molar cutters but are easier to close when cutting the tooth.

Shear mouth describes a defect in the arcades in which the lingual points of the lower arcade make contact with the hard palate [7]. Malocclusion of the incisors and narrowing of the intermandibular space as the horse ages have been implicated in the development of this condition [19]. Abnormal eating habits (tilting the head to the side, refusing to eat hay) can be seen with this condition [7]. To manage this condition, it is best to recognize it early and to treat the mandibular teeth with frequent floating [7].

A smooth mouth describes the change to the occlusal surface that occurs naturally or iatrogenically, causing the loss of the enamel ridges of the cheek teeth [20]. This can be caused by chronic ingestion of sharp sand, old age, hypoplasia of the enamel ridges, or overly aggressive floating practices [20]. As the teeth approach being completely worn out, the enamel ridges disappear and the teeth become "smooth." As they continue to wear, one tooth may appear as two teeth when the teeth have been worn to the level of the roots.

Elongation of the occlusal surface of one or more teeth at either end of the arcade, which is not in occlusion, is a hook (pointed down) or a ramp (pointed up) [7]. Both abnormalities are sometimes referred to as hooks, regardless of the direction in which they are pointing. It is important not to confuse the normal curvature of the mandible for a caudal ramp in short-headed breeds of horses (eg, Arabians, Miniature horses, and ponies) [15]. If a hook or a ramp is identified, one should look for a hook or a ramp at the opposite end of the opposing arcade [7].

Many techniques are available for removing hooks and ramps. Floating equipment, such as a caudal molar float (one with a curve of 30°) can be used for hooks that develop on the maxillary third molar [7]. Maxillary second premolar hooks can be reduced with a short-handled float with an angle of 30° [7]. Hooks that develop on the mandibular arcade can be corrected with a long-handled straight or offset straight float [7]. If the carbide blade that is being used cuts in only one direction, it is important to have it oriented so that it cuts when the float is pulled. Otherwise, unnecessary trauma to the vertical ramus of the mandible may result. Other techniques can be employed when reducing the height of a ramp or hook. Molar cutters, Gigli wire, dremmel tools, and other instruments are often used.

Intraoral extraction is a procedure that can often be used with geriatric horses and avoids the potential risks of gas anesthesia and recovery, which could prove to be life threatening for an older horse or one with other health problems. Factors that must be considered before taking a tooth out using this technique include location, condition, and amount of exposed crown [21]. A tooth that is significantly loose can easily be identified as one that needs to be removed. Teeth that are not obviously loose need to be identified with radiography or scintigraphy to help identify the diseased tooth or teeth before removal. Equipment needed to perform the extraction includes a dental halter, rope, molar cutters, molar forceps, molar spreader, dental picks, light source, root elevators, malleable curettes, osteotome and mallet, curved rongeurs, bone file, full-mouth speculum, and a type of alveolus packing material [21].

Teeth that need to be removed include some fractured teeth, diseased teeth, and teeth that are loose for other reasons, such as a loose tooth that is causing discomfort to a horse and does not seem to have a chance of regaining stability within the alveolus [7]. Excellent descriptions of intraoral extractions can be found in a number of texts. The following is an excerpt from an article by Lowder and Mueller [7]:

The horse should be restrained and sedated. The horse's mouth should be washed, and appropriate regional nerve blocks should be performed. The affected tooth is confirmed, and a dental pick is used to elevate the gingiva away from the tooth. Care must be taken not to elevate the gingiva below the bony alveolus. Next, a pair of molar spreaders (separators) is placed in the caudal diastema of the affected tooth and slowly closed until opposition is encountered. Because the spreaders cannot be fully closed at first, slow steady pressure is applied for 3 to 5 minutes. To prevent one's hands from becoming tired, a strap can be used to secure the handles of the spreaders together. The spreaders are then moved to the opposite side of the tooth and the process is repeated. Only mild loosening of the tooth takes place at first. Hemorrhage around the affected tooth aids in the loosening process.

Molar forceps are then applied to the tooth, and a strap is applied to the handles. The molar forceps are slowly moved in a medial-to-lateral direction, using a rocking motion, to loosen the tooth. Twisting the molar forceps increases the risk of fracturing a tooth root. Only after the tooth moves freely within the alveolus is extraction attempted. A molar fulcrum or a piece of wedge-shaped wood should be placed under the molar forceps handles on the dental arcade close to the head of the instrument. The tooth is extracted by rotating (pushing or pulling) the molar forceps over the fulcrum. If the tooth does not come out at first, the loosening process is repeated. The most important thing is to not rush the procedure.

Some caudal cheek teeth are too long for intraoral extraction without cutting the tooth in half during the procedure. The tooth can be cut with a pair of molar cutters or Gigli wire. Postoperatively, the alveolus should be digitally explored and the tooth should be inspected to ensure that it

has been completely removed. Radiographs should be obtained if questions persist.

Fragments that cannot be removed by the intraoral route require either a trephine hole or bone flap to remove them. Postoperative management varies with the individual horse. An older horse with a shallow alveolus may just require daily flushing with warm water until the alveolus closes, whereas a middle-aged horse might require packing of the affected alveolus with acrylic or some other suitable material. Pain management with non-steroidal anti-inflammatory drugs is often helpful as is antibiotic therapy to prevent continued sepsis. Close supervision of the patient is essential to ensure complete recovery. The horse's head should be examined closely for any abnormal discharge, halitosis, or facial swellings, and the alveolus should be inspected often until recovery is complete.

Other conditions

Most geriatric horses have some periodontal disease [22]. It is unknown how much can be prevented with routine dental care [7]. Older horses become more susceptible to periodontal disease because of their tendency to lodge feed between teeth [7]. Feeding a pelleted feed can sometimes minimize this problem [7].

Sinusitis can also be a problem in older horses. If the cause is not readily identifiable, the horse should be treated with systemic antibiotics and sinus lavage. A portal into the affected sinus can be created with a Steinmann pin. A drip set that has had the rubber needle attachment removed can be inserted into the sinus, with the tubing run over the horse's forehead and secured to the mane with tape [7]. A 1-L fluid bag can be attached and used to lavage the sinus [7]. The bag is left attached to the drip set and secured to the horse's withers until the next treatment [7]. Another method uses a Foley catheter that can be fed through the hole made by the Steinmann pin into the sinus. The balloon is filled with saline, anchoring the catheter into the sinus. The rest of the catheter is secured over the pole of the horse, and large syringes or fluid bags may be used to irrigate the affected sinus. A small syringe can be used as a stopper in the catheter until the next treatment.

As horses begin to lose their teeth or the ability to masticate effectively, dietary changes need to be considered. Many feeds are designed with the geriatric horse in mind. Most of these are a completely balanced ration and are often pelleted, which makes them more palatable and digestible. Many horses seem to prefer having access to forage even if they cannot utilize it sufficiently [7]. Some horses also prefer a warm water source, especially after the loss of a tooth, because cold water may cause discomfort at the alveolus [7].

Although horses seem to enjoy having hay to chew, older horses with missing teeth and minimal mastication efficiency may be prone to choking because they do not digest the food properly in the oral cavity before it

makes its way to the stomach [20]. Hay with minimal stem and more leaf may help to minimize the chance of choke. If the older horse repeatedly chokes despite seeking out hays with minimal stem, soaked hay cubes or haylage may be used as an alternative forage source.

Summary

Dental care in any horse need not be looked at as the difficult challenge it used to be before the days of sedation and tungsten carbide and diamond cutting wheels. Horses are living longer and more comfortable lives thanks, in part, to the advancements of dental care and special dietary rations. With the evolution of the horse's place in family circles today, people want the best care possible for their animals. Dentistry has become an important part of that care.

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