Dental Conditions Affecting the Juvenile Performance Horse (2-5 Years)

Maury B. Linkous, DVM

Author's address: 9305 Roberts Rd, Odessa, FL 33556
E-mail: clinkous@tampabay.rr.com

Take Home Message

Know normal eruption and wear patterns. Be familiar with common labeling and language as the triadan system. In unusual cases, an accurate diagnosis and evaluation (usually through radiographs) will help assure a successful outcome. Small, frequent (3-6 months) corrections over an extended period (years) are better and safer than dramatic endeavors.

Introduction

By carefully addressing the normal and abnormal mouth of the young performance horse, there is a unique opportunity to shape the horse's dental health and, ultimately, his performance career. The successful management of early dentistry translates into one more factor which will allow the horse to reach his optimal level. One must be able through knowledge, skill, and medical aids to recognize and, whenever possible, correct abnormalities.

The entire mouth should be evaluated, as all areas need to be addressed if optimal results are to be achieved. It is important that one become familiar with eruption times and wear patterns so that the normal dental arcade for a given age can be recognized (Table 1).[1]

Incisor		
	Central (1st)	2 ½ years
	Middle (2nd)	3 ½ years
	Corner (3rd)	4 ½ years
Canine		3 ½ - 5 years
Premolar		
	1st Premolar (Wolf Tooth)	6 – 9 months
	2nd Premolar	2 ½ years
	3rd Premolar	3 years
	4th Premolar	3 ½ - 4 years
Molars		
	1st Molar	9 – 15 months
	2nd Molar	2 – 3 years
	3rd Molar	3 ½ - 4 years

Table 1.

It is imperative to know the normal eruption times for equine teeth so as to accurately evaluate the dental condition of the patient.

Problems of incisor alignment (undershot or overshot jaw) may exist. Deciduous teeth may not be shed in a timely or symmetrical manner creating multiple problems. Attention should be given to the canine teeth. Wolf teeth, if present, should be extracted. Sharp points should be removed from cheek teeth leaving a rounded surface. The arcades of incisors and cheek teeth should be evaluated and, if necessary, corrected. Periodontal disease should be recognized and treated appropriately. Nasal discharge, draining tracks, and irregularities of the maxilla and of the ventral border of the mandible should be evaluated.

Brachygnathia – Prognathia

By the time the horse is two years old, efforts to correct brachygnathia (parrot mouth) or prognathia (sow or monkey mouth – Figs. 1 and 2) are probably futile. However, the abnormal wear patterns, which these conditions create, should be dealt with. Unless the degree of brachygnathia is relatively mild, the upper incisors become excessively long as they have no fully opposing teeth. They should be reduced if necessary. Likewise, lower incisors having no fully opposing members become excessively long and should also be reduced if necessary. Frequent (every 3 – 4 months) minimal (1 – 2 mm) reductions are safer as they are less likely to open a pulp cavity and risk the death of a tooth. Prognathia mouths present a similar problem with the lower teeth extending beyond the free margin. By regular small corrections of incisors in brachygnathia or prognathia, the horse never experiences the palate lacerations that may occur in the parrot mouth or the lower jaw lacerations that may occur in the individual with monkey mouth.

Figure 1. Brachygnathia or Parrot Mouth (Scrutchfield, L).

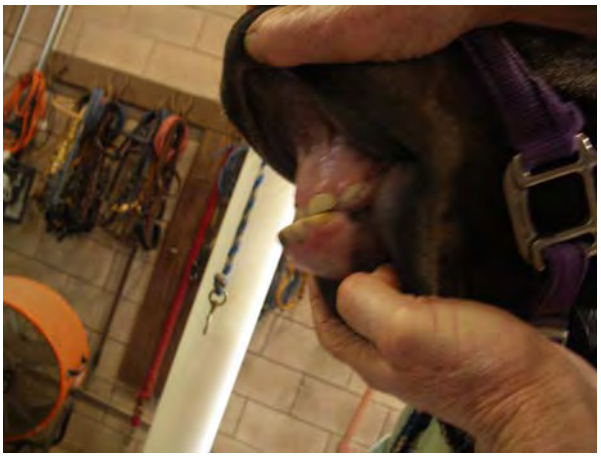

Figure 2. Prognathia also called Sow or Monkey Mouth.

The parrot mouth individual commonly develops rostral hooks of 106 and 206 and ramps or caudal hooks on 311 and 411. Conversely, the monkey mouth horse often develops hooks on 306 and 406 and ramps or hooks on 111 and 211. These irregularities should be addressed by leveling the arcades of the cheek teeth. Hooks and ramps are relatively easy to correct with motorized dental equipment. One should be careful not to overheat the teeth. Spending brief periods on each tooth and/or water-cooling can accomplish this.

Canine Teeth

Canine teeth, erupting between 3½ and 5 years of age, are generally present in the male but are usually absent or rudimentary in the mare (Fig. 3a). As their sole use is for combat, they are a nuisance in the domestic horse. They are commonly caught on the bit during bridling or unbridling and may create a tongue laceration when the tongue is trapped between the canine and the bit. They can be cut or readily ground down and their borders smoothed (Fig. 3b). It is good practice to remove slightly less than ½ of the original crown of a fully erupted tooth. In the young horse there is a good chance that the pulp cavity will not be involved if more radical crown removal is done. In the older horse, since more tooth has been extruded, the pulp cavity is nearer to the tip of the tooth. Therefore, in all but the very young horses, radical reduction of the canine teeth will likely invade the pulp cavity and lead to the death of the tooth.

As the canine teeth are not in wear, they are commonly covered with a tartar buildup. This buildup can easily be removed with a tartar scraper. Application of tartar control toothpaste twice daily will help prevent a recurrence of tartar.

Figure 3a. Canine teeth in 8 year-old Morgan.

Figure 3b. Canine teeth reduced to proper height and margins rounded.

Occasionally the point of the canine tooth can be felt below the gum surface and is slow to erupt. The area over the tooth's point may be irritated and sore. After using a small amount of Cetacaine®[b] and injecting 1 cc of 2% mepivacaine hydrochloride[c] over the

point of the tooth, one may grasp the gum with rat tooth forceps and, using surgical scissors, remove a small section of tissue. Then the tissue may be milked down over the crown with the rat tooth forceps and the point blunted. No effort is made to reduce the length of the canine tooth until it is fully erupted.

Wolf Teeth

Wolf teeth (105 and 205 - Fig. 4) are relatively small teeth usually found just anterior or anterior-medial to the anterior borders of the first maxillary cheek teeth (106 and 206). Occasionally, they are found on the lower jaw just anterior to the first mandibular cheek teeth (306 and 406). They are also found growing forward beneath the gum tissue of the upper jaw between the first maxillary cheek teeth (106 and 206) and the canine teeth.

There is some debate as to whether all wolf teeth should be removed depending on size, location, and the use of the horse. As wolf teeth have no redeeming value and often cause bitting problems, the obvious solution is simply to remove them all. Although usually present, there are individuals, which never develop wolf teeth. They usually erupt at 6 – 9 months of age but may erupt as late as 18 months.[3] As the horse ages, the roots of the wolf teeth seem to become more fragile and are more firmly anchored. The earlier the wolf tooth can be extracted the easier the procedure will be and the likelihood of breaking off a root fragment is lessened.

Figure 4 – Wolf Tooth 205.

Local anesthesia for extracting wolf teeth is accomplished by placing a small amount of Cetacaine® on the soft tissue just above the gum line medial to 106 and 206. This is followed by an injection of 1cc of Carbocaine® (Pharmacia and Upjohn; Kalamazoo, MI) in the same area. A butterfly catheter[d] (Fig. 5) adds to the ease of this procedure.

Normal wolf teeth can be extracted by carefully elevating the tissue away from the tooth with a small elevator[e]. Care must be taken not to lacerate the palatine artery on the medial surface of the tooth. Then more pressure is applied in front of the tooth to weaken the alveolus. Next, a heavier elevator[f] is applied behind the tooth with a gentle rocking motion. The motion should be slow enough to apply 10 – 15 seconds of steady pressure repeatedly in a controlled manner to break down periodontal attachments and loosen the tooth in its socket before extraction. At times the wolf tooth will be extracted during careful elevation. If not, and it is loose, wolf tooth forceps[g] may be used. It is important to select forceps that fit the tooth. The forceps should close tightly but should not create an excessive force, which could shatter the tooth. No matter how skilled and careful one is, occasionally a wolf tooth will break. If the break is close to the surface (an unlikely event if careful elevation was done unless the tooth was broken earlier by a bit), the root may be elevated and extracted. If the break is well above the gum line, it is probably best to leave the root tip and extract it at a later date if it grows down sufficiently.

Blind or impacted wolf teeth which can readily be felt under the tissue in the bars may be extracted by injecting a 1cc bleb of 2% mepivacaine hydrochloride[h] over the anterior point of the tooth and then trimming away a small portion of tissue over the point of the tooth. Grasp the tissue over the point with rat tooth forceps and remove it with scissors. Once the tissue is removed, elevate the tissue over the point and then elevate the tooth in front to back direction, remembering that this tooth is growing forward and not down. Once this tooth is elevated and loose, it may be extracted with wolf tooth forceps using a

Figure 5 – Butterfly catheter and syringe.

forward pull. Most blind wolf teeth are obvious and can easily be palpated. Some horses have small protuberances in the areas of blind wolf teeth but do not have wolf teeth. If there is a question concerning the presence or location of a tooth, take radiographs to ascertain the existence or position of a tooth before attempting its extraction.

Incisors

Improper shedding of the deciduous teeth creates most incisor problems in the young horse, excepting trauma and anatomical malformations. The retained deciduous tooth, commonly called a cap, may cause delayed eruption creating an unbalanced arcade. Otherwise the retained tooth may cause the erupting tooth to come in misplaced. Normally, upper and lower incisors are shed about the same time. To encourage even, symmetrical eruption of permanent incisors, symmetrical shedding of deciduous incisors should be aided by extraction whenever possible (Fig. 6). In most light horse breeds, the central incisors (101,201, 301, and 401) are shed at 2½ years; the middle incisors (102, 202, 302, and 402) are shed at 3½ years; and the corner incisors (103, 203, 303, and 403) are shed at 4½ years. Shedding is delayed about 6 months in Standardbreds and Belgian drafts. Shedding is delayed another 3 months in mini-Shetland ponies[4]

A relatively common problem is for the retained incisor to cause the displacement of the permanent incisor. The retained incisor may be trapped between erupting incisors creating a gap or the permanent tooth may erupt behind the retained cap. In all cases with which I am familiar, the permanent incisor is displaced behind the retained cap. There has been a case report of a permanent incisor erupting anterior to the retained cap.[5] Radiographs should be taken if there is any question as to which tooth should be removed. Retained portions of deciduous caps and root splinters and retained caps can be removed by local anesthesia, elevation and extraction. Once the retained caps and/or their lingering parts are removed the permanent teeth migrate into a more correct, or completely correct, position. In the case of overcrowding, it may be necessary to lightly file or trim the offset permanent tooth and the sides of the adjacent teeth to permit the offset tooth to drift into position.

Figure 6. Deciduous incisors ready to shed or to be extracted. (Scrutchfield, L)

Cheek Teeth

Cheek tooth problems in the 2 – 5 year old involve sharp points, caps, and dental impactions. Prior to inserting the speculum, evaluate the incisors for abnormalities and establish an estimated age. Most cheek teeth only require that sharp enamel points be removed, primarily from the buccal aspect of the upper cheek teeth and the lingual surface of the lower cheek teeth. It is also important to remove sharp corners and slightly round the anterior coronal edge of the first cheek teeth (106, 206, 306, and 406) so that the bit or hackamore does not pull the cheek into a sharp point creating discomfort. In evaluating caps, several factors should be considered:

- age of the horse and caps which should normally be shed at that time,
- balance of the mouth,
- eruption bumps,
- abnormal nasal discharge,
- draining tracks,
- loose, fragmented, or displaced caps,
- root fragments, and
- observable line of demarcation between cap and erupting permanent tooth.

Loose, fragmented, displaced caps and root fragments should be removed. They not only create discomfort but also may be associated with dorsal displacement of the soft palate. [6] Caps and their fragments may be removed by grasping with a cap or molar extractor and rolling the cap medially. Rolling the cap to the inside lessens the chance that small splinters will be broken off on the lateral side. If small splinters are left on the inside after cap extraction, they are more accessible for manual removal. In a normal situation, the horse may be able to remove these remnants with his tongue or they may be removed with a dental pick or forceps.

In removing caps one must be careful not to include gum tissue. This is particularly important on the upper medial side because of the palatine artery. Premature removal of a cap may cause damage to the erupting permanent tooth.[7] If a cap is above the arcade of adjacent teeth but there is no line of demarcation between the cap and the erupting tooth (Fig. 7) or if it cannot be removed with reasonable force, the surface should be lowered to match that of adjacent teeth.

Rostral hooks on sixes and caudal hooks or ramps on elevens create forces, which may interfere with cap shedding. The caps most often plagued by impaction are 108, 208, 308, and 408. This is because the adjacent teeth, sevens and nines are mature and in place when the eights erupt. The retained cap (Fig. 8) and/or a narrow eruption space between sevens and nines make eruption of eights more difficult. The apex of an erupting tooth, which is blocked, may become inflamed creating an eruption cyst on the maxilla anterior to the facial crest. Eruption cysts are relatively common, and without complication, will dissipate over a period of 1 – 2 years.[8] If the apex of the impacted tooth has severe, long-

Figure 7 – Demarcation line between cap and erupting permanent tooth 206. (Scrutchfield, L).

Figure 8. Retained cap fragment 208.

standing inflammation, the invasion of hematogenous bacteria may occur causing a pulpitis. This pulpitis in turn commonly results in a draining fistula on the mandible or flows into a sinus. At first the infection is thought to be limited to periapical tissue only. Later, as the condition progresses, the pulp and adjacent tissues become infected.[9] If a draining tract is present, radiographs with a probe or contrast media in the track, should be taken to determine if the track is associated with the tooth root, if the eruption space is adequate, and if the periodontal ligament is healthy. If a cap is present, it should be removed. If the eruption space is inadequate, the adjacent teeth may be filed to enlarge the space. Draining tracks associated with the root of the tooth should be curetted and lavaged with an antiseptic solution such as 1 part 2% chlorahexadine[i] with 4 parts water. Systemic antibiotic and NSAID therapy is also indicated. Should the pulpitis fail to respond and the tooth is stable with a healthy periodontal ligament, root canal surgery may be a consideration rather than extraction.

Loose, fragmented, displaced caps and root fragments should be removed. They not only create discomfort but also may be associated with dorsal displacement of the soft palate. [6] Caps and their fragments may be removed by grasping with a cap or molar extractor and rolling the cap medially. Rolling the cap to the inside lessens the chance that small splinters will be broken off on the lateral side. If small splinters are left on the inside after cap extraction, they are more accessible for manual removal. In a normal situation,

Medial displacement of cheek teeth, usually eights, is often associated with short heads or supernumery teeth. These teeth may be only slightly misplaced or may be, particularly in miniature horses, totally inside the arcade. Their treatment depends on clinical and, if necessary, radiographic evaluation. Treatment may include filing adjacent teeth to reduce food pocketing, regular reduction of a tooth not in wear, or extraction. [10]

Summary

Whenever possible, the mouth should be balanced so that uneven wear does not occur. Encourage, by extraction if indicated, the symmetrical shedding of deciduous teeth in a timely manner. As new teeth are erupting and deciduous teeth are being lost during this time frame, frequent exams at 3-6 month intervals are indicated. Young horses often develop sharp points within 3 months after floating. Once a cheek tooth cap is shed, the erupting tooth will commonly be in wear within 3 months. Frequent exams are conducive to less dramatic corrections as well as early detection of problems.

References and Footnotes

1. Lowder MQ. Equine Medicine and Surgery. St. Louis: Mosby, Inc., 1999; 660-667.
2. Johnson T. AAEP Advanced Dentistry Wetlab, 2005.
3. Easley J. Equine Dentistry. London: W. B. Saunders Company LTD, 1999; 220-249.
4. [i]Sofie M. Equine Dentistry. London: W. B. Saunders Company LTD, 1999; 35-46.
5. [i]Scrutchfield L. 2111 Arrington Rd., College Station, TX 77845-8496. 2005.
6. Easley J. Vet Clin North Am Equine Pract. Dentistry. August 1998; 411-432.
7. Wilewski KA, Green S, Basile T, et al. Equine Dentistry: A Practical Guide Philadelphia: Lipincott Williams & Wilkins. 2002; 79-114.
8. Dixon PM. Equine Dentistry. London: W. B. Saunders LTD, 1999; 3-28.
9. Crabill MR, Schumacher J. Vet Clin North Am Equine Pract. Dentistry. August 1998; 291-305.
10. Lowder MQ. Equine Medicine and Surgery. St. Louis: Mosby, Inc., 1999; 660-667.

b. Cetylite Industries Inc. Pennsauken, NJ
c. Carbocaine® - V, Pharmacia and Upjohn, Kalamazoo, MI 49001.
d. Terumo Surflo Winged Infusion Set®, 25 g x ¾". Terumo Medical Corporation; Elkton, MD 21921.
e. Medco Instruments; 7730 West 96th Place, Hickory Hills, IL 60457.
f. Jupiter; 6351 SW 95th Ave., Cedar Key, FL 32625.
g. Harlton's Equine Specialties; 792 Olenhurst Court, Columbus, OH 43235-2163.
h. Carbocaine®-V, Pharmacia and Upjohn; Kalamazoo, MI.
i. ChlorhexiDerm™, DVM Pharmaceuticals, Inc. Miami, FL 33137.