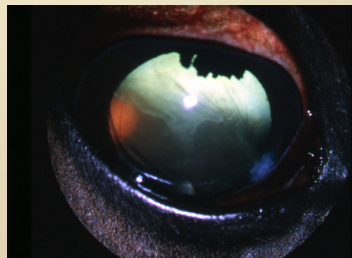
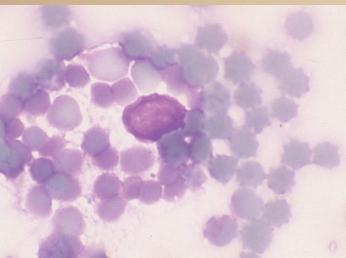
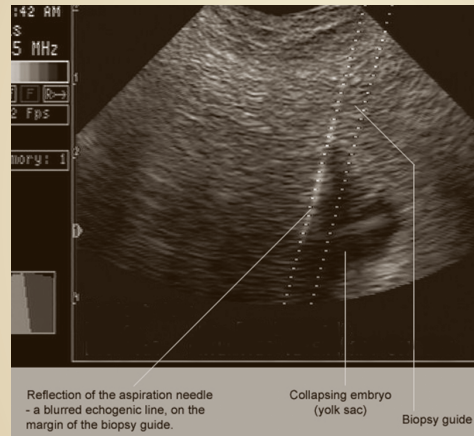


ILLUSTRATED GUIDE TO EQUINE DISEASES



Sameeh M. Abutarbush

Illustrated Guide to Equine Diseases

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Dedication

To my father Mohammad who passed away after a long battle with cancer while I was writing this book. He was a man of principles and had a strong belief in science and pursuing higher degrees. He nurtured my ambitions, supported my aspirations, and had a strong belief in me. This book is also dedicated to my dearest mother Fatima, my beloved brothers and sisters, Nidal, Reem, Khalid, Mai, Omar, and Mahmoud, and to my loving wife Marah. They are outstanding people who have worked hard, made sacrifices, guided me, and lent their unending support to allow me the opportunity to pursue the career of my dreams. Their patience and support throughout my personal and professional life is immeasurable. Professor Otto M. Radostits had a great influence on my life and career. He was my mentor during my internship and residency at The Western College of Veterinary Medicine, University of Saskatchewan. He guided me through my higher education and ongoing professional training. I hope that this book meets your expectations.

You will make more mistakes not looking than not knowing.

Professor Otto M. Radostits

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Preface

It has been said that “a picture is worth a thousand words.” It is the fundamental idea behind this illustrated guide. One cannot study veterinary medicine and be a good clinician without seeing clinical cases. Knowledge is likely to be retained for a longer period of time when given a contextual basis (i.e., when connected to photographic data). In addition, some diseases are rare and one may not see them more than once in a professional lifetime.

The aim of this illustrated guide is to provide the reader with the clinical picture of a disease or syndrome, presenting signs, diagnostic procedures, and a brief synopsis. There are 12 chapters, 11 of which are based on the different body systems. The twelfth chapter embraces diseases and conditions of the neonate, which are not shared with the adult horse.

Although it is impossible to include all diseases of the horse in one volume, this illustrated guide covers hundreds of internationally recognized diseases and conditions, some of which prevail in specific geographic areas. Moreover, it not only approaches disease from a clinical point of view, but also embraces additional diagnostic modalities, where applicable, such as radiology, nuclear scintigraphy, CAT scan, cytology, histopathology, and postmortem findings. Chapter 7, Diseases of the Bones, Joints, and Connective Tissues, focuses mainly on diagnostic imaging that is available for most of the diseases, since clinical signs alone are of limited value in the diagnosis of the different lesions associated with these structures. Presentation of such options is one of the features of this illustrated guide. Each chapter is followed by a list of readings that are believed to be helpful to the reader.

The illustrated guide is not intended to be heavily texted. It contains over a thousand educational photographs, singular and compound. The photographs used on these pages are highly informative and of excellent quality and resolution.

The contributors to this volume are experts in their disciplines and well-known authors. Their efforts contribute to the high quality of the material presented here. To see, diagnose, and treat a condition is one thing; to document a condition photographically is entirely another.

This book is intended to be helpful to veterinary medicine students, technicians, clinicians, and specialists, as well as horse lovers.

Finally, I would like to pass on the advice that I have taken from my phenomenal mentor, Professor Otto M. Radostits, who advised me to have a camera handy and carry it around whenever I practice veterinary medicine. I never knew how valuable that advice was until I began work on this project.

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Illustrated Guide to Equine Diseases

1

Diseases of the Gastrointestinal Tract and Liver

1

Diseases of Teeth

- Wave Malocclusion
- Rostral Hook
- Caudal Hooks or Ramps
- Stepped Tooth
- Step Mouth
- Hooks or Ramps
- Shear Mouth
- Overlong Distal Portion of the Third Incisor
- Diagonal Incisor Malocclusion
- Incisor Curvature
- Irregular Incisor Malocclusion
- Supernumerary Incisor
- Overbite (Parrot Mouth)
- Underbite (Sow or Monkey Mouth)
- Periodontal Disease, Diastema, and Enamel and Cemental Decay
- Geriatric Wear
- Teeth Eruption and Retained Deciduous Teeth “Cap”
- Wolf Teeth
- Deviation of the Maxilla
- Asynchronous Teeth Eruption
- Fractured Tooth
- Lingual and Buccal Laceration and Bit Pressure (Injury)
- Gingival and Lingual Ulceration of Systemic Origin
- Supernumerary Canine Tooth
- Polydontia
- Dysplastic Teeth
- Abnormal Tooth Wear

Diseases of the Mouth

- Squamous Cell Carcinoma
- Oral Foreign Body
- Glossitis

Diseases of the Esophagus

- Esophageal Obstruction (Choke), Primary
- Esophageal Obstruction (Choke), Secondary

Diseases of the Abdominal Region

- Abdominal Pain (Colic)
- Diseases of the Stomach
 - Gastric Dilatation
 - Gastric Impaction
 - Gastric Ulcers
- Diseases of the Small Intestine

Simple Obstruction of the Small Intestine

Ileal Impaction

Ileal Hypertrophy

Ascarid Impaction

Meckel's Diverticulum

Strangulating Obstruction

Mesodiverticular Band

Small Intestinal Volvulus (Mesenteric Torsion)

Small Intestinal Strangulation Caused by a

Pedunculated Lipoma

Epiploic Foramen Entrapment of the Small Intestines

Diaphragmatic Hernia

Incarceration of the Small Intestine Through the

Gastrosplenic Ligament

Intussusception

Functional Obstruction of the Small Intestine

Duodenitis-Proximal Jejunitis (DPJ) (Anterior or

Proximal Enteritis)

Proliferative Enteropathy (*Lawsonia Intracellularis*)

Diseases of the Large Intestine

Large Colon Volvulus (LCV)

Large Colon Displacement (LCD)

Right Displacement of the (Left) Large Colon (RDLC)

Left Dorsal Displacement of the Large Colon (LDLC)

Large Colon Impaction (LCI)

Large Intestinal Intussusception

Salmonellosis

Strongylosis

Cyathostomiasis

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) Toxicity

Grain (Carbohydrate) Overload

Small Colon Impaction

Intraluminal Obstruction of the Small Colon with

Enteroliths, Fecaloliths, or Foreign Bodies

Idiopathic Inflammatory Bowel Disease

Antibiotic Induced Colitis

Miscellaneous

Abdominal Abscessation

Abdominal Adhesions

Peritonitis

Enterocutaneous Fistula and Parietal (Richter's) Hernia

Omental Hernia

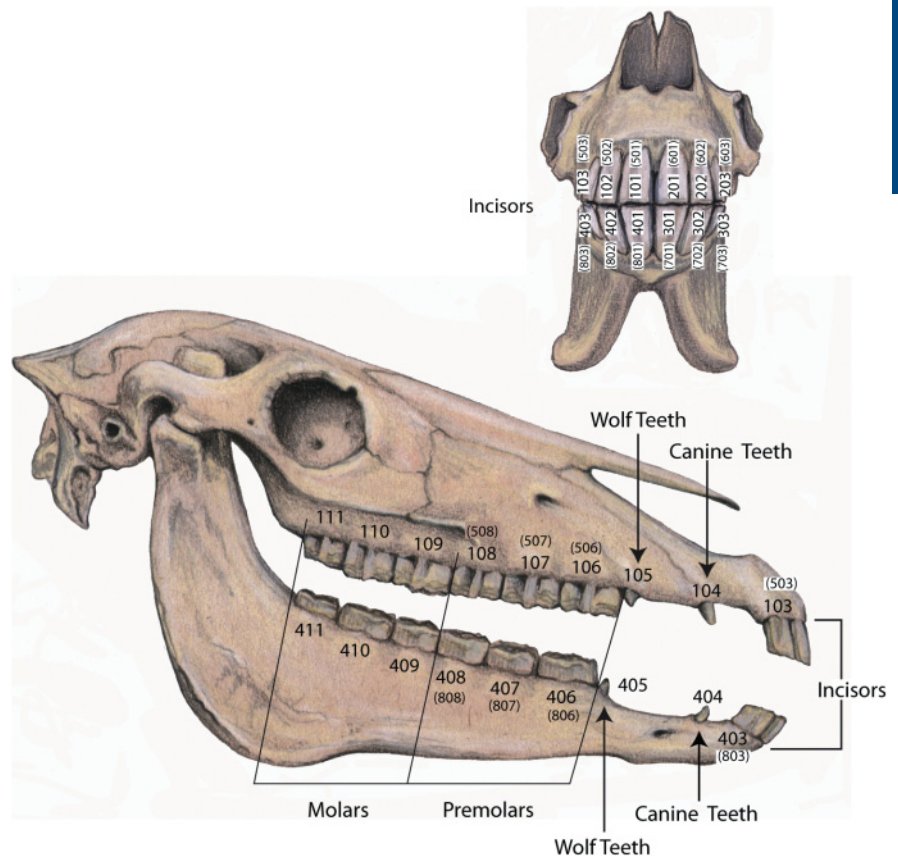
Grass Sickness (Equine Dysautonomia)

Hyperlipemia and Hyperlipidemia

DISEASES OF TEETH

1

Figure 1.1 Illustration for the Triadan numbering system for equine dentition. The permanent dentition is described by 1–400s while the deciduous dentition is described by the 5–800s.



Wave Malocclusion

Figure 1.2a Wave malocclusion involving the 200 and 300 arcades in a middle-aged patient. The 206 is overlong. The 207 and 208 exhibit progressively shorter clinical crown to the 208/9 junction. Note that the gingival margin is displaced dorsally at this point and dips ventrally again at the 209/10 junction where the 210 is overlong. This involvement of the gingival margin is an indicator of chronicity and signals probable bony remodeling. Patient age and amount of clinical crown and gingival margin/bony changes collectively determine the amount of correction possible at a single session. Some wave malocclusions cannot be normalized but are best maintained to minimize progression and deterioration.



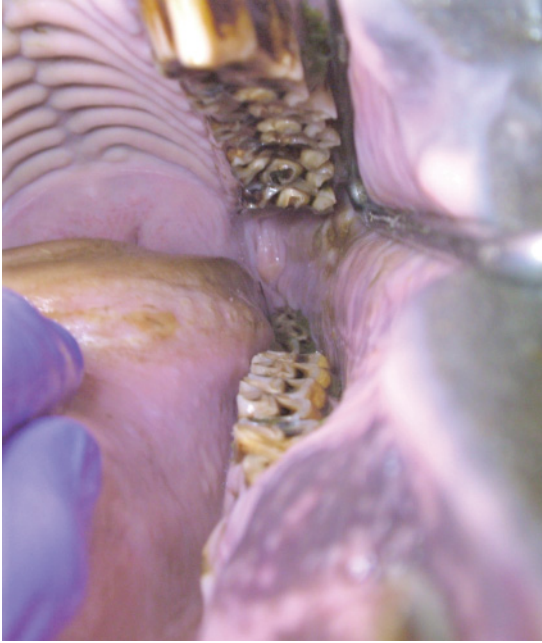


Figure 1.2b Same patient in fig. 1.2a. View of 300 arcade “wave” abnormality. Note that the distal 308 is the tallest point in the 300 arcade and the 309 is not visible at all.

Rostral Hook



Figure 1.3 Mesial portion of 206 is overlong due to malocclusion with 306. Commonly referred to as a “rostral hook,” this abnormality is often seen in class 2 malocclusions commonly known as “parrot mouth.” Early recognition and reduction of the excessive crown is recommended to avoid large or staged reductions.

Figure 1.4 Large amount of excessive crown at the mesial portion of 106 in a 10-year-old quarter horse stallion. This abnormality is common in class 2 malocclusions (parrot mouth) although this patient has normal incisor occlusion. Commonly referred to as a “rostral hook,” it is progressive, can traumatize soft tissue, may exacerbate malocclusions elsewhere in the mouth, and may interfere with normal masticatory function. Overlong crown of this magnitude requires staged reductions to avoid pulpar exposure or thermal injury.



Caudal Hooks or Ramps

Figure 1.5 Overlong crown at distal 311 due to malocclusion with 211. Commonly known as “caudal hooks or ramps,” these abnormalities are progressive, can injure soft tissue, predispose to other malocclusions and periodontal disease, and may interfere with normal masticatory motion. Commonly, though not exclusively, seen in class 2 malocclusions (parrot mouth).



Stepped Tooth

1



Figure 1.6 Overlong 209 due to missing 309. Commonly referred to as a “stepped tooth.” Regular crown reductions may be necessary to maintain normal rostral/caudal mandibular movement.

Step Mouth



Figure 1.7 Abrupt, severe changes in crown height along an entire arcade pair is commonly known as a “step mouth.” Normal mastication is significantly compromised with such malocclusions. Severe cases require serial crown reductions for safe correction.

Hooks or Ramps

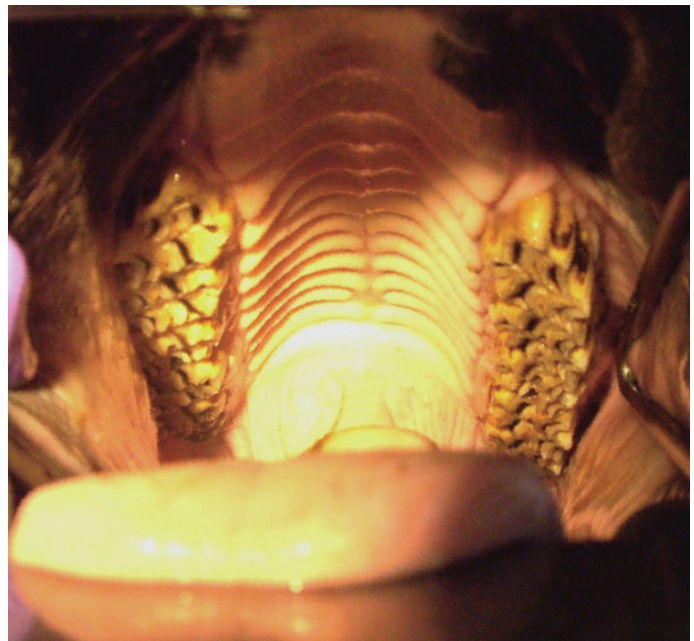
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Figure 1.8 The 306 and 406 with excessive mesial crown commonly referred to as hooks or ramps. They are caused by malocclusion with the maxillary 6s. They are progressive and can cause soft tissue injury, biting pain, periodontal disease, and abnormal mastication.



Shear Mouth

Figure 1.9 "Shear mouth" in an 8-year-old quarter horse mare. Note the slightly steeper table angle of the 200 arcade in comparison to the 100 arcade. Gradual reduction of the steep table angle can be helpful. If left unchecked, many cases will worsen to the point of abnormal mastication.



Overlong Distal Portion of the Third Incisor

1



Figure 1.10a Distal portion of 103 is overlong caused by a malocclusion with 403. Such areas of excessive crown are progressive and can cause interference with normal lateral excursion of the mandible and thereby affect functional occlusion of the cheek teeth.



Figure 1.10b Rostral view of overlong distal 103. Same horse in fig. 1.10a

Diagonal Incisor Malocclusion

1

Figure 1.11 Diagonal incisor malocclusion (DGL3) in an aged horse. Note the progressively increasing length of clinical crown from the 203 right to the 103 and from the 403 left to the 303. There is also a mandibular offset to the horse's left. Etiology can be difficult to determine and may be multifactorial. This malocclusion is progressive and early detection and correction are beneficial. Correction in some cases can be harmful. A thorough understanding of equine mastication biomechanics is critical for successful correction and maintenance.



Incisor Curvature

Figure 1.12 Dorsal incisor curvature in a juvenile. Etiology may be asynchronous eruption of the 1s or a cribbing/rubbing habit that is causing selective wear to 101 and 102.





Figure 1.13 Ventral incisor curvature in an aged horse. This malocclusion is usually progressive and can cause abnormal lateral excursion. Overlong incisors should be reduced as necessary to maintain normal lateral excursion and to prevent progression of the malocclusion.

Irregular Incisor Malocclusion



Figure 1.14 Irregular incisor malocclusion in which the occlusal plane undulates in a wave pattern. In this case, probably initiated by the abnormal positions of 101/201. As with any incisor malocclusion, lateral excursion and therefore efficient mastication may be affected.

Supernumerary Incisor

1

Figure 1.15 A 14-year-old Peruvian Paso mare with supernumerary and displaced incisors. Feed was collecting between the grossly displaced incisor and the ones lingual to it causing periodontal disease and dental decay. Extraction of the displaced incisor and reduction of other overlong incisor crowns to restore normal lateral excursion was beneficial.



Overbite (Parrot Mouth)

Figure 1.16 A 16-year-old Warmblood/Thoroughbred mare with a class 2 malocclusion (parrot mouth). Minimal occlusal contact occurs at the 3s.





Figure 1.17a Class 2 malocclusion in a yearling. Commonly referred to as “parrot mouth” or “overbite.” Early detection and removal of resultant overlong clinical crowns can be curative in mild to moderate cases. More severe cases may require orthodontic treatment.



Figure 1.17b Same horse in 1.17a, rostral view of class 2 malocclusion.

Underbite (Sow or Monkey Mouth)

1

Figure 1.18 Class 3 malocclusion (sow mouth or monkey mouth) in a 2 1/2-year-old. Early recognition and treatment to release the promaxilla from behind the mandible may allow for normal growth and resolution. Advanced cases may not be correctable but benefit greatly from regular reduction of overlong crowns and restoration of normal mastication biomechanics.



Periodontal Disease, Diastema, and Enamel and Cemental Decay

Figure 1.19a A 2-year-old Thoroughbred with feed packed between 506 and 507 and between 806, 807, and 808. This presentation is a strong indicator of periodontal disease and should prompt further examination. The 806 is also overlong due to a missing opposing tooth in the upper right arcade. The overlong crown may be contributing to the feed packing distal to it due to abnormal occlusal forces.



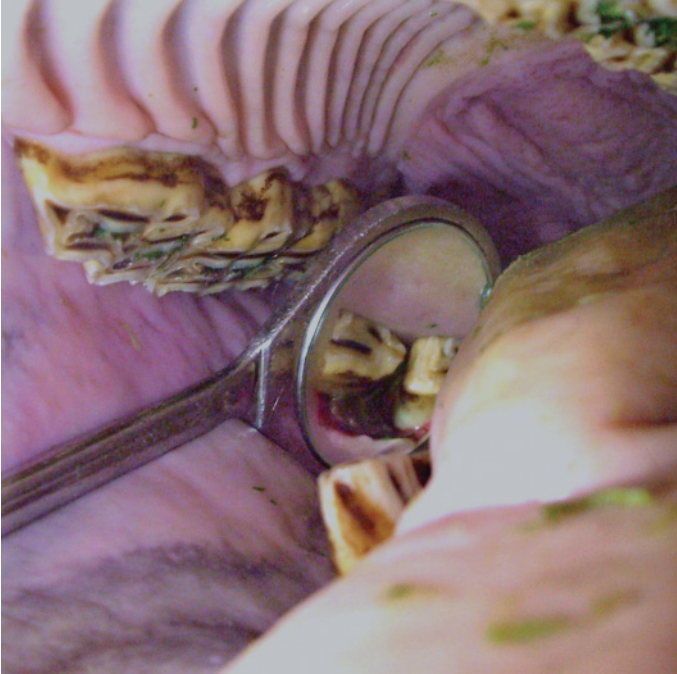


Figure 1.19b Same horse in fig. 1.19a; large periodontal pocket after cleaning trapped feed from interproximal space. Pockets of this size likely indicate bony involvement and radiography is warranted to assess the severity of the disease.

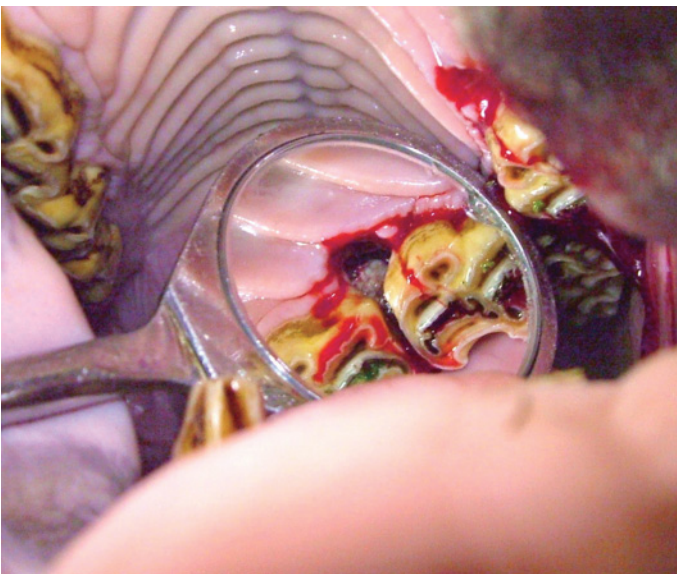


Figure 1.19c Same horse in fig. 1.19a; diastema and periodontal pocket between 506 and 507 after feed material was cleaned out. The grey tissue deep within the pocket is actually a free-floating "foreign body." Histological examination revealed that it was bone.

Figure 1.20 A 5-year-old paint mare with lingually displaced 308. The mirror is placed between 307 and 308. Feed is trapped at the lingual aspect of that interproximal space causing periodontal disease.



Figure 1.21 A 9-year-old Warmblood mare with lingual periodontal pocket at 410/11. Packed feed is visible in both views: the lingual (mirror) and the buccal aspect view. An overlong distal 411 has already been reduced. Excessive crown at the distal 311 or 411 may predispose to interproximal small diastema formation due to abnormal occlusal forces. Correction of malocclusions is sometimes curative. In other cases, primary treatment of the periodontal disease is also necessary.





Figure 1.22a Focal areas of enamel decay at 501 and 801. The focal nature of the lesion involving deciduous teeth necessitates no treatment.



Figure 1.22b Large area of enamel decay involving a permanent incisor. This incisor quadrant is also oligodontic. Radiographic examination is warranted to fully explore the dental pathology. Debridement and/or endodontic or restorative procedures may be indicated pending deep structure evaluation via radiography.

Figure 1.23 Peripheral cemental decay at the palatal aspect of 210 and 211. Note the normal yellow cementum on the palatal surfaces of 208 and 209. At 210 see darker staining roughened edge of a cemental “crescent” and a grey coating of “plaque” at the gingival margin marking early stage decay. At 211 see the underlying white enamel “skeleton,” denuded of its cemental covering. Feed stasis is a common cause of this condition. Underlying causes for feed stasis should be identified and corrected.



Figure 1.24a A 29-year-old Appaloosa gelding presented with dysphagia and acutely decreased water intake and loss of body condition. Diagnosis was chronic incisor periodontal disease with cemental hypoplasia. Radiographs showed predominantly cemental hypoplasia. The 102, 303, and 403 were grade 3 loose and were extracted. Water intake and feed consumption immediately returned to normal.

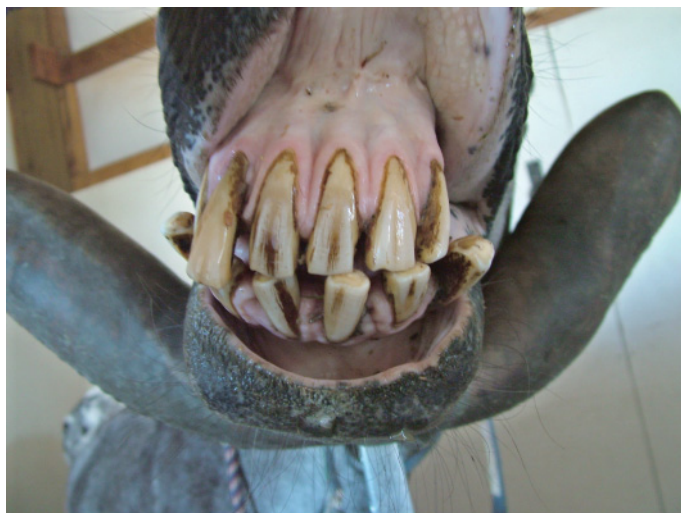




Figure 1.24b A 29-year-old Warmblood with chronic incisor periodontal disease. This disease is characterized by a concurrent cemental hyperplasia. This case displays predominantly cemental hyperplasia. None of the incisors are loose. Regular examination and periodic radiographs are recommended to monitor progress.



Figure 1.25 Severe calculus accumulation over and around 404. The 304 is also affected although to a lesser extent. Canine calculus can be a symptom of more severe periodontal disease. Careful examination of the affected tooth and its periodontal tissues is warranted in all cases of calculus formation.

Figure 1.26a Geriatric wear in an older horse, approximately 27 years old. Note the loss of transverse ridges on occlusal surfaces. Much of the enamel is worn away leaving smooth dentin and cementum. Commonly referred to as “cupped,” these occlusal surfaces have significantly reduced grinding ability. Dietary management may be necessary to meet this older horse’s nutritional needs.

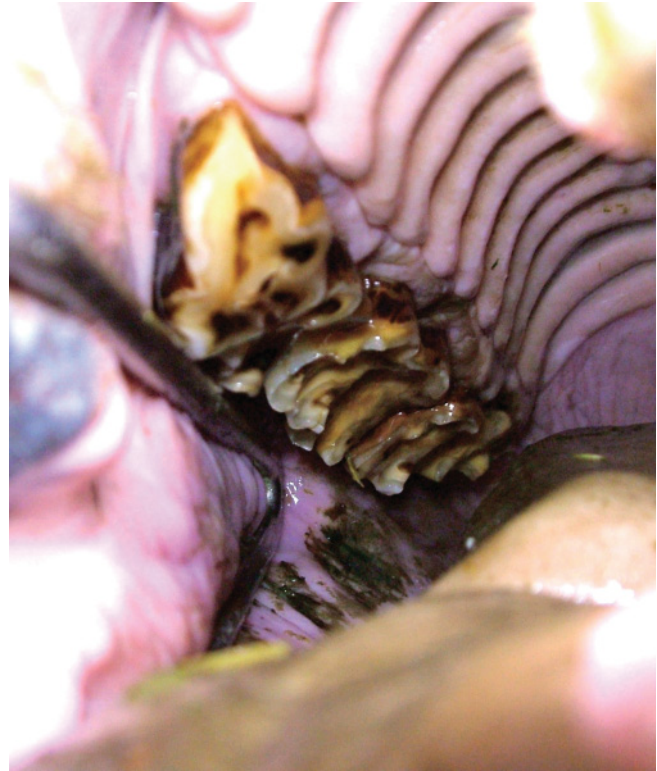
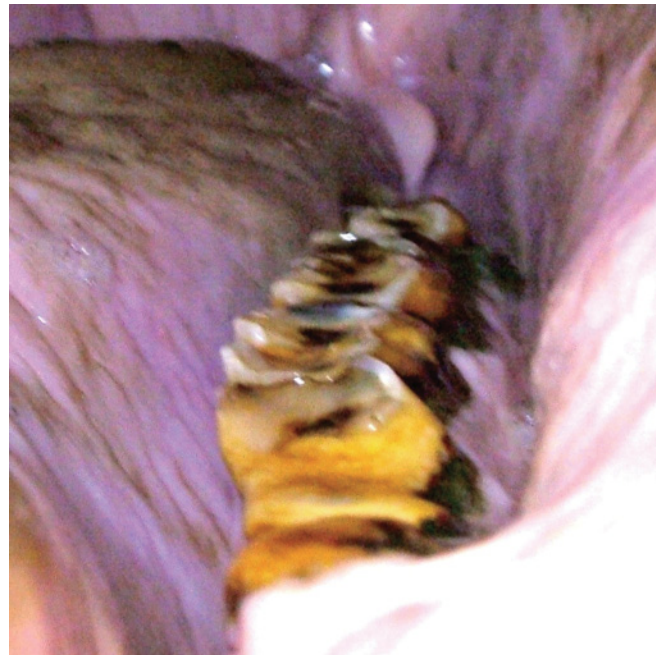


Figure 1.26b Geriatric wear involving mandibular cheek teeth in same horse in 1.26a. Note extreme wear at 306 and mesial 307. These teeth are often referred to as “smooth.”



Teeth Eruption and Retained Deciduous Teeth “Cap”

1



Figure 1.27 Typical appearance of erupting teeth in a 3-year-old patient. The 106 is erupted and very recently in wear. Tooth 107 is visible beneath its deciduous predecessor (507). The 507 in this stage is commonly referred to as a “cap.” Deciduous teeth normally exfoliate spontaneously but if encountered during dental examination, it is safer to remove them if they are loose and the permanent tooth is visible beneath them. Premature removal of deciduous caps may result in damage to the permanent tooth.



Figure 1.28 Retained 803 in a 5 1/2-year-old. Extraction is necessary to allow proper positioning of 403 and to avoid feed accumulation between teeth. Presence of even small root fragments from deciduous teeth can inhibit proper positioning of permanent teeth.

Figure 1.29a Retained tooth 802 in a 4-year-old Thoroughbred gelding. Note that tooth 302 is in normal position and in wear. Tooth 703 is still present. Tooth 803 is still present, and normally located. The right mandibular intermediate incisor is deciduous (802) and there is a permanent incisor erupted out of position distal to the rest of the arcade. Tooth 802 should be extracted.



Figure 1.29b Same horse in fig. 1.29a. Retained tooth 802 was extracted. Note no evidence of radicular resorption.





Figure 1.30 Crowding of 102 in a 3 year old. The 503 is preventing the 102 from full eruption into its normal position. Early detection and treatment may prevent permanent incisor malocclusions or periodontal disease.

Wolf Teeth



Figure 1.31 Very large wolf teeth in a 2-year-old Thoroughbred. Note that the mesial and buccal surfaces of the 506 and 606 have been previously rounded into a "bit seat" and wolf teeth have been reduced but not extracted. Large wolf tooth crown does not necessarily indicate a large root or a difficult extraction. Current recommendations are that wolf teeth be extracted before training to the bit. This is done to avoid "bit" discomfort. Excessive transverse ridges at the 109 and 209 are also present.

Figure 1.32 Atypical palatal location of wolf teeth in a yearling. Care should be taken when extracted to avoid the palatine artery.



Figure 1.33 Iatrogenic soft tissue injury to the gingiva making a small wolf tooth fragment visible just palatal to 206. Wolf tooth fragments can cause biting discomfort and should be removed when identified. They can result from fracture at the time of initial extraction or may be rudimentary or polydontic and not visible at earlier examinations.



Deviation of the Maxilla

1



Figure 1.34 “Wry nose” in a 2-year-old Thoroughbred colt. His maxilla deviates to the right.

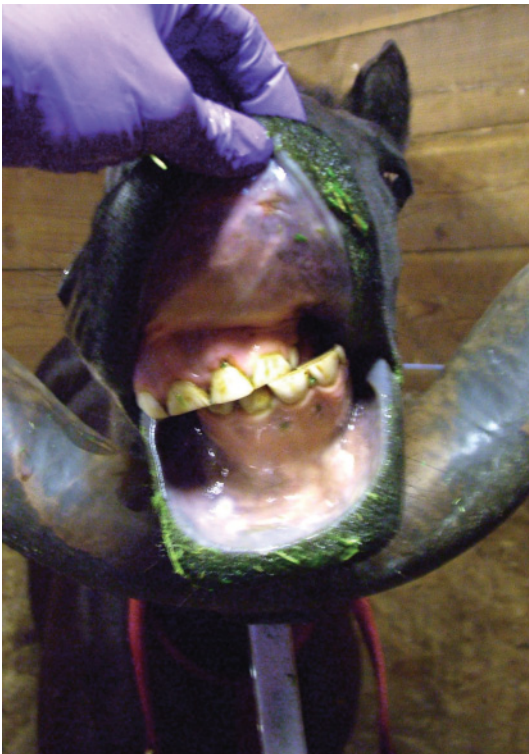


Figure 1.35 Same horse in fig. 1.34. Note the diagonal incisor malocclusion (DGL3) as a result of the deviation of the maxilla. This is a marked mandibular offset. Such malocclusions cannot be “corrected” but should be treated regularly to minimize overlong crown to maintain functional cheek teeth occlusion. If left unchecked as in this horse, it may progress to functional failure. This case exhibited other abnormalities including oligodontia, multiple diastemae, periodontal disease, and enophthalmos. See Diseases of the Respiratory System (Chapter 3) and Diseases of the Neonates (Chapter 12).

Asynchronous Teeth Eruption

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Figure 1.36 A 4-year-old horse with an overlong tooth 109. Note the difference in crown height when compared to tooth 110. Probable cause is asynchronous eruption. Tooth 109 likely erupted slightly before the 409. Failure to address this condition in the young horse can result in “wave” malocclusion.



Fractured Tooth

Figure 1.37a Cursory examination of the 200 teeth arcade reveals abnormality at the occlusal surface of tooth 209. When viewed with a dental mirror, a missing portion of the palatal crown was noted. Mirror also showed two small dental fragments embedded in the gingiva and mild superficial decay due to feed impaction.

