

Contents

Preface: It's not Just Dentistry, It's Dentistry and Oral Surgery! **xi**

Alexander M. Reiter

Designing and Equipping a Modern Dentistry and Oral Surgery Suite **1**

Stephen Juriga and Sharon Startup

Veterinary practices should consider designing and equipping a dedicated space to provide companion animal dental and oral surgical care. A single or multi-table dental suite design will allow organized and efficient delivery of dental care. Each workstation should be equipped with a procedural table that will allow for drainage, shadow-free procedural lighting, an anesthetic machine with monitoring, thermal support, anesthetic scavenger system, dental radiographic equipment, and an air-driven dental delivery system. Lift tables, dental-specific seating, swivel handpieces, and head-lamp/surgical loupe lighting should also be considered to improve ergonomics.

Communication, Veterinary–Client–Patient Relationship, and Teledentistry **25**

Brenda L. Mulherin and Kristin M. Bannon

Communication is the basis of any relationship. Communication can help strengthen the relationship between veterinarians, their clients, and their colleagues throughout the profession. Different models of communication have been demonstrated including the directive model, consumerism model, and relationship-centered model. When veterinarians refer to a specialist, they view the referral as an extension of the care they provide. Therefore, developing a relationship with the specialist is an important facet of patient care. Creating an appropriate veterinary–client–patient relationship (VCPR) helps the patient receive the best care possible. This needs to be considered when offering telemedicine or teledentistry to clients or referring veterinarians.

Role of the Veterinary Technicians and Hygienists in Veterinary Dentistry and Oral Surgery **49**

Mary L. Berg and Jeanette M. Eliason

It is important to remember that dentistry is one area of the veterinary practice that veterinary technicians/nurses/hygienists can take ownership of and drive the dental program forward under the supervision of a veterinarian. With proper training they can perform all skills except diagnosis and surgery. The veterinary technician/nurse/hygienist should educate the client about the dental procedure, perform a thorough oral examination and report findings on the dental chart, take dental radiographs, perform dental scaling and polishing, administer nerve blocks, administer periostealics, maintain instruments and equipment, and provide discharge and home care instructions to the pet owner.

Diagnostic Imaging of Oral and Maxillofacial Anatomy and Pathology

67

Lenin A. Villamizar-Martinez and Anson J. Tsugawa

This article describes the technical principles and indications for the most often encountered diagnostic imaging modalities in veterinary dentistry and oral surgery; with extensive coverage of intraoral (and extraoral) dental radiographic imaging and interpretation through detailed example figures of common dental and maxillofacial diseases in the dog and cat. Multidetector/multislice computed tomography (MDCT/MSCT) and emergent technologies such as cone-beam computed tomography (CBCT) are presented here in detail. Magnetic resonance imaging (MRI) and diagnostic ultrasound, which are used less frequently, are briefly discussed.

Oral Microbiome in Dogs and Cats: Dysbiosis and the Utility of Antimicrobial Therapy in the Treatment of Periodontal Disease

107

Eric M. Davis and J. Scott Weese

Advances in gene sequence technology and data analysis have enabled the detection and taxonomic identification of microorganisms *in vivo* based on their unique RNA or DNA sequences. Standard culture techniques can only detect those organisms that readily grow on artificial media *in vitro*. Culture-independent technology has been used to provide a more accurate assessment of the richness (total number of species) and diversity (relative abundance of each species) of microorganisms present in a prescribed location. The microbiome has been defined as the genes and genomes of all microbial inhabitants within a defined environment. Microorganisms within a microbiome interact with each other as well as with the host. A microbiome is dynamic and may change over time as conditions within the defined environment become altered. In oral health, neither gingivitis nor periodontitis is present, and the host and microbiome coexist symbiotically without evoking an inflammatory response. The circumstances that cause a shift from immune tolerance to a proinflammatory response remain unknown, and a unified, all-encompassing hypothesis to explain how and why periodontal disease develops has yet to be described. The purpose of this review is to clarify the current understanding of the role played by the oral microbiome in dogs and cats, describe how the microbiome changes in periodontal disease, and offer guidance on the utility of systemic antimicrobial agents in the treatment of periodontitis in companion animals.

The Relationship Between Periodontal Infection and Systemic and Distant Organ Disease in Dogs

121

Colin Harvey

Infection in the mouth causes systemic and distant organ changes in dogs. This article summarizes the information available. Reported changes include an increase in liver-generated acute-phase proteins in response to the infectious insult to the body and evidence of microscopic changes in renal, hepatic, and cardiac tissues. Treatment of periodontal infection results in a decrease in the acute-phase protein concentration, which supports the hypothesis that a cause-and-effect relationship exists between periodontal infection and distant organ changes.

Management of Dental and Oral Developmental Conditions in Dogs and Cats 139

Stephanie Goldschmidt and Naomi Hoyer

Developmental dental and oral disorders are present in juvenile patients less than 12 months of age. The conditions are diverse ranging from cosmetic only to requiring advanced surgical intervention to alleviate pain and secondary complications. Clinical presentation, diagnosis, and appropriate treatment of dental abnormalities including abnormalities in the number, structure, size, and shape of teeth, as well as oral abnormalities including malocclusions, congenital cleft lip and palate, developmental abnormalities resulting in bony proliferation, and soft-tissue abnormalities of the lip and tongue are discussed throughout the article.

Management of Severe Oral Inflammatory Conditions in Dogs and Cats 159

Jamie G. Anderson and Philippe Hennet

Severe oral inflammatory disease is not uncommon in the mouths of canine and feline patients. An approach to oral diagnosis is offered. This article discusses a brief review of important points in the oral diagnosis and management of main canine (canine chronic ulcerative stomatitis (CCUS), eosinophilic stomatitis, and Wegener's granulomatosis (WG)) and feline diseases (feline gingivostomatitis/caudal stomatitis, oral eosinophilic lesions, pyogenic granuloma, and autoimmune diseases with oral manifestations), and—whereby possible—information about the current understanding of disease pathogenesis and treatment is offered.

Update on Endodontic, Restorative, and Prosthodontic Therapy 185

Brian Hewitt and Curt Coffman

Endodontic therapy is intended to preserve the function of mature teeth with irreversible pulpitis or pulp necrosis or to maintain the vitality of endodontically compromised immature teeth. Standard root canal therapy and vital pulp therapy are 2 mainstays of endodontic treatment. Recent knowledge has improved the outcomes of endodontic treatment with newer materials, such as mineral trioxide aggregate. Composite or prosthodontic crown restoration is also a critical key to success.

Virtual Surgical Planning and 3D Printing in Veterinary Dentistry and Oromaxillofacial Surgery 221

Graham P. Thatcher and Jason W. Soukup

Virtual surgical planning and three-dimensional (3D) printing are preoperative processes requiring the acquisition of high-quality imaging data. A surgical treatment plan is created and rehearsed virtually as the operator manipulates the 3D images of the patient within the software. When the operator is satisfied with the plan, including anticipated osteotomies, tumor excision margins, and reconstruction options, physical 3D prints can be produced. This article introduces the reader to the basic concepts involved in virtual surgical planning and 3D printing as well as their implementation in veterinary oromaxillofacial surgery.

Oral and Maxillofacial Tumor Management - From Biopsy to Surgical Removal 235

Ana C. Castejón-González and Alexander M. Reiter

The main objective of oral and maxillofacial (OMF) tumor resection is to get local control of the disease. Many OMF tumors can be cured with wide or radical surgery, whereas others might only achieve temporary local control of the disease by removing gross disease, infection and the source of pain, thereby improving the quality of life of the patient while keeping masticatory function. The standard of care on managing OMF tumors includes the diagnosis and identification of the local and distant extension of the disease to establish an appropriate treatment plan tailored for each patient. In this article, we provide a practical review of the current information related to staging, biopsy, and main surgical techniques for OMF tumor removal.

Patient Triage, First Aid Care, and Management of Oral and Maxillofacial Trauma 271

Christopher J. Snyder and Charles Lothamer

Maxillofacial trauma is a common presentation in veterinary medical practice. Accurate assessment, diagnostics, pain management, and finally repair are tenants to treatment. In addition to typical tenants for fracture repair, the restoration of occlusion and return to function (eating, drinking, grooming) are unique to trauma management in these patients. Options for repair include conservative management (tape muzzles), noninvasive repair techniques (interdental wiring and composite splinting), and invasive repair techniques (interfragmentary wiring and plate and screw fixation).