Open up and say, “AHH”! What you are missing in an everyday oral exam

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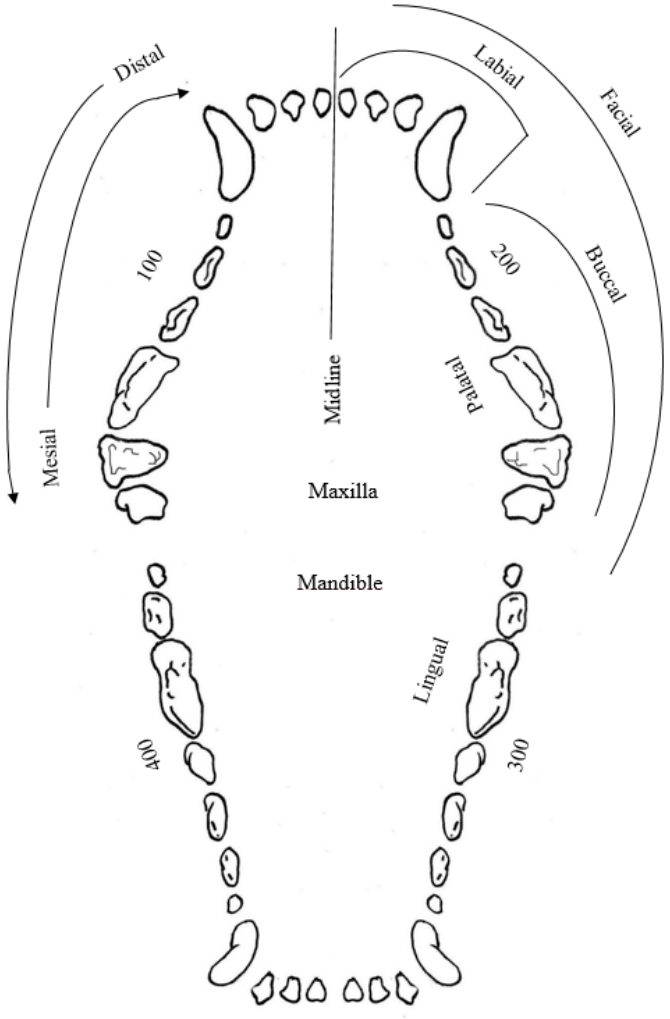
As a patients’ primary veterinarian, the general practitioner is tasked with assessing all major systems of their patients in a very short amount of time. The oral exam is vital in that it can be an area of insidious pathology and discomfort that is often overlooked. The objective of this lecture is to highlight important features of the awake oral exam in adult dogs and cats to enable the general practitioner to make clinical decisions that can improve the overall quality of the animal’s life.

Adult canine dental formula and directional nomenclature:

2 X (3/3I, 1/1C, 4/4PM, 2/3M)=42



The oral exam starts with assessing the symmetry of the muzzle and skull for signs of swelling or muscle wasting. This includes palpation of the lymph nodes and salivary glands for signs of enlargement or varying degrees of firmness. Assessing the muscles of mastication and soft tissue for any signs of wasting or swelling related to pathology such as abscess or cellulitis also needs

to be addressed. Retropulsion of the eye may be indicative of a retrobulbar swelling, pain or possibly an oral mass.

As you begin to assess the oral cavity, a bright light or surgical loupes are extremely beneficial to pick up subtle changes. The next step begins with assessment of the occlusion by a simple lifting of the lip to get a general impression. It is important to keep the mouth closed to best assess the length of the mandible and maxilla in relation to each other, as well as, to assess alignment of the individual teeth. A cotton swab or tongue depressor may be utilized to assess the dentition in smaller animals that may be aggressive. In dogs, the eruption of the adult dentition begins at 3-4 months of age with the permanent incisors and normally ends between 6-7 months with the eruption of the canines. Breed specific differences result in 3 major skull types: brachycephalic (Boxers, Pugs, Shih tzus), mesaticephalic (Labrador and Golden Retriever, Beagle), and doliocephalic (Collie, Borzoi).

Missing teeth is a frequently overlooked aspect of the oral exam that can result in pathology. In brachycephalic breeds, such as Boxers, Shih tzus, Boston terriers and Pugs, missing mandibular first premolars are most common. All missing teeth require intraoral radiographs to assess for the presence of retained roots, or impacted, embedded, unerupted or truly missing teeth (tooth agenesis). Impaction of teeth, especially the first premolar, is of concern due to its potential for forming dentigerous cysts.

Fractures of the teeth can range in severity from simple uncomplicated crown fractures, to complicated crown fractures and crown root fractures with pulp exposure. Fractures are identified by the location of the fracture and the presence or absence of pulp exposure.

- Classification of Fractures
  - Uncomplicated crown fracture (T/FX/UCF) – a fractured crown without pulp exposure
  - Complicated crown fracture (T/FX/CCF) – a fractured crown with pulp exposure
  - Uncomplicated crown root fracture (T/FX/UCRF) - a fracture of the crown and root without pulp exposure
  - Complicated crown root fracture (T/FX/CCRF) – a fracture of the crown and root with pulp exposure
  - Root fracture (T/FX/RF) – crown is intact, only the root is fractured

Pulp exposure requires more advanced endodontic treatment such as vital pulp therapy or root canal therapy to save the tooth. However, extent of the fracture may dictate that surgical extraction is the best option. The region of concern for pulp exposure can be assessed using the explorer end of a periodontal probe or a small endodontic file such as a pathfinder. Differentiation between pulp exposure and tertiary/reparative dentin becomes important. Abrasion with associated tertiary/reparative dentin feels glassy smooth and is indicative a lack of pulp exposure. If the explorer submerges or catches in the defect, this is often indicative of pulp exposure. It is important to note that it is possible to have pulp exposure with abrasion as well. Intraoral radiographs may reveal root fractures which often require more complex gingival flaps and bone removal for retrieval. Root fractures can also lead to mobility of the crown. The general

practitioner's level of comfort with extraction or the client's desire for endodontic therapy belies referral.

Discolored teeth are often indicative of a non-vital tooth and the color changes represent intrinsic staining. This staining is from hemorrhage of the pulp vasculature into the confined space of the pulp canal from a traumatic or concussive event. The breakdown products of the blood then seep into dentinal tubules causing the discoloration. These teeth can become painful and lead to infection over time. A small, raised, fistulous at the level of the mucogingival junction is an indicator of pulp necrosis, infection and correlates with periapical bone lysis. Extraction or root canal therapy are options. A draining tract seen in the skin ventral to the orbit is the classic appearance of a maxillary carnassial tooth abscess.

By far the most common disease in companion animals is periodontal disease. Periodontal disease is caused by the body's immune reaction to plaque and calculus that leads to gingivitis, bone resorption, loss of periodontal ligament and gingival recession. Periodontal disease is classified into 4 grades based on attachment loss. Attachment loss is tissue recession usually seen as loss of bone height, root exposure and pocketing.

- Grade 1 Periodontal disease - Gingivitis only
- Grade 2 Periodontal disease - <25% attachment loss
- Grade 3 Periodontal disease - 25-50% attachment loss
- Grade 4 Periodontal disease - >50% attachment loss

Periodontal disease is initiated by an autoimmune response to plaque. Initially the gums appear red and swollen due to inflammation. This gingivitis is reversible with treatment. Left untreated, plaque hardens into calculus and along with a shift from gram positive to gram negative bacteria, the inflammation becomes more severe. This is followed by inflammatory cells infiltrating the junctional epithelium. Grossly, moderate to severe periodontal disease can show any or all signs including gingivitis, purulent discharge, halitosis, gingival recession, and bone loss. Significant bone loss can lead to mobility of the affected teeth. An awake oral exam and thorough history, can aid in the general assessment of the severity of periodontal disease, but a sedated exam with dental radiography and probing is necessary to truly quantify and grade the severity of the disease. Severe periodontal disease can lead to local disease that may affect other systems. Oro-nasal fistulas can occur when severe periodontal disease leads to bone loss and a communication between the oral and nasal cavity. It is commonly seen on the palatal aspect of maxillary canines of Dachshunds and can lead to sneezing and purulent nasal discharge. It may not be identified on the awake oral exam and may require sedation or anesthesia to fully assess, using a periodontal probe and dental radiographs.

Crowding and rotation of teeth is often seen in the cheek teeth of brachycephalic breeds. The crowding can predispose the teeth to plaque accumulation and periodontal disease and can make the teeth difficult to maintain with tooth brushing. Severe periodontal disease in brachycephalic breeds can lead to severe bone loss. The combination of crowding and large tooth-to-jaw ratio can mean significant loss of bone in the smaller mandible of these breeds and smaller breeds like

Yorkies and Chihuahua. This leads to loss of jaw integrity and subsequently pathologic or iatrogenic fracture.

Gingival hyperplasia is a disease commonly found in Boxers and occasionally in other breeds that involves gingival reaction to immune stimulation caused by plaque and calculus resulting in gingival enlargement. These lesions can create significant pocketing and lead to progressive periodontal disease.

Tooth resorption in dogs is a common pathology. An oral exam is often not adequate to diagnose many of the types of resorption noted in the canine patient. On oral exam, a pink hue to the crown can be indicative of tooth resorption. Assessing the cervical portion of the crown with an explorer may reveal a characteristic catch or "ting" that resorptive lesions often provide. Full mouth intraoral radiographs are needed to more adequately assess resorptive lesions and determine whether these lesions require monitoring, extraction or crown amputation.

Tooth resorption is one of the most common pathologies of the dental tissue in cats with potentially up to 75% of the cat population affected. While the disease is common, the cause is not completely understood. The gradual loss of the crown and roots of the tooth often lead to the teeth becoming weak and in some cases fracturing. The changes can sometimes be subtle and an exam and imaging under anesthesia is needed to definitively diagnose tooth resorption in some teeth. If tooth resorption is diagnosed, a crown amputation may often be performed.

A caries lesion is defined by hard tissue loss due to bacterial infiltration resulting in the decay of enamel and dentin. These lesions are most often noted as dark brown/black spots on the occlusal surfaces of the maxillary first molar tooth, though caries may be identified on virtually any tooth surface. They can have a sticky/tacky feel when probed with an explorer and can be painful. Without intervention, these lesions can penetrate the pulp cavity leading to pulp infection and necrosis. If noticed early these lesions can be restored.

Ultimately, a thorough and comprehensive awake oral exam can justify the need for more significant work-up and progress to a sedated exam, intraoral radiographs, and possible referral for more advanced imaging and surgery. It can also help to create a more accurate treatment plan and set expectations for owners about treatment. Identification of these pathologies can lead to more successful outcomes for long-term comfort and maximized quality of life.

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