Growing Pains: Congenital and Juvenile Oral Issues in Dogs and Cats

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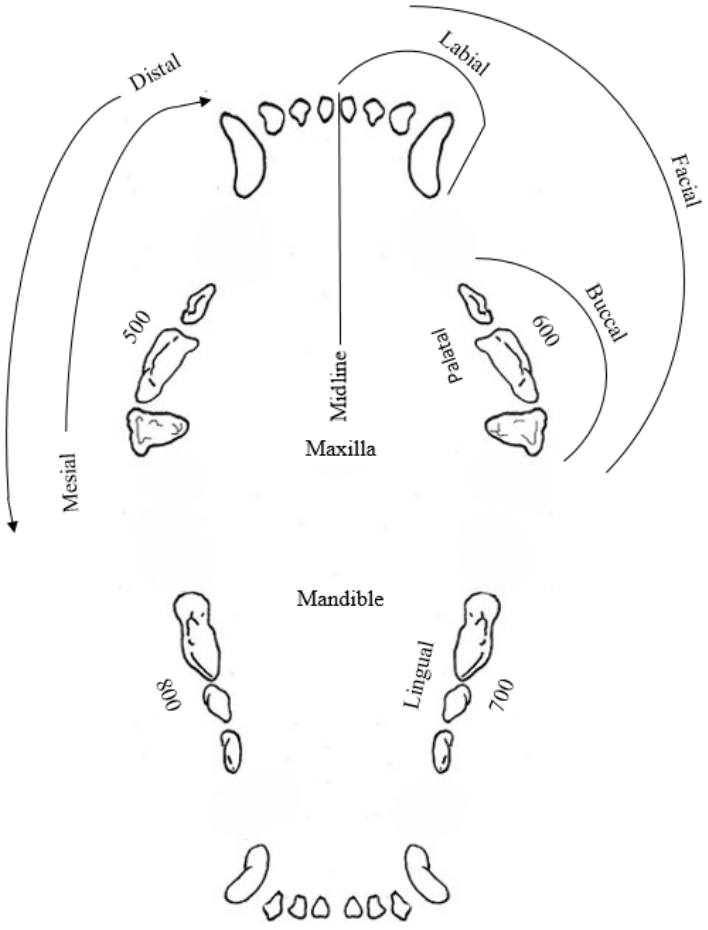
As a patient's primary veterinarian, the general practitioner is tasked with assessing all major systems of their patients in a very short amount of time. At an early age, the oral exam is vital in that it can be an area of insidious pathology and discomfort that is often overlooked. The objective of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

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.

<u>Deciduous canine dental formula and directional nomenclature:</u>

2 X (3/3i, 1/1c, 3/3pm)=28 teeth



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, and 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. The deciduous dentition usually erupt around 3-4 weeks, which is prior to the puppy's first exam, though the premolars may take up to 12 weeks. Once the occlusion has been checked, individual teeth should be assessed for signs of fracture, malocclusion or delayed eruption/missing teeth. Extraction of fractured deciduous teeth is advised to avoid infection, and potential damage to the developing tooth bud.

Teeth eruption schedules for the dog

	Deciduous teeth (weeks) Dog	Permanent teeth (month) Dog
Incisors	3-4	3-5
Canines	3	4-6
Premolars	4-12	4-6
Molars	—	**5-7**

Malocclusions of the deciduous/primary dentition can often lead to behavior that is associated with normal play in a young animal and therefore get overlooked. For example, certain malocclusions can cause soft tissue trauma when the mouth is closed and may be relieved by the animal holding a toy in their mouth. Keeping the mouth slightly ajar, allows for relief from the traumatic contact. Malocclusions are divided into four classes:

- Class 1 malocclusion (MAL1)/neutrocclusion – normal upper/lower jaw length, but one or more teeth are out of alignment.
  - This type of malocclusion is further classified by the direction for which the offending teeth are tipped
    - MAL1/BV = Buccoversion
    - MAL1/DV=Distoversion
    - MAL1/LABV=Labioversion
    - MAL1/LV= Linguoversion
    - MAL1/MV=Mesioversion
    - MAL1/PV=Palatoversion
  - Crossbite describes position of an incisor deviation from normal and can be either a rostral crossbite (CB/R) or a distal crossbite (CB/D).
- Class 2 malocclusion (MAL2) – Symmetrical malocclusion where lower jaw/mandible is shorter than the upper jaw/maxilla

- Class 3 malocclusion (MAL3) – Symmetrical malocclusion where upper jaw/maxilla is shorter than the lower jaw/mandible. In a class 3 malocclusion, maxillary incisors can traumatize the periodontal structures of the mandibular incisor and canine teeth.
- Class 4 malocclusion (MAL4) – Asymmetrical malocclusion in rostrocaudal, side-to-side, or dorsoventral direction
  - MAL4/DV, MAL4/RC, MAL4/STS

A common problem of puppies and young adult dogs involves linguoverted or "base narrow" canines. In this malocclusion, the canine teeth are tipped toward the palate or lingual tissue causing trauma to the soft tissue and opposing teeth. An example would be a class 1 or 2 malocclusion with linguoverted mandibular canines. In this case, the canines make contact and cause trauma to the palate. Treatment of the deciduous teeth involves extraction to relieve the trauma to the palate and allow permanent teeth more room to erupt. Ball and digital therapies can be instituted at the time of adult eruption to encourage permanent teeth to flare into a normal or comfortable position.

If adult mandibular canine teeth are linguoverted, and conservative management does not result in a normal or comfortable bite, surgical measures are instituted. These measures are often instituted between 6-7 months of age, after the adult teeth have completed eruption. These treatments can include extraction, orthodontic movement or crown shortening with vital pulp therapy.

Extraction offers a solution to the discomfort of soft tissue trauma caused by abnormal contact of the offending teeth. The most common teeth causing trauma in malocclusions include the canines. These teeth are responsible for grasping and holding of food and objects. While extraction is the simplest solution, it means loss of the function of the tooth and potential aesthetic changes that are often undesirable to the pet owner.

Orthodontic movement can be used in cases where permanent teeth erupt abnormally and are causing discomfort. Most commonly these offending teeth are linguoverted/"base narrow" canines. Coronal extenders and active force orthodontics can provide movement of teeth into comfortable, functional and sometimes normal occlusions in just a few weeks. After movement, the newly positioned teeth are often held in their new position by adjacent teeth acting as a natural retainer. While orthodontics can be very useful, they require anesthesia to place and remove appliances and occasionally additional anesthesia for adjustments. Orthodontics also requires a dedicated owner as oral hygiene is extremely important when orthodontic appliances are in place.

Crown shortening and vital pulp therapy (VPT) can offer resolution of trauma and continued function of the offending teeth if orthodontic movement is not an option. Vital pulp therapy requires follow-up at 6 months, 12 months and yearly. Crown shortening and VPT is a surgical procedure that involves pulpectomy, placing a dressing on pulp tissue to encourage dentin formation, followed by a restoration. The goal is to shorten the crown, while maintaining vitality of the tooth.

In cats, palatoversion of the upper fourth premolar teeth can lead to chronic trauma to the soft tissues of the lower jaw. This contact is often buccal to the lower first molar tooth and the chronic inflammation leads to pyogenic granulomas. This may be treated with blunting and

bonding of the cusp of the upper fourth premolar tooth. Ultimately, extraction of this tooth may be needed. The lower first molar is often victim of this chronic trauma and may require extraction as well.

Examination of the full permanent dentition should be performed to assess for the presence of all adult teeth. Congenital disorders of teeth such as bigeminy and supernumerary teeth are often incidental findings. Enamel defects may occur as an abnormality during enamel development. Enamel hypoplasia is a hereditary abnormality that has been identified in Standard Poodles, Italian Greyhounds and Samoyeds. It can result in a roughened surface that is more prone to adhering plaque. This leads to the crown of the tooth often having a yellow-brown stain. Enamel hypoplasia can also be seen in dogs exposed to distemper or a fever in utero or during permanent tooth development. These teeth are more susceptible to abrasion and fracture.

Breed specific differences identified in the oral exam can be helpful to quickly distinguish normal from pathology. Brachycephalic breeds normally have a class 3 malocclusion and are often subject to crowding and significant periodontal disease. Missing, impacted or unerupted teeth are common in breeds such as Boxers, Shih Tzus, Boston terrier and Pugs. These breeds often require dental radiographs to differentiate impacted, unerupted or truly missing teeth (tooth agenesis). While the extraction of impacted teeth can sometimes be through a simple flap and elevation, cone beam CT (CBCT) is desirable (but not always available) to identify pathology hidden by the superimposition of intraoral radiographs. Impaction of teeth, especially the first premolar, is of concern due to its potential for forming dentigerous cysts, the most common type of odontogenic cyst found in dogs.

Completion of the oral exam involves examination of the size and symmetry of the tongue and the soft tissues of the caudal oral cavity including the tonsils, hard and soft palates. Congenital disorders of the soft tissues and bone such as cleft lip and primary or secondary cleft palate often require specialized surgical intervention to prevent more severe and chronic disease.

Ultimately, a thorough and conscientious 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. Identification of these pathologies at an early age can lead to more successful outcomes for long-term comfort and maximized quality of life.

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