How to Recognize Common and Uncommon Dental and Oral Lesions in Dogs
Sandra Manfra Marretta, DVM, DACVS, AVDC
University of Illinois
Urbana, IL

The recognition and treatment of canine dental and oral lesions are important components in the successful management of canine health. Many dental and oral lesions occur frequently in dogs but may have a variety of presentations and treatment options. Commonly occurring canine dental and oral lesions include: variations in number of teeth and roots, periodontal disease, endodontic disease, dental caries, dental attrition/abrasion, discolored teeth and oral masses (benign and malignant).

Variations in number of teeth and roots

Dogs normally have 42 adult teeth. The permanent dental formula in the dog is as follows: 2(I3/3C1/1P4/4M2/3). Oligodontia or decreased number of teeth is more common in dogs than cats. Although oligodontia is not a serious medical problem, it can be a problem for breeders since it is considered a genetic imperfection. Puppies with missing deciduous teeth will also be missing the same adult teeth.

Supernumerary teeth or extra teeth may result in crowding and malalignment of teeth predisposing to the development of periodontal disease. Various teeth in the dog may be supernumerary. Supernumerary teeth that are not causing crowding or malalignment of teeth require no treatment. Supernumerary teeth that result in crowding should be extracted. Prior to extraction supernumerary teeth should be radiographed to evaluate their root structure. It is important to differentiate supernumerary teeth from overly retained deciduous teeth. In dogs, the canine teeth are the most frequently retained teeth, however, the incisors and premolars may also be retained. Retained deciduous teeth should be extracted as soon as they are diagnosed so that permanent teeth may erupt into their normal positions. When retained deciduous teeth are not removed, permanent teeth are deflected lingually, except maxillary canine teeth, which are deflected rostrally. Deciduous teeth are smaller than their permanent counterparts. When difficulty is encountered in determining which tooth is deciduous and which tooth is permanent a dental radiograph should be taken. The root of the permanent tooth in a 6-month-old animal will have a wide pulp canal with thin dentinal walls and an open apex compared to the deciduous teeth which will have a much thinner but more developed root.

Occasionally teeth may have extra roots this condition is known as supernumerary roots. Supernumerary roots are generally incidental findings on oral examination and generally occur as extra roots in teeth that normally have only two roots. It is important to recognize the normal and abnormal root structure in teeth requiring extraction. This permits appropriate sectioning prior to extraction. Dental radiographs can also assist in the localization of supernumerary roots.

Periodontal disease

Periodontal disease is the most common disease affecting dogs today. The common clinical presentations of periodontal disease in the dog include mobile teeth, periodontal and periapical abscesses with secondary facial swelling, gingival recession and furcation exposure, mild to moderate gingival hemorrhage, and deep periodontal pockets with secondary oronasal fistulas resulting in a secondary chronic rhinitis. Less frequently, severe gingival sulcus hemorrhage, pathologic mandibular fractures, painful contact buccal mucosal ulcers, intranasal tooth migration, benign gingival masses and osteomyelitis have been reported.

The treatment of periodontal disease is based on one major factor: a clean periodontium results in a healthy periodontium. There are numerous treatment modalities associated with the management of periodontal disease. These treatment modalities include: supragingival and subgingival scaling, root planing, subgingival curettage, polishing/irrigation, gingivectomy, open-flap curettage with augmentation of bony defects, treatment of endodontic/periodontic lesions, periosteums, exodontia, oronasal fistula repair, and home care. Prior to administration of various treatment modalities for periodontal disease a thorough assessment of the patient’s general health status is mandatory. Many animals with periodontal disease may have concurrent problems including diabetes, cardiopulmonary problems, hepatic, renal, and other metabolic problems. Once these diseases are recognized and managed appropriately, anesthetic protocols can be selected based on the individual patient’s requirements.

Endodontic disease

Endodontic disease refers to disease of the pulp, the inner aspect of the tooth. Dental trauma with or without pulpal exposure is the most common cause of endodontic disease in dogs. The canine teeth and the maxillary 4th premolars are the most frequently fractured teeth in dogs. Depending on the amount of tooth structure fractured off the pulp may or may not be exposed. A dental explorer is used to determine if the pulp has been exposed.

Fractured teeth are often noted as an incidental finding on physical examination. However, a series of events may occur in some fractured teeth with exposed pulp which can result in significant clinical presentations. This series of events includes the following
Dental caries
Dental caries is demineralization of the tooth and results in subsequent loss of tooth structure. Early dental caries may appear as a dark brown spot and have a sticky or slightly soft feel when probed with a dental explorer. Once dental caries perforates the enamel, the caries can progress rapidly in the dentin, destroying the tooth and eventually resulting in pulpitis and pain. This may be followed by pulpectomy and periapical infection. The teeth most commonly affected in dogs with dental caries are the maxillary first molar, and the mandibular first and second molar. When dental caries occur in the dog, the lesions are often multiple and advanced. Dental radiographs should be taken of teeth with dental caries to rule out any associated endodontic pathology. Treatment of dental caries includes extraction or restoration of affected teeth.

Dental attrition/abrasion and cage-biter syndrome
Dental attrition is the gradual and regular loss of tooth substance resulting from normal mastication. Excessive wear caused by malocclusion resulting in tooth-to-tooth contact is called pathologic attrition. Dental abrasion is the mechanical wear of teeth caused by mechanical wear other than by normal mastication or tooth-to-tooth contact such as wear caused by chewing rocks, cage bars, or wire. In cases of dental attrition the pulp responds to rapid wear by laying down tertiary or reparative dentin, which is visible as a dark brown spot on the affected tooth. The dark brown spot is solid and cannot be entered with a dental explorer. No therapy is usually required in these cases. Occasionally, very rapid dental attrition can result in pulpal exposure. These cases require endodontic therapy or extraction.

Cage-biter syndrome can be seen in dogs who chronically chew on their cage bars. The unique pattern of dental wear associated with cage-biter syndrome includes dental wear on the distal aspect of the canine teeth. Dogs affected by severe wear on the distal aspect of their canine teeth may present with severe maxillary or mandibular swelling. Endodontically diseased teeth may also cause nasal discharge or hemorrhage or ophthalmic signs. All endodontically diseased teeth should be either treated or extracted.

Discolored teeth
Hemorrhage or necrosis of the pulp results in lysis of red blood cells. This results in hemoglobin breaking down into pigments which penetrate into the dentinal tubules and result in a variety of discolorations of the affected tooth. The color of the traumatized crown may vary from pink-red to blue-gray or dark gray. When intrapulpal hemorrhage is minor the pulp may remain vital and the blood pigment may be resorbed and the crown discoloration may be temporary. In a recent clinical study reviewing the incidence of localized intrinsic straining of teeth due to pulpitis and pulpectomy in dogs, it was found that a distinct majority of teeth (92.2%) with pink/grey/tan crown discoloration had either partial or total pulp necrosis based on visual examination of the pulp during root canal therapy or exploratory pulpotomy. However, radiographic signs of endodontic disease were not present in 42.4% of affected teeth indicating that dental radiographs should not be relied upon to indicate pulp vitality in discolored teeth. This study recommended that all discolored teeth receive either endodontic or exodontic therapy. An obvious concern for practicing this treatment rationale routinely would be that vital, discolored teeth may undergo unnecessary endodontic therapy or extraction. However, the risk of unnecessary dental treatment would be acceptably low (<10%) in exchange for the assurance of potential pain alleviation.

Yellowish discoloration of teeth may be caused by tetracycline staining. When tetracycline is administered during pregnancy and the development of deciduous and permanent teeth, the tetracycline will combine with the calcium in the teeth to form a tetracycline-calcium orthophosphate complex that results in a yellowish discoloration of the teeth. To prevent tetracycline staining of teeth avoid administering tetracycline to pregnant and young animals.
Enamel hypoplasia is defined as an incomplete or defective formation of the organic enamel component. Enamel hypoplasia is caused by disruption of the ameloblasts during the first several months of life while the teeth are developing which may be associated with periods of high fever, infections (especially canine distemper), nutritional deficiencies, disturbances of the metabolism, and systemic disorders. Shortly after eruption, the soft, brittle enamel peels off exposing the underlying dentin which is soon stained yellowish-brown by extrinsic factors. In cases of enamel hypoplasia, there exists a deficiency in the thickness of the enamel: the defects in the enamel can be limited to a circumscribed area or be recognized as a single narrow zone of smooth or pitted hypoplasia. Disturbance in enamel formation over a longer period of time results in a more generalized distribution of lesions. When enamel hypoplasia is limited to a solitary tooth the most likely cause is trauma.

**Benign and malignant oral masses**

Oral tumors occur frequently in dogs and cats. Oral tumors account for approximately 6% of all malignant tumors in dogs with malignant cancer of the mouth and pharynx occurring 2.6 times more frequently in dogs than in cats. Oral tumors may be benign or malignant. Unfortunately, diagnosis of oral malignancies frequently occurs when the tumor is quite advanced, necessitating more extensive treatment. Thorough oral examination during routine physical examinations and during dental procedures can permit early detection of oral tumors providing patients with a better prognosis. Early diagnosis of oral tumors, appropriate staging, wide surgical resection and alternative treatment modalities can improve survival time.

When an oral mass is detected during a routine dental procedure a dental radiograph should be taken to determine the presence of underlying boney lysis which may be seen with malignant oral tumors. The mass should be biopsied to determine whether or not the tumor is benign or malignant. Biopsy of large oral masses must be deep, because superficial biopsies may reveal only inflammation or gingival hyperplasia. A deep wedge biopsy or a deep Tru-cut is recommended. The use of electrosurgery for obtaining oral tumor biopsies is not recommended.

Non-neoplastic reactive lesions that occur as a result of chronic low-grade irritation such as focal fibrous gingival hyperplasia and pyogenic granulomas occur at the gingival margin and are treated with a gingivectomy and treatment of the underlying cause of the inflammation which is most frequently periodontal disease. Sublingual and buccal mucosal areas of excessively loose mucosal folds that are indurated and hyperplastic secondary to repeated self-inflicted trauma have also been described as “gum-chewers lesions” because the behavior of dogs with these lesions may mimic that of a person aggressively chewing gum. These lesions may become quite large and may be painful when they are repeatedly traumatized by chewing on the lesions with the molar teeth. When these lesions become ulcerated and become a source of pain for the patient surgical excision is recommended. The resected tissue should be submitted for histopathologic evaluation to rule out the presence of neoplasia.

Malignant oral tumors require more aggressive surgical treatment to help prevent local recurrence including various partial mandibulectomy and maxillectomy procedures depending on the location of the oral tumor. It is important to properly stage all dogs suspected of having malignant oral tumors to rule out distant metastasis.

**References**


