

Pet Dental Scoring

1. Bad Breath

Bad breath (halitosis, malodor) is a very frequent problem in our pets. To a certain extent it can disturb the relation between the owner and the pet.

By far the most common origin of bad breath is the oral cavity. It is a result of bacterial metabolism of proteins, specifically sulphur-containing amino acids in dietary and salivary proteins.

Oral malodor is an indicator of accumulation of increased numbers of bacteria. Bad breath can be related to certain medical conditions of the oral cavity:

- Plaque and calculus and subsequent periodontal disease
- Abscessation of a dental root



- 1.1. Advanced plaque/calculus
- 1.2. Moderate periodontal disease
- 1.3. -5. Crown-root fracture before and after plaque and calculus removal (dental cleaning); dental x-ray showing the structures below the gum (severely affected root of a maxillary fourth premolar tooth)

2. Plaque and calculus

Calculus is the result of mineralisation of plaque with inorganic material from saliva. Calculus by itself is not harmful and does not cause periodontal disease (gum infection/gum inflammation). However, calculus provides an additional rough surface where bacterial plaque can form, causing gum inflammation and malodor. Excessive growth of the plaque bacteria can cause periodontal disease.

Plaque/calculus accumulation (simplified assessment):

0. No plaque/calculus. Clean tooth with no plaque/calculus, not even along the gingival margin.
1. Mild plaque/calculus. Plaque/calculus mostly along the gingival margin.
2. Moderate plaque/calculus. Plaque/calculus covering up to half of the tooth crown.
3. Advanced plaque/calculus. Plaque/calculus on more than half of the tooth crown.



- 2.1. Clean teeth, no plaque or calculus
- 2.2. Plaque/calculus along the gingival margin with mild gum inflammation

- 2.3. Plaque/calculus up to half of the crown with gum inflammation
- 2.4. Plaque/calculus on more than half of the crown with gum inflammation

While (especially early) plaque can be removed by brushing, calculus cannot be eliminated by rinsing or brushing. Only professional scaling and polishing under general anaesthesia provide adequate treatment, especially below the gum line, where it is most important for the plaque and calculus to be removed.

3. Inflammation

An inflammation of the gum (periodontal disease) is a reaction to bacterial irritation. In early stages, this inflammation is limited to the gum (gingivitis). If gingivitis is not treated, it usually progresses to affect other tooth supporting structures (periodontitis).

Any inflammation has to be treated professionally under general anaesthesia to remove the cause – bacterial plaque. If treated in early stages (gingivitis), the disease is completely treatable (reversible). Once the disease progresses to periodontitis it becomes an irreversible problem. Although recovery is not possible anymore in this situation, further progression can be delayed with professional treatments.

Visual assessment of periodontal disease: Please note this is only a visual classification. A detailed diagnosis can only be made after thorough examination and dental x-rays under general anaesthesia.

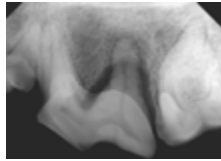
- 0. Normal/healthy. The gum has a natural rose colour. In some dogs dark pigmented spots can exist and are considered normal.
- 1. Gingivitis. Inflammation of the gingival margin showing a small red line along the gum. This situation is reversible, full recovery is possible.
- 2. Moderate periodontitis. Gingiva is inflamed and red, it may bleed if touched. Mild gum recession may be noted, indicating loss of the tooth attachment. This situation is irreversible and the loss of the tooth is likely in the future.
- 4. Advanced periodontitis. The gum and the alveolar bone have recessed to expose the roots of the teeth as a result of severe inflammation. This situation is very painful and has to be treated urgently. Extractions of the teeth can be expected.



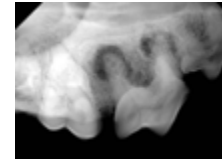
- 3.1. Normal healthy gum
- 3.2. Gingivitis
- 3.3. Moderate periodontitis
- 3.4.-5. Advanced periodontitis

Please note

It is important to perform a professional examination as not every situation is as it looks at first sight.



3.6+7. Seemingly harmless “slab” fracture of upper carnassial tooth with advanced alterations beneath the gum line



3.8+9 Visually intact crown of an upper carnassial tooth with advanced alterations around the apices of the roots.

4. Occlusion

Normal Occlusion

- Upper and lower jaws are of corresponding lengths:
- Lower canine teeth fit into the (middle of) the gap between the upper canine teeth and third incisor teeth.
- Upper incisor teeth are all positioned in front of (rostral to) the lower incisor teeth but in contact with them.
- The crown cusps of the premolar teeth fit into the gap formed by the crowns of the teeth of the opposite jaw (forming a zig-zag line).



4. 1. Normal occlusion

A malocclusion is any deviation from the normal occlusion and it can be a result of an abnormal positioning of a single tooth or some teeth, or it can be a result of the abnormal lengths or positioning of the jaws.

Malposition of a tooth or teeth

A displacement of a single tooth or some teeth most commonly affects canine teeth (e.g., “base narrow canine teeth”, “lanced canine”), incisor teeth (anterior crossbite) and upper carnassial teeth (posterior crossbite). The most common causes are:

- Persistent primary teeth
- Breed predisposition
- Genetic
- Trauma to the developing tooth bud

Displaced teeth may cause severe discomfort or even damage: the lower canine teeth may damage the hard palate, while posterior crossbite may hinder biting activity. Diagnosis and treatment early in the animal’s life, as soon as trauma from the malocclusion is noted, are essential. The treatment options vary from extraction of the tooth or teeth causing trauma, to shortening of the crown and treating the exposed pulp, or movement of the displaced tooth with an orthodontic device.



4.2. Displaced lower canine tooth ...



4.3. .damaging the hard palate



4.4. Reduction of the crown with treatment of the pulp and restoration of the tooth

Mandible (lower jaw) too short

A too short mandible (mandibular distocclusion, class 2 malocclusion) may cause pain and/or discomfort and severe oral pathology:

- The mandibular canine teeth usually cannot erupt into the correct position and are likely to damage the hard palate
- The mandibular incisor teeth may damage the hard palate
- Diagnosis and treatment early in the animal's life are essential.

Please note

- Class 2 malocclusions are hereditary and animals suffering from it should not be used for breeding
- Mandible and maxilla do not grow simultaneously but in non-parallel steps. If the mandible is only slightly too short it may catch up with the next growth period, unless dental malocclusion mechanically prevents its' normal growth



4.5. Lower jaw shorter than upper jaw

Mandible (lower jaw) too long

A too long mandible (mandibular mesiocclusion, class 3 malocclusion) may cause pain and/or discomfort and severe oral pathology:

- An incorrect interdigitation may hinder biting action
- Upper incisors are likely to damage the gingiva or teeth of the mandible
- Diagnosis and treatment early in the animal's life are essential.

Please note

- Class 3 malocclusions are hereditary and animals suffering from it should not be used for breeding
- Class 3 malocclusion is standard in some breeds (e.g. Boxers)
- The main goal of the treatment of class 2 and 3 malocclusions is the comfort of the patient. The treatment options vary from extraction of the tooth or teeth causing trauma, to shortening of the crown and treating the exposed pulp, or movement of the tooth or teeth with an orthodontic device.



4.6. Lower jaw longer than

5. Fractured tooth

Intact tooth

An intact tooth has a smooth surface named enamel. This layer is very hard and resistant to environmental influences. The thickness of the enamel is less than one millimeter. When a piece of tooth is breaking off the enamel is usually entirely removed and the dentine is exposed.



5.1. Intact canine tooth

Uncomplicated fracture

In an uncomplicated fracture the pulp is not exposed, only the dentine. This situation misleads to the estimation that it would be harmless. This is a false conclusion: injured dentin is painful and bacteria may penetrate through its tubules and cause an infection of the pulp which is also very painful. The proper treatment is a thorough examination and sealing off the broken site immediately. The tooth should be monitored in the future as well, as blunt trauma to the tooth may always result in tooth death.



5.2. Uncomplicated fracture

Complicated fracture

In a complicated fracture the pulp is exposed. Treatment of a complicated fracture is mandatory. A fresh fracture is bleeding and needs immediate (within 48 hours) treatment, if we want to try and save the tooth alive. An older fracture does not bleed anymore, treatment is necessary within short time.



5.3. Fresh complicated fracture



5.4. Old complicated fracture

Please Note

- Any tooth can break. It is therefore important to always examine all teeth, although the canine and the carnassial teeth are the ones most likely to fracture.



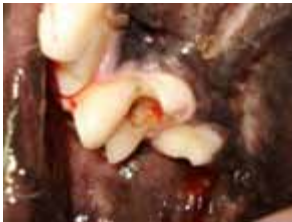
5.5. Uncomplicated crown-root ("slab") fracture of a carnassial tooth



5.6. -7 Complicated crown-root ("slab") fracture of a carnassial tooth



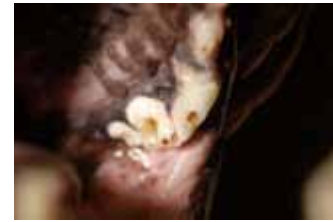
- Some situations can lead to confusion as they look like a fracture:
 - Caries: is very rare in dogs and usually occurs on the back premolar and molar teeth; needs treatment
 - Reparative (tertiary or reactionary) dentine: the pulp repairs abrasion with brownish dentine ("rock chewer")



5.8. Caries



5.9. Tertiary dentine



Fracture of a primary tooth

Fractures of primary teeth must be treated immediately. It is a painful condition. Also, if no adequate treatment is performed bacteria invade the pulp, penetrate into the alveolar bone and cause an infection of the tissue which may damage the developing tooth bud of the permanent tooth. This may lead to enamel defects or even malformation of the whole permanent tooth.



5.10. Fractured primary canine tooth



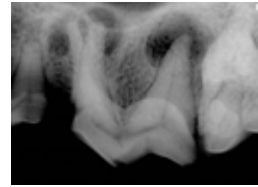
5.11. Enamel defect after infection of the tooth bud

Please Note

- Any tooth can fracture, examine the entire oral cavity.
- A fresh fracture is very painful and is an emergency. It needs immediate treatment either by extraction or root canal filling (partial or full).
- Every fracture has to be treated.
- It is important to perform a professional examination as not every situation is as it looks at first sight.



5.12. Uncomplicated fracture of upper carnassial tooth affecting crown and root of the tooth with moderate alteration of the gingiva



5.13. Dental x-ray showing severe alterations around all three roots

6. Persistent primary teeth

Before the permanent tooth erupts in the right place, the root of the primary tooth is gradually resorbed until the primary tooth exfoliates. The permanent tooth follows the path of the primary tooth. If this process is disturbed and the primary tooth does not get resorbed and stays firmly in its place, the permanent tooth will erupt besides the primary tooth.

Most likely situation:

- The upper canine tooth erupts in front of the primary tooth, which results in a narrow gap between the upper canine tooth and third incisor tooth. This may not allow the lower canine tooth to get into the gap (normal interdigitation).
- The lower canine tooth erupts lingually (more towards the tongue) of the primary tooth and can cause severe damage to the hard palate.

The primary tooth has to be extracted as soon as the permanent tooth is visible.

Please Note

In some breeds persistent deciduous (milk, primary) teeth are very common without causing any disorders in occlusion, but the teeth involved are prone to periodontal disease as a result of teeth crowding leading to food impaction.



6.1. The upper permanent canine tooth erupts in front of the pointed milk tooth



6.2. The permanent lower canine tooth erupts on the lingual side of the milk tooth



6.3. Food impaction between primary and permanent teeth