



## Malocclusions and Orthodontic Treatment

A malocclusion is an abnormal alignment of the teeth, also called an abnormal bite. Malocclusions can be harmless, or they can be a problem for your pet when there is abnormal tooth-to-tooth or tooth-to-soft tissue contact. This tooth-tooth or tooth-soft tissue contact can cause pain and long-lasting side effects that have a negative impact on your pet's health unless the malocclusion is addressed.

A malocclusion can involve one or many teeth, and can be due to genetic causes, trauma, tumors or infections that cause teeth to erupt abnormally, as well as baby teeth that fail to fall out. Breed differences in skull shape or changes in jaw length can lead to crowding and rotation of teeth that are common for a breed, but cause damage to the teeth and soft tissue. When malocclusions are caused by skeletal deformity and abnormal jaw length, this is considered genetic, and affected animals should not be bred.



This is a type II malocclusion in a dog- the lower jaw is shorter than the upper jaw by about 1 inch.

In order to correct an occlusion, multiple factors must be taken into account, including the type of malocclusion, whether it is genetic or acquired, and your pet's overall health status. Sometimes the bite can be returned to normal, but our main goal is always to have a pet with a comfortable and functional mouth, even if their bite is still slightly abnormal.

Treatment options vary for each type of malocclusion. Some of the various treatment options include extraction of the offending tooth or teeth, removing the crown of a tooth and performing

endodontic therapy in order to prevent the tooth from causing trauma, and using orthodontics to move the tooth into the correct position.

When the malocclusion is present in young puppies or kittens with all primary (baby) teeth, interceptive orthodontics can be performed. This is the selective extraction of the primary teeth in abnormal occlusion to allow the maximum amount of growth genetically possible. Extraction of the teeth may not completely correct the problem, but it will alleviate the pain associated with abnormal contact until the permanent (adult) teeth erupt. When the adult teeth are in place, further treatment may be needed depending on the type of malocclusion.



There are 5 baby teeth present in this dogs mouth that shouldn't be there, causing malocclusion, crowding and plaque accumulation.

## What are the types of malocclusions?

**Individual rotated teeth (class 1 malocclusion):** In these patients, their jaws are the normal shape and length. However, one or more teeth have erupted in a position that is leading to a problem. This may be an incisor tooth at the front of the mouth causing a “cross-bite”. These cases tend to have a good long-term prognosis without treatment. An example of this type of malocclusion are **linguoverted (also known as base-narrow) mandibular canine** teeth. These can be caused by persistent deciduous (baby) teeth that prevent the tooth from erupting normally (see below for more information). In this case, significant trauma can occur to the upper jaw and teeth if the occlusion is not corrected.

**Mandibular distocclusion - Overbite** (class 2 malocclusion): the lower jaw (mandible) is too short. This is a genetic skeletal deformity. The short jaw can cause the mandibular canine teeth or incisors to traumatize the palate and gum tissue of the maxilla (upper jaw), causing pain and damaging the teeth.

**Mandibular mesiocclusion - Underbite** (class 3 malocclusion): the upper jaw is too short. This genetic skeletal condition may be normal for some breeds such as Boxers and Bulldogs, however it can cause abnormal contact of the maxillary incisors against the gum tissue of the mandibular incisors, and wear on the canine teeth and or incisors making abnormal contact and cause damage to the teeth and gums. The short maxilla also often results in crowded and rotated teeth, which can cause abnormal wear as well as rapid onset of periodontal disease.



This is a type III malocclusion in a dog- the lower jaw is longer than the upper jaw by about 1/2 an inch.

**Wry Bite** – (Class 4 malocclusion): In this case there is left-to-right asymmetry of the jaws, meaning that they may have an “open bite” where their teeth cannot fit together normally, and the upper jaw may look as though it is to one side or the other of the bottom jaw. This usually is caused by trauma when the jaws are growing, leading to different growth rates of the jaws.

## What are common causes of malocclusions?

**Retained primary (deciduous) teeth:** If a baby tooth fails to fall out, and is still present as the adult tooth erupts, a malocclusion will likely develop. This is probably the most common cause of malocclusions in dogs and cats. Primary teeth should shed before the permanent teeth erupt. The primary teeth cause abnormal crowding, forcing the permanent teeth into abnormal position. It is especially important to monitor permanent tooth eruption from age 4-7 months. Remember: “No two teeth should occupy the same space at the same time”!

Some breeds are more predisposed to having retained deciduous teeth, including Yorkshire terriers, Toy Poodles and other small breed dogs. In other cases, trauma to the baby tooth (such as breaking it during play) can lead to a tooth being retained. If there are retained primary deciduous teeth or the patient has deciduous lingoverted lower canines, extraction of the primary teeth (interceptive orthodontics) should be performed as soon as possible to try to correct the problem.



There are 6 persistent deciduous teeth present in this picture, causing several teeth to erupt in the wrong position.

**Genetics, Abnormal Growth:** If a dog or cat has a class II or III malocclusion, where the one jaw is shorter than the other jaw, most often this is due to a hereditary genetic trait. These dogs and cats should not be bred, and the breeder should be informed of the problem so they can avoid breeding the parents of the dog or cat in the future.

**Trauma:** Occasionally we see dogs or cats that had some form of head trauma when they were still growing. This can lead to a malocclusion if the jaw growth is malaligned, or if an individual tooth is damaged and erupts in a different position than normal.

## COMMON MALOCCLUSIONS

**Linguoverted or Base-Narrow Mandibular Canine teeth:** The most common form of malocclusion in dogs is where the lower canine teeth are traumatizing the upper jaw. This can be from retained baby teeth forcing the tooth to erupt more upright than normal (linguoverted), or due to a genetically short jaw. There are three ways to treat this condition, all aimed at relieving the trauma to the upper jaw. The first option is to extract the lower canine teeth. This is aggressive, and involves oral surgery to extract the lower canine teeth. This results in weakening of the lower jaw that will require your puppy to be kept away from playing with toys for 6 to 8 weeks after surgery to allow full healing. This does lead to a thinner, weaker, lower jaw in the adult dog. The second option is to perform a crown amputation and endodontic therapy to remove the source of trauma to the upper jaw. For more information on this, please see our website handouts on Endodontic Therapy and Vital Pulp Therapy. The third option is **orthodontics**, and is aimed at moving the tooth into the correct position. In very mild cases, this may involve ball therapy or recontouring the gingiva to allow the tooth to erupt in an atraumatic position. In other cases, we may recommend using an inclined plane or other orthodontic appliance to push the tooth into an atraumatic position over a period of weeks. This technique is the least invasive, involves the least amount of trauma, but does require several anesthetics to place and adjust the device to make sure the teeth are being directed into the correct position.



This dog had linguoverted mandibular canines that are being moved into their appropriate position using an orthodontic appliance called an inclined plane, which wraps around the upper teeth.

**Rostroverted (Lance) canines:** the maxillary (upper) canine teeth sometimes erupt horizontally, causing the tip of the crown to point forward rather than down. This is most commonly seen as a genetic defect in Shetland sheepdogs, Italian greyhounds, Fox terriers and miniature Schauzers, though it can occur in any breed as a result of a persistent baby tooth. Not only can this result in periodontal disease and abnormal wear of the teeth, but it can also cause lip trauma and a malocclusion of the lower canine. Treatment options include extraction of the tooth, crown amputation and endodontic therapy, as well as orthodontics to move the tooth into its correct position.



This dog has a persistent upper deciduous canine tooth, causing the permanent tooth to erupt in a forward position, called lance canine.

**Anterior crossbite:** In these patients, the upper incisors erupt behind the lower incisors instead of in front of the lowers. This creates a “reverse scissor” bite but is usually comfortable. If it is due to a tooth problem, it can be corrected by an **orthodontic appliance** if necessary. If it is a jaw problem, correction should only be attempted if there is pain or damage to teeth or soft tissues. Orthodontic correction may be a lengthy and involved process, and animals with genetic malocclusions should be neutered.

**Posterior cross bite:** the upper fourth premolar occludes inside the lower first molar, reverse of the normal position. This is most common in collies. Correction of this defect is very difficult and is usually not necessary as the teeth function properly in their new alignment.

**\*\*An important note about orthodontic correction. \*\*** Movement of teeth is a procedure that requires proper materials and a degree of expertise in dentistry. Improperly applied orthodontic devices can cause more harm than benefit, and permanently damage the teeth and gums. Orthodontic correction should never be undertaken without a thorough bite evaluation and an understanding of the type of tooth movement and appliance needed. In addition, it is unethical to show a dog after orthodontics has been performed to correct a genetic malocclusion. If you have any questions, please feel free to discuss these with us at your consultation.