

Equine Power Dentistry II

Basic Procedures and Equipment

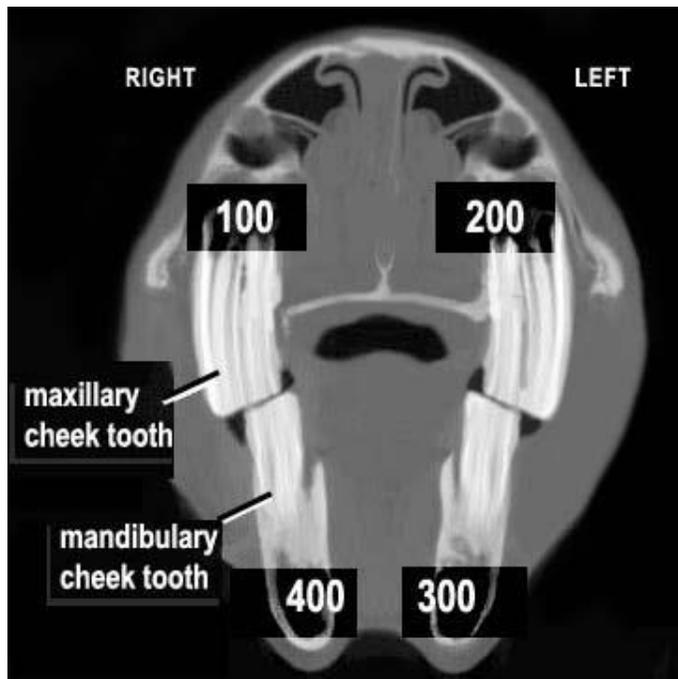
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Introduction

Floating is a term used in carpentry where it means to smoothening a surface. In equine dentistry we use the term to describe the grinding of sharp enamel points of cheek teeth. Routine procedures may also include the work on the biting surface of abnormally shaped cheek teeth or incisor teeth.

Historically floating was done with hand instruments– and often by lay dentists. Today we have new compact instruments that make the procedures much easier, more enjoyable and financially interesting for the veterinarian. Along with the development of these more practical instruments we see that veterinarians are increasingly interested in performing routine equine dentistry.



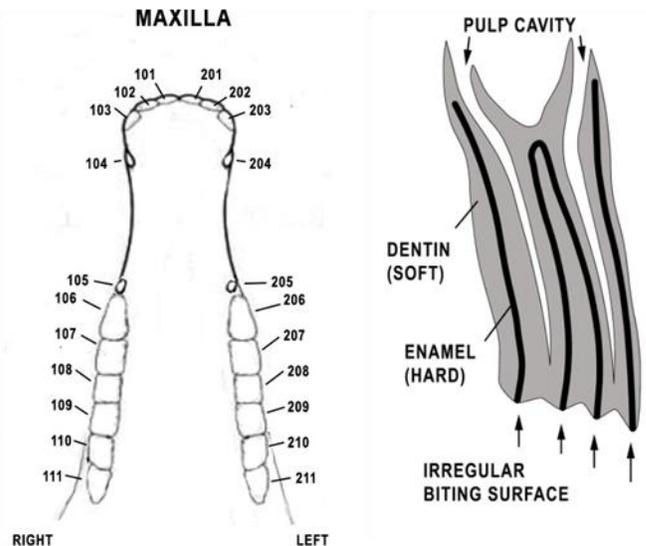
CT picture of a normal equine skull

Anatomical basis

Horses have in each quadrant of their mouth three incisors, a canine (especially well developed in male horses), optional a wolf tooth (mainly in the upper arcade), and with three premolars and three molars a total of six large cheek teeth. The canines, wolf teeth and molars do not have deciduous precursors, while the incisors and premolars do. In order to identify each tooth accurately it is easiest to use the Triadan System. Each quadrant is assigned a base number; upper right 100, upper left 200, lower left 300, and lower right 400 (see picture 1). When describing deciduous teeth the number increases by 400, ie 500/600 etc. Then each tooth has a number assigned starting with the first incisor as #01 etc. For instance, the last upper left molar is the tooth # 211

The Horses teeth are anisognathic, which means that the upper jaw is wider than the lower jaw and the biting surface is angled by about 15 degrees. During mastication, horses grind food mainly by moving their jaws to the side until the

upper and lower arcade reach contact. We know that there is more grinding action with roughage (hay, grass), and more crushing action with concentrated feed such as grain.



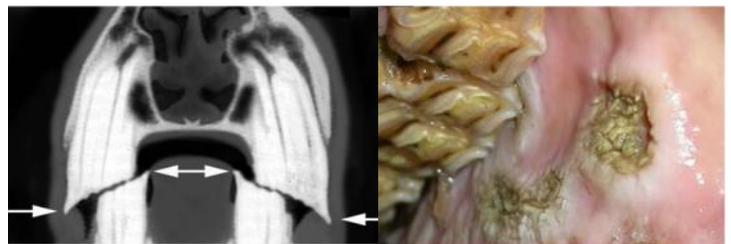
Triadan numbering maxilla (L) and cross section of a cheek tooth with irregular biting surface

The constant grinding of feed results in attrition or wear of the tooth surface, and the lost tooth is replaced by constant eruption of equine teeth. Teeth are composed of cementum, dentin and enamel, three materials with different hardness which ensures an irregular grinding surface of the tooth despite constant attrition. The irregular biting surface is important to accurately grind the feed.

Basis for dental pathologies

Theoretically every tooth in a horse's mouth that grinds well against an opposite tooth should not show pathologies of wear. However, horses with inadequate alignment and wear show signs of dental overgrowth.

Most commonly we see sharp enamel points on the buccal aspect of upper cheek teeth and the medial aspect of lower cheek teeth. Insufficient lateral

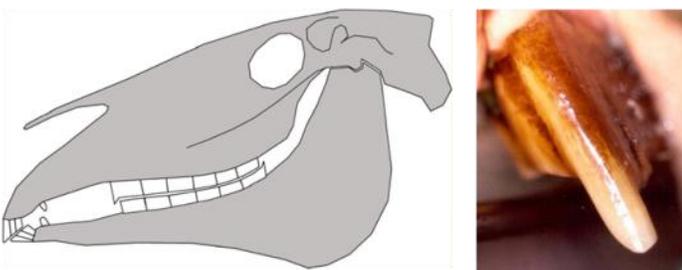


Sharp enamel points (arrows) on buccal side of the upper jaw and mucosal scars due to sharp points (R)

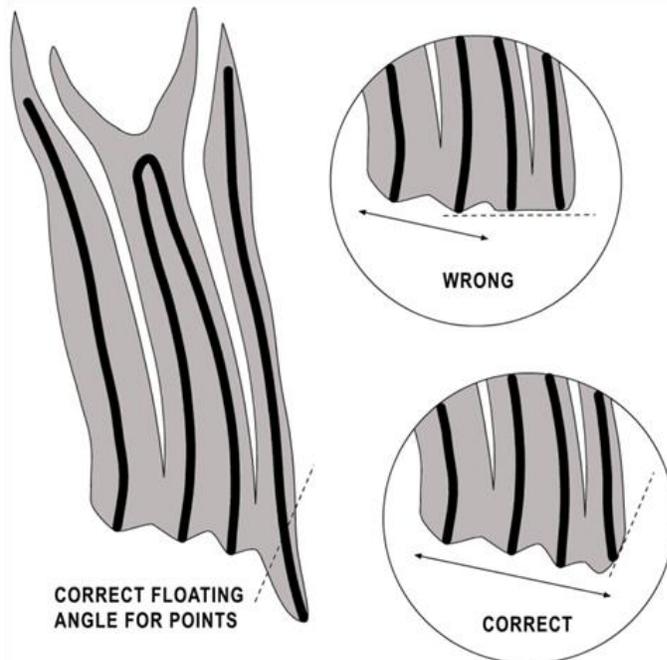
grinding action due to concentrated diet or reduced daily eating time are some of the factors that contribute to the development of those points. These points, if severe enough cause painful mucosal damage on cheek or tongue.

Affected horses may show any of the classical signs of dental disease: slow eating, drooling, quidding, fighting the bit, head shaking, weight loss and even choke and colic.

On to caudal – rostral (mesial) aspect of cheek teeth we often see hooks on 106/206 and 311/411 (picture 3) although the opposite arcades can be affected as well. Usually a misalignment is the reason for these sharp hooks and over-biting incisor teeth are seen in many of these horses as well.

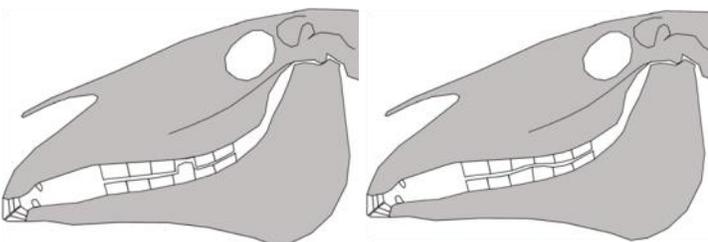


Hooks on the first and last cheek teeth (L) and severe hook formation of 206



Floating angle for sharp enamel points on cheek teeth

Absent cheek teeth over time will lead to step formation by an overgrowth of the opposite cheek tooth. This is most commonly seen in older horses with missing teeth or after a surgical removal of a cheek tooth. The clinical signs of horses with a step mouth are the similar to the one caused by sharp enamel points although it is usually a less painful condition and more affecting the riding of the horse.



Step mouth (L) and wave mouth (R)

A wave mouth is caused by several long cheek teeth with shorter counterparts. We see this formation often with short 109/209 and longer 3/409 (see picture 9). The 1/209 are the first molars and without deciduous precursors the first permanent teeth to erupt. As the oldest teeth in a horse's mouth they show most wear and have a tendency for wave formation. The clinical significance of waves is disputed, and likely not very significant although severe waves are often associated with secondary problems.

Treatment principles

The goals of routine equine dentistry procedures are to achieve a balanced, symmetrical occlusion, to correct malocclusions and to prevent future pathologies. This should be done in a gentle way for the horse and by preventing injuries to the horse and the veterinarian.

The treatment approach is relatively easy: Sharp points, long hooks and steps are reduced using a grinding instrument.

Before the introduction of power instruments these procedures had to be performed with hand instruments. This was a strenuous work that often resulted in

incomplete results (for long hooks or steps), injuries of the horse (cuts on mucosa) and frustrated veterinarians (hard work and poorly paid).

Today it is much easier to perform the procedures using power instruments. However it is also easy to overfloat and cause more harm than benefit for the horse. A few treatment principles have to be respected:

- Leave as much grinding surface as possible
- Do not smoothen the irregular grinding surface
- Do not open a pulp cavity
- Do not cause soft tissue damage
- 'Less is more'

It is important to leave as much of the grinding surface as possible. When grinding sharp enamel points the instrument should grind mainly on the buccal side or lingual side in an angle of about 45 degrees (see picture 9). If ground from the occlusal surface the procedure will leave a smooth surface and reduced grinding area which negatively affects the grinding capability of a horse's teeth.

Hooks or steps should be corrected in more than one session over the period of several months to a year in order to avoid accidental opening of a pulp cavity. This is especially important in young horses with longer pulp cavities.

When correcting a wave mouth, it is recommended to work only on the longer teeth (in the example above, the 3/409) and not to attempt flattening both arcades. This would result in a gap between the arcades which requires incisors reduction or this gap inhibits a horse from accurately grind the feed.



Using the Swissfloat for floating sharp enamel points on cheek teeth

Instrumentation

It is essential to perform a thorough examination, which requires a properly restrained horse, a full mouth speculum and a light source. A powerful flush system and a dental mirror are great accessories. Most veterinarians agree today that powered instruments are indispensable for proper dentistry treatment. Their use is effortless, they are faster and more accurate to use and they are less traumatic for the horse. Good hand floats have very sharp blades and it is not uncommon to create accidental mucosal damage which causes unpleasant bleeding and pain for the horse. In addition it is hard to float partially



Swissvet full mouth speculum for manual examination

loose teeth from older horses with hand floats. However hand floats will always have their place in equine dentistry and they are great instruments to finish up a case or to float minor lesions in younger horses.

There are several full mouth speculums on the market with advantages and disadvantages. The choice depends on personal preference. It is important to use a high quality speculum that is easy to open and that does not fail while the operator has a hand or an instrument in the horse's mouth. One-sided mouth gag are no longer recommended since they have the potential of cheek tooth fracture and they put stress on the TMJ (temporo mandibular joint).

A good light source that illuminates the oral cavity is important for examination, client education, treatment and picture recording. There are a large number of

specialty lights on the market, with a wide range of prices. However most department stores carry very powerful LED head lamps for recreational purpose today and these lights are very affordable and usually sufficient for an everyday use in equine practice.

Over the last decade several good power instruments have been introduced. There are two groups of instrument, compact and advanced instruments. The advanced instruments use various hand pieces for different applications, and



Routine dentistry using a cordless Swissfloat

usually have a motor and a flexible shaft. These instruments are great for advanced dentistry but they are expensive and too complex for a routine application.

The compact instruments such as the Swissfloat have a motor with grinding shaft and little advanced options. They are easy to use, fast and very gentle for the horse. The Swissfloat in particular is very durable, it has no daily maintenance with a water resistant head and belt drive, and it is available conveniently in a corded or cordless version. It is the ideal instrument for routine dentistry for an equine or large animal practitioner, but also the work horse for advanced users – and for many veterinarians it is the best money maker in their practice.

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