ROSSDALES
VETERINARY SURGEONS

Dental Anatomy and Routine Dental Care

As with other adult mammals the horse has four distinct types of teeth – incisors, canines, premolars and molars. The surface of the teeth in contact with the opposing ones is known as the occlusal surface.

Horses are hypsodont animals, which mean that their teeth continually erupt throughout their lives and worn away by grinding feed material at their occlusal surfaces. Therefore, each horse has both an erupted clinical crown and un-erupted reserve crown.

The teeth are composed of an irregularly formed laminate of different tissues - dentin, cementum and enamel. These tissues wear at varying rates, ensuring the occlusal surface of the teeth is irregular and rough, which helps to increase the efficiency of grinding feed materials.

The teeth have one or multiple pulp cavities containing the veins, arteries and nerves. The sensitive structures of the pulps are sealed from the mouth by a layer of protective dentin, giving them a shiny black appearance, which can be seen on the occlusal surfaces of the teeth. If this is damaged or removed by excess rasping then the sensitive structures of the tooth can be exposed potentially leading to clinical disease.

INCISORS

The horse has 12 incisors, all of which have a deciduous counterpart (milk teeth), which erupt and are then shed as the permanent teeth begin to emerge, at varying ages (Table 1). They are mainly used, along with the lips, to manipulate feed materials. Routine dental work is not usually necessary for the incisors, but their position at the front of the mouth predisposes them to trauma, from kicks or play with inanimate objects. The varying eruption times of the teeth can provide an estimate of the age of the horse.

CANINES

Male horses more often have canine teeth compared to females, and usually erupt between 4 and 6 years of age. When present the canine teeth are never usually in occlusion and it is believed this is why they are prone to developing calculus, which is often observed as a thickening at the base of the tooth. The canines have a very wide pulp cavity, sometimes positioned close to the occlusal surface. The only routine dental care that they usually require is removal of the calculus build up at their base.

WOLF TEETH

First premolars (wolf teeth) are simple teeth, like our own teeth, with small or absent roots and no deciduous precursor. They are sometimes displaced into the bitting area, and may cause painful interference with the bit when under ridden work. For this reason, wolf teeth found in such positions are often removed to prevent problems when ridden with a bit.

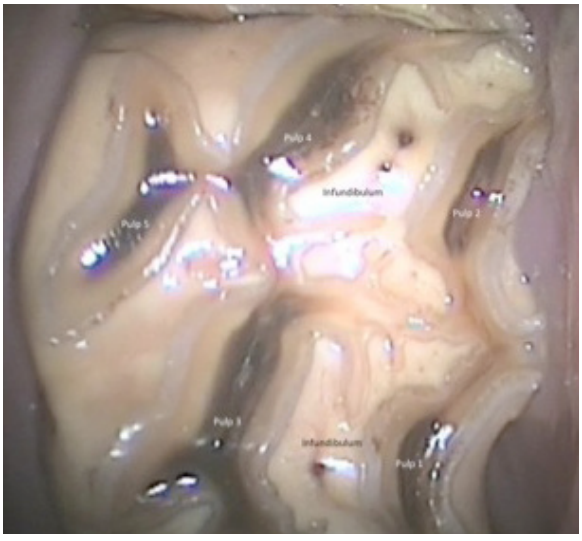

Figure 1: The occlusal surface of one of the upper cheek teeth.

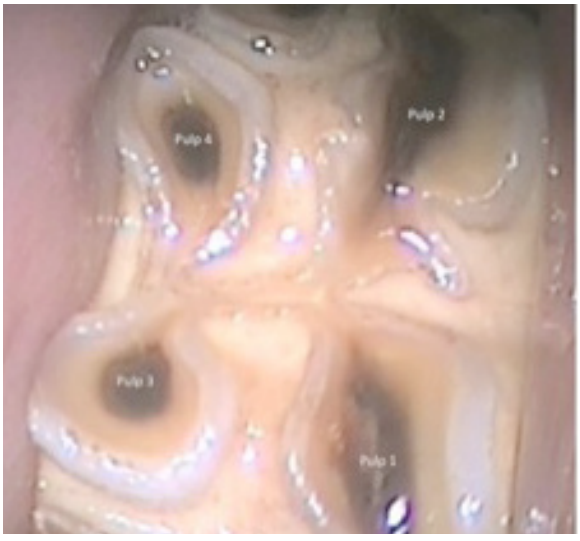

Figure 2: The occlusal surface anatomy of the lower cheek teeth.

Eruption times of the equine incisors and cheek teeth		
Tooth	**Deciduous/ Milk Eruption**	**Permanent Eruption**
Central incisor	0-1 week	2.5 years
Lateral incisor	2–4 weeks	3.5 years
Corner incisor	7–9 months	4.5 years
First cheek tooth	2–8 weeks	2.5 years
Second cheek tooth	2–8 weeks	3 years
Third cheek tooth	2–8 weeks	4 years
Fourth cheek tooth	–	1 years
Fifth cheek tooth	–	2 years
Sixth cheek tooth	–	3.5 years

CHEEK TEETH

The horse usually has 24 cheek teeth, with 3 premolars and 3 molars in each quadrant of the mouth. Like the incisors, the premolars all have deciduous counterparts (caps) present at varying ages, which are shed with advancing age. The cheek teeth erupt at varying angles, with the front ones having their clinical crowns tilting backwards and the back teeth tilting forward. The remaining teeth tend to erupt vertically. The angulation of the teeth acts to compress the occlusal surface into one functional grinding unit, and prevent the formation of gaps between them. The outside aspects of the upper cheek teeth have vertical ridges (cingula or styles) with two deep grooves between them.

The occlusal surface is irregular, with cusps forming pronounced elevations of thicker enamel. Interconnecting cusps may form linear transverse ridges on the surface and they have adjacent craters and fissures. The resulting irregularity increases the occlusal surface available for chewing. The cheek teeth rows tend to be curved on their occlusal surface, with the back teeth curving upwards to form the Curve of Spee, which needs to be accounted for when rasping the teeth routinely. Some horses also have an upward curving of their front cheek teeth. The occlusal surfaces of the cheek teeth are usually angled 15-35° from higher on the inside to lower on the outside. The upper cheek tooth row is positioned wider than the lower ones, and in some horse the upper cheek teeth rows are positioned further forward than the lower ones.

The first 2-3 upper cheek teeth are positioned with their roots within the bones of the face; therefore, infections extending to the roots may result in abscesses seen as firm facial swellings. Likewise, all of the lower cheek teeth are positioned in the bones of the jaw, and similar disease may lead to swellings underneath the jaw. The remaining cheek teeth usually have their roots positioned in the sinus compartments of the head. Infection of these teeth will, therefore, often lead to infection of the sinus compartments (sinusitis) with an associated nasal discharge.

ROUTINE DENTAL CARE

The horse uses it cheek teeth to grind food in nearly a 'figure-of-eight' circular motion, which when eating long-fibred forage means the entire occlusal surface of the teeth is used. Feeding concentrate foodstuffs provides many of the horses' daily nutrients in a form that requires much less chewing and grinding than forage. The domesticated horse, therefore, spends much less time chewing and wearing down their cheek teeth than their wild counterparts and ancestors. As a consequence of this, and the natural position of the teeth, this often leads to overgrowths of the outside of the upper teeth and the inside of the lower teeth As they become sharp, they can traumatise the cheeks and the tongue, and if they become large enough they prevent regular circular motion of the teeth, thus exaggerating the problem. These overgrowths can cause a number of problems in the mouth, including cuts and ulcers of the cheeks and tongue, which can be painful when eating and when ridden. It is these overgrowths that are routinely reduced every 6-12 months.

Figure 3: Sharp overgrowths on the outside of the upper cheek teeth and the inside of the lower ones.

Figure 4: Overgrowths at the front of the first upper cheek teeth and at the back of the last lower cheek teeth are known as hooks.

As mentioned previously, the upper cheek teeth are sometimes positioned further forward than the lower ones, inevitably leading to the formation of overgrowths at the front of the first upper cheek teeth and at the back of the last lower cheek teeth. These are known as hooks and are also reduced during routine rasping of the teeth.

When shedding their caps many horses will experience some discomfort as the tooth becomes loose and the attachments to the surrounding tissues are lost. In some instances, these caps can be removed using forceps to alleviate the discomfort.

IN SUMMARY

The inherent anatomy and the management and feeding methods utilised to ensure the modern horse is performing adequately, mean that routine dental care is mandatory to prevent the formation of painful overgrowths. Additionally, regular dental examination may help in the identification of other disease and problems as soon as possible.